

CLIMATE EMERGENCY

QUÉBEC ZéN

PROJECT

zéro émission nette



ROAD MAP
for **Québec**'s Transition
toward **Carbon Neutrality**

VERSION 1.0



In this document, Québec's scale has been chosen for strategic and practical reasons. However, we acknowledge that the territories where we live and work are part of the unceded traditional territories of the Kanien'kehá:ka, Anishinabeg, Atikamekw, Innus, Mi'kmaq, Hurons Wendat, Abénaquis, Wolastoqiyik, Cris, Naskapis and Inuits' nations.

It would be impossible to list all the people and organizations that helped in the creation of this document without risking an oversight. To all, we are truly grateful.



Québec ZéN (zéro émission nette) *Project. Road Map for Québec's Transition toward Carbon Neutrality, Version 1.0.*

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A message from the United Front for Energy Transition

Together, Let's Build our Road map to Achieve a Zero Net Emissions Québec

Scientific consensus is clear: the consequences of the climate crisis are already upon us, whether it is in our communities or elsewhere on the planet. If nothing is done, today's youth could see the Earth becoming an inferno in a few decades, where life itself would be threatened in many places and the world would be devastated by ecological and economical collapses. Our world would dive in utter social chaos. Indigenous Peoples have warned us against this for centuries and environmentalists have too for quite some time.

Climate scientists warn that to avoid the worst case scenario, we have to limit global warming to 1.5 °C above the pre-industrial level. Going above this ceiling could cause feedback loops with unforeseen and potentially tragic consequences. Considering the climate emergency, the shifts that we are taking now can make a difference: the 2020 decade will be crucial and we must achieve carbon neutrality as soon as possible.

Solutions exist. They are known and achievable, but we must act now. They bring us to a cleaner, safer and friendlier world. Their implementation, adapted to different contexts and realities, will still be demanding, which is why we need to undertake a vast social debate on the subject, especially considering the short delays we have and the depth of the changes that need to happen.

The United Front for Energy Transition wants to energize and to facilitate this process. With this goal in mind, it suggests in the following pages its version 1.0 of a Road map towards a Québec that will be carbon neutral, more resilient and more just. The organization wishes to invite all the social actors in the province to use the document as a basis for a constructive dialogue on the urgent choices we have to make and the actions we have to take in the short, medium and long term. These exchanges will complement our analyses and suggestions. Our hope is to reach a general consensus in Québec and among the people that live in this political territory which would allow us to complete the Road map in April 2020.

Our version 1.0 is improvable. The goal of our approach is to benefit from all political views, intersectional analyses and technical skills.

At the end of this adventure, there will still be much to do. However, if this enterprise only allows us to identify significant and socially fair solutions to address the challenges we face, we will have made major progress. If it helps us to further comprehend certain complex issues, it will be a gain for the future. If we create inclusive spaces where we can consolidate our efforts and collective resilience, we will have established starting points with amazing potential.

We hope that you will join us in these paths of transition. Together, we will succeed!

The United Front for Energy Transition (Le Front commun pour la transition énergétique)
September 30, 2019

Do you want to be involved in this process? Would you like to share your comments, meet some of the best transition thinkers, invite your members to a round table or organise a public assembly on the matter?

Contact us at info@pourlatransitionenergetique.org. We will be happy to work with you to find the best avenues for collaboration.

Québec, a Role Model in the Fight Against GHG Emissions?

The province of Québec is significantly different compared to other Canadian provinces regarding GHG emissions. A Quebecer produces 9.6 tons of CO₂ equivalent annually compared to the national average of 19.4 tons¹.

However, Québec's performance is far less impressive when we compare it to other countries such as Sweden (4.5 tons of CO₂ equivalent per person), France (4.6 tons) or the United Kingdom (6.5 tons), especially when we consider that those nations do not have the same access to hydroelectric resources and are also far from being carbon neutral themselves.

Québec's record is even less brilliant when we account for the province's hidden climate footprint (GHG emissions associated with imported goods) or when we compare our emissions to those of some countries in Africa or South Asia, where the inhabitants individually produce less than 1 ton of GHG per year, but are the most exposed to the dire impacts of climate change².

Québec must do better. As our production of electricity is already almost 100% renewable, the hardest challenges are still ahead. We must face them without delay. This is a historic opportunity for the province to become a leader in innovation to achieve carbon neutrality, in solidarity with the most vulnerable regions of the world.

1. [Inventaire québécois des émissions de gaz à effet de serre en 2016 et leur évolution depuis 1990](#).

2. [Banque mondiale](#) (2014).

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Vision of a Québec ZéN

What would a Net Zero Emissions Québec look like?

Before contemplating the journey that will lead us to carbon neutrality, we felt that it was essential to visualize a Québec that would have escaped climate devastation and where the GHG net emissions would be nil. We invite you to forget the present for an instant and join us in imagining what our society would look like after a successful transition.

In tomorrow's Québec ZéN...

- 1** **Québec's communities have put resilience at the heart of their actions. They have the ability to sustain almost all the systems that support their ways of life.** They make and implement their own decisions in accordance with a global action plan for decarbonisation and self-sufficiency. Far from being a withdrawal, their self-sufficiency is founded on inclusion, sharing, cooperation and local creativity.
- 2** **Our society is peaceful, as it has been throughout its transformation. Public interest** has become a priority again and, because of this, the transition was implemented peacefully and progressively, without triggering chaos.
- 3** **All parts of society were involved in the process of changing our ways of living, producing and consuming in a spirit of shared but differentiated responsibility.**
- 4** **The transition has not penalized either vulnerable groups or workers. On the contrary, the standards of living and working conditions have improved. Social justice has increased.**
- 5** **We have protected human rights while transitioning and did our fair share to ensure decent living conditions to climate refugees.**
- 6** **We have avoided climate devastation as well as the ecological, economical and social chaos that would have ensued.**

- 7 Our production of goods and services is once again balanced with the resources available on Earth.** The economy is based on satisfying our needs and not on accumulation.
- 8 Our energy needs went down by at least 50%. Almost 100% of consumed energy is renewable. Geothermal, biomass, solar and wind energy are used for specific purposes,** especially for local energy autonomy. We produce small quantities of biofuel, including renewable natural gas (RNG) ¹, that we keep for a few industrial processes and heavy-duty vehicles.
- 9 While respecting Indigenous Peoples' territorial rights, Québec protects half of its lands and half of its internal, coastal and marine waters,** including those of crucial importance for biological diversity and ecosystem services (such as carbon control and sequestration). The wetlands and the waterways, including the Saint-Lawrence river, are truly protected. Blue and green belts are everywhere in the communities. Urban neighbourhoods and heart of villages are close-knit, dense and connected to public transportation networks. The majority of goods and services are available from a walking distance.
- 10 Road traffic is always fluid and the total energy consumption in the transportation sector has greatly diminished.**
- ... **Mobility** has improved, including for people living in far-away regions, families, disabled people or with reduced mobility and other groups with special needs.
- ... **The number of personal vehicles** registered in the province has reduced drastically, so has their weight. Walking, biking, electric biking, bike sharing and car sharing, taking the bus, the train, the tramway, the subway, the taxi (or shared taxis) complement each other to fill most mobility needs. Solo driving is the exception.
- ... **Buying locally** is now the norm in all possible sectors and the number of trucks on the road has reduced drastically. Logistics efficiency greatly improved. Marine transportation is preferred to land transportation for carrying goods for long distances.
- ... **100% of light vehicles** and almost every heavy-duty vehicles on and off roads are electric (including boats). A few industrial and agricultural vehicles work on biofuels.
- ... **Most of the commuting for work** is done locally, within a few kilometers.
- ... **Telecommuting**, remote work centers, teleconferences and intelligent multimodal delivery services eliminated a good part of transportation needs.

1. The expression "renewable natural gas" can be confusing: when referring to biogas from decomposing organic waste, we should say "manufactured gas" as it is created via an industrial process (it is not the underground natural gas). In this document, we nevertheless use the erroneous marketing term "renewable natural gas" adopted by industry and governments, so as not to confuse readers further.

- 11** The industry only uses renewable energy. Circularity is its new norm.
- 12** No building is heated with gas or oil. All recent buildings are passive and built with low-carbon materials. Even older buildings have a good energy efficiency performance.
- 13** The transformation of agricultural techniques is complete: it began before it was too late. Methods of soil protection and revitalization are universally used. Organic farming is the norm. We use very few pesticides, herbicides or chemical fertilizers. Québec's rural areas are dynamic and reinvigorated with the installation of new farms of human size. Agro-ecological farming blooms in every region, including cities. Urban agriculture plays an important role for food security. Our eating habits respect the environment and 80% of our food is local. Carbon sinks in forests and agricultural lands help to compensate for the GHG emissions that were not eliminated in other sectors.
- 14** Whether at home, in businesses or organizations, Québec is heading towards zero waste. Every person sends less than 50 kg of waste to landfills every year, in comparison to the 750 kg we currently send. Recycling is a sideline activity because garbage is eliminated at the source. Composting organic waste is universal.

... **A society of well-being** has replaced our consumerist society.

Is your vision of Québec ZéN somewhat different?
Please tell us!

We are very interested in your vision.

The governments of Québec and Canada, municipalities, businesses, other organizations and citizens: everyone has a distinct but essential role to play.

The climate crisis demands a widespread mobilization on a scale never seen before in the history of humanity. It is therefore useless to point finger: all sectors of society are indispensable to resolve the problem.

The governments of Québec and Canada must decide to make the climate emergency their top priority and have the political courage to use every legal, fiscal and financial means to introduce change. They must also implement a framework in which communities will have access to the necessary tools to go toward carbon neutrality and resilience.

At the same time, organizations, such as businesses, trade unions, associations, professional associations and nonprofits, must implement ambitious processes to quickly bring their net GHG emissions to zero.

Municipalities also have a crucial role to play because the solutions to climate change and the path toward resilience are often found locally.

Finally, reaching carbon neutrality demands that each individual make this a personal goal and act decisively to achieve it in their immediate environment.

1. Resilient Communities

Everywhere in the world, communities acknowledge the climate emergency and the environmental crisis. They get together to reclaim ownership of their lifestyles, rooting it in the places where they live. They plan and act for the future starting from their neighborhoods, villages and cities. Slowly but surely, they create solutions that work for their day-to-day life, they build a more simple, friendly and united society, even a more prosperous one, respecting its surrounding habitat and all of Earth's resources.

These communities consider nature and its resources as a common good which must be utilized through social consensus. They work on regaining a balance for a livable world. They create a local, humane and greener economy while they reduce their energy consumption, free themselves from fossil fuels and develop their self-sufficiency to fulfill their basic needs. They utilize the available and useful technology, but remain mindful of technological fallacies.

Indigenous Peoples cultures are a big inspiration for these communities where humans are part of a whole, of a single planet where their actions are guided by the respect owed to the seven next generations. They acknowledge the rights of Indigenous Peoples and contribute to the collaboration between aboriginal people and others, namely to better understand natural environments and the respect of the land.

These communities are called “resilient” because they make decisions, which affect society, the environment and the economy, collectively and democratically. They give themselves the ability to anticipate the chronic stresses and shocks they face and are able to adapt in order to survive.

Resilient communities are at the heart of the transition. They show that by changing our world view, we can achieve a lifestyle that reinvigorates the Earth instead of destroying it and is not only possible and highly desirable, but is even safer. The communities benefit from favourable financial decisions and policies at the political level, which are complemented by coherent individual choices. They are a vector of transformation and give us hope that we can still steer in the right direction peacefully and on time.



By coming together, they [the citizens] are able to create solutions together. They seek to nurture a caring culture, one focused on connection with self, others and nature. They are reclaiming the economy, sparking entrepreneurship, reimagining work, reskilling themselves and weaving webs of connection and support. Courageous conversations are being had; extraordinary change is unfolding.

Essential Guide to Transition,
Transition Network



In tomorrow's Québec ZéN...

Québec's communities have put resilience at the heart of their actions. They have the ability to sustain almost all the systems that support their ways of life. They make and implement their own decisions in accordance with a global action plan for decarbonisation and self-sufficiency. Far from being a withdrawal, their self-sufficiency is founded on inclusion, sharing, cooperation and local creativity.



What we need to do to achieve that vision

- ✓ Reclaim our living environments and the means to protect the ecosystems on which we depend.



What would prevent us from succeeding

- × Viewing the transition as a technical challenge and managing it as such, when the challenge is actually social transformation.
- × Continuing to avoid the problem and hoping that some magic solution, such as carbon sequestration technologies, will solve everything.



Proposed Actions

Governments of Québec and Canada

Support community resilience.

1. National education strategy on environmental citizenship (see the section on Education and social dialogue).
2. Knowledge acquisition, information sharing and funding communities for the planning and implementation of a resilience strategy.
3. Support the birth of resilient communities with interventions in land-use planning and urbanism, such as:
 - 3.1 - Financial aid to support urban requalification and rural communities revitalization;
 - 3.2 - Diversification of the housing and transportation supply;
 - 3.3 - Optimization of infrastructures to make better use of available constructions and existing or planned networks;
 - 3.4 - Agricultural reform and care of agricultural lands;
 - 3.5 - Project for food sovereignty and safety;
 - 3.6 - Valorization of green infrastructures to fight against urban heat islands et to reduce GHG;
 - 3.7 - Protection and remediation of natural environments.
4. Social economy support.



