

Approval of the Fourth Annual Progress Report to support reporting on the implementation of the PCF / L'approbation du Quatrième Rapport d'étape annuel afin de faciliter le suivi de la mise en œuvre du CPC

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Attachments: PCF Fourth Annual Progress Report on Agriculture - For PT
Approval_FR.docx, PCF Fourth Annual Progress Report on Agriculture - For
PT Approval_EN.docx

Dear Colleagues:

Thank you for providing input for the Fourth Progress Report on Agriculture for the Pan-Canadian Framework on Clean Growth and Climate Change. Please find attached, in English and French, a final, consolidated version of the report. We would like to request Deputy Minister or Assistant Deputy Minister (at your discretion) approval of the attached report no later than **March 26, 2021**.

Please do not hesitate to reach out if you have any questions or concerns.

Regards,

Matt Parry

Director General

Policy Development and Analysis Directorate

Strategic Policy Branch

Agriculture and Agri-Food Canada

Chers collègues,

Merci pour votre contribution pour le Quatrième Rapport d'étape sur l'agriculture relatif au Cadre pancanadien sur la croissance propre et les changements climatiques. Veuillez trouver ci-joint, en anglais et en français, une version finale et consolidée du rapport. Nous aimerions demander l'approbation de votre sous-ministre ou sous-ministre adjoint (à votre discrétion) du rapport ci-joint au plus tard le **26 mars 2021**.

S'il vous plaît, n'hésitez pas à me contacter si vous avez des questions ou des préoccupations relatives à cette demande.

Je vous prie d'agréer l'expression de mes sentiments les meilleurs.

Bien à vous,

Matt Parry

Directeur général

Direction de l'élaboration et de l'analyse des politiques

Direction générale des politiques stratégiques

Agriculture et Agroalimentaire Canada

MINISTRES FÉDÉRAL, PROVINCIAUX ET TERRITORIAUX DE L'AGRICULTURE
QUATRIÈME RAPPORT D'ÉTAPE DU CADRE PANCANADIEN SUR LA CROISSANCE
PROPRE ET LES CHANGEMENTS CLIMATIQUES
2020

1. INTRODUCTION

En décembre 2016, les premiers ministres ont adopté le Cadre pancanadien (CPC) sur la croissance propre et les changements climatiques¹. Le CPC s'appuie sur les premiers efforts déployés par les gouvernements provinciaux et territoriaux pour réduire les émissions de gaz à effet de serre (GES), et décrit les autres mesures à prendre dans toutes les régions et dans tous les secteurs de l'économie, y compris le secteur agricole, afin de contribuer à l'atteinte de l'objectif du Canada en matière de réduction des émissions et de profiter des possibilités économiques liées à la croissance propre.

Le Cadre pancanadien prend appui sur quatre piliers principaux :

- Tarification de la pollution par le carbone²;
- Mesures complémentaires pour réduire davantage les émissions dans toutes les sphères de l'économie;
- Mesures pour s'adapter aux répercussions des changements climatiques et renforcer la résilience;
- Mesures pour accélérer l'innovation, appuyer la technologie propre et créer des emplois.

Les ministres fédéral, provinciaux et territoriaux (FPT) de l'Agriculture reconnaissent que les gouvernements ont un rôle important à jouer pour aider les agriculteurs et les producteurs agroalimentaires à réduire les émissions de gaz à effet de serre (GES) et à s'adapter aux changements climatiques. Le quatrième Rapport d'étape annuel sur l'agriculture décrit les mesures liées à l'agriculture présentes dans le CPC et s'appuie sur les réalisations soulignées dans les trois rapports d'étape annuels précédents.

Les agriculteurs et les éleveurs canadiens pratiquent depuis longtemps une gérance responsable des terres et peuvent jouer un rôle dans la transition vers une économie à faibles émissions de carbone et résiliente face aux changements climatiques, entre autres, en améliorant l'efficacité de la production et en augmentant la quantité de carbone stocké dans les terres agricoles. Ils ont déjà pris des mesures pour atténuer les émissions agricoles de GES, qui représentent 10 % des émissions totales du Canada.

D'importantes réalisations à ce jour comprennent ce qui suit :

¹ La Saskatchewan n'est pas signataire du CPC et l'Alberta et l'Ontario se sont retirés de l'entente dans l'intervalle.

² Le filet de sécurité fédéral pour la tarification du carbone, en place depuis le 1^{er} janvier 2019, s'applique aux provinces et aux territoires qui l'adoptent ou qui proposent des approches qui ne répondent pas aux exigences de rigueur fédérales.

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- Le Canada est l'un des rares pays qui peuvent faire état à la fois d'émissions légèrement moindres depuis 2005 et d'un puits de carbone net provenant de terres agricoles.
- Les émissions totales provenant de l'agriculture (c'est-à-dire du bétail, des cultures et de la consommation de carburant à la ferme) demeurent plutôt stables depuis le milieu des années 1990, en dépit d'une croissance notable de la production sur cette période, qui témoigne d'un décalage entre les émissions et la production. En 2018, l'agriculture canadienne a produit 50 % moins d'émissions de GES pour chaque dollar de PIB qu'elle a généré, comparativement à 1997.
- Depuis la fin des années 1990, les sols agricoles stockent le carbone de l'atmosphère en raison de l'adoption généralisée de pratiques de gestion des terres comme le semis direct, le travail de conservation du sol et l'utilisation réduite de la jachère. Selon les données les plus récentes, les sols agricoles retiraient un peu plus de 6 millions de tonnes d'équivalent de dioxyde de carbone (Mt éq. CO₂) en 2018, compensant environ 8 % des émissions agricoles annuelles.
- L'amélioration de l'alimentation des animaux et de l'élevage a permis de réduire les émissions de 15 % par kilogramme de bœuf produit, depuis les 30 dernières années, en réduisant simultanément la pression exercée sur les ressources en terre et en eau. Une diminution semblable de l'intensité des émissions a été mesurée pour d'autres animaux d'élevage.
- Grâce à des investissements dans l'innovation et les pratiques de gestion durable des terres, les rendements récents des cultures ont montré une plus grande résilience dans des conditions météorologiques extrêmes (p. ex., sécheresse) comparativement à des conditions similaires à la fin des années 1980.

La croissance accrue du secteur, notamment en vue d'atteindre l'objectif ambitieux énoncé dans le budget fédéral de 2017 d'augmenter les exportations agroalimentaires canadiennes au minimum à 75 milliards de dollars annuellement d'ici 2025, tout en atténuant les répercussions sur les changements climatiques, constitue un important défi pour la réduction continue des GES dans le secteur. Les mesures agricoles annoncées en décembre 2020 dans le cadre du Plan climatique renforcé, « Un environnement sain et une économie saine », aideront le secteur à atteindre ces objectifs. Par exemple, le financement axé sur le développement et l'adoption de technologies propres et novatrices, comme celles liées à l'agriculture de précision, aideront le secteur à relever ce défi en améliorant le stockage du carbone dans le sol et en réduisant l'intensité des émissions de GES liées à l'utilisation d'engrais ou à la production animale. Toujours dans le cadre du Plan climatique renforcé, le gouvernement a annoncé qu'Agriculture et Agroalimentaire Canada mettra en place un nouveau programme Solutions agricoles pour le climat pour appuyer les mesures du secteur face aux changements climatiques et d'autres priorités environnementales pour 2030 et 2050. Le secteur agricole peut aussi contribuer à la réduction des émissions de GES en fournissant des bioproduits d'origine agricole (p. ex. bioplastiques, carburants renouvelables) qui peuvent remplacer les intrants à base de combustibles fossiles à forte intensité d'émissions.

Parallèlement, les effets des changements climatiques sur les conditions de production (c.-à-d., températures, profils de précipitations, événements météorologiques extrêmes) ont une incidence sur les agriculteurs canadiens. Un risque accru est prévisible, en raison de sécheresses, d'inondations et de feux de forêt plus fréquents ou plus intenses, ou de changements dans la fréquence des apparitions de nuisibles, de maladies et d'espèces envahissantes. À l'inverse, des saisons de croissance plus longues et

l'augmentation des températures offrent des possibilités de diversification des variétés de cultures et d'expansion des cultures à des zones non traditionnelles, ainsi qu'une saison de pâturage prolongée.

