

# FORECAST NL

Charting a Course for  
Newfoundland and Labrador's  
Climate, Economy, Society

FINAL REPORT

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# Overview

In February 2021, the Leslie Harris Centre of Regional Policy and Development launched the Forecast NL initiative, a province-wide public-dialogue process that provided a neutral platform to discuss ideas and solutions to create economic and social prosperity while mitigating and adapting to climate change. The project was designed to engage a wide range of participants – from academia, industry, community, government, and the public – in a balanced discussion regarding the climate, economy, and society of Newfoundland and Labrador.

The structure and topics for the initiative were informed by a Steering Committee comprised of former industry and government leaders, academics, and community experts. Additionally, the initiative created a Citizen Forum - a demographically representative group of citizens (self-nominated and selected by the Steering Committee) - tasked with participating in the discussion series, providing ongoing feedback to help identify knowledge gaps, key areas of concern, and formulate recommendations for actions.

This report outlines the process of establishing the initiative while highlighting the outcomes from panel discussions and providing a summary of the recommendations from the Citizen Forum.

## Highlights

- Over the course of the project a total of 10 panel sessions were held (in addition to one introductory session), with over 30 expert panelists, focusing on different topics related to the impacts of climate change on NL's economy, society, and environment.
- Overwhelmingly, discussions with the Citizen Forum members and expert panels identified a need for local solutions. While climate change is a global issue, it will impact NL (and different parts of the province) in unique ways; as such, information and strategies are needed that consider the local context.
- Local capacity to respond to climate change impacts was a predominant theme throughout all of the Forecast NL discussions. Devising effective mechanisms to build local capacity and enable action at the community-level will be critical to the success of any federal- or province-level adaptation initiatives.
- The discussions undertaken during the Forecast NL initiative also highlighted the tremendous opportunities that current conditions present for NL, especially related to the abundant supply of renewable energy.
- To assist in planning and analyzing local infrastructure risks, expert panelists identified the need for wide availability of climate projections for local areas, as well as increased research and data on the impacts of climate change and climate change response for specific sectors such as the fisheries and agriculture.
- A key overarching theme identified through the Forecast NL discussions was the need for a social lens to be considered when creating and implementing all climate-related policies.
- The need for Indigenous inclusion and leadership was identified early in the discussions and continued to resurface as critical throughout the process.

## Background

Newfoundland and Labrador is a province sustained by natural resources, with a culture and society intricately tied to the land and ocean. The province covers diverse environmental systems, from the island of Newfoundland, to the Northern climate of Labrador, which has been at the frontlines of a changing climate for decades. The health and well-being of citizens and communities, as well as the strength and survival of major industries, depends on the health of our natural environment.

When the Forecast NL project was first conceived (2020), Newfoundland and Labrador was facing a series of pressing economic and social issues with both short and long-term consequences: substantial provincial debt, increased by the fiscal dependence on declining revenues from oil and gas and by the unexpected additional costs of Muskrat Falls; a declining and aging population; and the local and global effects of the COVID-19 pandemic and subsequent public health responses. At the same time, the province was contending with concerns over a deepening global climate emergency, driven by the consumption of the same fossil fuels that support the provincial economy and bringing anticipated impacts on oceans, coastal areas, health, and infrastructure in the province, as well as the long-term economic prospects of global oil markets. Together, these factors presented a complex and serious challenge for citizens and policy makers. The conflicting priorities over which crisis was more immediate, or what actions needed attention and investment first, created significant tension in the public discourse. While the world was moving to take climate measures seriously, the conversation in NL was often framed as an essential conflict between economy and environment; that is, that global efforts to address climate change directly jeopardize the ability of a petroleum producing province to address their financial challenges.

ForecastNL was conceived as an alternative to these overly simplistic (and potentially harmful) perspectives, and an opportunity to ask more complex questions: how can a jurisdiction facing such large economic challenges move away from economic dependence on the oil and gas industry? What economic risks are posed by a continued (or even increased) reliance on fossil fuels, either in the short- or long-term? How can a place so inherently tied to the health and sustainability of the land and sea, and already experiencing severe effects from climate change, particularly in Labrador, not take significant steps to both mitigate and adapt to climate change?

There has emerged overwhelming agreement among researchers that, if not addressed, current projections for our warming climate in the province will likely have devastating impacts on our natural, social, cultural, and economic systems.

## Project Overview

As noted, Newfoundland and Labrador's culture and economy is closely linked with the natural environment; aside from the health and well-being of citizens and communities, the strength and survival of the fishing, farming, forestry, and tourism industries are all reliant on the health of the land and ocean.

For the last 20 years, the provincial economy has benefitted from its heavy reliance on the continued development of the oil and gas industry. While the call to diversify the economy has always been there, it has become even more necessary considering the climate crisis. The global push toward renewable energy and lowering carbon emissions, combined with the instability of global oil prices, has created an economic incentive to look to innovative solutions. Aside from the environmental and social obligation to reduce the province's own carbon footprint, the environmental, social and economic sustainability of the province rests on the ability to transition to a greener economy in the long-term.

# Project Implementation

To ensure the independence and relevance of the project, three groups were established in addition to the Harris Centre's Project Team.

### **Steering Committee:**

The project brought together a group of thoughtful and experienced individuals to help direct the project and recommend key themes, topics and presenters to be included in the initiative's programming. This committee was comprised of both academics as well as former industry experts. The Steering Committee met regularly throughout the project and was directly involved in selecting the topics, as well as the panelists for each of the sessions. The full list of Steering Committee members can be found in the appendix.

### **Knowledge Mobilization Committee:**

The second group established was a Knowledge Mobilization Committee of local organizations, industry and government representatives. The intention of this group was not to meet regularly, but rather to be a resource for the Steering Committee to suggest panelists, as well as resources and information as the project unfolded. This group was an integral component for sharing information amongst key stakeholders related to climate change in the province. The full list of organizations represented on this component of the project can be found in the appendices.

### **Citizen Forum:**

The Citizen Forum was established by selecting a group of individuals from a self-nomination process. A total of 45 citizen representative positions were originally planned (based on one representative from each of NL's 40 electoral districts and 5 Indigenous groups, including the Innu Nation, Miawpukek First Nation, Nunatsiavut Government, Nunatukavut Community Council, and Qalipu First Nation). Applications were reviewed and selected based on demographic variability (gender, age, location, occupational and educational backgrounds).

While over 175 citizens applied to participate, there were no applications from several regions and some Indigenous groups. The Harris Centre worked to fill any gaps in the Citizen Forum composition throughout the first six months of the project and ultimately there were 38 regions represented and 4 Indigenous groups.

## Engagement Activities

### Online Discussion Platform

The project was housed through an online engagement platform that allowed users to view recordings of sessions, make comments in discussion forums, share useful materials with one another, pose questions to the project coordinators and expert panelists, suggest topics for future sessions, and view the content provided by the site administrators.



While the interactive features are no longer available, all information and documents that were housed on the online portal are currently available on the Harris Centre website at <https://www.mun.ca/harriscentre/what-we-do/public-policy/forecastnl/forecastnl-materials/>

# Panel Discussions

Over the course of the project a total of 10 panel sessions were held (in addition to one introductory session), with over 30 expert panelists, focusing on different topics related to the impacts of climate change on NL's economy, society, and environment. The project began with an introductory panel discussion outlining the project as a whole and introducing the many intersections of climate, economy and society. Following that initial session, another four sessions were designed by the Steering Committee to provide an entry point into each of the main areas of discussion (how NL's environment, economy and society will be impacted, as well as a specific session focused on the impacts of climate change in Labrador). From comments that emerged from these initial sessions, as well as roundtable discussions with the Citizen Forum, the topics for the remaining sessions were determined. These topics were identified as both requiring additional clear, accessible information, and necessitating discussion from multiple perspectives.

Each session had excellent attendance and consisted of a moderated panel discussion and audience Q&A. In addition to the live sessions themselves, recordings of the sessions were posted on the Harris Centre YouTube channel and continue to receive views. A partnership was also established with CBC Radio to have the panel sessions rebroadcast as part of the province-wide lunchtime show "Crosstalk" (now called "The Signal").

A summary of the sessions' titles, panelists and attendance numbers is included in the appendices.

A summary of the discussion that took place during each session follows.

## Topics Covered:

- Local Environment Impacts
- Overview of Economic Impacts
- Focus North: Climate Change in Labrador
- Overview of Social Impacts
- Future and Role of NL Oil & Gas Industry
- Impact on Oceans & Fishery
- Understanding Clean Tech Opportunities
- Role of Renewable Energy & Opportunities
- Impact on Communities & Infrastructure
- Impact on Food & Agriculture

# Climate Change in NL – Impacts and Actions

## Panel Discussion 1

Dr. Joel Finnis (associate professor with the geography department at Memorial University) began the session with an overview of what we currently know about how climate change is impacting the environment in NL. Dr. Finnis walked attendees through the latest temperature projections as well as projections for precipitation and storm events for both the island and Labrador. More details on the projections presented in this session can be explored in 2022 edition of Vital Signs, as well as on the Forecast NL website. The following is a summary of the main points of Dr. Finnis' presentation.