Proposed Actions (suite)

Municipalities, Businesses and Other Organizations, Citizens

5. Protection of natural environments and agricultural lands.
6. Protection of land potential in food production and drinking water.
7. Implementation of a resilience process, including:
 - 7.1 - Social debate on the common goods to preserve. How to produce less and consume only what we need to produce, share more and develop a new community based on changing production of goods and services in all sectors;
 - 7.2 - Big resilience skills acquisition project;
 - 7.3 - Regional and local risk management plans to anticipate, avoid, attenuate and better manage chronic stresses and shocks from the climate crisis and transition;
 - 7.4 - Economy of proximity and local purchasing;
 - 7.5 - Large food sovereignty project;
 - 7.6 - Protection of urban agricultural plots, including the necessary help to implement agricultural projects;
 - 7.7 - Policy for housing access;
 - 7.8 - Prevention and elimination of urban heat islands;
 - 7.9 - Urban and rural planning focused on an all year long community life;
 - 7.10 - Development of inclusivity, solidarity and a neighbourhood culture;
 - 7.11 - New initiatives for a thrifty economy: reusing, repairing and sharing;
 - 7.12 - Resource and energy efficient buildings;
 - 7.13 - Inclusion of the right to the sun for passive solar buildings;
 - 7.14 - Energy efficiency and frugality, zero emission energy;
 - 7.15 - Implementation of small autonomous local networks of renewable electricity production, and of energy districts, if needed;
 - 7.16 - Strengthening the community ability to fulfill its health and safety needs;
 - 7.17 - Strengthening the community ability to fulfill its transportation needs;
 - 7.18 - Implementation of production, consumption and housing cooperatives. ■

2. Coherence and Accountability of Governments

Despite billions of dollars invested in the fight against climate change, Québec reduced its GHG emissions in 2016 only by 9.1% compared to 1990¹, even though reductions of 20% and 37.5% are its targets for 2020² and 2030 respectively³.

At the Canadian level, the official target is to reduce GHG emissions by 30% in 2030, compared to 2005 (a target that is seen as heavily insufficient). Nevertheless, GHG emissions only went down by 2% in 2017 and there is no sign of an accelerated reduction trend. On the contrary, national emissions increased slightly between 2016 and 2017⁴. The Canada's Greenhouse Gas and Air Pollutant Emissions Projections 2018 report⁵ published in December 2018, confirmed that with each passing year, the chances of hitting the 2030 target get slimmer⁶.

As time goes by without progress, there is a greater need for a clear plan and there are increased risks of damage caused by improvisation and procrastination.

Dumbfounded by the apparent powerlessness of the state to implement the appropriate emergency measures, an increasing part of the population links our leaders' apathy to the hindrances that seem to paralyse them, such as free trade agreements that annihilate the states' ability to implement coherent policies at the required scale, the chronic problem of tax avoidance and tax evasion which deprives governments of considerable financial resources and, more generally speaking, the huge democratic deficit caused by the excessive influence of the financial and industrial powers on public authorities.



Whatever the causes of the current delays, our governments will certainly not accelerate the transition to carbon neutrality if they maintain their current incoherent structures and operating modes which weaken climate responsibilities. On the contrary, considering the needed changes and the speed required for their implementation, this conversion necessitates a complete and structured plan with compatible tracking mechanisms and full accountability (after taking the crucial steps of social dialogue and participation). This plan must allow the decisions to be taken at the appropriate levels, as close as possible to the affected communities to ensure that the significant social aspects of the transition are taken into account. Every state department or public and para-public agencies of the provincial and federal governments will be concerned, demanding accountability at the highest levels.

1. Inventaire québécois des émissions de gaz à effet de serre in 2016 and their evolution since 1990.

2. Website of the ministère de l'Environnement et de la lutte contre les changements climatiques, read on August 11, 2019.

3. Decree 1018-2015 of November 18, 2015 on the adoption of a reduction of Québec GHG emissions target for 2030, Gazette officielle du Québec, part 2, December 9, 2015, 147^e year, n° 49. (unofficial translation).

4. Canada's Official Greenhouse gas inventory 1990-2017: Sources and sinks of greenhouses gases in Canada, United Nations Framework on Climate Change (UNFCCC), April 2019. (unofficial translation).

5. Greenhouses Gas and Air Pollutant Emissions, Environment and Climate Change Canada, December 2018.

6. Le Canada prend encore du retard dans sa réduction des GES, Le Devoir, December 21, 2018.



In tomorrow's Québec ZéN...

Our society is peaceful, as it has been throughout its transformation. Public interest has become a priority again and, because of this, the transition was implemented peacefully and progressively, without triggering chaos.



What we need to do to achieve that vision

- ✓ Adopt rapidly a climate legislation, a coherent framework based on the subsidiarity principle¹, a strong interministerial coordination and the principle of accountability at the highest level.



What would prevent us from succeeding

- ✗ Let the environment deteriorate further without developing the necessary tools to solve the situation.
- ✗ Maintaining free trade agreements clauses impeding the implementation of climate change solutions and tolerate the existence of tax havens.



Proposed Actions

Governments of Québec and Canada

1. Acknowledgement of the climate emergency and the need to act accordingly by putting it at the heart of all the actions taken by the state, its agencies and society.
2. Evaluation of all Québec natural carbon sinks' capacity after rehabilitation and protection, and the resulting total carbon budget².
3. Climate Legislation:
 - Requiring a minimum GHG reduction of 65% by 2030 and reaching carbon neutrality by 2040 with the adoption of the appropriate intermediate targets;
 - Setting up a mandatory annual carbon budget (total and by sector) in order to continuously monitor our progress against targets;
 - Requiring the application of a climate test to any investment, infrastructure or industrial project.
4. Immediate adoption of a complete, persuasive and coherent government action plan on the transition toward carbon neutrality, including:

1. Subsidiarity is among the 16 principles of the Québec Sustainable Development Act. This principle requires that powers and responsibilities must be delegated to the appropriate level of authority and as close as possible to the citizens and communities concerned.

2. The carbon budget is the maximum amount of greenhouse gases that could be released into the atmosphere while avoiding global warming exceeding the cap we have set for ourselves. This limit can be extended to some extent if more carbon is removed from the atmosphere by increasing the capacity of natural carbon sinks (soils, wetlands, forests, etc.). This can be done by restoring soil health and planting trees for example. Neither the potential additional capture capacity of natural carbon sinks nor Québec's total available carbon budget appears to have been calculated to this date.

- 4.1 -** All the necessary steps to achieve carbon neutrality (net zero emissions);
 - 4.2 -** The fight against tax avoidance and tax evasion;
 - 4.3 -** Obligation for all the ministries, public agencies, municipalities, businesses and other organizations to achieve the intermediate and final targets;
 - 4.4 -** Mandatory production of an annual carbon assessment for every entity;
 - 4.5 -** Citizen engagement is at the core of the plan;
 - 4.6 -** Financial transparency of the institutions and organizations issuing opinions on climate change.
- 5.** Strong monitoring and rigorous mechanisms for measuring the results.
Coordination of the implementation of the government action plan with a strong accountability at the highest political level.
 - 6.** Exemplarity of the state and mandatory exemplarity of all municipalities for the implementation of the proposed actions.
 - 7.** Renegotiation of clauses in free trade agreements that impede Canada's ability to reduce its GHG emissions, such as those that limit eco-design opportunities by imposing uniform standards, limit opportunities for green taxation, allow multinationals to sue Canada if the initial conditions of their investments are changed by measures taken by the country to fight global warming.

Municipalities

- 8.** Carbon assessment.
- 9.** In collaboration with the community, development and implementation of a Road map (action plan) toward carbon neutrality.
- 10.** Climate test for urban projects where an important climate impact is anticipated.

Businesses and Other Organizations

- 11.** Carbon assessment.
- 12.** In collaboration with the employees (including trade unions where applicable), development and implementation of a Road map (action plan) toward carbon neutrality.

Citizens

- 13.** Individual or family carbon assessment.
- 14.** Development and implementation of a personal or family Road map towards carbon neutrality.
- 15.** "ZéN events", i.e. friendly discussions to exchange on successes, failures and discoveries.
- 16.** Creation of a ZéN task force to accelerate the awareness, mobilization and action in the community.
- 17.** Support for climate demands. ■

3. Education and Social Dialogue

The transition towards carbon neutrality will require profound changes but it could also allow us to build a more resilient, peaceful and strong society. If, on the contrary, decisions are taken in close quarters for the benefit of a few or without considering their impact on the populations, it could create social tensions. A successful transition requires that every Quebecer, every member of an Indigenous community and every organization in the province—whether they belong to the scientific, governmental, economic, cultural, agricultural, environmental, trade union, community, cooperative, association or other sectors—have a meaningful opportunity to participate in the decision-making process and abide by the collective decisions taken and assume responsibility accordingly. Dialogue will have to go on after the transition to allow the individual and collective transformation process to take root in the affected populations.

To allow for a peaceful and constructive social dialogue to take place, it is important that all the social players and the population have a clear picture of the situation. Even now, a huge number of people in the province do not grasp the magnitude of the threat, the nature of the measures to be taken or the unassailable advantages of a transition towards a Québec ZéN. Many need to gain the necessary ethical, critical and political skills for green citizenship. A national information strategy is therefore an essential preliminary step before the social dialogue that will allow us to change.

Training is also an unavoidable condition for a successful change that requires learning new ways to operate in ordinary life and new work skills. How do we eliminate food waste? How do we establish a Carbon assessment for our locality? How do we manage a food service without waste? How do we apply new construction norms? Structured training programs will help to answer these types of questions that will arise in all sectors.



In tomorrow's Québec ZéN...

All parts of society were involved in the process of changing our ways of living, producing and consuming in a spirit of shared but differentiated responsibility.



What we need to do to achieve that vision

✓ **Together, plan and build the Québec ZéN of tomorrow.**



What would prevent us from succeeding

- ✗ **To remain divided when confronted with historic challenges;**
- ✗ **Planning the transition without integrating major information and educational efforts;**
- ✗ **Planning the transition in close quarters and limiting the dialogue to a few targeted groups while having consultations that are only a facade.**



Proposed Actions

Governments of Québec and Canada

1. Major information program on the climate emergency and the benefits of the transition added to a national green citizenship education strategy.
 - 1.1 - Intensive and continuous information and education program for citizens of all ages, for leaders and influencers everywhere, civil servants and elected officials at every level.
 - 1.2 - Education to green citizenship in schools.
 - 1.3 - Governmental support and funding for awareness programs, including those developed by environmental organizations.
 - 1.4 - Generic hearing of the BAPE on climate emergency and transition.
 - 1.5 - Continuous participatory decision-making mechanisms for transition.
 - 1.6 - Support to the population during the entire transition by calling upon the specialists to help (sciences, communication, education, health, etc.) while taking inspiration of harm reduction models proposed by experts in addiction and dependence.

Municipalities, Businesses and Other Organizations, Citizens

2. Active support and participation in the information project and the national education strategy.
3. Personal or group information approach on climate issues and on transition through reading, conferences and documentaries coming from credible sources.
4. In every region, implementation of working groups where socio-economic actors will collaborate to develop a carbon neutral territory respecting the economic priorities of communities, by diversifying the economy if needed, supporting social development and putting together structuring projects that will reduce GHG emissions.
5. Development of the educational skills of municipality departments, such as libraries, parks and recreation departments, waste management, water management, snow removal, land planning, etc., so that everyone will participate in the education effort.
6. Continuous participatory decision-making mechanisms on transition. ■



4. Fair Transition

Seeking fairness between social groups and generations is an important factor to consider while planning the transition. If we are not careful, the transition could unfairly harm certain people and increase inequalities. Taxation or regulatory measures could, among others, unfairly harm those among us who are the most vulnerable and who contribute less to global warming, unless compensation mechanisms are provided for.

Also, workers in the fossil fuel sector could face hardship and have to change their careers. Indeed, the energy transition is an opportunity of major transformation in the workforce that goes well beyond the energy sector, including volunteer and unpaid work. It is important to make sure that this transformation does not increase precarious work but instead brings dignity and better life conditions for workers and communities.



In tomorrow's Québec ZéN...

The transition has not penalized either vulnerable groups or workers. On the contrary, the standards of living and working conditions have improved. Social justice has increased.



What we need to do to achieve that vision

✓ **Leave no one behind in implementing a fair transition for everyone.**



What would prevent us from succeeding

- ✗ **Underestimate the risks of social ruptures inherent to the unavoidable transition.**
- ✗ **Taking into account the social component only at the end of the process.**
- ✗ **In the necessary transformation of the workforce, limit ourselves to the energy sector.**
- ✗ **Omit to consider volunteer and unpaid work as a component of the workforce.**



Proposed Actions

Governments of Québec and Canada

1. Inclusion of the crucial aspects of social justice in every discussion on transition.
2. Participation of the people and groups concerned to the discussion and to the decision-making process.
3. Regulatory and green taxation rules applied with compensation measures for the more vulnerable and support measures for companies that are forced to transform their business model.
4. Industrial policies to accelerate job replacement in high GHG emission sectors with quality jobs in sectors contributing to decarbonisation and to the greening of the economy, or that support a transition, bringing social justice.
5. Support for workers, companies and communities affected by the end of fossil fuels, in particular:
 - 5.1 - Support measures based on scientific facts, such as the thorough analysis of the impacts of enterprises in their communities (including their closure or their decline) on the economy, the environment, and public health;
 - 5.2 - Retirement benefit programs in the event of a closure or mass layoff;
 - 5.3 - Transition fund for the requalification of the workforce and remoteness and mobility allowance;
 - 5.4 - Funding training program in the workforce and support securing professional careers to maintain jobs;
 - 5.5 - Creation of a list of all the available jobs for reorientation purposes;
 - 5.6 - Funding program to improve the industrial installations to eliminate GHG emissions while maintaining the financial conditions and health and security of the workers;
 - 5.7 - Funding program for the communities that would suffer economic hardships created by a rapid transition, including communities that are now in an autonomous network powered by fossil fuels, if needed.