2. PROGRÈS DES MESURES PRÉVUES DANS LE CADRE PANCANADIEN SUR L'AGRICULTURE

Le CPC définit les mesures suivantes liées à l'agriculture dans le cadre du pilier des *mesures complémentaires visant à réduire davantage les émissions dans l'ensemble de l'économie* :

- **Augmentation du carbone stocké** dans les sols agricoles pour éviter partiellement les émissions du secteur : Les gouvernements FPT collaborent pour protéger et améliorer les puits de carbone, y compris dans les domaines de l'agriculture, des milieux humides et des forêts. En appuyant les pratiques de gestion bénéfiques (PGB), les gouvernements aident les agriculteurs à améliorer les puits de carbone par des mesures comme l'augmentation des cultures de couverture permanentes, de meilleures rotations des cultures et le travail de conservation du sol;
- **Production de bioénergie et de bioproduits** pour déplacer les émissions vers d'autres secteurs économiques : Les gouvernements FPT collaborent pour cerner les possibilités de produire des combustibles renouvelables et des bioproduits. Les agriculteurs peuvent fournir de la biomasse pour les bioproduits qui remplacera les combustibles fossiles dans d'autres secteurs ou comme matières premières dans la production d'énergie renouvelable. Les programmes gouvernementaux contribuent à cette transition vers une économie à faibles émissions de carbone; et
- **Amélioration des innovations** liées aux pratiques de gestion bénéfiques des GES pour réduire les émissions agricoles et leur intensité : Les gouvernements FPT collaborent pour améliorer l'innovation afin de faire progresser les pratiques de gestion efficace des GES en agriculture. Les investissements publics dans la recherche et l'adoption de technologies permettent aux agriculteurs de réduire les émissions provenant de l'agriculture, grâce aux nouvelles technologies pour le bétail et la production végétale, notamment en agriculture de précision, et grâce aux engrais « intelligents » qui se libèrent progressivement selon les besoins des plantes, et finalement, grâce aux additifs et inhibiteurs dans les aliments pour animaux qui réduisent la production de méthane chez les bovins.

Les gouvernements investissent pour prendre des mesures dans ces trois domaines prioritaires, qui couvrent l'éventail des options d'atténuation des GES dans le secteur. La contribution du secteur agricole et agroalimentaire canadien aux mesures liées à l'agriculture définies dans le CPC s'accomplit principalement dans le cadre du Partenariat canadien pour l'agriculture (Partenariat) d'une durée de cinq ans (2018-2023) et sera soutenue par d'autres mesures complémentaires au partenariat.

Le Partenariat canadien pour l'agriculture

Depuis plus de 15 ans, les cadres stratégiques FPT pour l'agriculture ont amélioré la cohérence des politiques et de la réglementation et ont assuré une approche concertée qui favorise l'investissement, l'adaptation et la croissance durable du secteur.

Prenant appui sur les réussites antérieures, les ministres FPT de l'Agriculture ont lancé le *Partenariat canadien pour l'agriculture* (le Partenariat) le 1^{er} avril 2018. Cet investissement quinquennal (2018-2023)

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de 3 milliards de dollars a pour but de renforcer le secteur de l'agriculture, de l'agroalimentaire et des produits agro-industriels tout en assurant le maintien de l'innovation, de la croissance et de la prospérité.

Trois domaines prioritaires sont énoncés dans le Partenariat, tous pertinents quant au CPC :

- **Croissance du commerce et expansion des marchés** – Contribuer à améliorer la compétitivité, la croissance et la capacité d'adaptation du secteur;
- **Croissance innovatrice et durable pour le secteur** – Stimuler la compétitivité du secteur par l'entremise de la recherche, des sciences et de l'innovation et de l'adoption de pratiques et de produits novateurs, en mettant l'accent sur l'environnement et la croissance écologique; et
- **Soutenir la diversité et un secteur dynamique en évolution** – Renforcer le secteur en tenant mieux compte de la diversité des collectivités canadiennes, améliorer la collaboration entre les diverses juridictions, obtenir et soutenir la confiance du public dans le secteur et rehausser les services à la clientèle.

Au cours du Partenariat, les mesures de lutte contre les changements climatiques du CPC sont soutenues par trois types de programmes :

- Des **programmes dirigés uniquement par le gouvernement fédéral** qui soutiennent la résilience et la durabilité du secteur par la science, la recherche et l'adoption de pratiques et de technologies novatrices (1 milliard de dollars sur cinq ans);
- Des **programmes FPT de mesures à la ferme à frais partagés**³ offerts par les provinces et les territoires qui sensibilisent les producteurs aux risques environnementaux et accélèrent l'adoption de technologies et de pratiques visant à réduire ces risques (2 milliards de dollars sur cinq ans); et
- Des **programmes de gestion des risques de l'entreprise (GRE)** qui sont axés sur la demande et qui aident les agriculteurs à gérer les risques importants menaçant la viabilité de leurs activités (environ 1,5 milliard de dollars par année).

L'approche adoptée par le Partenariat met l'accent sur la combinaison de mesures à la ferme et la science et l'innovation afin de réduire les émissions, de renforcer la résilience et de soutenir la croissance pour satisfaire une demande alimentaire mondiale croissante.

La série de programmes spécifiques du Partenariat qui appuient les mesures visant à protéger et à améliorer les puits de carbone en agriculture, à produire de la bioénergie et des bioproduits, à promouvoir des pratiques de gestion novatrices et efficaces des GES et à soutenir la résilience climatique dans les systèmes de production agricole, comprend les éléments suivants :

- Programmes FPT de mesures environnementales à la ferme à frais partagés exécutés par les provinces et les territoires pour appuyer les plans environnementaux des fermes et l'adoption de

³ Les programmes FPT à frais partagés sont financés selon une formule 60:40 entre le gouvernement fédéral et les gouvernements des provinces et des territoires.

PGB qui offrent de nombreux avantages pour l'environnement, notamment la conservation des sols et de l'eau, la réduction des émissions et de l'intensité des émissions et la résilience au climat. Toutes les provinces appuient les mesures à la ferme grâce à de tels programmes. D'après l'analyse menée en 2020, au cours de la première année du Partenariat (2018-2019), les fermes de partout au Canada ont mis en œuvre plus de 1 800 PGB qui ont contribué à l'atténuation des changements climatiques et environ 1 200 PGB qui ont trait à l'adaptation aux changements climatiques.

- Le programme **Agri-innover** vise à accélérer la commercialisation, l'adoption ou la démonstration de produits, de technologies, de processus ou de services novateurs qui améliorent la compétitivité et la durabilité du secteur. Les domaines prioritaires d'Agri-innover englobent l'adoption de nouvelles technologies propres, y compris l'agriculture de précision, et l'augmentation de la productivité par la fabrication de pointe, l'automatisation ou la robotique.
- Le programme **Agri-science** vise à accélérer le rythme des innovations en offrant du financement et en appuyant les activités, au stade précommercial, et les investissements dans la recherche de pointe, qui sont bénéfiques au secteur de l'agriculture et de l'agroalimentaire et pour les Canadiens. Les domaines prioritaires d'Agri-science sont les suivants : les défis que posent l'environnement et l'adaptation aux changements climatiques, l'incidence de l'agriculture sur l'air, l'eau et le sol; la réduction des émissions de GES; la transformation des produits agricoles en biocarburants; la gestion de l'eau et des sols.
- Le programme **Agri-diversité** soutient des ateliers et des séminaires à l'intention des jeunes, des femmes, des peuples autochtones et d'autres producteurs agricoles sous-représentés, afin qu'ils en apprennent davantage sur les pratiques, l'équipement et les technologies favorisant la résilience aux changements climatiques.