*“Climate change is posing challenges to environment, infrastructure, health, and economy in NL. We also bear an outsized share of responsibility for creating this problem. Fortunately, this means that the province also has an outsized (relative to our small population) to contribute to climate solutions – both by enabling lower-carbon lifestyles and economies, as well as by judicious approaches to oil & gas production (current and future).” – Dr. Joel Finnis*

- **Warmer Temperatures:** In summary, he stated that NL can expect warmer temperatures everywhere, in every season – four degrees Celsius in some locations, and two to 13 degrees for parts of Labrador in the winter. In the simplest terms, by 2050 Corner Brook's winter temperatures will resemble traditional St. John's winters, and by 2100 Nain's winter temperatures could resemble winter in St. John's as well.
- **Wetter Weather:** In terms of precipitation, Dr. Finnis explained that depending on the specific projection models used, what used to be a “one in 100 years” rain event will become a 25-year event or potentially a 10-year event. This will mean a much higher risk of heavy precipitation – about four to 10 times more likely – which will have significant impacts on flooding and infrastructure, as well as trickled-down impacts such as insurance costs on individuals.
- **Sea-Level and Storm Surge:** Dr. Finnis also outlined changes expected to sea-level rise and storm surges. An increase of 0.5m to 0.75m by 2100 in some areas. He explained that with a half-metre rise the risk of coastal flooding increases dramatically – more than 100 times higher than present, and with a 0.75m rise the future low tide will be the equivalent to the current high tide.

## Panel Discussion Summary

- **Less Sea-Ice:** Moving from the 1980s to the last decade or so, the number of days in which there has been open water around Labrador has been increasing, as has the mean annual concentration of sea ice. Landscapes are changing the oceans and thus changing the ways we can use the environment.
- **Other Changes:** Other weather events will also be impacted such as freeze/thaw cycles, precipitation types, as well as changes to wind events – these will all have impacts on ecology and shift where animals are able to survive, where fish are, where plants, insects, pests etc. are found, along with other unexpected changes.
- **Rethink, Rebuild and Redesign:** To begin to address the problem of climate change, Dr. Finnis suggests we need to “rethink, rebuild and redesign” our infrastructures, our cities and communities, as well as our lifestyles.

The panel, comprised of Ashley Smith (Owner and managing director of Fundamental Inc.), and Dr. Ashlee Cunsolo (vice-provost, Labrador Campus of Memorial University and dean of the School of Arctic and Subarctic Studies) responded to Dr. Finnis’ presentation and outlined many of the changes they are already seeing in the environment through their respective work. Highlights from the panel discussion and question and answer period with the audience include:

- **Labrador already seeing change:** The environment in Labrador has already changed and will continue to experience changes from climate change, and people have been living with the changes and adapting for decades. Some changes by 2100 will be very serious and quite alarming for the people living in the area. Many people in Labrador have already been experiencing the physical and mental health impacts of climate change, as well as the impacts to livelihoods, to travel safety due to sea ice decline, to hunt food, and, more generally, the impacts on their culture and identity.
- **Local action is underway, but there needs to be more:** There have been great successes and collaborations with municipalities working on climate action plans and instituting projects around things like renewable energy, community composting, solar lighting, energy efficiency measures, and watershed modeling as the foundation for an eco-asset management plan – but there’s lots of opportunity for more of that work.

## Panel Discussion Summary

- **Quick and decisive action is needed now:** The time for easy, comfortable, slow solutions has passed. In previous decades, when alarms were being sounded, we had more of an opportunity for mitigation and adaptation that would have made some significant changes to reduce this loss that we are facing. We are now passed that, so even if we adapt and mitigate and do the best that we can, there will still be losses and we will need to accept that. However, there is a willingness to push governments, businesses, and people to take collective action. There have been large protests in the last few years regarding climate change; there is a level of attention now related to inequality, and environmental justice that was not acknowledged previously. A motivating factor is the knowledge that people do care, and there is a desire to address climate change. Seeing all the efforts over the last few years in the province, seeing people pursuing local solutions like community agriculture, putting in renewable energy at community scale, and looking at eco-asset management as the initial framework, are all also hopeful characteristics in the province.
- **Canada & NL are responsible for the problem and can influence solutions:** Arguments against taking decisive action on climate change often frame the crisis as a demographics problem; that is, as a consequence of rising global population. Given our small population and low birth rates, this implies that Canada and NL are not a significant source of climate change; instead, these arguments place responsibility on countries with large populations and (especially) high birth rates. The implication is that Canada need not respond, as we have very little influence. The panelists stressed that this framing is both inaccurate and irresponsible, and argued that the climate crisis is best understood as a problem of excessive consumption – of fossil fuels directly, but also the many goods and services that require those fuels to produce, use, and/or distribute. As a country with extremely high rates of per capita fossil fuel consumption, this reframes Canada as a country with relatively high responsibility and capacity for influence. It also places responsibility back on countries that have i) historically benefitted the most from fossil fuel consumption and ii) have the most resources available to implement solutions.
- **Evidence-based decision-making and opportunity for action:** The science around climate change is rigorous and supported by theory, modelling, and (crucially) observations – there is no global dispute. We need to incorporate scientists and Indigenous science into larger provincial plans. There are enormous opportunities in Newfoundland and Labrador to utilize the abundance of renewable energy resources such as wind and solar, as well as our skilled human resources and engaged community members who are willing to sit down and care enough to have a conversation about what action is needed.

### Economy - Dollars and Cents of Climate Change

#### Panel Discussion 2

How will climate change affect the economy? How might we see that impact locally? What will that impact look like for our towns, businesses and individuals? What are the risks? Where are the businesses, and individuals? What are the risks? Where are the opportunities? And what can we do about it? These were the central questions addressed in the session focused on the economic impacts of climate change.

Elizabeth Beale began the session with a brief presentation. The following outlines the main points she addressed:

- **Climate change is leading to significant changes in the economy:** Climate change is impacting industries (food industries like fisheries and agriculture at risk from changes in ocean environment, drought, etc.), communities (livelihood and infrastructure at risk from flooding, wildfires and rising sea levels), individuals (employment, housing, and health risks; rising inequality), and environment (risk to ecosystems and loss of biodiversity).
- **Governments target reducing GHG emissions to limit the damage of climate change:** Pricing carbon is the core element of Canada's strategy to achieving net zero emissions, and limiting global temperature rise to 1.5°C. Placing a price on the emissions from fossil fuels creates an incentive to use cleaner energy options and requires heavy industry to become more efficient.
- **Policies to combat climate change create economic winners and losers:** Carbon intensive industries face the biggest disruption as the price of carbon rises – as well as the provinces, communities, and individuals most dependent on these industries. Renewable energy, green tech, and electric vehicles are clear winners, while firms that fail to adjust their business model to adapt to the realities of climate change are the clear economic losers in the context of these policies. Big risk, big reward technologies that may make a big difference in reaching climate targets are wild cards.
- **The path to Net Zero in 2050 is achievable:** Net zero refers to the balance between the amount of GHG emissions produced, and the amount removed from the atmosphere. Most of this will be achieved by cutting emissions, and the balance will depend on the effectiveness of negative emissions technologies to remove residual emissions. A recent study suggests we have the tools we need, but we will need a strong commitment from business, governments and citizens to achieve this.

## Panel Discussion Summary

The panel, comprised of Elizabeth Beale (economist and former board member of the Canadian Institute for Climate Choices), Kieran Hanley (executive director of econext), and Dr. Deatra Walsh (director of advocacy and communications at Municipalities Newfoundland and Labrador) reflected on the presentation and explored additional questions in this Forecast NL session.

A detailed summary of the session can be found in the appendices and on the Harris Centre website. Below are some of the key highlights from the discussion and Q&A period with the audience:

- **Economic challenge for municipalities:** Dealing with the economic impacts of climate change with a limited, or sometimes stagnant and decreasing tax base is a challenge for municipalities moving forward. The cost of dealing with climate change impacts is enormous, and way beyond the ability of any individual municipality to manage. Municipalities do not have the economic capacity to address all of this and have the least economic organizational capacity. Municipalities have responsibility for 60 per cent of Canada's infrastructure, but can access only 10 cents on every tax dollar.
- **Opportunity for economic diversification and growth:** Addressing and tackling climate change is an enormous opportunity for economic growth, diversification, and innovation for Newfoundland and Labrador, as well as major industrial opportunities. A lot of infrastructure work is going to be required in communities which means opportunity for businesses and jobs in every corner of the province. There is opportunity for the oil and gas industry to continue to be a cornerstone of the provincial economy provided we rise to the challenge in the substantial technological advancements and investments required to make the best possible environmental performance. There will also be opportunities for jobs, growth, and investment associated with the clean electricity available to green operations processes within the province. Additionally, the opportunity for hydrogen in Newfoundland and Labrador could be significant.
- **Managing the transition:** The continued importance of the oil and gas industry in the province as we manage this transition to net zero is important to consider. A transition is something that takes time, and this is one of the biggest challenges that the province will face over the next 10 years. There are calls for the province to move away from oil and gas, and this is certainly where we need to go but it will not be a snap change – the industry is such an engine of the provincial economy so the transition path is going to be tricky, and there needs to be a strategy in place that considers a lot of things.