Municipalities, Businesses and Other Organizations, Citizens

6. Participation of the people and groups concerned in the thinking and decision-making process. ■

5. Human Rights

Human rights issues will arise from the transition because the changes accompanying it could have specific impacts on certain groups of people such as women, youth, Indigenous Peoples, northern, coastal and insular communities, minorities and disabled people.

More specifically, mining projects related to electrification can have impacts on the ways of life of Indigenous Peoples and other populations living on the affected territories. As an example, we can think of the rare metal production sites that hire children in some countries or of the graphite, cobalt or lithium mines for which extraction is necessary for battery construction but can have nefarious effects on the environment of the neighboring localities.

The rights of climate migrants are also at the heart of the transition. More climate refugees will have to be welcomed and decent life conditions will have to be ensured for climate victims everywhere in the world.



In tomorrow's Québec ZéN...

We have protected human rights while transitioning and did our fair share to ensure decent living conditions to climate refugees.



What we need to do to achieve that vision

- ✓ **Include from the start, in the decision-making process, the groups whose rights may be affected by the transition. Respect the right of Indigenous Peoples to a free, prior and enlightened consent.**



What would prevent us from succeeding

- ✗ **Having consultations that are only a facade with women, youth, Indigenous Peoples, northern, coastal and insular communities, minorities and disabled people, or consulting them only at the end.**
- ✗ **Failing to fulfill our international solidarity duties toward climate refugees.**



Proposed Actions

Governments of Québec and Canada, municipalités, Businesses and Other Organizations, Citizens

1. Full respect for all human rights in accordance with the principle of the interdependence of rights, in accordance with the following texts:
 - International Covenant on Economic, Social and Cultural Rights;
 - International Covenant on Civil and Political Rights;
 - Convention on the Rights of the Child;
 - Convention on the Rights of Persons with Disabilities;
 - Convention Relating to the Status of Refugees.
2. Assessment of the potential impact of the transition measures on all rights, particularly those of vulnerable groups and victims of exclusion and discrimination.
3. Participation of the persons and groups concerned in all the thinking and decision-making.
4. Review of international law to define the concept of climate refugees and grant them the same rights as other refugees. ■

6. Crisis financing

Important investments will be necessary to transform our society in a way that will prevent climate devastation. Whatever the costs of action, however, it will always stay below the costs of inaction. Therefore, the fight against climate change must go at the top of the budgetary priorities of the state and all its departments and agencies.



In tomorrow's Québec ZéN...

We have avoided climate devastation as well as the ecological, economical and social chaos that would have ensued.



What we need to do to achieve that vision

- ✓ **Make immediately extraordinary financial efforts.**



What would prevent us from succeeding

- ✗ **Underestimate the risk that our ecological debt rapidly becomes unbearable and, because of this, choosing not to invest on time sufficient resources in the fight against global warming.**
- ✗ **Fail to redirect public funds invested in fossil fuels and those deposited in tax havens to transition.**
- ✗ **Put the burden of the financial effort on the shoulders of less well-off populations or workers.**



Proposed Actions

Governments of Québec and Canada

1. Reallocation to the transition of all amounts previously allocated to fossil fuels and new infrastructures that encourage their consumption, such as highways and airports.
2. Fight against tax avoidance and tax evasion; allocating recovered amounts to transition.
3. Reallocation of other budgets to supplement the necessary amounts.

4. Priority funding of transition plans for municipalities, regional county municipalities (MRC) and regions, all in accordance with the principle of subsidiarity.
5. Use of progressive regulation and eco-taxation to achieve some aspects of the transition at no cost.
6. Modification of the mandate of economic institutions to reflect the climate crisis and involve them in the implementation of solutions, including subjecting all their investments and projects to a climate test.

Municipalities

7. Reallocation to the transition of all amounts previously allocated to fossil fuels and new infrastructures that encourage their consumption.
8. Reallocation of other budgets to supplement the necessary amounts.
9. Modification of the mandates of the municipal advisory commissions dealing with land use planning, transportation, housing and the environment so that they include the need to submit new initiatives to a climate test.
10. Reassignment of staff and changes in mandates to prioritize the transition.

Businesses and Other Organizations

11. Participation in the funding effort for the energy transition.
12. Redeployment of staff and modification of mandates to give priority to the transition.
13. Reduction of working time without loss of salary or rights.

Citizens

14. Personal and family financial choices in harmony with the imperatives of transition. Ensure that these choices are made without increasing the burden of work traditionally performed by women and that equality is promoted when sharing unpaid work.
15. Support for progressive eco-tax measures.
16. Temporary cessation of certain activities to allow time for planning a ZéN lifestyle, as well as for acquiring and integrating new knowledge and habits. ■

7. Economy and Consumption

An economy based on finances is focused on the accumulation of capital and not on the satisfaction of needs. It prioritizes investment performance over the protection of the environment and human rights. It is inseparable from the “extract, manufacture, consume and throw away” economic model that inevitably leads to the end of the resources of the planet. In 2019, humanity consumed in only 211 days what the Earth can renew in 365 days.

If every human consumed at the same rate as the Canadian population, the threshold for over-running the planet’s resources would have been on March 18¹. Supported by our governments, who equate their success with economic growth, this tendency is fed by overconsumption and the accumulation of goods and waste which define the lifestyle of a good proportion of the Québec population.

1. Le « jour du dépassement », symbole de la surconsommation humaine, Le Devoir, July 30, 2019.

An Economy Fueled by Waste

Here are a few examples demonstrating the excessiveness of the current overexploitation of resources.

- Usable groceries found in disposal sites across Canada would be enough to feed Canadians for five months².
- Québec produces 750 kilos of non-recovered waste per person per year, or 344 kilos of residential origin and 404 kilos from businesses and institutions³.
- Each Quebecer throws an average of 24 kilos of clothing away each year, for a total of 190,000 tons of fabric⁴. The Global Slavery Index estimates that 40 million workers in factories supplying western clothing brands live as slaves⁵.
- Planned obsolescence of devices has become the norm in several sectors.
- Department stores throw away unsold or returned items after rendering them unusable.
- Disposable objects, often made of plastic, absorb the planet’s resources at an excessive speed before filling landfills of mountain of garbage and suffocating the oceans.
- Overpackaging, which exist in many sectors, is at its highest in the food sector which produces about 70% of all packaging on the market⁶.
- Each year, Quebecers use one billion plastic bags and buy one billion bottles of water, of which 600 million are not recycled⁷.
- Only 54% of the recyclable materials in our green bins are recycled, including just 14% of glass items⁷.
- Generally, only one of the 4 to 7 seats in the cars congesting our roads during rush hour is occupied. The average is 1.2 people per vehicle⁸.
- It is estimated that 32 billion kilometres are driven each year by empty trucks travelling across North America⁹.

2. Les Canadiens, champions du gaspillage alimentaire, Le Devoir.

3. Production de déchets (2012), Conference Board of Canada.

4. Les Québécois jettent 24 kg de vêtements par an!, UdeMNouvelles.

5. La mode détruit des vies et la planète, L’Actualité.

6. Mieux comprendre l’emballage dans l’alimentation, Radio-Canada.

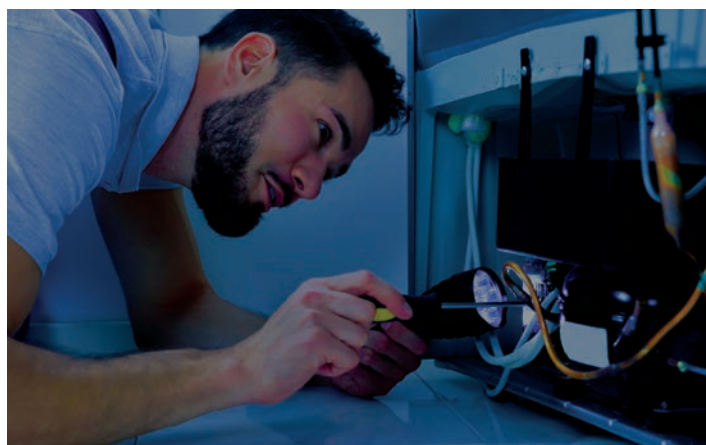
7. CAQ—Spring 2019 Consultation for Regional Tables.

8. Congestion routière, 25 millions de sièges vides à combler, La Presse, June 20, 2018.

9. Réduire les « kilomètres parcourus à vide », Canadian Fuels Association.

The plundering of the resources is unbearable. The biophysics limits of the Earth forbid that we continue in this way any longer.

In this context, we believe that a planned transition towards a radical reduction of the consumption of materials and energy is our only guarantee of resilience, our only protection against an ecological, economic and social crash.



Refuse first, Reuse second, Recycle as a last resort

We have heard about the 3R, the 4R, the 5R and all the other versions under which the “R” concept appears. It incorporates words such as, reduce, reuse, recycle, recuperate, repair, restore, relook, among many others, and is sometimes completed with the V for Value and the C for compost.

Humanity is faced with an existential threat directly related to the overexploitation of matter and energy. That is why we support, for our part, a waste hierarchy that gives the first place to refuse: refuse disposable items, packaging, planned obsolescence, goods of bad quality, unnecessary trips, overfilled closets, useless gifts, replacement of a good that still works, etc.

We then give priority to reuse, a notion describing all the possible ways to avoid the production of new goods by extending the lifespan of already existing goods that we would otherwise discard. It can be done by reusing goods to the same end¹ or to new ends².

Recycling, which aims at transforming waste with chemical or mechanical processes before reintroducing it, as raw material, in the production cycle of new goods, is a last resort option. The ecological footprint of this option is important because it perpetuates the transportation of a huge amount of residual material and the use of industrial processes to transform matter. Even more concerning,

recycling does not contribute to reduce overconsumption or overexploitation of resources for goods’ production, transportation and distribution.

Far from being only a management problem, Québec’s current recycling crisis is proof of the overflowing of goods in circulation.

P.S. Composting is in a class by itself at the top of the waste hierarchy, as long as it’s not fed by food waste.

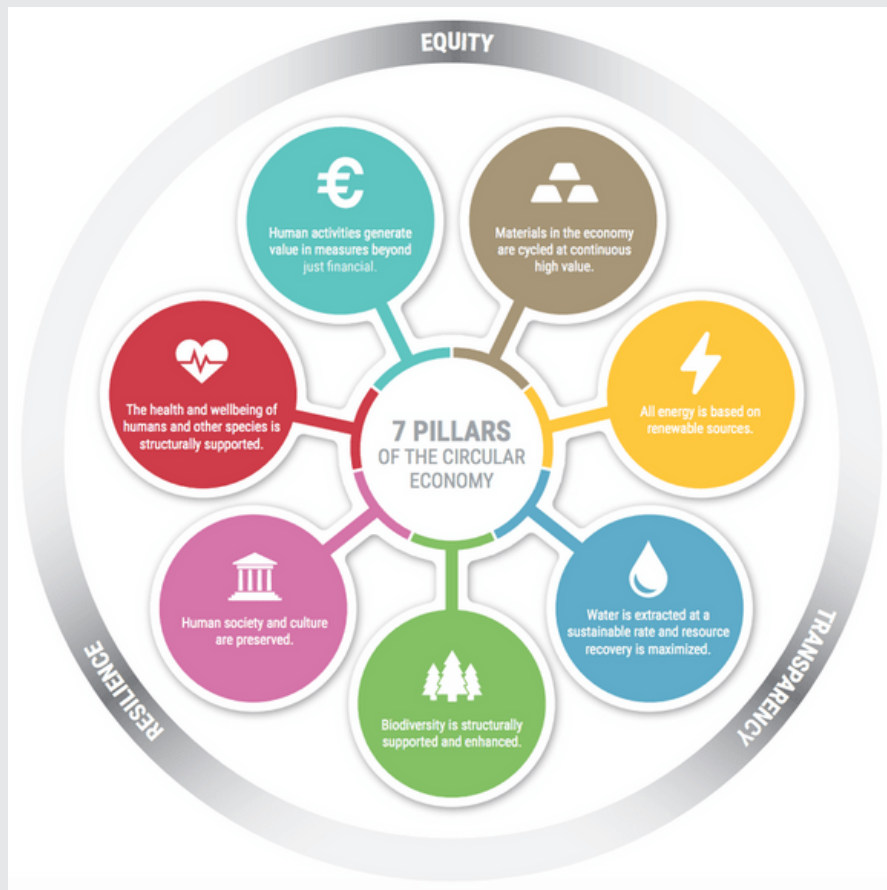
1. By depositing, repairing, exchanging or buying used goods, for example.