3. LACUNES, DÉFIS ET POSSIBILITÉS

L'agriculture est un secteur diversifié caractérisé par différents types de systèmes de production et de conditions de croissance. L'agriculture est également de compétence partagée. En effet, les provinces et les territoires sont essentiellement chargés de planifier l'utilisation des terres et de gérer les ressources naturelles servant à l'agriculture. Contrairement à de nombreux autres secteurs, la plupart des émissions agricoles de production primaire ne proviennent pas de la consommation d'énergie, mais plutôt de processus biologiques qui réduisent les possibilités de substitution à des intrants et des processus de production à faibles émissions.

Les possibilités de réduction absolue des émissions varient d'une région à l'autre. L'agriculture n'est une source importante d'émissions de GES que dans certaines provinces, dont la Saskatchewan, le Manitoba et l'Île-du-Prince-Édouard. Dans toutes les autres provinces, l'impact du secteur agricole sur les émissions totales du Canada est d'environ 10 % ou moins.⁴

Afin de réduire les émissions en 2030 par rapport aux niveaux de 2005, le secteur doit continuer d'adopter des pratiques qui limitent les émissions provenant de la production animale et végétale, ainsi que la consommation de carburant et d'énergie à la ferme. Les tendances à la baisse des émissions dans la production animale doivent se poursuivre grâce à la recherche scientifique et à l'innovation dans

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l'alimentation et la nutrition du bétail, ainsi que dans la génétique et l'élevage des animaux. Il faut accélérer la décarbonisation de la consommation de carburant à la ferme, tandis qu'il faut inverser la tendance à l'augmentation des émissions dans la production végétale et à la diminution du taux de séquestration du carbone.

À cette fin, les mesures annoncées dans le cadre du Plan climatique renforcé du gouvernement du Canada appuieront les efforts de réduction d'émissions dans le secteur. Ces mesures comprennent un objectif de réduction des émissions à l'échelle nationale de 30 % par rapport aux niveaux de 2020 dues à l'épandage d'engrais, et le financement d'un renouvellement du Programme des technologies propres en agriculture pour aider à réduire les émissions associées à la production de bétail, à l'utilisation de combustibles ou d'énergie à la ferme et à la production de cultures.

Un potentiel supplémentaire de stockage du carbone demeure, mais relativement limité, car plus de 80 % des terres préparées pour l'ensemencement sont déjà cultivées sans labour ou en travail de conservation du sol. Il serait possible de réaliser d'autres gains en carbone stocké grâce à des pratiques agronomiques variées, incluant les cultures de couverture, l'agroforesterie, les brise-vent, les zones tampons riveraines et la gestion améliorée des prairies. Afin d'aider les exploitations agricoles du Canada à accroître la séquestration du carbone dans le sol et à réaliser d'autres avantages environnementaux, le programme Solutions climatiques agricoles, annoncé en novembre 2020, appuiera les mesures prises par le secteur en matière de changements climatiques et d'autres priorités environnementales vers 2030 et 2050.

À moyen et à long terme, certaines technologies propres novatrices promettent d'autres réductions des émissions dans le secteur des cultures (p. ex., génie biologique, engrais intelligents, capteurs, robotique et intelligence artificielle), secteur de l'élevage (p. ex., choisir des ruminants produisant peu de méthane, mettre au point des inhibiteurs de méthane et des suppléments alimentaires et améliorer la gestion du pâturage) et la consommation de carburant à la ferme (développement et commercialisation de véhicules électriques hors route). Le secteur agricole peut aussi contribuer à la réduction des émissions de GES en fournissant des bioproduits d'origine agricole (p. ex. bioplastiques) et des carburants renouvelables capables de remplacer les intrants à base de combustibles fossiles à forte intensité d'émissions. La future réglementation, comme la Norme sur les combustibles propres, exigera un mélange accru d'éthanol et de biodiesel, et pourrait offrir des possibilités d'accroître la production de ces carburants et matières premières (p. ex., maïs, blé, canola, soya et biogaz provenant de la digestion anaérobie).

L'utilisation d'outils stratégiques novateurs (p. ex. l'économie de croissance, les instruments axés sur le marché) rend possibles d'autres réductions d'émissions au-delà de celles obtenues grâce à l'approche actuelle fondée sur des mesures incitatives pour l'adoption de PGB. L'infrastructure verte (p. ex., les terres humides) sur les terres agricoles peut aussi contribuer à des priorités plus vastes du gouvernement du Canada, comme la conservation de la biodiversité, la séquestration du carbone, la qualité de l'eau et l'amélioration du contrôle des inondations. Cela dit, les terres humides peuvent également constituer une source importante d'émissions de méthane.

4. PROCHAINES ÉTAPES

Le Partenariat a commencé le 1^{er} avril 2018 et sera en place jusqu'au 31 mars 2023. Les programmes exclusivement fédéraux et les programmes FPT à frais partagés appuyant les mesures climatiques du secteur agricole avec le Partenariat ont été ouverts aux demandes. Des détails sur les activités et les projets financés par des programmes complémentaires lancés dans le cadre du Partenariat sont inclus dans le présent rapport et d'autres le seront dans les futurs rapports d'étape.

ANNEXE – MESURES DÉTAILLÉES PRISES PAR LES GOUVERNEMENTS PROVINCIAUX ET TERRITORIAUX

Les mesures de soutien aux interventions en matière de climat et aux technologies propres dans le secteur agricole ne se limitent pas à celles qui ont été lancées dans le cadre du Partenariat. Les provinces et les territoires disposent de programmes et d'initiatives variés qui s'ajoutent aux efforts déployés dans le cadre du Partenariat. Ces programmes et initiatives vont de la gestion des éléments nutritifs à l'efficacité énergétique en passant par la conservation des prairies, les stratégies alimentaires locales et la diversification agricole.

GOUVERNEMENT DU CANADA

Voici les initiatives et programmes fédéraux à l'extérieur du Partenariat qui contribueront également à l'avancement des mesures touchant l'agriculture recensées dans le CPC :

- Le **programme de lutte contre les gaz à effet de serre en agriculture** (PLGESA) est un investissement quinquennal (2016-2021) visant à améliorer la compréhension et l'accessibilité des technologies agricoles, des PGB et des processus qui peuvent être adoptés par les agriculteurs pour atténuer les émissions de GES agricoles au Canada. La plupart des projets sont dirigés par des universités canadiennes partout au pays et relèvent d'au moins un des quatre domaines prioritaires suivants : systèmes d'élevage, systèmes de culture, utilisation efficace de l'eau en agriculture et agroforesterie. Le programme prendra fin en mars 2021.
- Le **Programme des technologies propres en agriculture** (TPA) est un investissement sur trois ans (2018 à 2021) qui favorise le développement et l'adoption de technologies propres grâce à l'adoption de l'agriculture de précision et des bioproduits agro-industriels et à des investissements en ce sens. Ces technologies ont permis de réduire les émissions de GES, de générer une vaste gamme de retombées positives et de promouvoir une croissance à la fois propre et durable. Comme le programme TPA prend fin le 31 mars 2021, il fallait que toutes les demandes dûment remplies soient soumises au plus tard le 30 septembre 2020 pour passer à l'examen des demandes. Au 31 décembre 2020, le programme de TPA avait reçu au total 30 demandes. De ce nombre, 18 ont été considérés comme des dossiers de demande complets dont le financement a été approuvé pour un total de 12 projets.
- Un investissement de 70 millions de dollars sur cinq ans dans la découverte scientifique et l'innovation en agriculture (2018-2023), annoncé dans le budget de 2017, aide à donner suite à des priorités comme les changements climatiques, la conservation des sols et de l'eau et la biodiversité. De cet investissement, 44 millions de dollars sont consacrés à l'embauche de la prochaine génération de chercheurs et de professionnels scientifiques fédéraux. L'investissement appuie également l'**Initiative des laboratoires vivants**, une approche intégrée de recherche agricole qui réunit des agriculteurs, des scientifiques et d'autres intervenants pour élaborer, mettre à l'essai et surveiller conjointement de nouvelles pratiques et technologies à la ferme. Le résultat de cet investissement permettra aux agriculteurs canadiens d'adopter plus rapidement des technologies innovatrices et des pratiques agricoles durables. À ce jour, trois laboratoires vivants ont été lancés, le plus récent en décembre 2020 au Québec.