## Panel Discussion Summary

- **Structure is needed to accelerate to net zero:** We need a structure in place to strategically address climate change and cooperate to accelerate and expedite the transition to net zero carbon. This is an important gap that has been identified. Governmental departments that are critically important to the plan we put in place to achieve net zero – such as the Department of Industry, Energy, and Technology, the Department of Environment and Climate Change, the Department for Transportation and Infrastructure – as well as other actors including municipalities, universities, colleges, and organizations like econext need to work together and support each other.
- **Leadership and some risk is needed to capitalize on opportunities:** We need to embrace the idea that we can be leaders in some of these areas, and we need to take some risks. Hydrogen is an example of an area where if the province is going to make the most of the opportunity, it needs to have an early entrance. Being able to take risks is critical and we need to be able to build upon the innovation that is happening here.
- **Monitoring and transparent data:** Regular monitoring and transparent data released to the public should be a key component of a well-established strategy to net zero. It is important for the public to know and understand completely what kind of progress we are making on the cost of mitigation. It is difficult to quantify numbers for specific industries – they are very complex and there is not enough work being done on this yet. We need to do better at collecting good data that is accessible and transparent and connecting those data at levels that make sense.

### Focus North:

## Labrador at the Front Lines of Climate Change

### Panel Discussion 3

Temperature increases, sea ice changes, and melting permafrost – these are just some of the environmental changes already happening in Labrador because of climate change. For a region with a population so connected to the land, these changes have tremendous impacts on the health, wellbeing, cultural connections, and livelihood of residents.

Dr. Ashlee Cunsolo gave a brief overview of some of the current climate challenges Labrador is facing, and some of the projections of what's to come, outlining the following:

- From December 2020 to March 2021, Labrador was four to six °C above normal: This means it was extremely warm; there were no cold spells; there were numerous warm spells; there was lots of snow; and it was terrible for ice.
- There is an approximately 10 °C increase projected by 2100: By 2100 winter in Nain will look like St. John's winter today; winter temperatures will look like spring today; fall temperatures will look like summer today.
- Labrador is one of the fastest warming places in the North: Warming at three times the rate of the rest of the country, Labrador has lost an average of 10 to 15 days of sea ice cover.

The panel, comprised of Derrick Pottle (Nunatsiavut Elder, hunter, carver, researcher, and advocate), Abigail Poole (member of NunatuKavut, and recent Memorial graduate with an honours degree in psychology), Stanley Oliver (Nunatsiavut beneficiary, Labrador advocate, and Manager with TradesNL), Jodie Ashini (Innu Heritage Guardian for the Innu Nation), and chaired by Dr. Ashlee Cunsolo (vice-provost, Labrador Campus and dean of the School of Arctic and Subarctic Studies) reflected on the presentation and explored additional questions in this Forecast NL session.

The following are some of the key highlights from the discussion and Q&A period with the audience:

## Panel Discussion Summary

- **Changes to sea ice:** There are major changes in the sea ice that prevent people from getting around like they did in the past. Going back to the 60s, 70s, and 80s, it was common to hunt seals, snowmobile, and go on dog team on Lake Melville in late May and early June – in recent years, conditions become unsafe in April. The seasons dictate the way Inuit and other Indigenous Peoples operate; spring for hunting seal, cutting wood, ice fishing, and getting nets ready for the summer; summer for fishing and growing vegetables; fall for hunting geese and rabbits, and to go trapping; and winter for trapping, hunting, and fishing – now the weather is unpredictable and it is no longer safe for people to do what they once did.
- **Skills learned from Elders struggle to be passed down to youth today:** Land-based skills, such as navigating, travelling safely, reading weather and ice patterns, knowing when ice is safe to cross, hunting, trapping, and preparing for trips is being lost. Future generations may not be able to continue these traditions and do the same things growing up as previous generations. Some things are slowly fading away from cultures because these lifestyles are reliant on the snow and the ice, and it is just not there for as long. Communities are also losing Elders, and that diverse and deep knowledge of surviving and thriving in the North is disappearing. It must be documented and preserved so that future generations know that this was a way of life.
- **Environmental changes are drastically impacting mental health:** It can be quite jarring for people of Labrador, specifically in Indigenous communities, when their ability to go out on the land, to cabins to hunt, or fish, gather with family, or be on the land to support their overall wellbeing, is compromised due to climate change. These changes can influence people's overall wellness, sense of self, and sense of place and community, and can lead to an increase in unhealthy behaviours, and mental and emotional impacts, such as sadness, depression, anxiety, grief, and loss. These changes affect physical, mental, and emotional wellbeing, as well as cultural identity and connection to land and community.
- **Food security is impacted when people cannot get out to fish, hunt, and trap:** This affects what people eat, how people eat – not just for those who would normally fish, hunt or trap, but for others in the community who are physically unable to do so and rely on shared food from those who can. It is getting increasingly difficult to rely on these foods due to changing conditions, which is leaving people reliant on store-bought items which are expensive, often not as healthy, and not always available.

# Climate Change and Our Society

### Panel Discussion 4

How is climate change affecting society in NL? What changes are we already seeing in our way of life as a result of climate change? What will the changes needed for climate change mitigation and adaptation mean for how we live, work, and play in NL? Professor Mark Stoddart (sociology department, Memorial), Megan Samms (Mi'kmaq artist and entrepreneur), Josh Smee (CEO of Food First Newfoundland Labrador) and Dr. Barb Neis (honorary research professor, sociology department, Memorial) tackled these questions in one of the initial Forecast NL sessions on societal impacts of climate change. Below are some of the key highlights from the discussion:

Dr. Mark Stoddart began the presentation by discussing five key points that emphasize why a social lens on climate impacts is necessary:

1. The main obstacles to making progress on climate change tend to be more political and social.
2. Climate change is global but will have real, significant impacts at the local level; a social lens is vital for thinking about how the global climate regime (e.g., IPCC, Paris Agreement, etc.) translates (or doesn't) into national or regional or local-municipal level climate action and responses. We also need to think about how scientific climate knowledge and action works between these different scales – from the global to the very local.
3. We can frame the climate change conversation around responsibility, vulnerability, and adaptive capacity. Responsibility – which countries have historically had, or currently have, the biggest carbon footprints. Vulnerability – who is most acutely vulnerable to the negative impacts of climate change. Adaptive capacity – who has the resources, knowledge, know-how, financial resources, infrastructure, etc. to actually adapt. All three of those things are tied to issues of social power, political efficacy, and access to resources. Those social dynamics play out at multiple levels from the global (for example, the global North compared to the global South), national (northern Canada compared with the south), regional and local levels.

## Panel Discussion Summary

4. A social lens on climate change is vital to ensure that climate solutions do not create new social inequalities or magnify existing inequalities. When we don't have a strong social lens on how we deal with climate change it becomes very easy for market-oriented solutions or technologically-oriented solutions to amplify existing social inequalities – whether we're talking about economic inequality, gender inequality, or in a broader global scale, global North-global South inequalities.

5. Pursuing climate action that also contributes to more equitable, just, and sustainable societies will also contribute to community well-being. We need to look for the solutions and actions in both climate change mitigation and adaptation that also help build community resilience, sustainability, and well-being.

The panel continued the discussion; a summary of which follows:

- **Geographic vulnerability:** NL is highly dependent on food production, goods production, money and supply chains from elsewhere. We also have a large labour force that works in other places, making that income dependent on the climate change impacts of other parts of the world, as well as ours. We are open to environmental change because of our proximity and dependency on the ocean and coasts. We are geographically isolated and spread over large distances, making transportation difficult and critical.
- **Impact on our food systems:** Our food system is highly vulnerable to the global food system since much of our food is produced elsewhere. Disruptions to transportation due to unstable weather and other unpredictability can have significant impacts on our food supply. In addition, we are already seeing access to traditional food impacted in Labrador
- **Poverty and inequality:** We are not all equally vulnerable to the impacts of climate change. The impacts of climate change will be greater for those already struggling with poverty and inequality. For people who already have difficulty accessing good quality food to feed their families, increases in food cost due to climate change will make that even more difficult. The ability to grow your own food is also expensive and requires significant access to land, tools and expertise – this is not available to those already living in poverty. The same can be said for infrastructure damage to property during major storms – damage can happen to any house, but more damage is likely to houses that have been poorly constructed or not well maintained due to poverty; the cost therefore is greater for those who have little control over the infrastructure of the housing in which they live.