2. We can use an object to new ends without modifying it or by using its initial components to assemble new items.

Circular economy according to the Circular economy institute

“Circular economy proposes [...] to transform waste into raw material reused in the creation of products or other uses. In other terms, to stop creating residual matter that industrial and natural systems cannot absorb. The cycle is complete. It obviously represents an enormous gain in competitiveness for industries mastering their raw material flux.”

François Michel Lambert, president of the Circular Economy Institute¹



The seven pillars of circular economy

The notion of circular economy applies not only to raw materials but also to energy.



1. Web site notre-planete.info, accessed 7 August 2019.



In tomorrow's Québec ZÉN...

In tomorrow's Québec ZÉN... Our production of goods and services is once again balanced with the resources available on Earth. The economy is based on satisfying our needs and not on accumulation



What we need to do to achieve that vision

- ✓ Radically reduce our energy and material consumption. Make a decisive shift toward the circular economy and the economy of proximity.



What would prevent us from succeeding

- × Clinging to the “extract, produce, consume, throw away” model.



Proposed Actions

Governments of Québec and Canada

Economic Policy providing for the optimal use of all instruments available to governments¹ to firmly support the emergence of an economy radically less greedy in raw materials and energy.

1. Adoption of socio-economical and environmental indicators measuring the whole of positive and negative impacts of human activities;
 2. Public financing of research to university researchers, particularly in sectors linked to economy, business and technology;
 3. Framework law on energy and raw material sober economy;
- 3.1 -** Through fiscal measures, accompaniment, R&D and massive support to the deployment of business models, initiatives and practices favoring a major reduction in energy and raw materials consumption. For example:
- circular economy—zero waste enterprises, industrial symbiosis, local energetic districts, etc.;
 - local production, local manufacturing, local purchasing—proximity economy, short supply chain;
 - collaborative economy—sharing networks;
 - product-service system, renting services for vehicles, goods and equipments of enterprises;
 - bulk trades;
 - ecoconception;
 - social economy;

1. Legislation and regulations, taxation, pricing, education, support programs and tax incentives.



Proposed Actions (suite)

- repair and revaluation of objects, clothings and perishing foods, confection and distribution of home made unwrapped meals, in all seasons;
 - modernizing waste sorting units;
 - etc.
- 3.2 -** Much higher taxing on goods than on services in order to encourage reuse, repair and revalue instead of the buying of new goods;
- 3.3 -** Prohibition of foodwaste¹, programs to support the fight against food waste;
- 3.4 -** Prohibition of planned obsolescence;
- 3.5 -** Manufacturers obligation to take back old devices for free;
- 3.6 -** Prohibition of single use objects, including water bottles and their avatars, disposable food containers, plastic bags and most wrapping, and seeing that the alternative solutions contribute to a better carbon footprint;
- 3.7 -** Priority to reuse, container-deposit especially for glass and metal containers; marginal use of recycling materials.
- 4. Renegotiation of free-trade agreements dispositions limiting the relocalisation of the economy;**
- 5. Develoment of industry of second and third transformation;**
- 6. Adding the hidden footprint of imported goods and travels to the greenhouse gas emissions inventory of Québec and Canada, for information and awareness².**

Municipalities

- 7. Support the transition of the enterprises of the territory towards circularity;**
- 8. Support a sober economy;**
- 9. Support local economy, encouraging local responsible buying;**
- 10. Support zero-waste initiatives;**
- 11. Support initiatives of money-less exchanges (troc) and local currencies;**
- 12. Prohibition of bottled water, inside its premices and in organised events.**

1. La France pionnière de la lutte contre le gaspillage alimentaire, Ministère de l'Agriculture et de l'Alimentation de la France, December 26, 2018.

2. Without these emissions being added to the official numbers presented at the IPCC, in accordance with international reporting norms.

Businesses and Other Organizations

- 13. Updating the business model and processes in order to respect circularity principles;
- 14. Zero waste policy;
- 15. Local and eco responsible purchase policy.

Citizens

- 16. Reduction of consumption, developing reflexes of: “less is more” and “do I really need it”;
- 17. Zero waste lifestyle—groups or cooperatives—organising Zero Waste meetings or festivals;
- 18. Buying locally—groups or coop of local buying;
- 19. Initiatives of revaluation, sharing or trading of objects.
Joining trading groups, bulk cooperatives;
- 20. Reading clubs about sobriety, voluntary simplicity, zero waste, hidden footprint...
- 21. Developing simple objects that can be made easily by their users with locally found materials;
- 22. Training in eliminating food waste;
- 23. Refusal of single use objects, including water bottles and their avatars, disposable food containers, plastic bags and most wrapping, and seeing that the alternative solutions contribute to a better carbon footprint. ■

8. Energy

Around 54% of the primary energy¹ available in Québec is consumed in vain because it does not offer an energy service². Adding to this inefficiency inherent to the technologies used, waste of useful energy (one that offers a service) also happens routinely: fuel consumed by solo-driven cars trapped in traffic; energy used in the production of wasted foods; coal, oil and gas burned in production, transportation, distribution and disposal of throwaway goods, etc.

Worldwide, only Canada and the United-States exceed the average energy consumption per Québecer. Two thirds of all the energy is consumed by industrial, commercial and institutional uses while the other third is consumed by households.

Around 51% of the consumed energy in Québec is derived from fossil energy, primarily oil and gas, with the major part being burned by transportation and the industry³. Those fossil fuels explain most of the GHG emitted on the territory and, because they are all imported, they cause 14 billion dollars to leave the Québec economy each year⁴. The transition is, therefore, a good opportunity for the province to get richer by saving money.

Québec is richly endowed with renewable energy and has a good potential of energy sobriety and efficiency. It has an hydroelectricity surplus and interesting alternatives in biomass production and in geothermal, solar or wind energy. Its challenge is not to produce more clean electricity, but to free itself from oil and gas, to radically reduce its energy losses and to relearn how to save electricity in every possible way.

Thanks to energy sobriety, Québec will be able, without new infrastructure, to fulfill its needs coming from the electrification of mobility, connect new autonomous networks to renewable energy sources, in replacement of fossil fuels, face the potential reduction of available power at the end of the contract between Hydro-Québec and Newfoundland and Labrador in 2042 while helping its neighbours to reduce their addiction to oil and gas. Sobriety will have to be combined to other means such as education and pricing to allow Québec to fulfill its peak demand needs without using fossil fuels.

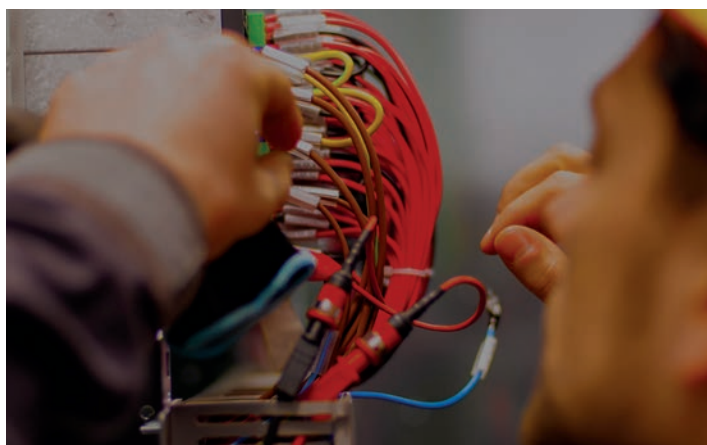
1. "Primary energy is recovered from natural resources such as solar radiation, falling water, wind, coal, petroleum products and uranium. [...] A significant portion is lost in storage, processing and transportation before primary energy is delivered to consumers as secondary energy. Further energy is lost through the inefficiencies of conversion devices (cars, appliances, heaters, etc.) that transform the secondary energy into useful work." O.J.C. Runnalls, *Energy*, Canadian Encyclopedia, March 4, 2015, Read May 13, 2019.
2. *État de l'énergie au Québec 2019* – Chair in energy sector management.
3. *Ibid.*
4. *Le Québec chiffres en main 2019*, Institut de la statistique du Québec.

And when it is - 25 °C ?

One of the main issues with hydroelectric production is to answer to demand during peak periods when the weather is cold. Sometimes, those peaks force Hydro-Québec to buy electricity from other producers who may use fossil fuels.

First and foremost, the main solution would be to increase energy efficiency and to reduce our consumption of electricity with better habits all year long, but especially during cold weather. Another solution would be to use technologies such as hydrogen production by electrolysis which would allow us to stock energy outside peak periods and use it if needed. Moreover, some energy sources, such as geothermal energy and biomass, can furnish part of the necessary heat to keep buildings warm, which would allow also to limit peak demand.

Biofuels produced with the help of household organic matter, agricultural waste and forest residues, including renewable natural gas (RNG)¹, can fulfill specific needs. Their use must, however, be strictly supervised and respect the environment. Otherwise, biodiversity and carbon storage in the trees, the forests and the ground (which is the first carbon sink on Earth) may suffer. It may also compete with composting and heating with forest biomass, which are greener and more economical when done with local resources and while respecting ecosystems.



1. The expression “renewable natural gas” can be confusing: when referring to biogas from decomposing organic waste, we should say “manufactured gas” as it is created via an industrial process (it is not the underground natural gas). In this document, we nevertheless use the erroneous marketing term “renewable natural gas” adopted by industry and governments, so as not to confuse readers further.



In tomorrow's Québec ZéN...

Our energy needs went down by at least 50%. Almost 100% of consumed energy is renewable. Geothermal, biomass, solar and wind energy are used for specific purposes, especially for local energy autonomy. We produce small quantities of biofuel, including renewable natural gas (RNG) that we keep for a few industrial processes and heavy-duty vehicles.



What we need to do to achieve that vision

- ✓ Prioritize initiatives which combine sobriety and conversion to 100% renewable energy.



What would prevent us from succeeding

- ✗ Financing new gas infrastructures or gas conversions.
- ✗ Allow the production of oil and gas in Québec or the construction of new infrastructure ensuring the transit for export of oil and gas products from Western Canada or the United States.
- ✗ Delay the conversion to renewable energy of off-grid systems.
- ✗ Invest in energy production (even renewable) instead of investing in sobriety and electrification.
- ✗ Inject in the gas network the small quantities of produced RNG instead of saving it for a few industrial processes.



Proposed Actions

Governments of Québec and Canada

Energy Policy providing for the optimal use of all instruments available to governments¹ to firmly support the concurrent development of energy sobriety and electrification in order to rapidly free ourselves from fossil fuels by doing the following:

1. Intensive support for the concurrent development of energy sobriety and electrification:
 - 1.1 - Major increase in energy sobriety targets;
 - 1.2 - Major support to research and development in energy sobriety;
 - 1.3 - Major support of the implementation of solutions combining both energy sobriety and electrification with tax incentives, significant investments and support programs.

For further reading, see also the proposed actions for a more frugal economy in material and energy in the Economy section.

1. Legislation and regulations, taxation, pricing, education, support programs and tax incentives.

2. Appropriate carbon pricing and implementation of mitigation measures for the economic impacts on affected workers and low income households.
3. Major support to exit strategies related to the use of fossil fuels:
 - 3.1 - Replacement of fossil fuels by hydroelectricity;
 - 3.2 - Replacement of fossil fuels with other sources of renewable energy to cover specific needs (such as distance from the hydroelectric grid or specific industrial processes);
 - 3.3 - In the case of communities with off-grid systems based on fossil fuels, connection to the hydroelectric grid or conversion to renewable energy sources;
 - 3.4 - Planning the needs during peak periods to avoid using fossil fuels by combining general efforts for energy sobriety and specific tools for energy saving during peak periods such as education, pricing and technological tools;
 - 3.5 - Replacement of the *Petroleum Resources Act* by a legislation preventing the exploration and exploitation of oil and gas in the province and in the Gulf of Saint Lawrence. Plan to revoke current gas and oil licences.
4. Mechanisms to deter investments in fossil energies.
 - 4.1 - Review of all taxation and investment rules of all governmental departments and agencies to end all direct and indirect financial support to fossil fuels;
 - 4.2 - Rules forbidding any investment in the oil and gas sector from a portfolio under the control of the State or of a public or parapublic agency, including the Caisse de dépôt et placements du Québec (Québec Deposit and Investment Fund) (“disinvestment”);
 - 4.3 - Mandatory annual public report on the carbon footprint of all investments made by financial institutions, including pension funds.

Municipalities, Businesses and Other Organizations, Citizens

5. Initiatives to reduce energy consumption and rapid total transition to renewable energy. ■

Note. The measures mentioned above are completed by many other specific actions concerning energy in sections such as transportation, industry, buildings, agriculture, etc.

9. Land Use Planning and biodiversity

Poor practices in land use planning produce the destruction of natural environments. These are important carbon wells that are fundamental to the fight against global warming. The poor practices are among the reasons for the rapid decline of biodiversity, the growth of the car population and the enormous quantities of GHG related to transportation in Québec. Moreover, the province has a deficit of conservation areas.

We urgently have to protect the territory of the province and its biodiversity. To do so, our relationships with the ecosystems where we live must be revisited in depth. It is crucial, among other things, to rearrange the governmental action in land use planning as it is actually scattered, incoherent and lacks a global vision. Moreover, we have to



coordinate the actions of the state, of the municipalities, of Indigenous Peoples and local communities on the matter.



In tomorrow's Québec ZéN...