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- Le **Programme canadien des priorités stratégiques de l'agriculture**, un programme annuel de 10 millions de dollars sous forme de contribution non remboursable qui financera, sur cinq ans (2019-2024), le secteur agricole pour lutter contre les problèmes émergents et tirer parti des occasions. La durabilité de l'environnement est l'un des quatre domaines prioritaires. Ce sont les projets qui élaborent ou améliorent les outils d'évaluation de la réduction des gaz à effet de serre qui sont mis de l'avant. Autrement, les projets qui testent des modèles économiques novateurs servant à déterminer la séquestration du carbone et à effectuer une gestion expérimentale dans le secteur sont aussi soutenus. Finalement, les projets qui étudient les possibilités pour le secteur agricole de fournir des solutions aux changements climatiques à d'autres secteurs sont encouragés.
- Dans le cadre du Plan renforcé pour le climat du gouvernement du Canada, *Un environnement sain et une économie saine*, annoncé le 11 décembre 2020, le gouvernement du Canada investira 165,7 millions de dollars sur sept ans pour aider l'industrie agricole à mettre au point des technologies propres transformatrices et aider les agriculteurs à adopter des technologies propres disponibles sur le marché.
- Les exploitations agricoles canadiennes ont un potentiel important d'accroître la séquestration du carbone et de réaliser d'autres avantages environnementaux grâce à l'adoption de PGB. Dans l'Énoncé économique de l'automne, le 30 novembre 2020, le gouvernement a proposé de verser 98,4 millions de dollars sur 10 ans, à compter de 2021-2022, y compris 1,6 million de dollars pour les amortissements restants, à Agriculture et Agroalimentaire Canada pour la création d'un nouveau fonds des solutions climatiques naturelles pour l'agriculture. Ce fonds mobilisera 85 millions de dollars dans les programmes existants et sera guidé par une nouvelle stratégie agroenvironnementale canadienne élaborée en collaboration avec des partenaires pour soutenir les mesures du secteur face aux changements climatiques et d'autres priorités environnementales à l'horizon 2030 et 2050.
- Le **Fonds pour une économie à faibles émissions de carbone**, le **Fonds du leadership pour une économie à faibles émissions de carbone** et le **Fonds d'incitation à l'action pour le climat** (FIAC) ont appuyé un certain nombre de projets agricoles et agroalimentaires mis en œuvre dans plusieurs provinces. En janvier 2021, il y avait 172 ententes de financement actives dans le cadre du FIAC, et sept projets sont actifs ou en parachèvement dans le cadre des volets du Fonds pour une économie à faibles émissions de carbone.

Des détails supplémentaires sur les mesures provinciales et territoriales en appui aux mesures climatiques qui complètent celles du Partenariat sont présentés ci-dessous.

GOVERNEMENT DE LA COLOMBIE-BRITANNIQUE

À l'échelle provinciale, la *Climate Change Accountability Act* oblige la Colombie-Britannique (C.-B.) à atteindre des cibles de réduction des émissions de 40 % d'ici 2030, de 60 % d'ici 2040 et de 80 % d'ici 2050 par rapport aux taux de 2007. Le plan climatique phare de 908 millions de dollars de la province, CleanBC, offre une avenue pour réduire la pollution climatique tout en créant des possibilités dans toute la province. Les mesures liées à l'agriculture dans le cadre de CleanBC comprennent le développement de biocarburants et le réacheminement de 95 % des déchets organiques des sites d'enfouissement. Le ministère de l'Agriculture, de l'Alimentation et des Pêches (MAAP) de la C.-B., par l'entremise du

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Partenariat canadien pour l'agriculture (PCA), finance des programmes qui appuient la mise en œuvre du Cadre pancanadien sur la croissance propre et les changements climatiques et du programme CleanBC. Ces programmes contribuent à l'adaptation et à la résilience du secteur agricole, au développement de technologies propres et à l'amélioration des puits de carbone, ainsi qu'à la croissance d'entreprises agricoles durables. Les points saillants sont présentés ci-dessous.

Le programme de plans environnementaux à la ferme (PEF) [5,0 M\$ dans le PCA] & le programme de pratiques de gestion bénéfiques (PGB) [6,5 M\$ dans le PCA] – En 2020, la C.-B. a investi 2,34 millions de dollars dans le programme de plans environnementaux à la ferme (PEF) et dans le programme de pratiques de gestion bénéfiques (PGB) en appui à la réalisation de 200 nouveaux PEF et à la reconduction de 148 PEF supplémentaires, au moyen d'un guide de planification actualisé visant à renforcer l'intégration de l'adaptation au climat et de l'atténuation de ses répercussions à la planification des PEF dans le cadre du PCA. Le programme de PGB a fourni un financement à frais partagés à plus de 230 projets visant à adopter des pratiques à la ferme qui ont contribué à la réduction des GES, à la séquestration du carbone et à l'adaptation au climat. Les résultats comprennent : 28 plans de gestion de l'irrigation et 18 projets de gestion de l'irrigation, retenus en vue d'accroître l'efficacité de l'utilisation de l'eau (adaptation); 26 plans de gestion des nutriments, contribuant à optimiser l'utilisation de l'azote afin de réduire les émissions d'oxyde nitreux (atténuation); 18 projets destinés à réduire les émissions de dioxyde de carbone grâce à l'amélioration de l'efficacité énergétique (atténuation) ; 62 plans de gestion des zones riveraines et 27 projets connexes de PGB, notamment des projets d'établissement (plantations) d'habitats riverains (atténuation et adaptation) et enfin 22 plans de gestion des pâturages destinés à améliorer la santé des sols et le stockage du carbone.

Un montant supplémentaire de 1,9 million de dollars a été investi pour l'exercice 2020-2021, dont 1,6 million dans le cadre du Plan de relance économique 2020 de la C.-B. à l'appui du Programme complémentaire d'innovation à la ferme qui favorise la mise en œuvre de PGB visant à atténuer les répercussions des changements climatiques.

Programme d'innovation agricole [25,8 M\$ dans le PCA] – Depuis le début du PCA, ce programme a investi plus de 1,6 million de dollars dans les bioproduits, le biogaz et le développement de technologies propres pour le secteur. Un projet explore le potentiel des algues en tant qu'additif alimentaire pour le bétail, afin de réduire les émissions de méthane provenant de la fermentation entérique. En 2020, dans le cadre du PCA, le Programme d'innovation agricole Canada–C.-B. a investi 2,375 millions de dollars de plus dans des projets de bioproduits et de technologies propres dans le secteur de l'agriculture et de l'agroalimentaire, pour un total de 2,9 millions de dollars depuis le début du PCA. De même, le Programme des projets d'importance provinciale a investi 1,0 million de dollars de plus au cours de l'exercice 2019-2020, pour un total de 2,1 millions de dollars depuis le début du PCA. Dans le cadre du Partenariat, 18 millions de dollars seront investis, selon les estimations, dans ces deux programmes d'agro-innovation, et d'autres projets devraient favoriser les technologies propres dans le secteur agricole. Le Programme d'innovation Canada–C.-B. et le Programme des projets d'importance provinciale continuent d'accepter des demandes et de mettre en œuvre des projets jusqu'en 2023.

Le MAAP investit 0,7 million de dollars par année dans le Programme de gestion des éléments nutritifs amélioré, qui aide les agriculteurs à gérer l'application des éléments nutritifs afin de réduire les émissions de GES et de protéger la qualité de l'eau potable. En 2020, l'outil de gestion des risques de l'application en ligne (BC ARM) a été développé et amélioré pour appuyer la prise de décisions concernant l'application

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de la gestion des éléments nutritifs pendant les saisons intermédiaires dans les zones de fortes précipitations. Le ministère a récemment parachevé un manuel sur le biogaz pour aider les producteurs à élaborer de nouveaux projets de biogaz. Grâce au CleanBC Industry Fund pour les grands émetteurs industriels, deux grandes serres ont réussi à obtenir un financement combiné de 900 000 \$ pour des améliorations écoénergétiques et des rideaux thermiques.