## Panel Discussion Summary

- **Diversity in representation and governance:** Indigenous Peoples and other vulnerable groups across the board such as people with disabilities, and young, precariously employed workers, have not been actively brought into the discussion and to the table to have a meaningful, deep, solid conversation in the province around how do we respond to climate change. By having a diverse representation, and restructuring governance to include room for those voices, and behaving responsively versus reactively to the situation, we can address the economic situation and the climate situation at once. It is not just about ensuring that there is an Indigenous presence in the room, but also about creating rooms that are run by Indigenous folks – this needs to be not just a partnership but a devolution of power and responsibility and resources – particularly true in food systems to Indigenous communities.
- **Rural-Urban divide:** Rural communities also face inequities since they are heavily reliant on shipping, and often depend on a single industry such as fishing that requires considerable infrastructure that is vulnerable to climate change – extreme weather events can have massive effects and be very costly. It also opens the question of who is going to pay for these damages. Rural areas are also under-resourced and have less adaptive capacity (human and financial resources to plan and implement adaptation).
- **Long-term planning for our economy means long-term planning for our society:** The dependency of the province on oil and gas revenues also puts us in a precarious position – if global markets are moving toward a low-carbon economy and we continue to focus on oil and gas, we will lag behind – this will create an economic and social risk. The economic and political choices now could have negative impacts on our society down the road in five to 15 years. We cannot lose sight of the global conversation and what that means for our economies and the social well-being of the people of the province.

# The Future of Our Fisheries in the Face of Climate Change

## Panel Discussion 5

Dr. Brad DeYoung (honorary research professor and Bartlett Professor of Oceanography at Memorial University and Forecast NL Steering Committee Co-Chair) began with an overview of changes the ocean is currently seeing. He explained that unlike in the past when the ocean was considered to be so large and vast that it would be largely unchanged, scientists now have come to expect the unexpected. He explored four key aspects of ocean changes - temperature, ice, oxygen, and productivity. Cyr Couturier (aquaculture scientist, Marine Institute), Dr. Erin Carruthers (scientist, FFAW), and Dr. Mariano Koen-Alonso (scientist, DFO) joined for a moderated panel discussion and question and answer period with the audience.

Below are some of the key highlights from the discussion:

- **The ocean is changing and we need to expect the unexpected:** A shift to anticipating changes that previously seemed unlikely is necessary in all aspects of our relationship to the ocean, from how we utilize it for food and resources such as fish, as well as how we live and adapt in coastal areas. Small changes can have big impacts: The ocean ecosystem is sensitive, and even small shifts in the environment (temperature, salinity, etc.) can make a habitat no longer sustainable for some organisms which can have drastic impacts on the ecosystem.
- **Ocean productivity is declining and changing:** All the modelling work associated with productivity in the ocean linked to climate change are consistently predicting declines in productivity and biomass in the ocean – this is something we need to prepare for. But changes are not homogeneous, scientists are observing a mismatch between when the food is available and when that food is needed to be consumed by other components on the food web, thus limiting productivity of many stocks. Both fish harvesters and scientists are noting changes in the common species seen here to include other fish that favour warmer temperatures. This all reinforces the need for consistent science to enable us to prepare and be agile in identifying these changes and understanding how those different pieces play together.
- **Climate change impacts for aquaculture are unique:** While some of the changes such as ocean temperatures also impact aquaculture, there are other challenges, such as increases in disease, pests and parasites, as well as infrastructure damage from storms, that are more specific to the industry. Farmers, like fish harvesters in the capture fishery, will have to adapt and rely on research and innovation to build a sustainable industry in the face of climate change.

- **Succession planning and human resources:** The issue of succession planning and human resources for both wild capture fishery and aquaculture is an issue separate from climate change. However, the challenges that climate change is presenting to both industries have significant implication for the ability to recruit younger people into the industries, as well as recruiting people to take over existing enterprises. Thus, while it is certainly a broader issue, it should be examined in light of the climate change conversation.
- **Ecosystem-based management is necessary:** There is a need to shift to a more ecosystem-based management approach that considers species interactions that considers climate change and other important stressors. This is necessary to enable the agility to adapt and take advantages of opportunities.
- **More and better data:** Better data and more sharing of the information amongst stakeholders is necessary. This could include shorter term fail-safes for longer-term projections on stocks, as well as gathering data directly from fish harvesters. More resources are necessary to increase information sharing – collecting, summarizing and sharing data, as well as having discussions about what it means and what other data is needed to make better decisions.
- **Resources and policies to consider agility and adaptation:** With unknown changes expected, resources and policy approaches should consider the need for fish harvesters to be adaptable. Thought and consideration are necessary to plan for an unpredictable future with flexible supports and resources to ensure the industry can be agile.

### Renewable energy

#### Panel Discussion 6

What are the renewable energy sources in NL? How renewable is the current electricity grid? What opportunities will arise from the global shift to renewable energy? What are the barriers to capitalizing on those opportunities? These were the questions that framed the discussion for the panel discussion on renewable energy. Panelists including Dr. Larry Hughes (professor in the Department of Electrical and Computer Engineering at Dalhousie University), Amy Pellerin (a professional engineer who has been working in the renewable energy sector across Canada for over 10 years, and is currently Director of Canadian Developments at Natural Forces), and Jennifer Williams (CEO and President of Newfoundland and Labrador Hydro) tackled these questions as well as others presented by the audience.

The following is a summary of key highlights from the discussion:

- **Green electricity in NL:** NL has an abundance of green energy, and already has an electricity grid predominantly fueled by renewable hydroelectricity. In addition to hydro, the provincial electricity grid also uses some wind energy, and some gas turbines for backup. There is also the Holyrood Thermal Generating Station, which is currently planned to end its tenure upon the full integration of the Muskrat Falls Hydroelectric Project, and a small portion of diesel plants in the province's remote communities.
- **Non-electricity energy usage is largely non-renewable:** Beyond the electricity grid, a large percentage of the energy consumed in the province (for things like heating and transportation) comes from oil (almost 40% of the province's emissions are coming from transportation). About half of the province's emissions are coming from non-renewable sources.
- **Supply vs Capacity:** Supply of energy (including renewables) is tremendous, but capacity to deliver the energy where and when it is needed is a key part of the issue. Because we have an abundance of green electricity, moving our current consumption of energy sources like oil and gas to electricity will greatly shift our total emissions. From an utility planning perspective, anticipating the future demand is key – this is the determining factor for what and when you need to build next. We may have an abundance of supply, but you cannot just build something because you can – you have to look at what you need, when you need it, and what the options are for that.

## Panel Discussion Summary

- **Opportunities for renewables:** Newfoundland and Labrador has an excellent source of renewable energy and is very well positioned to be exporting a lot of that energy. Using this resource would not only benefit the province for all sorts of reasons, but also other markets and other jurisdictions that don't have that wind resource, availability, or space to put these types of projects within their own communities.
- **Green electricity for remote communities is a challenge and opportunity:** Small, remote communities currently being run on diesel can make a difference by finding renewable resources of electricity. Even though the current demand for electricity and energy from renewable resources in these communities is not huge, there is still opportunity to have an impact by finding renewable sources of energy. Many Indigenous communities are interested in being involved in this transition to provide their communities with green energy and also potential generate revenue where the opportunity exists to sell the excess supply.
- **Opportunities exist for the province to produce and ship hydrogen:** Demand for hydrogen is anticipated in Germany and other parts of Europe and possibly the United States. NL has potential to develop this product but discussions need to take place to discuss details and feasibility.
- **Electric vehicles are part of the solution:** Electric vehicles (EVs) are becoming more affordable and available; infrastructure to support this is critical: Where you get the electricity to power EVs is incredibly important, in NL that electricity is largely renewable. The infrastructure for EVs is a big investment, but necessary to facilitate the transition. It will take several years to electrify transportation, and part of the challenge will be getting charging stations in place to provide a reliable network of options to people, especially in places outside of cities like St. John's.

# The Future of Oil: NL's Offshore and Climate Change

## Panel Discussion 7

If global markets are moving away from fossil fuel consumption, where does that leave the NL oil and gas industry? Can we (and should we) continue to rely on it? Does the industry have a role to play in building a greener, more sustainable economic future in this province?