While respecting Indigenous Peoples' territorial rights, Québec protects half of its lands and half of its internal, coastal and marine waters, including those of crucial importance for biological diversity and ecosystem services (such as carbon control and sequestration). The wetlands and the waterways, including the Saint-Lawrence river, are truly protected. Blue and green belts are everywhere in the communities. Urban neighbourhoods and heart of villages are close-knit, dense and connected to public transportation networks. The majority of goods and services are available at walking distance.



What we need to do to achieve that vision

- ✓ Immediately stop urban sprawl and protect natural environments.



What would prevent us from succeeding

- ✗ Continue to develop the freeway system.
- ✗ Authorize industrial, commercial and residential projects that destroy natural environments.



Proposed Actions

Governments of Québec and Canada

Protection of biodiversity and land-use planning policies that use efficiently all instruments available to governments¹ to contain the carbon footprint of the human communities and to protect the natural environments necessary to their survival.

1. Enactment of biodiversity legislation and important restoration, protection and conservation program of natural environments with the goal to reach 30% of protected areas (both on land and water) on the territory in 2030 and 50% in 2050, in partnership with Aboriginal and Inuit peoples and in respect of their territorial rights.
 - 1.1 - Restoration of wetlands (swamps, bogs, etc.).
2. Protection of the Saint Lawrence river by giving it a legal personality so that it can be defended in court and that projects which threaten it can be banned.
3. Land use planning act favourable to sustainable mobility, local services, cessation of urban sprawl, revitalization of green areas and carbon stocking. This act should provide for the:
 - Priority protection of natural environments;
 - Important reinforcement of the *Act respecting the preservation of agricultural land and agricultural activities*;
 - Location standards of public buildings that favour public transportation, biking and walking;
 - Connexion of the employment centers with the green transportation networks and vice-versa;
 - Reinforcement of downtowns, villages, main streets and center of existing neighbourhoods;
 - Reuse of existing buildings;
 - Taking into account the social and sanitary impacts;
 - Measures to end gentrification.
4. Reform of the municipal taxation so that municipalities do not depend only on property taxes to finance their activities.

Municipalities

5. Regulation and practices favouring conservation and restoration of natural and agricultural environments while preventing urban sprawl.
6. Measures favouring ecological connectivity (natural corridors), urban forest planning, general greening and useful planning for biodiversity, both on public and private lands.
7. Regulations and initiatives favouring the development of neighbourhoods and of the heart of mixed villages, friendly and close-knit, offering all essential goods and services at walking distance and connected to the green transportation networks.

1. Legislation and regulation, pricing, education, support programs and tax incentives.



Proposed Actions (suite)

8. Important efforts of consultation and collaboration with the population to support established land planning plans when confronted with derogation demands made by promoters.
9. Support an economy of proximity and a local agriculture.
10. Restoration of damaged natural environments and support of citizen initiatives to do so.
11. Greening of public parkings.

Businesses and Other Organizations

12. Respect of the rules aiming to protect natural environments and biodiversity.
13. Location at places with easy access to public transportation.
14. Greening of private parking places (large shopping centers).
15. Joining Alliance Ariane.

Citizens

16. Respect of the natural environments.
17. Individual or group initiatives for greening spaces and of restoration of damaged natural environments. ■

GHG EMISSION REDUCTION

SECTORIAL ACTION

Accounting for GHG emissions in Quebec

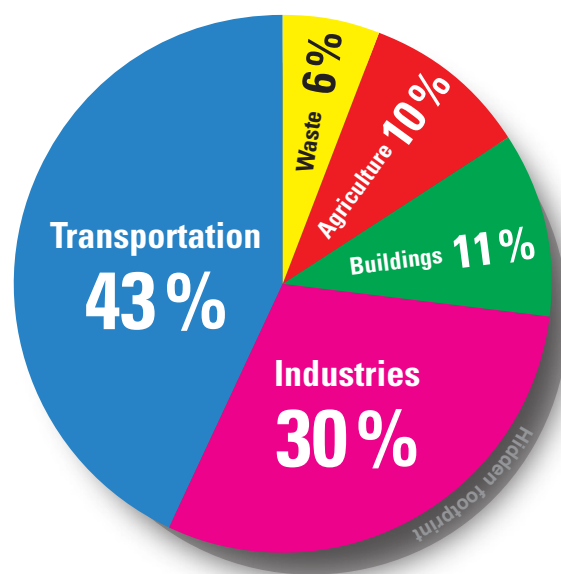
In the preceding sections, we have dealt with the climate crisis and the transition to carbon neutrality from the perspective of the major societal choices before us. This is an essential exercise in identifying the substantive issues and guiding principles for the transformation that is required. The following sections address the issue from a more technical angle: that of the five sectors covered by the Québec Greenhouse Gas Emissions Inventory:

transportation, industry, buildings, agriculture and waste. In real life, these categories are not perfectly watertight and certain activities contribute to emissions in several sectors. Despite this limitation, the Inventory provides a useful structure for reporting on Québec's GHG reduction efforts and their results.

Contribution of the five sectors to GHG emissions recorded in Québec

The 2016 Quebec GHG Emissions Inventory indicates that the sector producing the most emissions in Quebec is transportation (43.0%), followed by industry (30.1%), heating of residential, commercial and institutional buildings (10.8%), agriculture (9.6%) and waste (6.2%). The electricity sector accounts for 0.3% of GHG emissions.

It is logical that the action plans should focus on the sectors that emit the most GHGs, starting with transportation. However, it is important to note that to achieve carbon neutrality, all sectors will need to be transformed, and that this process can be particularly long in some sectors such as industry and agriculture.



Beware! The hidden footprint of our way of life is not accounted for in Quebec.

Quebec's GHG emissions inventory does not reflect all of Quebec's impacts on the global climate system. To understand this, it is important to know that, under international rules, only GHGs emitted in Québec are recorded in Québec.

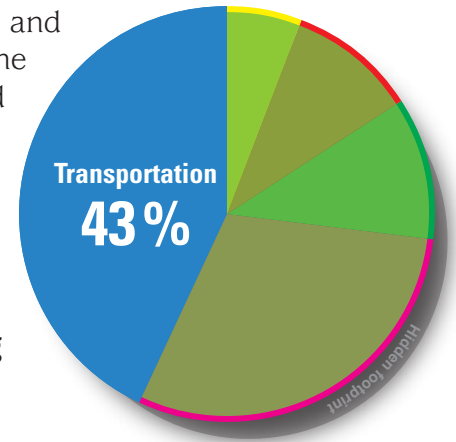
Thus, the GHGs released during the extraction of the oil we burn or the natural gas used to make our chemical fertilizers are not accounted for in Québec. Neither are the emissions produced during the manufacture of our cars and the production of a very large portion of our food. GHGs from our

foreign bandwidth consumption, long-haul flights and cruises are also «under the radar». These GHGs and many others add up to form our «hidden footprint», which is not taken into account in the Quebec GHG Inventory but nevertheless contributes significantly to global warming.

10. Transportation

Quebecers have consumed huge quantities of fossil fuels to move around and to carry different products. This is why the transportation sector is the one that produce the most GHG in Québec, with 43% of total emissions. Road transportation alone represents more than 34% of total emissions. Its emissions rose by 52% between 1990 and 2016 due to an increase in the number of light vehicles (+125%) and heavy duty vehicles (+171%)¹.

Personal vehicles consume 48% of the energy used in the transportation sector in Québec, compared to 35% in the freight transport sector. The remaining 17% is due to the commercial transport of travelers, including 15% for air transport and a marginal percentage for the bus and train².



1. Inventaire québécois des émissions de gaz à effet de serre en 2016 et leur évolution depuis 1990.

2. The State of Energy in Québec 2019 – Chair in Energy Sector Management of HEC Montréal. The data on air transport includes both domestic and international flights, considering the different ways energy is used, as reported in the Report on Energy Supply and Demand in Canada (Statistics Canada).

People Transportation

- 5 million passenger vehicles are registered in Québec. They weigh an average of 1,500 kg³.
- 42,000 electric vehicles (hybrid and rechargeable) were on the roads of the province as of March 31, 2019⁴, representing less than 1% of the total motor vehicle fleet.
- Almost 19,000 buses circulate in Québec, including more than 10,000 school buses⁵.
- Among Quebecers who commute to work every weekday, 7 in 10 do it by solo driving and 1 in 10 do it by car pooling; only 14% generally choose public transportation and only 7% walk or bike during their commute⁶.
- During morning peak hours in the Montreal area, each car contains an average of 1.2 passengers. This means that we need 5 cars to transport 6 people⁷.
- Since 2015, more light-duty trucks (minivans, SUV and pickup trucks) are sold than cars. Their popularity explains in part why gas sales rose by 33% between 1990 and 2017, even with the better energy performance of motors⁸.
- Electric vehicles gain autonomy and affordability every year. Nevertheless, their production still has a substantial carbon footprint and they offer no solution to the traffic problem.
- The growth of air transport is exponential. In the 20 years between 1999 and 2018, the number of fare-paying passenger kilometers tripled in the world, going from 2.8 billion to 8,2 billion⁹.

3. Bilan 2017 : accidents, parc automobile et permis de conduire. Société d'assurance automobile du Québec.

4. Les ventes de voitures électriques au ralenti au Québec. Journal de Québec, April 29, 2019.

5. Bilan 2016 des taxis, des autobus, des camions lourds et des tracteurs routiers. Société de l'assurance automobile du Québec.

6. The State of Energy in Québec 2019 – Chair in Energy Sector Management.

7. Congestion routière : 25 millions de sièges vides à combler. La Presse, June 20, 2018.

8. The State of Energy in Québec 2019 – Chair in Energy Sector Management.

9. De plus en plus de voyages, mais à quel coût pour l'environnement. Radio-Canada, July 28, 2019.

Freight transportation

- According to recent data considering only intercity travel, trucks travel 5 billion kilometers yearly on Quebec's roads, charged with 146 million tons of merchandise¹.
- In ton per kilometer, interprovincial and international exchanges represent 78% of the transported tonnage.
- Wood (wood products, paper, printings), food products, minerals and mineral products, chemical and petrochemical products account for more than two thirds of the transported tonnage.
- The conversion of trucks to natural gas is very criticized as natural gas is a fossil fuel. The International Energy Agency has not prioritized liquified natural gas or natural gas in its 2050 scenarios aiming to limit the rise of global temperatures to 2 degrees².
- Increasingly autonomous and efficient electric vehicles are coming on the market, including school buses and buses for urban transport, trucks of all sizes, ferries, ships and even tractors.

1. [Portrait statistique et économique du camionnage au Québec.](#)

2. [Plan directeur en transition énergétique](#) – Transition énergétique Québec.



In tomorrow's Québec ZÉN...

Road traffic is always fluid and the total energy consumption in the transportation sector has greatly diminished.

... Mobility has improved, including for people living in far-away regions, families, disabled people or with reduced mobility and other groups with special needs.

... The number of personal vehicles registered in the province has reduced drastically, so has their weight. Walking, biking, electric biking, bike sharing and car sharing, taking the bus, the train, the tramway, the subway, the taxi (or shared taxis) complement each other to fill most of mobility needs. Solo driving is the exception.

... Buying locally is now the norm in all possible sectors and the number of trucks on the road has reduced drastically. Logistics efficiency greatly improved. Marine transportation is preferred to land transportation for carrying goods for long distances.

... 100% of light vehicles and almost every heavy-duty vehicles on and off roads are electric (including boats). A few industrial and agricultural vehicles work on biofuels.

... Most of the commuting to work is done locally, within a few kilometers.

... Telecommuting, remote work centers, teleconferences and intelligent multimodal delivery services eliminated a good part of transportation needs.





What we need to do to achieve that vision

- ✓ **Uncompromisingly choose collective, shared and active modes of transportation, combined with electrification.**



What would prevent us from succeeding

- ✗ **Continue to develop the freeway system.**
- ✗ **Invest in conversion to natural gas of trucks and other heavy vehicles.**
- ✗ **Invest in electric cars instead of active and collective transportation.**
- ✗ **Replacing a road network jammed by thermal vehicles by a road network jammed with electric vehicles.**
- ✗ **Investing public funds in hydrogen cars and a network of hydrogen recharge.**



Proposed Actions

Governments of Québec and Canada

Transportation plan leading to a GHG reduction consistent with the Quebec government's overall targets, providing for the optimal use of all instruments available to governments¹ to enhance mobility while using less energy and zero fossil fuel, and while giving specific attention to people living in remote areas, people living with a handicap or with particular mobility challenges.

1. Reducing transportation needs:

- 1.1 -** National land use policy discouraging urban sprawl;
- 1.2 -** Unlimited moratorium on the expansion of the freeway system;
- 1.3 -** Obligation for employers to reserve parking spaces for car-poolers and to offer allowances for walking, cycling, collective transportation;
- 1.4 -** Support to Telecommuting work centers linked with shared transportation services and intermodal installations;
- 1.5 -** Tax credit for telecommuting;
- 1.6 -** Support for local ecotourism;
- 1.7 -** Inventory of international flights and maritime transport emissions on national GHG assessments. Carbon tax on flights and maritime transport.