Bien que les programmes susmentionnés indiquent des progrès vers la réduction des émissions agricoles et l'amélioration des puits de carbone, des lacunes persistent quant à l'estimation, la mesure et le suivi des niveaux de ces émissions par rapport aux sous-secteurs agricoles et aux pratiques agricoles. Pour remédier à cette situation, le MAAP a lancé un projet dirigé par le Sustainable Agriculture Landscapes Lab de l'Université de la C.-B., afin de déterminer et d'évaluer les pratiques et les technologies les plus susceptibles de réduire les émissions nettes de GES en agriculture dans le contexte de la C.-B. Le lien entre la comptabilité du carbone et les pratiques agricoles est un travail fondamental qui permettra au MAAP d'appuyer les PGB et les technologies qui mènent à des réductions ciblées des émissions de GES pour le secteur.

CleanBC comprend également un engagement à élaborer une stratégie d'adaptation aux changements climatiques en C.-B. fondée sur une évaluation des risques climatiques à l'échelle de la province publiée en 2019. Le MAAP a participé à des travaux interorganismes visant à élaborer la stratégie d'adaptation tout au long de 2020. Pour l'avenir, la C.-B. reconnaît la nécessité d'investir dans l'adaptation du secteur agricole afin de profiter de la prolongation de la saison et de gérer les risques liés aux changements climatiques comme les feux de forêt, la sécheresse, la chaleur, les inondations et les organismes nuisibles.

L'adaptation est de toute évidence une priorité climatique pour le secteur, avec plus de 12 millions de dollars investis dans le Programme d'adaptation aux changements climatiques dirigé par l'industrie depuis 2013 [6,6 M\$ dans le PCA], qui est exécuté par l'entremise de la Climate & Agriculture Initiative BC. Le Programme d'adaptation régionale continue d'élargir sa portée, la Stratégie d'adaptation régionale de l'île de Vancouver étant terminée en 2020, et 22 projets financés par le PCA étant terminés, entrepris ou en cours pour répondre aux priorités d'adaptation prioritaires définies dans sept autres régions agricoles clés de la province. Le programme a une force considérable en raison de son approche de collaboration multipartite, qui fait participer activement les collectivités locales de producteurs, les organismes de l'industrie, les ONG et les gouvernements à l'élaboration des stratégies régionales et des projets de mise en œuvre. On prévoit que de cinq à dix autres projets seront terminés d'ici 2023 dans les huit régions visées par les stratégies d'adaptation régionales.

Le programme d'adaptation aux changements climatiques de la C.-B. s'appuie sur des projets et des ressources élaborés dans le cadre du Programme d'adaptation régionale en agriculture de la C.-B. et sur les leçons tirées des saisons des feux de forêt de 2017 et de 2018 en C.-B. afin de mettre en place des initiatives provinciales de préparation aux feux de forêt et d'atténuation financées par le PCA. En 2020, des ateliers de préparation aux feux de forêt ont été offerts aux producteurs agricoles de cinq collectivités de la C.-B. Ces ateliers ont réuni plus de 125 producteurs, du personnel d'intervention en cas d'incendie et de gestion des urgences, des représentants des administrations locales et du personnel d'organismes provinciaux. De plus, en partenariat avec le MAAP et des organismes provinciaux, la BC Cattlemen's Association met à l'essai l'utilisation du pâturage pour réduire les carburants fins dans les collectivités environnantes. Cette approche collaborative en matière d'adaptation produit des avantages synergiques en réduisant le risque de feux de forêt près des collectivités et en permettant aux éleveurs d'avoir accès à de nouveaux fourrages. Des ateliers de préparation aux feux de forêt visant à former des professionnels qui peuvent offrir des services individuels de sensibilisation et de soutien aux agriculteurs et aux éleveurs.

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sont prévus pour 2021-2022 et seront financés par le programme d'investissement dans la résilience communautaire de la C.-B.

Le Programme d'innovation en adaptation agricole finance des projets pluriannuels de recherche appliquée et de démonstration qui aident les producteurs à s'adapter aux répercussions des changements climatiques. Ce programme investit 1,5 million de dollars pendant le PCA dans 12 projets de recherche pluriannuels appliqués sur l'adaptation au climat, qui comprennent plusieurs pratiques d'amélioration des puits de carbone dans le sol. Les sujets de recherche actuels sont : la modélisation de la phénologie viticole, l'irrigation déficitaire dans les vergers, les modèles de recherche à la ferme, les pratiques novatrices de rajeunissement des pâturages, l'amélioration de la gestion des sols par rapport à l'humidité des sols et la séquestration du carbone, la lutte contre les organismes nuisibles à la ferme et l'innovation en matière de serres pour la prolongation de la saison. Ce programme est fortement axé sur la collaboration. En effet, la plupart des projets comportent des partenariats entre des producteurs coopérateurs, des chercheurs, des associations sectorielles, des établissements d'enseignement et des experts techniques. Les projets approuvés dans le cadre du Programme d'innovation en adaptation agricole seront en cours jusqu'en 2023.

Le rapport présentant les conclusions et les recommandations du Groupe de travail sur la sécurité alimentaire de la C.-B., publié en 2020, comprend des recommandations sur l'utilisation de la technologie et de l'innovation pour continuer à renforcer le secteur agricole tout en s'attaquant aux changements climatiques.

GOVERNEMENT DE L'ALBERTA

L'Alberta continue de progresser vers l'atteinte des objectifs en matière de changements climatiques. Avec l'abrogation de la redevance sur le carbone de l'Alberta en mai 2019, le financement des programmes afférents au climat a diminué. Les programmes ont été réorganisés, certains ont pris fin (le Programme de transformation agricole et d'énergie à la ferme et le Programme d'énergie solaire photovoltaïque à la ferme) et un nouveau programme (le Programme de séchage efficace du grain) a été lancé.

Le système réglementé de crédits compensatoires de l'Alberta est maintenu dans le cadre du programme d'innovation technologique et de réduction des émissions de l'Alberta. Le programme de compensation de l'Alberta existait en vertu du Specified Gas Emitters Regulation et du Carbon Competitiveness Incentive Regulation. Ce programme offre aux éleveurs et aux agriculteurs la possibilité d'être rémunérés pour l'adoption de pratiques de gestion bénéfiques qui séquestrent le carbone et réduisent les émissions. Depuis l'introduction du système de compensation de l'Alberta en 2007, le protocole de conservation des cultures, qui favorise la gestion sans labour, est le plus populaire. L'Alberta a également élaboré des mesures de compensation pour la microgénération, les bovins gras et le biogaz. Nous continuons d'examiner les possibilités d'élaborer de nouveaux protocoles de compensation agricole.

GOVERNEMENT DE LA SASKATCHEWAN

La Saskatchewan continue de respecter ses engagements en matière de résilience dans les Prairies : ***A Made-in-Saskatchewan Climate Change Strategy***. En juin 2020, la province a publié son second rapport d'étape annuel sur la résilience climatique. Le rapport définit les cibles, les bases de référence, les tendances historiques et l'état actuel de 25 mesures de la résilience, dont cinq sont axées sur le secteur agricole. Voici ces mesures :

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1. Superficie totale des terres agricoles sous couverture permanente en Saskatchewan;
2. Quantité totale de matière organique du sol séquestrée dans les terres cultivées;
3. Pourcentage de la superficie des terres agricoles ayant un plan de gérance des nutriments 4R;
4. Revenu agricole net réalisé;
5. Pourcentage de terres cultivées dans différents types de cultures.

Des cibles sont établies pour chacune des mesures dans le cadre, et le gouvernement continuera de faire rapport sur les progrès réalisés à l'égard de chacune des cibles chaque année. La province prévoit également tenir des consultations et élaborer des documents d'orientation, des normes et le registre en vue du déploiement du programme provincial de compensation en 2022.