Dr. Angela Carter (professor of political science at the University of Waterloo) gave a brief presentation on the future of oil in NL, outlining the following:

- Urgent and rapid response is necessary: Our outstanding, global challenge is bending the curve of emissions drastically and rapidly, aiming to meet global emissions reduction targets now to 2050.
- The climate crisis is a health crisis: There is an uptick in mortality rates from extreme heat and cold, and illness associated with the climate crisis. It is getting worse by the decade and people are doing some very grim research now on the number of climate-related deaths of people between now and the end of the century.
- Here in NL, there are major economic costs, community costs, and cultural costs: This is especially true for Labrador. Just one example is the decreasing sea ice – a cultural, economic, and day-to-day safety problem for Indigenous Peoples in the North that will only get worse as temperatures rise.
- The primary driver of the climate crisis is fossil fuels (oil, gas, and coal): This is well documented, and the Intergovernmental Panel on Climate Change (the IPCC) reporting shows 86% of global emissions over the decade prior to Dr. Carter's presentation came from the burning of oil, gas and coal.
- Emissions have continued to rise despite national commitments: Every time Canada has committed to deep emission reductions, emissions in NL keep going up. The largest source of these emissions are coming from transportation, oil and gas, electricity (including fuel-burning generators), with the province's offshore oil projects among the largest emitters in the province.
- There is an economic risk: As the world quickly moves to a renewable energy future, demand for fossil fuel will dramatically decline, this will have major implications for the NL economy.

## Panel Discussion Summary

The panel, comprised of Dr. Angela Carter and Max Ruelokke (former head of the Canada-NL Offshore Petroleum Board, retired deputy minister, and consultant), moderated by Ashley Fitzpatrick (journalist and past fellow with the Metcalf Institute for Marine and Environmental Reporting), reflected on the presentation and explored additional questions. Below is a summary of the key highlights from the discussion and Q&A period with the audience:

- Oil and gas is a big part of the provincial economy: \$23 billion in royalties and investment has been put into NL oil and gas between 1998 and 2019. In the 2021 provincial budget, public revenues from offshore oil royalties were slotted at roughly a billion dollars. There's around 7000 to 8000 people who are currently employed, either directly or indirectly, in support of offshore oil and gas. About 15 to 16% of recent provincial revenues was estimated to come from offshore oil and gas
- Winding down or immediate pivot: While there is general agreement that focus must shift away from oil and gas and towards renewable energy and the economic opportunities those present, the key dividing point is how fast the real transition could and should happen.
- It is important to get past taking sides: Everybody needs to focus together on how to create a future that protects the provincial economy (good jobs for people and stable communities) and that aligns with a climate safe future for our kids.
- What about "low-carbon" oil?: While some argue that NL produces clean "low-carbon" oil, others say this argument is flawed. Consideration needs to be given to the location of oil and gas exploration and development in NL since it overlaps with marine areas with extreme ecological and economic value. While it is true emissions associated with extraction of oil here are lower in some instances, this calculation does not consider any of the GHG emissions when extracted oil is used.
- A Just Transition takes two parts – the wind down, and the wind up: This means committing to continuing to manage production safely and responsibly through end life, redirecting supports and subsidies from oil to low-carbon activities, supporting workers as industry changes; and on the wind up making sure we have access to our share of the Federal Just Transition Fund to improve the energy sector, increase the level of electrification in our transportation systems, improve infrastructure for climate adaptation, and more.
- Can improvements to production make a difference?: There is much research activity related to making NL oil and gas less harmful to the environment. The two primary sources of GHGs from offshore production are flaring of associated gas and the use of gas to fuel the turbines that provide power to producing fields. Operators must spend a small percentage of revenues on research and development to decarbonize production.

### Beyond the Buzzwords – Clean Tech in NL

#### Panel Discussion 8

This session presented an overview of clean tech – what it means, what opportunities exist for NL, and what is needed to position NL to make the most out of these opportunities. Dr. Lesley Anne James (professor, Faculty of Engineering and Applied Sciences, Memorial University) began the discussion with an overview of what is meant by “clean tech”. She explained that clean tech is any process, product, or service that reduces negative environmental impacts through significant energy improvement and sustainable use of resources or environmental protection activities.

Significant areas of clean tech were identified as recycling programs, renewable energy, energy savings, and sustainable buildings. Josh Green (CEO of Mysa) and Ashley Noseworthy (CEO and founder of Edgewise Environmental) joined for a moderated panel discussion and question and answer period with the audience.

Below are some of the key highlights from the discussion:

**Potential and excitement in the clean tech industry:** Clean tech represents a significant economic opportunity globally and there is much activity already in the clean tech space in the province. Currently, there is activity focused on renewable energy, marine transportation, energy efficiency, waste management technology, and more. The Blue and Green economies are being fueled through organizations such as Memorial Centre for Entrepreneurship, Genesis, econext, TechNL, EnergyNL, Energy Research & Innovation Newfoundland & Labrador. Continuing to develop this ecosystem will be key to NL’s ability to capitalize on the global opportunity.

**Entrepreneurial mindset:** Clean tech is entrepreneurial by nature – it involves seeing an opportunity where we can improve on the current system, fill a gap or need, and figuring out how to fill that gap. It is important to have an entrepreneurial mindset, to be able to recognize opportunities, to come up with creative solutions to capitalize on those opportunities, and to have the resilience to push through and make ideas reality. Inter-sector collaboration is necessary: Inter-sectoral collaboration between academia, industry, and government is critical and may require a different approach than has been traditional. The knowledge, momentum and opportunity is all there, but collaboration is necessary to bring it all together.

Continued investment is needed in both small and large tech: To capitalize on the current opportunity investment is needed at the local and global level in small and large tech opportunities.

Role of municipalities: It was suggested that municipalities can play a big role if clean tech is made accessible to them. By implementing at a small scale they can create the foundation for implantation across the province and reach broader audience.

### Communities and Infrastructure

#### Panel Discussion 9

What is the capacity of NL's municipalities to take on the adaptation and preparation that is needed to mitigate and adapt to the impacts of climate change? What is already underway, and what else needs to be done? What is the role of regional and place-based decision making in relation to adaptation? And how equipped (or not) are we? These were the focus questions of the session on how climate change will impact (and is already impacting) our communities and infrastructure.

In this session, panelists Dr. Joseph A. Daraio (Faculty of Engineering and Applied Science), Dr. Kelly Vodden (Environmental Policy Institute, Grenfell Campus, Memorial University), and Dr. Kathleen Parewick (Municipalities Newfoundland and Labrador (MNL)'s Community Collaboration and Development Officer) discussed the challenge and capacity for communities to respond to adaptation needs, especially as it relates to infrastructure.

A summary of the session and key highlights from the discussion are below:

Five key areas of impact: Dr. Kelly Vodden opened the session by referencing a guidebook for communities, *7 Steps to Assess Climate Change Vulnerability in your Community* (a link to the guidebook is provided in the resources section of the Forecast NL website). The guidebook identifies five key weather and climate-related issues, and walks communities through how those issues might affect their community. These issues include river and coastal flooding, erosion and slope movement, the impacts of freeze and thaw cycles on roads, disruptions to livelihoods or recreational activities due to reduced snow and ice cover, and concerns about drinking water and forest fire.

- **Disproportionate impact:** Small, rural, and remote communities are disproportionately impacted by the changes that are occurring partly because livelihoods in these communities are intertwined with the natural ecosystems that are changing.
- **Limited capacity to respond:** Reduced capacity is also a challenge in many of these communities where there is limited financial and human resources to deal with level of changes happening and expected – this is particularly acute in arctic and sub-arctic regions where these changes are occurring more rapidly.
- **Engineering infrastructure is costly:** Engineers have developed and are developing ways to incorporate climate change into design – for many issues the solutions have been developed but the methods require expensive engineer planning teams and municipalities do not have the capacity to implement those solutions.

## Panel Discussion Summary

- **Opportunity for greater collaboration between engineers and communities:** There is a gap between technical expertise in engineering and what community members and decision makers understand about the problems and the solutions. There needs to be more of a common space for engineers and communities where engineers engage with community members who live with the infrastructure to find things that work, and create a better understanding of possible solutions. It is also important for economic development officials working with organizations to ensure that they're considering climate change impacts, and adaptation and mitigation options in their work and bringing that expertise to community planning.
- **Human resource capacity is limited:** Most municipalities only have one or one half-time staff to handle all administration functions of the organizations. Towns generally do not have staff with the expertise or time to utilize the tools available. With declining populations, they also have less revenue and tax income to take on additional tasks or services.
- **Leveraging local strengths:** Rural and remote communities have strength of connections to each other and to place, and the understanding of changes that are happening in place – this can be leveraged to help communities adapt.
- **Flexibility and local-specific solutions:** There are a suite of issues affecting many NL communities and each of these communities is being affected differently by climate change. Their cultures, ways of life, and economies are all different, so we need flexible programs and supports to help communities where they are.
- **Local-specific regional approach:** While every community faces its own specific issues around infrastructure, there is still a lot of commonalities, so a regional approach makes sense. Local-specific data and expertise can be combined to create a more effective response – collaboration between communities is critical.
- **Coastal infrastructure issues are key:** Much of the infrastructure at risk relates to eroding coastlines and flooding areas near our coastlines. A wide array of infrastructure solutions should be explored to address coastal issues at large in the context of other issues and concerns in communities at the same time.
- **Applying a climate change lens:** It is important for individuals to continue to think about climate change and its implications as impacting all things and integrate a climate-lens into our work and decisions, as opposed to seeing it as something separate or add-on. Collaboration with various actors is essential for local communities to find solutions that work for everybody.