1. Legislation and regulations, taxation, pricing, education, support programs and tax incentives.

2. Developing ecomobility:

- 2.1 -** Reallocation to ecomobility of all planned capital budgets for expansion of the motorway network and the construction of airports - and other budgets if necessary;
- 2.2 -** Development of an affordable, innovation and performing ecomobility offer providing options to specific needs of certain populations, like people living with disabilities;
- 2.3 -** Priority to public transit with a focus on efficiency and affordability, including free transit in certain contexts or for certain populations and a greater number of reserved lanes; investment budget of \$5,650 per capita over the next 10 years for local and inter-municipal public transit, as in Ontario, rather than the \$1,081 currently planned in Québec¹;
- 2.4 -** Substantial investment budgets for the other ecomobility offers: walking, cycling, wheelchair, bike-sharing, electric bike, carpooling, taxi, shared taxi, car-sharing;
- 2.5 -** Intensive support for carpooling by reserving more lanes for carpoolers, developing more reserved parking and financial incentives for them;
- 2.6 -** Supporting car-sharing by reserving more lanes for shared vehicles and giving them access to free parking at public transit hubs;
- 2.7 -** Regulations adapted to facilitate the sharing of vehicles between citizens (registration, insurance, financing, etc.);
- 2.8 -** Support for active transportation to help municipalities provide convenient, attractive and safe facilities for cyclists and pedestrians, including services for those with mobility impairments or disabilities;
- 2.9 -** Development and promotion of integrated mobility applications combining all ecomobility offers and their pricing;
- 2.10 -** Obligation, for municipalities of all sizes as well as for large transportation generators to develop a transportation plan;
- 2.11 -** Accompaniment of the municipal environment to ensure that priority is given to methods of optimal local and inter-municipal transport for each territory;
- 2.12 -** Affordable access to a network of fast electric trains between city centres in Quebec, starting with corridors where the rails are already present and existing projects such as VIA Rail's high-frequency train project and the Sherbrooke-Montreal train project, among others. Subsequent development, after studies, of corridors to be prioritized and promising technologies for Québec;
- 2.13 -** Cessation of subsidies for fossil fuel buses, support for urban and school transporters for the conversion of their bus fleets to electricity;
- 2.14 -** Abolition of advertising on individual vehicles and promotion of the active, collective and shared transport, providing mechanisms to compensate for the loss of revenue from affected media.

1. Fiche comparative des investissements en transport collectif au Québec et en Ontario, Alliance TRANSIT pour le financement des transports collectifs, June 14, 2018.



Proposed Actions (suite)

3. Transport electrification:

- 3.1** - Funding earmarked for new infrastructure and new 100% electric transport offers;
- 3.2** - Prohibition of new sales of gasoline-powered vehicles in 2028 and the traffic of these vehicles in 2040;
- 3.3** - In the meantime, gradual implementation of a malus of up to \$15,000 upon purchase of greedy petrol-fuelled cars¹ 1.1. and equivalent bonuses for light electric vehicles - without penalising low-income households, large families, disabled persons or persons with reduced mobility;
- 3.4** - Electrification of freight transport;
- 3.5** - Support for the development of a niche of excellence in the electrification of the light trucks, heavy trucks, buses, school buses, industrial and farm vehicles, ferries and ships;
- 3.6** - Opportunity analysis of the electrification of motorways and highways and ports for the transport of goods;
- 3.7** - Electrification of Fishing Vessels;
- 3.8** - Opening of the Eco Trucking Program to light freight trucks and exclusion of this program of truck conversion to natural gas or propane;
- 3.9** - Multiplication of quick-charging terminal stations;
- 3.10** - Prohibition of two-stroke engines (boats, lawnmowers, snowblowers, etc.);
- 3.11** - Ban on new sales of gas-powered pleasure craft in 2028 and the circulation of these vehicles in 2040;
- 3.12** - With some exceptions, e.g. for isolated indigenous communities, moratorium on the development of regional air transport and an end to subsidies for the establishment of regional airports by ensuring that the improvement of public transport supply compensates for the possible negative effects on the regions;
- 3.13** - Ban on ethanol and other biofuels for combustion engines.

4. Rationalisation of freight transport:

- 4.1** - R&D in logistics and deployment of high-performance logistics solutions;
- 4.2** - Taxation of home delivery of non-essential consumer goods;
- 4.3** - Implementation of a modern and green logistics system that promotes rail and marine freight transport as well as electric trucking;
- 4.4** - Reorganization of the infrastructure and transport operations of the goods (more flexible working hours, consolidation of deliveries).

1. See [France's 2019 scale](#).

Municipalities

Transportation plan leading to a GHG reduction consistent with the Quebec government's overall targets.

5. Reducing transportation needs:

- 5.1 -** Regulations and initiatives to ensure, wherever possible, the development of dense, mixed, compact and user-friendly urban or village core neighbourhoods, offering all essential products and services within walking distance, linked to green transportation networks;
- 5.2 -** Linking employment centres to green transport networks, and vice versa;
- 5.3 -** Support for the establishment of telework centres linked to green transportation services;
- 5.4 -** Support for the development of local ecotourism offers.

6. Developing ecomobility:

- 6.1 -** Financing public transit and other solutions;
- 6.2 -** In consultation with the community, an ecomobility plan aimed at the entire territory and municipal activities;
 - Consideration of the needs of various groups, e.g. children, young parents, people with reduced mobility or disabilities, etc.;
- 6.3 -** Incentive parking and transshipment zones;
- 6.4 -** Car-sharing of municipal electric vehicles;
- 6.5 -** Pedestrian zones in city centres, village and neighbourhood cores;
- 6.6 -** Integration of cycling and pedestrian infrastructures from the design stage of infrastructure construction or rehabilitation projects;
- 6.7 -** Development and promotion of integrated mobility applications combining all ecomobility offers and their pricing;
- 6.8 -** Taxation of large off-street parking spaces;
- 6.9 -** Regulation to reduce the number of parking spaces per dwelling unit.

7. Transport electrification:

- 7.1 -** Support for the installation of quick charging stations;
- 7.2 -** Purchase or lease of 100% electric vehicles only, as an administration and as a mobility service provider.

8. Rationalisation of freight transport:

- 8.1 -** Regulations promoting and supporting rationalisation of deliveries;
- 8.2 -** Support for the development of warehousing and dispatch centres around urban centres in order to streamline deliveries and have them carried out by small electric trucks.



Proposed Actions (suite)

Businesses and Other Organizations

Transportation plan leading to a GHG reduction consistent with the Quebec government's overall targets.

9. Reducing transportation needs:

- 9.1** - Incentives for telework, webinars, teleconferences, etc.;
- 9.2** - Telework centre close to a public or shared transportation node;
- 9.3** - Policies on air travel reserving this mode of transportation for emergencies needs, e.g. to address pressing issues affecting Indigenous Peoples and isolated communities.

10. Developing ecomobility:

- 10.1** - In consultation with unions and employees, develop and deploy an ecomobility plan for staff travel between work and home and for the organization's activities;
- 10.2** - Parking spaces reserved for carpoolers;
- 10.3** - Mileage allowance for walking, cycling, public transit. Abolition of free parking for employees (cash-in principle).

11. Transport electrification:

- 11.1** - Purchase or lease of 100% electric vehicles only;
- 11.2** - Charging stations reserved for carpoolers.

12. Rationalisation of freight transport:

- 12.1** - Purchasing and delivery planning to minimize or group trips;
- 12.2** - Joining a shared delivery service;
- 12.3** - Bicycle delivery network for the last few kilometres;
- 12.4** - Network of drop-off points (e.g. in subway stations) for small parcels.

Citizens

Personal or family transport plan leading to carbon neutrality in mobility.

13. Commuting reduction:

- 13.1** - If possible, choosing a place to live within walking distance of at least one of the essential daily destinations (work, school);
- 13.2** - Planning activities in order to group or minimize trips;
- 13.3** - Major reduction in air travel, except in cases of urgent necessity;
- 13.4** - Elimination of super-cruise ship travel.

14. Developing ecomobility:

- 14.1** - Choose walking, biking, electric biking, public transit or carpooling over solo driving;
- 14.2** - Creation of an action group or cooperative offering ecomobility solutions.

15. Transport electrification:

- 15.1** - Unless walking or cycling, travel in 100% electric vehicles only.

16. Rationalisation of the transport of goods:

- 16.1** - Planning the errands to be done in order to minimize or group trips;
- 16.2** - Buying local products;
- 16.3** - Elimination of non-essential home deliveries.

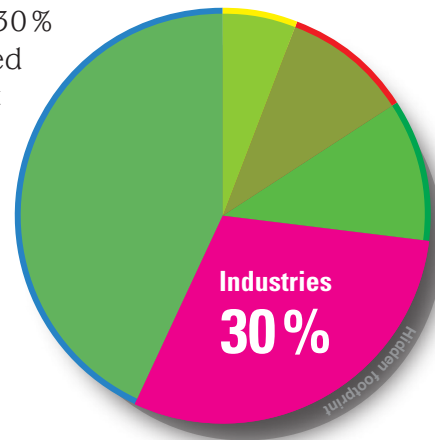
17. Commitment:

- 17.1** - Participation in the creation of transportation plans for employers, municipalities and all of Quebec;
- 17.2** - Mobilisation in support of ecomobility projects and against motorway projects. ■

11. Industry

The industry sector is the second largest GHG emitter in Québec with 30% of total emissions. In this sector, around half of the emissions are related to heat production and the other half is due to processes. The biggest emitters among industries are the aluminium producers, cement plants, lime plants, ferrous metal production and oil refinery.

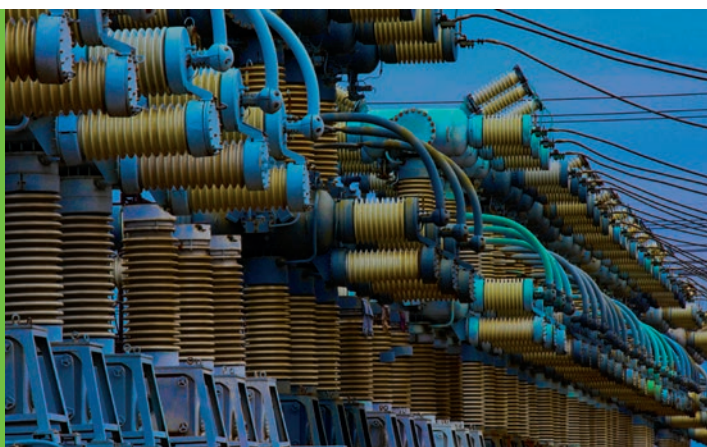
No technical reasons prohibits the replacement of fossil fuels by renewable energy to create heat in the industry. In fact, the increase in the use of biomass contributed to the decrease of the emissions in the industrial combustion subsector between 1990 and 2016.



In regards to GHG emissions, related to industrial processes, they can be eliminated by:

- refusing to consume products manufactured using those processes (use of wood instead of cement, green fertilizer instead of nitrogen ones or an electric vehicle instead of a vehicle using fossil fuels);
- creating new zero emission processes, such as the one said to be developed by the aluminum industry;
- using renewable natural gas (RNG), if its a process with natural gas;
- refusing to consume goods that are short-lived, useless or harmful (devices of bad quality, throwaway objects, military ammunition, etc.).

We have to remember that some petrochemical products will still be necessary for an extended period of time, but that their replacement by more eco-friendly products will be needed in the long term. Those goods will need to constitute only a very small part of manufactured goods and will have to be integrated in recycling or reusing networks to diminish their impact on the environment.





In tomorrow's Québec ZéN...

The industry only uses renewable energy. Circularity is its new norm.



What we need to do to achieve that vision

✓ Decarbonize heat production and processes.



What would prevent us from succeeding

- ✗ Convert heat production systems to natural gas.
- ✗ Continue to subsidize the expansion of the gas network.
- ✗ Authorize new industrial projects with strong GHG emissions such as new refineries, conversion of refineries to process bituminous oil, natural gas liquefaction plants, etc.



Proposed Actions

Governments of Québec and Canada

Industrial policy using efficiently all instruments available to governments¹ to decarbonise heat production, create zero emission processes, replace the products manufactured with GHG emissions with greener ones, replace fossil gas with renewable gas if gas is essential in a process.

1. Major investments to transform the industry for the implementation of solutions combining electrification and energy sobriety.
2. Discontinuance of the use of fossil fuels in heat production.
3. Discontinuance of the use of fossil fuels in processes.
 - If there is no substitute for gas as an input, use renewable gas.
4. Research and development for the decarbonisation of industrial processes to allow rapid technological changes in our businesses.
5. Tax credit for the implementation of zero emission processes.
6. Support to the innovation culture and the industrial champions in the energy transition so that they can become the frontrunners of their specific domain.
7. Creation of an observatory to watch for new technological development in decarbonisation, guide economic decisions and train the workforce of the future.
8. Use of governmental economic departments and organisms to help the decarbonisation of the economy.

1. Legislation and regulation, taxation, pricing, education, support programs and tax incentives.

9. Use of the hydroelectricity surpluses in low emission sectors that will support the resilient economy of the future.
10. Insertion of climate performance and the principles of circular economy in the criteria for public contracts attribution.
11. Application of a climate test to every new industrial project.
12. Opposition to the implementation of high GHG emitters in the province.

Municipalities

13. Opposition to the implementation of high GHG emitters in the province.
14. Welcome industrial projects only after the population has been given independent information and when public consultation has been held if needed.
15. Purchasing, building and renovation practices ensuring a reduction of the general consumption and the use of green products instead of goods associated with GHG-emitting processes.