Les investissements dans **la recherche et le développement** mènent à des innovations supplémentaires pour l'atténuation des changements climatiques et l'adaptation à ces changements. En 2019, le ministère de l'Agriculture et le gouvernement du Canada ont annoncé un financement de 11 millions de dollars pour 47 projets de recherche sur les cultures. Ce financement est accordé aux termes du fonds Agriculture Development Fund (ADF) et de la Strategic Research Initiative pour des projets liés à la résistance aux maladies, aux herbicides ainsi qu'à la sélection des cultures, dans le but d'assurer une résilience climatique dans le secteur des cultures. Au total, le fonds ADF a investi plus de 7,5 millions de dollars entre 41 projets portant sur divers thèmes environnementaux liés aux changements climatiques de 2013 à 2020.

Dans le cadre du Partenariat canadien pour l'agriculture (PCA), le ministère a également consenti des fonds au cours de l'exercice 2019-2020 aux instituts et initiatives de recherche suivants :

- Le Centre d'amélioration des cultures qui contribue au développement de nouvelles variétés végétales pouvant être mieux adaptées à notre climat en mutation;
- Le Global Institute for Food Security (l'institut mondial de sécurité alimentaire) où les travaux comprennent l'amélioration de l'efficacité des cultures comme le blé et le canola, de même que le développement de cultures plus tolérantes à la sécheresse;
- Le nouveau Centre d'excellence pour le bétail et le fourrage, qui mène des recherches sur l'amélioration des fermes d'élevage, la production de fourrage et les pâturages;
- Le Prairie Agriculture Machinery Institute (l'institut de la machinerie agricole des Prairies) qui effectue de la recherche novatrice en technologie de la machinerie.

Le ministère offre des programmes et un appui à long terme sur la durabilité environnementale et les changements climatiques. Le PCA comprend le financement du Programme d'infrastructure d'approvisionnement en eau pour les exploitations agricoles et les ranchs afin de soutenir le développement de sources d'eau sécuritaires et durables pour l'agriculture. Le Programme de gérance agroenvironnementale offre une aide financière aux producteurs pour la mise en œuvre de PGB. Les PGB, comme la cartographie à taux variable et le fourrage cultivé et naturel, peuvent réduire les émissions de gaz à effet de serre, séquestrer le carbone et favoriser la résilience. Du 1^{er} avril 2018 au 31 décembre 2019, 2 344 projets du Programme d'infrastructure d'approvisionnement en eau pour les exploitations agricoles et les ranchs et 907 PGB ont été financés. Les services-conseils du ministère appuient l'adoption de PGB par les producteurs et l'amélioration des pratiques et des technologies.

En juillet 2020, le gouvernement de la Saskatchewan a annoncé les premières étapes d'un projet générationnel visant à étendre de 500 000 hectares l'irrigation à partir du lac Diefenbaker. Ce projet contribuera à accroître la résilience de l'industrie agricole à la sécheresse. Le ministère continue d'investir dans l'adaptation accrue aux changements climatiques par le développement de l'irrigation. D'avril 2018

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à décembre 2020, le Programme d'irrigation du ministère de l'Agriculture a fourni plus de 5 millions de dollars à 102 projets d'irrigation, dont 39 projets de développement et 63 projets d'efficacité énergétique. De plus, 9 200 hectares d'irrigation ont été aménagés en 2020. Ce développement s'est effectué à l'intérieur et à l'extérieur des districts d'irrigation.

Les producteurs de la Saskatchewan continuent d'adopter des **pratiques et des technologies améliorées** qui favorisent la résilience et la réduction des émissions. Par exemple, la superficie en jachère a diminué de 94 % de 1990 à 2020. Les superficies consacrées aux légumineuses ont augmenté considérablement, passant d'environ 400 000 hectares en 1990 à 6,38 millions d'hectares en 2020, ce qui a réduit les émissions agricoles d'environ 2,3 millions de tonnes. La superficie de la culture sans labour ou avec peu de labour est passée de 36 % en 1991 à 93 % en 2016. En 2018, les sols agricoles ont séquestré 9,5 millions de tonnes d'équivalent CO₂. L'amélioration de l'efficacité pour le bœuf et le porc continue de réduire les émissions de gaz à effet de serre par unité.

Le ministère met à jour son Plan environnemental de la ferme (PEF) pour offrir un outil plus convivial qui aidera les producteurs à se préparer à répondre aux nouvelles exigences en matière d'approvisionnement durable sur le marché. Le personnel des services-conseils du ministère s'efforce d'encourager l'adoption de pratiques de gestion bénéfiques et celle du plan environnemental de la ferme. L'élaboration du nouveau PEF est en cours. Une décision définitive est attendue d'ici la fin de 2021.

GOUVERNEMENT DU MANITOBA

Le Manitoba a établi le Wetlands GROW Trust en 2020, d'une valeur de 50 millions de dollars, ce qui porte à 204 millions de dollars l'investissement total du Manitoba dans les fiducies qui soutiennent les biens et services écologiques. Jusqu'à 8,6 millions de dollars en intérêts générés par la Conservation Trust, la GROW Trust et la Wetlands GROW Trust seront accordés aux demandeurs retenus en 2021, à l'appui de la restauration et de la conservation des terres humides, de la rétention de l'eau, de la couverture végétale permanente des sols et de la plantation d'arbres.

En 2020, Ag Action Manitoba – Assurance : Activités sur les pratiques de gestion bénéfiques (PGB) a approuvé 57 projets, engageant plus de 500 000 \$ en financement pour améliorer la performance environnementale, y compris la séquestration du carbone. Les demandes pour 2021-2022 ont été examinées à la fin de 2020 et le financement sera accordé aux demandeurs retenus au printemps 2021.

Les 14 districts de bassins versants du Manitoba continuent de mettre en œuvre un réseau réparti de structures de rétention d'eau, améliorant ainsi la résilience climatique à l'échelle locale et régionale. Les districts de bassins versants ont réalisé 173 projets de rétention d'eau depuis 2015, fournissant une capacité de stockage d'eau de 4 135 hectares-pieds dans le paysage du sud du Manitoba. En 2020, 46 demandes provenant de 13 districts de bassins versants ont été approuvées dans le cadre du programme des biens et services écologiques des bassins versants.

Le Manitoba investit dans la recherche pour accélérer la croissance durable dans le secteur de l'agriculture et de la transformation agroalimentaire grâce à l'innovation. Depuis 2018, le Manitoba a appuyé 109 projets de recherche et d'innovation en agriculture dans le cadre d'Ag Action Manitoba – Activités de recherche et d'innovation, dont 27 projets dont le début a été approuvé en 2020. Les nouveaux domaines d'intérêt pour la demande de 2020 comprennent :

- Adaptation aux changements climatiques

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Mettre au point des technologies et des pratiques d'innovation perturbatrices qui aident les producteurs à s'adapter aux changements climatiques.

- Durabilité environnementale
Déterminer et utiliser les technologies et les pratiques de production pour améliorer la durabilité environnementale
- Alimentation, nutrition et santé
Déterminer les avenues d'utilisation des ressources qui améliorent la durabilité environnementale, la nutrition humaine, l'élaboration de politiques et la confiance du public dans la production alimentaire à base de protéines
- Offre et utilisation durables de céréales fourragères
Accroître la durabilité de la production et de l'utilisation d'aliments du bétail.

Le Manitoba a lancé la stratégie Avantage protéique du Manitoba, qui met l'accent sur la durabilité. Des indicateurs et des cibles de durabilité sont en cours d'élaboration, y compris une réduction de l'intensité des GES de la production de protéines animales. Dans le cadre du **Sustainable Protein Challenge Dialogue**, le Manitoba travaille en collaboration avec les intervenants pour **créer un cadre d'action** afin de positionner la province comme chef de file mondial en matière de protéines durables et de créer un réseau de collaborateurs au sein duquel une gamme d'initiatives sur les protéines durables peut être mobilisée.