### Food & Agriculture

#### Panel Discussion 10

What challenges and opportunities exist for agriculture in NL, in the face of a changing climate, both locally and globally? What research and opportunities are currently being explored? These questions were the focus of the panel discussion moderated by Dr. Ivan Emke (former professor and researcher at Memorial University's Grenfell Campus). The panelists for the session included Dr. Mumtaz Cheema (professor in the School of Science and the Environment at Grenfell Campus of Memorial University), Susan Lester (agriculture entrepreneur, Lester's Farm Market), and Josh Smee (CEO of Food First NL).

A summary of key highlights from the discussion follows:

- Climate change is already having a significant impact on farming and food supply: While the weather has always impacted agriculture, changes in our climate is shifting farming and food access. Especially in Labrador, climate change is limiting access to traditional foods. On the Island, as well as Labrador, changes to precipitation can have a significant impact on the timing of planting and overall yields.
- Global food systems are at risk and NL is highly dependent on imported food: Newfoundland and Labrador is part of a globalized food system (somewhere between 70-90% of food comes from outside the province); there are now increasing numbers of climate disasters that are hitting parts of that supply chain, so it's fairly predictable that food prices are going to go up. It's important to consider how this will affect the people who are already struggling to access food affordably. And this all looks very different in Northern Labrador where food systems have already been severely disrupted. Additionally, policy decisions at the national level to address climate targets are also impacting transportation and consideration needs to be given to how those policies will affect food prices and access in places like NL that are dependent on imported food.
- Food choices and habits are an important piece of the puzzle: If part of NL's climate change adaptation plan is to rely less on imported food, then individual food choices and habits need to shift to work with the local supply. To support local farmers, the local economy, and to reduce individual carbon footprint, consumers will need to consider choosing foods that are in-season, as well as freezing or preserving foods for consumption out of season. This is a shift from a modern consumer's expectation to have fresh produce, for example, year-round.

## Panel Discussion Summary

- **Food access and transportation are inextricably linked:** Food access and transportation are inextricably linked, even more so in light of climate change: Meeting climate goals is not possible without radical shifts in our transportation systems – in NL our food system is highly dependent on transportation. Part of addressing climate change, and adapting to the impacts it will have on our food system, is through addressing transportation issues in the province (access to public transportation in particular).
- **Opportunities for bioeconomy:** Opportunities for bioeconomy to address agriculture needs while also addressing climate goals: There is ongoing research regarding the increased use of local organic waste products as soil amendments, rather than shipping in fertilizer from elsewhere. There are projects in place with pulp and paper, the dairy industry, the mining industry, and forestry that can both reduce waste and increase agricultural opportunities.
- **Possible opportunities for increased food production:** Climate change will give the province a longer growing window which allows for better crops and can improve food security in the province.
- **Affordability and access for people with low-incomes must be an additional lens:** Almost 1/5 Newfoundlanders and Labradorians are food insecure – given current increases to food prices, that number is likely to rise. People living at the bottom of the income scale are already facing the biggest challenges for food access (due to cost of food overall, higher cost of fresh food, in addition to limited access to transportation to access food supply alternatives). Consideration for this needs to be included when examining food policies that adapt to climate change.

# Citizen Forum Roundtable Discussions:

## Summary of Discussion and recommendations

For several weeks in early fall 2022, the Citizen Forum members were invited to participate in a series of roundtable deliberation discussion sessions. These Citizen Forum Roundtables gave participants an opportunity to consider and discuss the information shared throughout the Forecast NL process (including panel discussions and online content) and engage in a discussion regarding key take-aways and recommendations to put forward. While attendance for these sessions was unfortunately low, the engagement and depth of discussion was significant. The outcome of these discussions is provided in the section following.

The following is a synopsis of recommendations and considerations put forward by Citizen Forum participants during the Forecast NL Citizen Forum Roundtable Discussions held in September and October 2022.

Citizen Forum members reached these recommendations by exploring the following discussion questions:

How might we (NL) create economic and social prosperity while mitigating and adapting to climate change?

What areas or actions do you think should be a focus?

What potential opportunities should be capitalized on?

What are the biggest challenges NL must overcome to thrive in a changing climate?

What are NL's major strengths, in that they position us for a prosperous future? How do we build on those strengths?

What barriers to action still exist that need to be addressed in order to make progress?

What would happen if we "solved" climate change by 2050 to 2070? What would the world look like? What did we do to get there?

In the initial discussion session, Citizen Forum members identified four theme areas:

- 1) Collaboration & Capacity
- 2) Public Awareness & Motivation for Change
- 3) Policy & Structure
- 4) Economic Challenge & Opportunity

Subsequent group discussions held during the weeks that followed then focused on the four theme areas to identify specific recommendations and considerations. These are listed in detail below.

## Collaboration & Capacity

A key theme area identified in the initial discussion with the Citizen Forum was the need for increased collaboration and capacity to respond to climate change at the provincial and local level. Participants noted that both a lack of fiscal and human resources challenge capacity for action at the local level; however, they also noted that increased collaboration could help maximize the impact of the limited resources and reduce inefficiencies. Participants recognized the impact of climate change is wide reaching and multi-dimensional, thus a need to collaborate on the response across sectors and levels of government was emphasized.

Specifically, the group identified the following as potential actions related to collaboration and capacity:

### Regional & Community Collaboration:

- Establish a regional climate resilience task force for every region, including local experts, municipal representatives, non-profits and other stakeholders, with particular attention paid to including youth representatives. Using an innovation and asset-based framework, the aim of these regional task forces would be to help communities and regions initiate and implement climate adaptation plans and projects. Building capacity at a regional and municipal level would allow communities to apply for project funding.

### Inter- & Intra-Government Coordination & Collaboration:

- Establish cross-departmental working groups on climate change adaptation to seed funding opportunities and programs sparking innovation and entrepreneurship related to climate change adaptation and mitigation. Working groups could explore opportunities for the innovative use of existing programs and funding.
- Establish central coordination of local project opportunities and ideas to broker local and regional connections and collaborations, and coordinate federal, provincial and philanthropic funding opportunities.

### Indigenous Leadership and Collaboration:

- Collaborate with Indigenous communities, learn from Indigenous collaboration models, and enable Indigenous leadership. Indigenous Peoples in the province, particularly in Labrador, are already living with rapidly changing climate and environmental conditions, and experiencing the physical, mental, emotional, cultural, social, economic, and infrastructure impacts. It is essential that Indigenous leadership, knowledge, expertise, and experience be part of — and lead — climate change adaptation and mitigation planning in Newfoundland and Labrador.

### Government-Community-University-Collaboration:

- Facilitate a process to enable communities to suggest areas of concern and research questions relevant to the impacts of climate change in NL that could be investigated through research at Memorial. Establish an associated research fund and process for the knowledge translation and mobilization to appropriate policy makers, community leaders and stakeholders to ensure communities are able to tap into the research capacity of Memorial.

## Public Awareness & Motivation for Change

Another key theme that emerged from discussions was the need for more public awareness of climate change in Newfoundland and Labrador, along with a need to increase individuals' motivation to accept and undertake changes—both in their own lifestyles and the broader societal changes necessary to help mitigate climate change and adapt to climate impacts. Understanding that shifting public attitudes and behavior is complicated and not something that can be accomplished quickly, the Citizen Forum suggested the following actions could be taken:

### Climate Change Impacts Information Sessions:

- Develop a short course (could be offered online, in-person or hybrid) on climate change impacts for members of the public; this course should be mandatory for all elected officials and public servants (e.g., similar to training on inclusivity).

### Increase Opportunities for Youth Participation:

- Identify ways to build climate change awareness and action opportunities specific to NL into existing K-12 curriculum (in collaboration with Memorial's Climate Collective and other youth-focused organizations), such as the Community Youth Networks.

### Identify and Establish Champions in Land- & sea-based industries:

- Identify industries reliant on the health of land and sea (e.g. fishing, farming, tourism, etc.) and work with industry associations to identify community-based champions and opportunities for education and collaboration to build awareness and motivation for action.

### Increase Opportunities for Rural, Remote, & Regional Climate Change Discussions:

- Create opportunities for further discussion of how climate change is affecting rural parts of NL; this could be done through a series of regional climate change discussion forums or workshops. \*This activity is currently underway as a partnership between the Harris Centre, CLIMAtlantic and Econext.

### Utilizing Creative Arts Capacity:

- Explore opportunities for public awareness and motivation for change through creative industries and the arts sector. This could be achieved through funding community-level creative arts projects that bring awareness to climate change and help build climate-action narratives.

## Policy & Structure

While policy, structure and governance was addressed in other theme areas, the Citizen Forum participants also identified several areas relating to policy and governance they felt should be identified in a separate category.