Businesses and Other Organizations

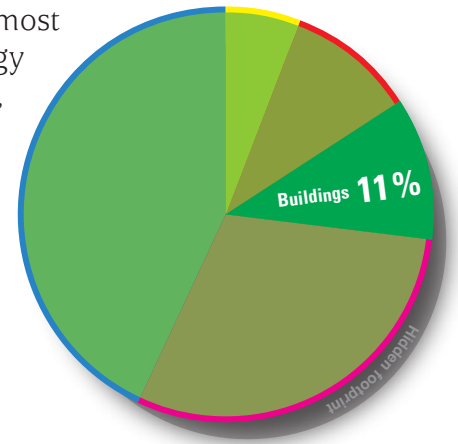
16. Conversion to renewable electricity or biomass of every heat production system using fossil fuels.
17. Research and development in energy efficiency and decarbonisation of industrial processes.
18. Creation and implementation of creative solutions for the circular economy.
19. Review of the business model to occupy low emission sectors that will be pillars in the resilient economy of the future.
20. Requalification of the workforce if needed.
21. Purchasing, building and renovation practices ensuring a reduction of the general consumption and the use of green products instead of goods associated with GHG-emitting processes.

Citizens

22. Purchasing, building and renovation practices ensuring a reduction of the general consumption and the use of green products instead of goods associated with GHG-emitting processes.
23. Opposition to any new plant, mine or infrastructure project using fossil energy as fuel or input. ■

12. Buildings

The residential, commercial and institutional building sector is the third most important GHG emitter in Québec, mainly due to its use of fossil energy for heating commercial and institutional buildings. For those buildings, natural gas, fuel oil and coal provide 53% of the consumed energy. Given the present hydroelectricity surpluses in Québec, the use of fossil fuels to heat buildings cannot be justified. Important forest biomass stocks can also fulfill a huge part of needs in many regions. In heat production, biomass is more appropriate than biofuels (ecologically and economically), whether they are renewable natural gas (RNG) or any other.



In tomorrow's Québec ZéN...

No building is heated with gas or oil. All recent buildings are zero net energy and built with low-carbon materials. Even older buildings have a good energy efficiency performance.



What we need to do to achieve that vision

- ✓ Remove all oil and gas heating systems in the short term. Implement Net Zero Emissions building standards.



What would prevent us from succeeding

- ✗ Continue to install gas and fuel oil heating systems.
- ✗ Continue to subsidize the expansion of the gas network and the conversion of heating systems to this fuel.





Proposed Actions

Governments of Québec and Canada

Policy on buildings using efficiently all instruments available to governments¹ to achieve a Net Zero Emissions housing inventory.

1. Discontinuation of the subventions used for the expansion of the gas network and the conversion of heating systems to gas.
2. Incentives for green construction and renovation.
3. Immediate prohibition of all new gas heating systems and replacement in the next 10 years of existing gas heating systems.
4. Immediate launch of a massive program promoting the electrification of the buildings heated with gas.
5. For off-grid communities using fossil energy in autonomous networks, conversion of those with renewable energy in 5 to 10 years. Banning of any new fuel oil heating systems and replacement of the existing ones in a window of 5 to 10 years.
6. Adoption for 2030 of a new Construction Code forcing the construction of net zero energy buildings and using materials with a low carbon footprint. Rule requiring that mortgage lenders balance the higher initial cost of properties with the much lower monthly heating costs when assessing loan applications.
7. Mandatory use of low carbon footprint materials and processes to build or renovate public and private buildings.
8. Incorporation of a minimum energy performance requirement in the *Act respecting the Régie du logement*. Program of isolation of existing rental units without raising the rent due to its implementation.
9. Inspection and recycling program to dispose safely of air conditioning and cooling systems with cooling agents with high greenhouse effect impacts.
10. Refresher training of the workforce.
11. Criteria of climate performance and of the principles of circular economy added to the rules for granting public contracts in construction and renovation.

Municipalities

12. Incentives and support for green construction and renovation, such as the implementation of a transferable program that allows homeowners to borrow an amount from the municipality to carry out energy-efficient renovations and then repay them from the property tax through energy savings².
13. Mandatory climate test to every construction and important renovation projects.

1. Legislation and regulations, taxation, pricing, education, support programs and tax incentives.

2. For example, see the program of Varenne's Innovative funding for efficient municipalities (FIME) (in French).

- 14.** Incentives to reduce the climate impacts of existing neighbourhood or village hearts densification, such as transforming them in ecodistricts or by building tiny houses.
- 15.** Conversion of municipal buildings to renewable energy, if needed.
- 16.** Application of the highest criteria in energy efficiency and climate performance when buying, building or renovating a property.
- 17.** Safe collection and storage of air conditioning and cooling systems.
- 18.** Support for passive solar energy buildings. Codification of the right to the sun. Appropriate orientation of new streets and buildings, incentives for adding windows to the south and taking away windows to the north, or for adding greenhouses used for food production.

Businesses and Other Organizations

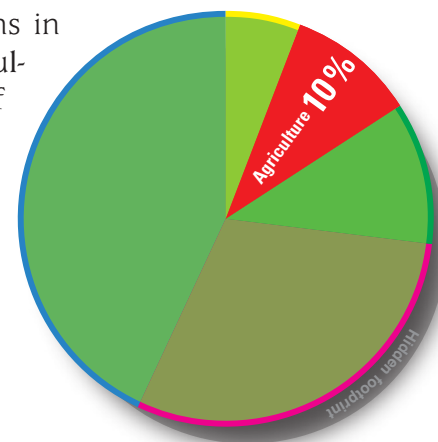
- 19.** Conversion of buildings to hydroelectricity or biomass, when needed.
- 20.** Application of the highest criteria in energy efficiency and climate performance when buying, building or renovating a property.
- 21.** Recycling of air conditioning and cooling systems, where appropriate.
- 22.** Cooperatives for the recycling of construction waste.
- 23.** Cooperatives of green construction by oneself.
- 24.** Mortgage lenders: balancing the higher initial cost of properties with the much lower monthly heating costs when assessing loan applications.

Citizens

- 25.** Application of the highest criteria in energy efficiency and climate performance when buying, building or renovating a property.
- 26.** Training in green construction and renovation.
- 27.** Smaller and less equipped houses with shared facilities—big kitchen, dining room, spare room, workshop, etc.—for special occasions.
- 28.** Housing cooperatives and land trusts to ensure access to housing.
- 29.** Creation of a group of Cities in Transition, adhesion to the Québec Transition Network or other groups active in net zero emissions construction and renovation. ■

13. Agriculture

The agricultural sector is responsible for almost 10% of GHG emissions in Québec. Animal digestion (enteric fermentation), management of agricultural land and farm manure account for 95% of the total emissions of the sector. The CO₂ produced by liming and urea application, along with other fertilizers producing carbon, are responsible for the remaining emissions.



Unfortunately, even though soil is naturally one of the most important carbon sink, industrial agriculture processes are detrimental to the storage capacity of agricultural lands. We also learned recently that they are literally destroying organic soil of southwest Québec. This area is important for its food production, but each year it loses 2 cm of soil and could vanish in 30-50 years if no appropriate measures are taken for its protection¹. Industrial meat and dairy production is another difficult question because its contribution to global warming is excessive compared to the amount of calories produced for human consumption. Moreover, only 33% of our plate comes from Québec, as compared to 80% in 1985.

In addition, usable grocery products that end up in disposal sites in Canada would be enough to feed Canadians for five months². Waste occurs primarily at the food production, processing and manufacturing stages, which account for 24%, 34% and 13% of losses³, respectively. These losses are only one of the issues related to the industrialization of food, which created food giants whose influence is now just as noticeable behind the scenes of power as it is on grocery store shelves and in household refrigerators.

1. Le garde-manger des Québécois menacé de disparaître, TVA.

2. More than half of all food produced in Canada is lost or wasted, report says, CBC, January 17, 2019.

3. Vast majority of Canadian food waste takes place within the food industry—and not at the household level, study finds, The Globe and Mail, January 17, 2019; The Avoidable Crisis of Food Waste, Second harvest, website read on August 12, 2019.



In tomorrow's Québec ZéN...

The transformation of agricultural techniques is complete: it began before it was too late. Methods of soil protection and revitalization are universally used. Organic farming is the norm. We use very few pesticides, herbicides or chemical fertilizers. Québec's rural areas are dynamic and reinvigorated with the installation of new farms of human size. Agro-ecological farming blooms in every region, including cities. Urban agriculture plays an important role for food security. Our eating habits respect the environment and 80% of our food is local. Carbon sinks in forests and agricultural lands help to compensate for the GHG emissions that were not eliminated in other sectors.



What we need to do to achieve that vision

✓ Turn massively toward agroecology, food sovereignty and ecological eating habits.



What would prevent us from succeeding

- ✗ Ignoring the knowledge of Indigenous Peoples and peasants regarding sustainable agriculture and land use planning.
- ✗ Leaving industry at the helm. Allow it to take ownership of change through the industrialization of organic farming, seed control, the creation of patent-based fake meat, etc.
- ✗ Estimating wrongly the gains that could be made in carbon sequestration by restoring the health of agricultural soils.



Proposed Actions

Governments of Québec and Canada

Agricultural and food policy using all instruments available to governments¹ to massively support agroecology—including soil health, organic farming, permaculture, etc.—, food sovereignty and a significant increase in the share of vegetable proteins in food.

1. Review of the land and agricultural system.
2. Withdraw agriculture from the free-trade agreements.
3. End of industrial crops and livestock.
 - 3.1 - Reallocation of the funding and intensive support of farmers towards ecological agriculture to ensure a fair transition (grants and subsidies, guaranteed income, technical aids, etc.).
 - 3.2 - Important investments in soil health protection and regeneration practices such as no-till farming, green fertilizers, legume culture, crops diversity and rotation and end of synthetic fertilizers, herbicides and pesticides.

1. Legislation and regulations, taxation, pricing, education, support programs and tax incentives.



Proposed Actions (suite)

4. Important investments in the protection of pollinator insects and natural environments in agricultural lands.
5. Participation in the Global Soil Health Challenge.
6. Human size farming (peasant agro-ecology).
7. Big project on food sovereignty on all the territory to increase the demand and supply of cheap local organic food and the implementation of small, performing and creative distribution networks:
 - 7.1 - Support the construction of rural and urban greenhouses;
 - 7.2 - Support the implementation of dynamic regional agri-food clusters;
 - 7.3 - Identification of Québec and regional products;
 - 7.4 - Educational campaigns on “eating locally all year long”.
8. Environmentally responsible food policy for all public and parapublic agencies (daycares, schools, hospitals, cegeps, etc.).
9. Legislation against food waste and important programs on the topic.
10. Reform of the *Act respecting the preservation of agricultural land and agricultural activities* its strict application, including mechanisms to avoid speculation and the loss of lands to foreign interests and big corporations.
11. Facilitating land transmission from one generation to the next.
12. Protection of the status of agricultural lands for food production and end of all production done for the creation of energy products or plastics derived from plants.
13. Significant reforestation with multiple tree species in all areas deforested without reason.

Municipalities

14. Support personal or commercial organic farming.
15. Support soil health regional projects.
16. Protection of the status of agricultural lands for food production and end of all production done for the creation of energy products or plastic derived from plants. Opposition to de-zoning and speculation of farming lands.
17. Creation and implementation, with the help of the population, of a regional program for food sovereignty, including the construction of rural and urban greenhouses, the supply of cheap organic food and creative and efficient distribution, conservation, stocking and packaging systems.
18. Implementation of local public markets.

19. Support the creation of seed libraries and production of local seeds.
20. Land planning favouring food sovereignty.
21. Development of permaculture islets such as urban forest gardens.
22. Plant selection favouring those that offer at least one nourishing function, such as textile, edible or nectaried plants, etc.
23. Policy and programs supporting urban agricultural projects (land access, etc.).
24. Programs to support plant-based diets with a decrease of meat consumption. (see the Canada Food Guide).

Businesses and Other Organizations

25. Eco-friendly food policy including the purchase of local organic food, zero waste practices, vegetarian menus, etc.
26. Farmers:
 - 26.1 - Adoption of soil health practices and agro-ecological practices in general.
 - 26.2 - Gradual end of industrial crops and livestock in favour of organic farming focused mainly on regional needs.
 - 26.3 - Launching a regional food sovereignty program or supporting such a program.
 - 26.4 - Innovation to prevent food waste before and after the harvest.
 - 26.5 - Production of vegetables in greenhouses all year long.
 - 26.6 - Refusal to participate in any speculative transaction regarding land or the fabrication of energy products and plastic derived from plants.