GOUVERNEMENT DE L'ONTARIO

Les agriculteurs et les entreprises agroalimentaires de l'Ontario s'intéressent vivement à la protection des terres agricoles et à l'utilisation durable des ressources, comme le sol et l'eau, pour assurer la capacité de production à long terme du secteur agroalimentaire, et ils en comprennent l'importance. C'est pourquoi ils continuent de contribuer, à leur échelle, à réaliser le plan environnemental conçu en Ontario. Grâce à l'application de technologies novatrices et de pratiques exemplaires, les agriculteurs peuvent produire davantage avec moins d'espace, moins de déchets et moins de ressources, améliorant (ou minimisant) leur empreinte sur l'environnement. Grâce à l'appui de la série de programmes de gérance de l'Ontario et aux investissements en recherche agroalimentaire de l'Ontario, notamment l'Alliance pour l'innovation agroalimentaire de l'Ontario, le secteur agroalimentaire de l'Ontario continue de faire preuve de leadership environnemental en s'attaquant aux changements climatiques et à d'autres défis environnementaux.

Le plan environnemental conçu en Ontario s'engage à « continuer d'appuyer les programmes et les partenariats visant à rendre les secteurs de l'agriculture et de l'alimentation plus résilients aux répercussions climatiques actuelles et futures. Nous soutiendrons les programmes de qualité des sols et de l'eau à la ferme et travaillerons avec des partenaires pour améliorer les pratiques de gestion agricole ». Le ministère de l'Agriculture, de l'Alimentation et des Affaires rurales de l'Ontario (MAAARO) respecte l'engagement du Plan en matière d'agriculture par la mise en œuvre de « Nouveaux Horizons : la Stratégie de conservation et de santé des sols agricoles de l'Ontario; le programme du PCA pour les sols et l'eau; et le soutien d'initiatives dirigées par le secteur (voir les lignes suivantes pour plus de détails). Lancé en janvier 2020, le MAAARO collabore avec les membres du Groupe multipartite d'action pour les sols afin d'élaborer un plan de mise en œuvre pour donner suite aux mesures en cours et coordonner les mesures d'intérêt commun afin de faire progresser les buts et les objectifs de la Stratégie sur les sols.

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Le MAAARO investit dans des activités de gérance de l'environnement par l'entremise du PCA et d'autres programmes qui améliorent la qualité de l'eau et la santé des sols, tout en offrant d'importants avantages connexes en matière de changements climatiques.

Voici les résultats des programmes de gérance de l'environnement du PCA pour les deuxième et troisième années :

- Le MAAARO a versé 5,1 millions de dollars en fonds à frais partagés aux agriculteurs pour appuyer l'achèvement de 552 projets d'amélioration de l'environnement à la ferme entre avril 2019 et mars 2020. Les projets comprennent la plantation de cultures de couverture, l'achat d'équipement de travail de conservation du sol et la mise en œuvre de structures de contrôle de l'érosion.
- Le MAAARO s'est engagé à verser jusqu'à 5,9 millions de dollars en fonds à frais partagés aux agriculteurs pour appuyer l'achèvement de 593 autres projets dans les fermes entre avril 2020 et mars 2021.
- Le MAAARO s'est engagé à verser jusqu'à 1,26 M\$ en financement à frais partagés du PCA aux organismes sectoriels et aux collaborations au cours de la deuxième année du PCA pour soutenir dix projets d'une valeur de 2,1 M\$.
- Au cours de la troisième année du PCA, le MAAARO s'est engagé à verser jusqu'à 167 475 \$ en financement à frais partagés du PCA aux organismes du secteur pour appuyer trois projets d'une valeur de 597 500 \$.
- Au cours de la deuxième année du PCA (d'avril 2019 à mars 2020), 685 participants au total ont participé aux ateliers sur le plan environnemental à la ferme (PEF) et aux guides de travail électroniques. Les agriculteurs participants ont élaboré 563 nouveaux plans d'action PEF complets et vérifiés.
- Au cours de la troisième année du PCA (d'avril 2020 à septembre 2020), 21 autres participants aux ateliers sur le PEF et aux guides de travail électroniques et dix nouveaux plans d'action vérifiés et complets sur le PEF ont été élaborés. La COVID-19 a une incidence limitée dans ce volet.

Dans le cadre de la mise à jour de l'outil Agri-Suite par l'Ontario, un nouveau calculateur de gaz à effet de serre (GES) sera conçu et ajouté pour aider les agriculteurs à déterminer les sources d'émissions de GES au niveau de la ferme, encourager l'adoption de pratiques exemplaires et quantifier les possibilités de réduction des émissions de GES dans les fermes.

De plus, l'Ontario investit 5,75 millions de dollars dans le projet de démonstration pluriannuel de recherche appliquée et de surveillance à la ferme (ONFARM) et collabore avec divers partenaires agricoles et de conservation. Le projet comprend des activités clés comme l'élaboration de méthodes scientifiques exhaustives pour mesurer la santé des sols en Ontario et l'évaluation de l'utilisation de diverses pratiques de gestion bénéfiques (PGB) pour améliorer la santé des sols et la qualité de l'eau. Des sites de recherche appliquée et de surveillance sont établis pour faciliter le transfert de connaissances entre pairs et le renforcement des capacités dans le secteur agricole.

La phase 2 de l'Initiative pour la compétitivité et l'innovation en serre (terminée en juillet 2020) a accordé 3,6 millions de dollars à des projets approuvés, dont plusieurs ont appuyé des investissements du secteur dans la durabilité et l'innovation afin d'optimiser les intrants, d'accroître l'efficacité de l'utilisation des ressources (p. ex., énergie, chaleur) et appuyer la résilience et la compétitivité à long terme.

En janvier 2020, le MAAARO a publié des modifications réglementaires proposées qui faciliteraient et accéléreraient l'établissement par les agriculteurs de digesteurs anaérobies produisant du GNR à la ferme,

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pour les aider à prendre de l'expansion sur le marché émergent du gaz naturel renouvelable en Ontario. Les changements proposés encourageront le recyclage des éléments nutritifs pour produire de l'énergie propre et le retour des matières organiques sur les terres agricoles pour améliorer la santé et la fertilité des sols pour la production de cultures, ainsi qu'à promouvoir de nouvelles possibilités de développement économique pour le secteur rural.

L'Alliance pour l'innovation agroalimentaire en Ontario et les programmes de recherche ouverts du MAAARO suivent leur cours. Dans le cadre du mandat élargi de soutien à l'innovation agroalimentaire en Ontario, les programmes de recherche et d'innovation financés par le MAAARO abordent les priorités en matière de changements climatiques au moyen de projets précis axés sur la réduction des émissions, l'adaptation et la résilience aux changements climatiques, les pratiques exemplaires et le développement et la commercialisation de technologies propres, ainsi que le transfert des connaissances et la formation de personnel hautement qualifié.

1. En 2020, l'Ontario Agri-Food Innovation Alliance a financé 20 projets de recherche (2,57 millions de dollars en provenance du MAAARO) sur les changements climatiques dans le secteur agroalimentaire de l'Ontario.
2. En 2020, le programme de recherche ouverte du MAAARO a financé un projet de recherche (100 000 \$) sur les changements climatiques.

De plus, le ministère aide l'industrie agroalimentaire à faire preuve de leadership dans les efforts qui contribuent à de nombreux avantages environnementaux, notamment par la gestion 4R des nutriments menée par 4R Ontario qui concourt à la réduction des GES, le projet collectif Thames River Phosphorus Reduction Collaborative, l'initiative Timing Matters et la Stratégie ontarienne de culture de couverture, dirigée par Grain Farmers of Ontario.

En 2020, le MAAARO a décerné à Burnbrae Farms Limited un prix d'excellence en agriculture pour son leadership en matière de solutions énergétiques durables. Burnbrae Farms Limited est la plus grande ferme avicole à énergie solaire au Canada et partage son surplus d'électricité avec la ferme adjacente. La solution d'énergie durable dans cette ferme consiste en quatre granges pourvues de moteurs à haut rendement, de systèmes d'éclairage et de ventilation destinés à une utilisation minimale de l'énergie pour faire fonctionner l'équipement. La ferme fonctionne à partir du réseau et est alimentée par l'énergie solaire au moyen de panneaux solaires situés sur le toit.