### Increase Capacity at Regional Level:

- Increase support and capacity at the regional and municipal level for planning.
- Increase opportunities for regional collaboration to enable communities to access project funding and implement climate adaptation plans.

### Focus on Mitigation:

- Focus on efforts to mitigate CO2 emissions, not only on adaptation efforts. It was felt that a plan with concrete GHG reduction targets and measures is necessary.

### Clean Transportation:

- Develop a plan focused on transforming the transportation industry to reduce NL's CO2 emissions. This plan should consider affordable and accessible public transport/infrastructure options; the development of cycling infrastructure; and the development of infrastructure for electric vehicles across the province.

### Transition Oil and Gas Industry:

- There was a clear call from many Citizen Forum participants and other attendees of the Forecast NL public sessions to end subsidies to the oil and gas industry, and start winding down production of fossil fuels. To help facilitate this transition, Citizen Forum members suggested that funding be channeled to training for oil and gas workers impacted by the energy transition in new industries.

## Economic Challenges & Opportunity

While there was a significant focus on the need to phase out oil and gas dependency in the province during the Citizen Forum discussions, there was also an acknowledgement that this transition presents an opportunity to innovate and grow other industries.

Entrepreneurship and innovation were recurring themes, as was the need for cross-departmental and cross-sectoral collaboration.

### Support Entrepreneurship and Innovation:

- Foster social innovation and social enterprise, especially opportunities tied to tourism, green energy, food, and health; include immigration and retention lens and entrepreneurship opportunities for newcomers.
- Improve coordination (especially cross-departmental coordination) on innovation and entrepreneurship related to climate change.
- Continue to foster opportunities in renewable energy (wind in particular), blue economy and ocean industries, and eco-tourism.

### Focus on Pilot Test Cases:

- Use the opportunity for project funding, along with the current creative and innovation momentum on climate change, to pilot new ideas in NL.

### Capitalize on Funding Opportunities:

- Use the opportunity for Federal and philanthropic funds focused on climate adaptation and mitigation to fuel new industries and economic growth.

### Immigration and Demographics:

- New industry opportunities, innovation and entrepreneurship opportunities for climate change mitigation and adaptation projects could also be opportunities to attract and retain newcomers with the necessary specific skills and expertise (especially from areas that may become less hospitable as global temperatures increase).

# Additional Knowledge Mobilization: Vital Signs Forecast Report

In the fall of 2022, the Harris Centre, in partnership with the Community Foundation of NL, released a summary of information covered throughout the project in the annual Vital Signs report. The newspaper-style report, written for a general audience, and containing a mix of news-style articles, opinion pieces, as well as data and infographics, is released annually to highlight issues of concern in the province. The report appears in newspapers throughout the province as part of Saltwire Networks newspaper distribution and is also distributed throughout the year to hundreds of organizations, groups and individuals including government officials, municipalities, researchers, industry partners, non-profit agencies, and libraries throughout the province.



The Forecast edition NL's Vital Signs report contained summary data and information from the panel discussions along with additional information and contributions from other experts and sources. The publication can be found on the Harris Centre website by visiting [www.mun.ca/harriscentre/vitalsigns](http://www.mun.ca/harriscentre/vitalsigns)

Content for the Forecast NL edition of Vital Signs was developed by the Forecast NL project team with oversight and direction provided by the Steering Committee. The report provided a summary of issues and information presented throughout the Forecast NL project and served as a review of key issues for the Citizen Forum, as well as a tool to help broaden the reach of information identified and gathered through the process to members of the public that were not engaged in the project throughout.

The report provided an additional tool for sharing information addressed in the panel discussions and Citizen Forum discussions. While the timing of the report prevented the inclusion of recommendations and findings from the final Citizen Forum discussion session, it was able to highlight some of the opportunities and innovative solutions that had been identified throughout the project. The report continues to be distributed and used as a tool to spark local climate action and a renewed focus and understanding about the urgency of the need for climate action, as well as the opportunities for economic growth and sustainability and social and community wellbeing.

## Conclusion & Next Steps

One of the key objectives of the Forecast NL initiative was to provide a platform to increase the scope and depth of discussion of climate change in Newfoundland and Labrador. Throughout the process, while the debate regarding the level of investment in and importance of the oil and gas sector continued, there was yet agreement about the necessity of a rapid cut globally to oil and gas usage. Also emerging from discussions was an acknowledgement that while our global position may grant us refuge from some forms of climate-related devastation, NL is far from exempt from the environmental, economic and social impacts of climate change.

Overwhelmingly, discussions with the Citizen Forum members and expert panels identified a need for local solutions. While climate change is a global issue, it will impact NL in very specific ways and affect different parts of the province in unique ways; as such, information and strategies are needed that consider the local context. In addition, discussions identified the need for strategies beyond the provincial context, with specific consideration to the unique regional and community level impacts. Local capacity to respond to climate change impacts was a predominant theme throughout all of the Forecast NL discussions. Devising effective mechanisms to build local capacity and enable action at the community-level will be critical to the success of any federal- or province-level adaptation initiatives. In Newfoundland and Labrador in particular, the local capacity issues already present a significant barrier to accessing program funding designed for larger centres. Mechanisms for municipal- and community-level collaboration on funding applications could reduce this barrier, but only if programs are designed to allow for this structure. There is need for speed in identifying and addressing issues around access to funding programs, with every missed fund there is a failure to capture federal resources for local needs.

The discussions undertaken during the Forecast NL initiative also highlighted the tremendous opportunities that current conditions present for Newfoundland and Labrador, such as the prospects to utilize the Province's abundant renewable energy. Additionally, there is growing research and interest in areas such as making use of bio-waste from existing, local processing facilities as a form of reducing carbon emissions, and creating new soil amendments for local agriculture – addressing both food supply challenges while supplementing existing responsible agricultural practices.

Access to locally relevant data was raised as an issue that crosscuts many sectors. To assist in planning and analyzing local infrastructure risks, expert panelists identified the need for wide availability of climate projections for local areas, as well as increased research and data on the impacts of climate change and climate change response for specific sectors such as the fisheries and agriculture.

A key overarching theme identified through the Forecast NL discussions was the need for a social lens to be considered when creating and implementing all climate-related policies. As we look to government policies and industry opportunities to find solutions to transition away from fossil fuel use and address climate change impacts, we risk looking to solutions that may also amplify existing social inequities. Applying a social lens when considering solutions is critical to mitigate the risk of exacerbating pre-existing economic and social inequality.

Lastly, the need for Indigenous inclusion and leadership was identified early in the discussions and continued to resurface throughout the process. A pivotal moment for many Citizen Forum participants occurred during the panel discussion on climate impacts in Labrador – hearing first-hand from individuals who were already living with such rapid changes to their natural environment and learning about the very deep mental, emotional, cultural, social and economic impacts, evoked a personal connection with an issue that until then had largely been viewed as intangible and difficult to grasp in the context of Newfoundland and Labrador. Also evident in that panel discussion, as well as in subsequent discussions, was the critical role of Indigenous leadership on the issue, and the necessity of integrating Indigenous knowledge, expertise and experience as we plan and take action towards climate change adaptation and mitigation.

With these key themes in mind, while the Forecast NL initiative of the Harris Centre has concluded, work to both facilitate discussions and broker research and projects related to these issues continues. Over the last several months the Harris Centre has collaborated with CLIMAtlantic and Econext to engage in regional climate workshops to help connect communities with resources available through CLIMAtlantic, as well as facilitate discussions to identify key issues, priorities and assets for regional climate adaptation. The report from these regional workshops will provide a guide for communities to work together on local solutions.

Furthermore, as communities begin to understand local climate change impacts in more depth, new issues and ideas continue to be identified; the Harris Centre will continue to play a role capturing these ideas, connecting the community with the resources at Memorial, mobilizing information and research, and fostering discussion on the critical issues related to climate impacts in NL.