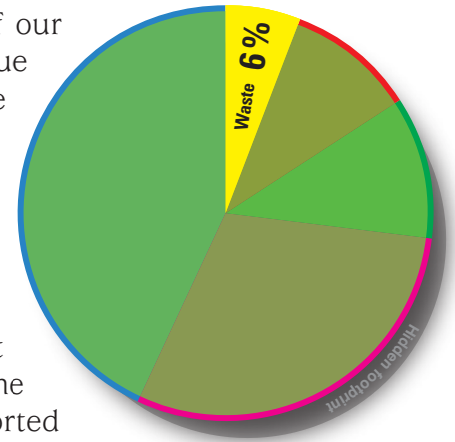
Citizens

27. Greening the diet. Reducing meat consumption and other food of animal origin.
28. Purchase of local green food (produced and transformed locally).
29. Implementation of a citizen local and public market.
30. Learning how to eat locally all year long. Creation of groups and cooperatives facilitating those practices.
31. Learning how to fight food waste and how to use food nearing the end of its life. Creation of zero food waste groups.
32. Personal food production. Creation of groups and cooperatives of personal food production.
33. Collective kitchens to optimize energy consumption for cooking or to prepare raw food in a friendly environment. ■

14. Waste

According to the Québec greenhouse gas emissions inventory, 6% of our GHG come from residual material. Almost all (93%) of those GHG are due to the solid waste breakdown after it is buried. This non-recovered waste amount each year to 749 kg per Québécois, including 344 kg of domestic origin and 404 kg of other sources such as industry, commercial and institutional activities and construction¹.

This carbon footprint is amplified with disposable products and wasteful behaviours which took alarming proportions (see the Economy and consumption section). Recycling can only be a last resort option. It is not a panacea because even if it was strictly controlled, it would not erase the climate impact of those piles of products that are manufactured, transported and thrown away each day.



1. Production de déchets (2012), The Conference Board of Canada.



In tomorrow's Québec ZéN...

Whether at home, in businesses or organizations, Québec is heading towards zero waste. Every person sends less than 50 kg of waste to landfills every year, in comparison to the 750 kg we currently send. Recycling is a sideline activity because garbage is eliminated at the source. Composting organic waste is universal.

... A society of well-being has replaced our consumerist society.



What we need to do to achieve that vision

- ✓ **Prioritize unequivocally reduction at the source.**



What would prevent us from succeeding

- ✗ **Create important waste gasification centers instead of favouring source reduction.**
- ✗ **Favour recycling.**



Proposed Actions

Governments of Québec and Canada

1. Zero waste policy providing an efficient way to use instruments available to governments¹ for source reduction.
 - 1.1 - Implementation of a society project inspired from the best known practices (such as those from San Francisco);
 - 1.2 - Legal prohibition of planned obsolescence by obliging manufacturers to recover or repair devices that no longer work.
2. Prohibition of food waste and support programs for its annihilation.
3. Support to the best practices for organic waste composting, depending on the local environment.
4. Prohibition of throwaway plastic.
5. Recycling confined to a marginal role, as a complement to source reduction achieved by the abandonment of single-use objects (packaging, disposable objects, etc.) and the reuse of other goods.

Municipalities

6. Adoption of a package free and zero waste local economy project for the territory.
7. Support to enterprises and to the population to go toward local and package free purchase and zero waste.
8. Implementation of the best practices for organic waste composting depending on the local environment.
9. Where possible and relevant, pricing of garbage collection based on the weight with redistributive mechanisms that offset its effects on low-income households.

Businesses and Other Organizations

10. Adoption of a zero waste, package free and local purchase policy.
11. If necessary, update of the business model and processes to adopt the principles of the circular economy.
12. Universal application of the principles of eco-design.
13. Production of compostable plastic of plant origin from organic and green waste, invasive plants, urban sewage sludge, among others, and without using agricultural lands, with the goal to replace plastics derived from oil.

1. Legislation and regulations, taxation, pricing, education, support programs and tax incentives.



Proposed Actions (suite)

Citizens

- 15. Sustainable consumption of goods, services and transportation.
- 16. Local purchase, package free.
- 17. Learning how to fight food waste and use food at the end of its life. Creation of zero waste food groups.
- 18. Zero waste lifestyle project. Creation of zero waste groups or cooperatives. ■

Note: Different solutions for the elimination of waste at the source will be found in the economy and consumption section.



QUÉBEC ZéN PROJECT

zéro émission nette

Conclusion

“The next few years will be among the most important in our history¹.”

“The present generations have the responsibility to bequeath to future generations a planet that is not irreversibly damaged by human activity. [...] We must live on earth differently².”

Our territories and millions of human beings are already impacted by the climate crisis. The most affected people are often those who contribute the least to global warming and there is no magic solution. We must urgently eliminate our GHG emissions, limit as much as possible our use of fossil energy while developing social justice.

The emergency of the situation requires an economic revolution. It is crucial. We have to use our intelligence and creativity now so that it is done within the scope of a fair society inclusive of all its citizens.

It's also a golden opportunity to improve our personal and collective life by replacing the consumerist society with one of well-being. This means more human relationships, cooperation, inclusion, safety, nature in an urban context, less pollution, etc.

The changes to be made are formidable, but possible. Everyone must play a role: Ottawa, Québec, municipalities, businesses, other organizations and citizens. The means will have to be proportionate to those used in times of crisis.

We wish that this document helps to promote the social dialogue so that together, we can accelerate this inescapable transition towards a fairer and more resilient net zero emissions society.

1. Debra Roberts, Co-Chair of one of the IPCC Working Groups, *Radio-Canada*, October 7, 2018.

2. Audrey Azoulay, General Director of the UNESCO, commentaries of IPBE's partners. *Nature's Dangerous Decline "Unprecedented"; Species Extinction Rates "Accelerating"*, Media Release, IPBES—Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, April 2019.

Definitions and Commentaries on the Terminology

There are many definitions of different terms used in this document. We suggest the following ones.

Greenhouse gas (GHG): gas that absorbs infrared radiation and captures the heat produced by the planet. Human activities—especially the post-industrial western lifestyle—caused the dramatic rise of GHG concentration in the atmosphere, mainly by massively using fossil fuels (such as coal, gas and oil), but also by deforestation, intensive livestock farming and industrial agriculture.

Global warming: rise of the average ocean and atmosphere temperature created by the increase of GHG emissions. For many decades, this rapid increase is due to human activities (of anthropogenic origin) which cause a global warming of a magnitude never seen before.

Main GHG related to human activities: carbon dioxide or carbon (CO_2), methane (CH_4), dinitrogen oxide (N_2O), hydridofluoridocarbon (HFC), perfluorocarbon (PFC) and sulfur hexafluoride (SF_6).

Warning! Every GHG has a different atmospheric lifespan and its own global warming potential. However, to facilitate the tracking of the emissions, the CO_2 is used as a reference gas and the emissions of the different GHG are expressed in “equivalent CO_2 ” over 100 years. This is why the terms “ CO_2 ” or “carbon” are often wrongly used as if they were synonymous of “GHG” when many other GHG are a substantial and more rapid cause of global warming. Because of the climate crisis, we have to take into account the short term effect of different GHG, such as the methane (of which 95% of natural gas is composed) whose impact on global warming is 84% more important than CO_2 over the first 20 years.

Carbon footprint or carbon assessment: total GHG emissions due to an entity (country, business, person, etc.), a project (highway, gas pipeline, building, etc.) or an event (congress, sport tournament, celebration, etc.).

Hidden footprint: GHG emitted outside Québec for the fabrication and transportation of goods and services consumed in Québec. This footprint is said to be “hidden” because those GHG are not included in Québec’s inventory of GHG. Conversely, the GHG associated with the making and transportation, in Québec, of goods and services consumed outside of Québec, are tracked in Québec.

Warning! The hidden footprint of Quebecers has not, to our knowledge, been measured. However, studies done elsewhere show that it is very substantial in privileged regions such as ours. It is certainly impressive in the sectors where our imports are the most significant, such as cars, oil, pharmaceutical products, clothes, electronic material, among others¹. In France, it is estimated that the carbon emissions generated in other countries by imported goods and services increase by half the real carbon footprint of the country².

1. Importations des principaux produits selon le SCP17, désaisonnalisées et en dollars constants, Institut de la statistique Québec, June 2019.
2. Gaz à effet de serre : la France sur la mauvaise pente, Le Monde, January 23, 2018.

Carbon sequestration (or carbon storage): long term CO₂ storage, outside of the atmosphere.

Carbon sinks: sinks that store more carbon than they emit and contribute to reduce the GHG concentration in the atmosphere.

Natural carbon sinks: the natural carbon sinks are the oceans, growing forests and the soils.

Warning! Carbon storage stops and may even reverse when trees reach the end of their growth. Therefore, even if the climate crisis requires that we protect the existing forest and massively plant new ones, those actions will only have a transitory effect. Planting trees does not exempt us from eliminating almost all GHG emissions in the coming decades, nor does it justify new GHG-emitting projects.

Carbon sequestration technologies: processes used to reduce the CO₂ concentration in the atmosphere by burying carbon in the underground (artificial carbon sinks) or other techniques.

Warning! Artificial carbon sequestration technologies are highly contentious. Still at the experimental stage, they are uncertain and very expensive. While serving as an excuse to maintain massive use of fossil fuels, they consume resources that should serve to find solutions for deep decarbonisation. Moreover, their ecological impacts raise important questions.

“ZéN” or “net zero emissions” or “carbon neutral” or “carbon neutrality”: desired balanced state between GHG that will continue to be emitted as a result of human activities once the transition is complete and the GHG that will be removed from the atmosphere through carbon sequestration.

Warning! While we must recognize that it will be almost impossible to completely eliminate GHG emissions, it remains vital to not overestimate the ability of carbon sinks to cancel residual emissions. The little leeway carbon sinks will give, if we are able to make the most of them, must not serve as an excuse not to implement the needed fundamental changes. We also have to resist the impression that we can justify high emissions consumption behaviours or projects (such as highways or the development of fossil fuels) by purchasing carbon credits. Therefore, the proposed choices in this document are based on the assumption that carbon neutrality can be reached only by combining the gradual cessation of almost all the GHG emissions of human origin and the concurrent maximization of natural carbon sinks. In the actual state of knowledge, those choices exclude taking into account hypothetical carbon sequestration technologies.

Resilience: the ability of a system, human or not, to absorb shocks and chronic stresses while continuing to fulfill its functions, whether they are physical, chemical, social, economic, cultural, emotional or spiritual.

Energy transition: all the necessary transformations to create a society in which energy consumption and greenhouse gas emissions are fundamentally reduced.

Proposed Actions by Categories of Stakeholders

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Businesses and Other Organizations

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Municipalities

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Citizens

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Created in 2015, the Front commun pour la transition énergétique (United Front for Energy Transition) is a coalition of more than 60 citizen groups, environmental NGOs, trade unions and community organizations sharing the goal of accelerating the transition towards a Québec that will be carbon neutral, more resilient and more just. To this end, it relies on collaboration, dialogue and respect for the diversity, freedom and autonomy of each of its member groups.

www.pourlatransitionenergetique.org
info@pourlatransitionenergetique.org

Members of the Front commun pour la transition énergétique (September 2019)

350.org	Fédération autonome de l'enseignement	Mur de femmes contre les oléoducs
Action Climat Outaouais	Fédération des travailleurs et travailleuses du Québec (FTQ)	Nature Québec
Action Environnement Basses Laurentides	Fondation Coule pas chez nous	NON à une marée noire dans le St-Laurent
Alerte Pétrole Rive-Sud	Fondation David Suzuki	Pétroliques Anonymes
Alternatives	Fondation Rivières	Projet de la réalité climatique Canada
Amis de la Terre – Québec	G-MOB	Réseau québécois des groupes écologistes (RQGE)
Association des propriétaires Privés, Agricoles (horticoles) et Forestiers (ApAF)	Greenpeace	Regroupement citoyen contre les bitumineux et pour le développement durable
Association madelinienne pour la sécurité énergétique et environnementale (AMSÉE)	Groupe de recommandations et d'actions pour un meilleur environnement (GRAMÉ)	Regroupement vigilance hydrocarbures Québec (RVHQ)
Association québécoise de lutte contre la pollution atmosphérique (AQLPA)	Groupe de Recherche d'Intérêt Public de l'UQAM (GRIP UQAM)	Réseau québécois de l'action communautaire autonome (RQ-ACA)
ATTAC Québec	Groupe d'initiative et de recherches appliquées au milieu (GIRAM)	Saint-Antoine-de-Tilly – Milieu de vie
Centrale des syndicats du Québec (CSQ)	Idle No More	Solidarité NABRO
Centre de ressources sur la non-violence (CRNV)	Justice climatique Montréal	Sierra Club Québec
Carrefour de participation, ressource et formation (CPRF)	La planète s'invite au parlement	Sherbrooke en transition
Ciel et Terre	L'Assomption en transition	Stellaire
Coalition climat Montréal	Leap Montréal	Société pour Vaincre la Pollution (SVP)
Coalition Vigilance Oléoducs (CoVO)	Le Pacte pour la transition	SOS Territoire (comité du GRIP-UQAM)
Conseil Central du Montréal Métropolitain – CSN	Les Citoyens au Courant	Syndicat de la fonction publique et parapublique du Québec (SFPQ)
Conseil de bande de Kanehsatà:ke	Lotbinière en transition	Tache d'huile
Eau Secours ! Coalition québécoise pour une gestion responsable de l'eau	Marche des peuples pour la Terre mère	Transition Capitale nationale
Énergie Alternative	Mobilisation environnement	Union des employé-es de service – UES800
Environnement Vert Plus	Ahuntsic-Cartierville	Union Paysanne
Équiterre	Montmagny en transition	Villeray en transition
	Montréal pour tous	
	Mouvement d'éducation populaire et d'action communautaire du Québec (MÉPACQ)	
	Mouvement écocitoyen UNEplanète	

Together, let's draw the paths leading to a Québec ZéN.