# Appendix A:

## **Steering Committee Members:**

- Elizabeth Beale, co-chair (former president, CEO, and chief economist of the Atlantic Provinces Economic Council and past board member of the Canadian Institute for Climate Choices)
- Brad De Young, co-chair (professor and Bartlett Chair in Oceanography at Memorial)
- Ashlee Cunsolo (vice-provost, Labrador Campus and dean of the School of Arctic and Sub-Arctic Studies at Memorial, and climate change and health researcher)
- Joel Finnis (climatologist and professor of geography at Memorial)
- Ashley Fitzpatrick (local journalist with an extensive history in reporting on the oil and gas industry)
- Barbara Neis (sociologist and Memorial University research professor; Dr. Neis participated for the first half of the project but recused herself upon her retirement)
- Mark Stoddart (professor in Memorial's sociology department; Dr. Stoddart joined the project after Dr. Neis recused herself from the committee)
- Abigail Poole (Memorial graduate, current graduate student at Saint Mary's University, and Indigenous representative)
- Max Ruelokke (former deputy minister and CEO of Canada-Newfoundland and Labrador Offshore Petroleum Board)

## **Knowledge Mobilization Committee:**

An invitation was extended to local organizations, industry and government representatives to serve as a resource for the project to share information, make recommendations for panelists and provide additional context and information as needed. The full list of organizations represented on this component of the project is included below:

- Association for New Canadians NL
- Atlantic Canada Opportunities Agency (ACOA)
- Atlantic Coastal Action Program
- Canadian Manufacturers and Exporters Newfoundland and Labrador (CME-NL)
- Choices for Youth
- College of the North Atlantic
- Community Business Development Corporation (CBDC)
- Conservation Corps of Newfoundland and Labrador (CCNL)
- Federation of Agriculture
- Food First NL
- Government of Newfoundland and Labrador - Environment, Climate Change and Municipal Affairs

## Appendix A:

- Grenfell Campus – Memorial University
- HeritageNL
- IAP2 Canada
- Iron & Earth/Decarbonize NL
- Memorial University
- Multi-Materials Stewardship Board (MMSB)
- Municipalities Newfoundland and Labrador (MNL)
- Econext (environmental industry association of NL)
- Newfoundland and Labrador Oil and Gas Industries Association (NOIA)
- NunatuKavut Community Council
- Parks Canada
- Qalipu First Nation
- Social Justice Co-op
- Western Environment Centre
- Trades NL
- Women in Resource Development Corporation
- World Wildlife Fund

## Appendix B:

### Panel Discussion Summary

	NAME	DATE	DESCRIPTION	ATTENDEES (REAL-TIME)	POST-EVENT ONLINE VIEWS
	"What's the Forecast?" An Introduction to ForecastNL"	5 February 2021	An introduction to the project: its goals, methodology, and desired outcomes. Featuring Dr. Rob Greenwood, Cathy Newhook, Dr. Brad DeYoung, and Elizabeth Beale.	92	82
1	Climate Change in NL: Impacts and Actions	10 March 2021	An introduction to the environmental impacts of climate change on NL. Featuring Dr. Joel Finnis, Dr. Ashlee Cunsolo, and Ashley Smith (Fundamental Inc.).	127	2500
2	Dollars & Cents: The Economic Impacts of Climate Change	22 April 2021	An introduction to the economic impacts of climate change on NL. Featuring Kieran Hanley (NEIA), Dr. Deatra Walsh (MNL), and Elizabeth Beale.	73	104
3	Focus North: Labrador at the Front Lines of Climate Change	6 May 2021	A closer look at the impacts of climate change in Labrador and the North, with a focus on Indigenous experiences. Featuring Dr. Cunsolo as moderator, Derrick Pottle, Abigail Poole, Stanley Oliver, and Jodie Ashini.	58	240

# Appendix B:

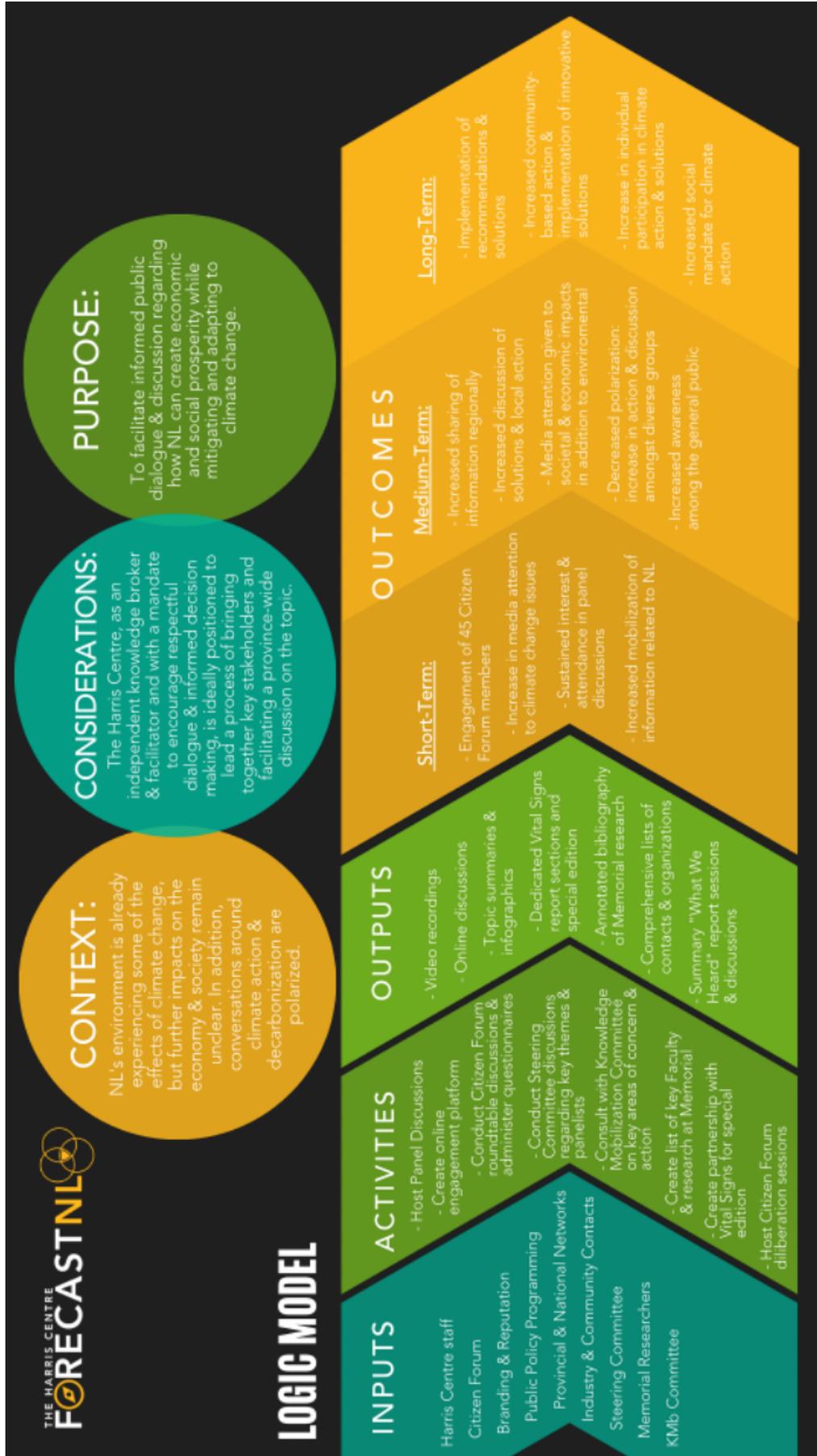
## Panel Discussion Summary

	NAME	DATE	DESCRIPTION	ATTENDEES (REAL-TIME)	POST-EVENT ONLINE VIEWS
4	Climate Change and Our Society	18 May 2021	Overview of major impacts of climate change on how we work/live/play. Featuring Dr. Barb Neis, Dr. Mark Stoddart (sociology, Memorial), Megan Samms (artist and farmer), Josh Smee (FoodFirstNL).	55	114
5	Oil & Gas in Newfoundland and Labrador	June 22 2021	An exploration of the future of the NL oil and gas industry. Featuring Dr. Angela Carter and Max Ruelokke.	200	1000
6	Fisheries & Oceans	26 October 2021	A discussion of the impacts of climate change on NL's oceans and fisheries with Dr. Brad deYoung (Memorial), Cyr Couturier (Marine Institute), Dr.	82	137
7	Clean Tech: Beyond the Buzzwords	30 November 2021	An overview of clean tech – what it means, what opportunities exist for NL, and what is needed to position NL to make the most out of these opportunities. Featuring Dr. Lesley Ann James (Memorial Engineering), MYSA's Josh Green, and Ashley Noseworthy from Edgewise Environmental.	62	68

# Appendix B:

## Panel Discussion Summary

	NAME	DATE	DESCRIPTION	ATTENDEES (REAL-TIME)	POST-EVENT ONLINE VIEWS
8	Renewable Energy	10 March 2022	An overview of renewable energy in NL, including the barriers to capitalize on opportunities. Featuring Dr. Larry Hughes of Dalhousie, Jennifer Williams (CEO of NLPower), and Amy Pellerin from Natural Forces.	62	145
9	Communities & Infrastructure in the Face of Climate Change	5 April 2022	A look at the capacity of municipalities to take on the adaptation and preparation that is needed. We considered how replacing and adapting infrastructure in our communities is paramount in the face of climate change. Featuring Drs. Josph Daraio (Memorial), Kelly Vodden (Grenfel Campus), and Kathleen Parewick (MNL).	212	97
10	Food and Agriculture	16 June 2022	A conversation about food supply, food security, and the impact of climate change not only on how we make and import food, but how we create policy around food, and how we plan for the future. Featuring moderator Dr. Ivan Emke, Josh Smee of FoodFirstNL, Susan Lester from Lester's Farm, and Grenfell's Dr. Mumtaz Cheema.	78	102





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