De plus, des organismes comme Provision Coalition aident les entreprises de produits alimentaires et de boissons de l'Ontario à être des chefs de file en matière de durabilité, notamment dans la réduction de la perte et du gaspillage d'aliments, l'atténuation des changements climatiques et l'approvisionnement responsable.

GOVERNEMENT DU QUÉBEC

En 2020, de nouvelles initiatives importantes ont été lancées dans le secteur bioalimentaire pour faire face aux changements climatiques. Ces nouvelles initiatives témoignent de l'engagement du Québec à encourager les producteurs agricoles à adopter des pratiques agroenvironnementales et à stimuler l'innovation.

Nouvelles politiques annoncées en 2020

1— *Plan d'agriculture durable 2020–2030 (PAD)*

Le PAD a été annoncé en octobre dernier et vise à accélérer l'adoption de pratiques agroenvironnementales responsables et efficaces. Les entreprises agricoles se retrouvent ainsi au cœur de l'action. Le PAD préconise des investissements totalisant 125 millions de dollars au cours des cinq prochaines années. Il prévoit des objectifs en matière de qualité des sols, de qualité de l'eau, de gestion des engrais azotés et de biodiversité. Ces objectifs ont également un impact positif sur la réduction des émissions de gaz à effet de serre (GES) et l'adaptation des systèmes agricoles aux changements climatiques. Le budget sera réparti comme suit : 70 millions de dollars pour la reconnaissance des pratiques agroenvironnementales mises en œuvre par des producteurs passionnés, compétents et innovateurs; 30 millions de dollars pour le perfectionnement des connaissances; 25 millions de dollars pour le transfert des connaissances, la formation et le soutien, en plus des sommes investies dans les différents programmes du ministère de l'Agriculture, des Pêcheries et de l'Alimentation (MAPAQ). Ce plan répond à deux objectifs de la *Politique bioalimentaire 2018–2025 — Alimenter notre monde* (ci-après la *Politique bioalimentaire*) en contribuant à encourager des approches concertées pour protéger la santé et l'environnement, en plus de renforcer la mise en œuvre de pratiques commerciales responsables.

2— *Plan pour une économie verte et son plan de mise en œuvre*

En novembre 2020, le Québec a annoncé le nouveau *Plan pour une économie verte* (PEV). Ce plan prévoit des investissements de près de 6,7 milliards de dollars au cours des cinq prochaines années, dont le financement est principalement associé aux revenus du marché du carbone accumulés dans le *Fonds d'électrification et de changements climatiques* (anciennement, le *Fonds vert*). Le premier plan de mise en œuvre du PEV 2021-2026 prévoit 32,8 millions de dollars pour des mesures visant la réduction des émissions de GES liées à la production agricole. Ces mesures compléteront celles qui seront menées dans le cadre du PAD. Les nouvelles mesures visent également le développement des bioénergies, la recherche et le développement, et le stockage du carbone dans les forêts et les milieux naturels.

3— *Stratégie de croissance des serres au Québec 2020–2025*

Le 27 novembre 2020, le ministre de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, André Lamontagne, et le ministre de l'Énergie et des Ressources naturelles du Québec, Jonatan Julien, ont présenté la nouvelle *Stratégie de croissance des serres au Québec 2020-2025 — Pour une plus grande autonomie alimentaire*, qui vise à doubler le volume des cultures en serre au Québec d'ici 2025. En ajoutant les montants investis directement dans la *Stratégie de croissance des serres* (91 M\$) à ceux réservés au programme d'extension du réseau triphasé (21 M\$), le gouvernement investit plus de 112 M\$ pour atteindre les objectifs établis.

Hydro-Québec vient appuyer la *Stratégie* en accordant aux 1 000 producteurs serricoles de la province un tarif d'électricité préférentiel de 5,59 ¢/kWh pour l'éclairage de photosynthèse et le chauffage de leurs installations, comme autorisé par la décision de la Régie de l'énergie du 1^{er} décembre 2020. Le seuil d'admissibilité sera réduit de 300 kW à 50 kW, ce qui permettra aux petites entreprises de bénéficier du tarif préférentiel. Les grandes entreprises de serres consommant plus de 5 000 kW pourront désormais aussi bénéficier de ce tarif.

Le développement du secteur des serres sera axé sur les sources d'énergie renouvelables reconnues pour leur faible empreinte environnementale, contribuant ainsi non seulement à la relance économique, mais aussi à l'autosuffisance alimentaire du Québec.

Mesures en vigueur en 2020

Le *Plan d'action sur les changements climatiques 2013-2020* prendra fin en mars 2021. Ce plan prévoit un investissement de près de 8 millions de dollars dans des mesures visant à réduire les émissions de GES dans le secteur agricole, et de 4,9 millions de dollars dans des mesures spécifiques pour aider le secteur agricole à s'adapter aux changements climatiques. Dix-huit projets étaient en cours en 2020. Un appel de propositions de projets a été lancé durant l'été 2020 dans le cadre du nouveau *Programme d'appui à la lutte contre les changements climatiques en agriculture*. De nouveaux projets devraient démarrer en 2021.

Le programme *Prime-Vert 2018-2023* prévoit également le financement de mesures ayant un impact positif sur la réduction des émissions de GES et sur l'adaptation aux changements climatiques. En 2020, plus de 4,4 millions de dollars d'aide financière ont été accordés pour les mesures suivantes :

- Pratiques et travaux de conservation des sols (cette mesure finance notamment l'implantation de cultures de couverture);
- Aménagements agroenvironnementaux durables intégrant des arbres et arbustes et faisant la promotion de la biodiversité;
- Équipement permettant l'application en bande des engrais dans les cultures horticoles;
- Équipement de gestion optimale de l'eau d'irrigation.

Le gouvernement du Québec continue aussi à investir dans des efforts visant à encourager des pratiques responsables en matière de santé des sols. Au cours de la période 2018-2023, des mesures ont notamment permis d'augmenter le taux d'aide aux entreprises pour des services-conseils ciblés en santé et en conservation des sols afin d'appuyer plus de quinze projets de développement et de transfert de connaissances.

Le *Plan de soutien aux investissements en agriculture contribuant à l'adaptation des entreprises en matière de bien-être animal et d'efficacité énergétique (PSI)* propose trois programmes destinés aux entreprises agricoles. Le *plan de soutien aux investissements en matière de bien-être animal et d'efficacité énergétique* offre une aide financière directe aux investissements admissibles pour la modernisation des installations de production, soit par la construction de nouveaux bâtiments, soit par la rénovation de bâtiments ou par l'acquisition et l'installation d'équipement fixe de production.

Plus de 4 300 formulaires d'admissibilité générale ont été soumis pour le PSI, et 62 % des projets présentés comprennent des mesures visant à améliorer l'efficacité énergétique des entreprises. Le budget total du PSI dans son ensemble s'élève à 195 millions de dollars. Ces trois programmes ont été prolongés d'un an et prendront fin le 31 mars 2023.

Toutes ces mesures découlent de la *Politique bioalimentaire 2018-2025* et de son *Plan d'action 2018-2023 pour la réussite de la Politique bioalimentaire*, qui a été rendue publique le 29 janvier 2020. Il convient de noter que la *Politique bioalimentaire* propose 69 plans d'action regroupés en 16 objectifs selon les quatre orientations suivantes :

1. Une offre de produits répondant aux besoins des consommateurs;
2. Des entreprises prospères, durables et innovantes;
3. Des entreprises attrayantes et responsables;
4. Des territoires dynamiques contribuant à la prospérité du bioalimentaire.

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Une des sept cibles de la *Politique* vise à augmenter la part des entreprises agricoles et de transformation alimentaire québécoises ayant implanté des pratiques d'affaires responsables. Ces pratiques comprennent la qualité des sols, la qualité de l'eau, la gestion des pesticides et des engrais, la biodiversité, la réduction des GES, l'adaptation aux changements climatiques et l'efficacité énergétique.

GOUVERNEMENT DU NOUVEAU-BRUNSWICK

L'agriculture contribue à 4 % des émissions de GES du Nouveau-Brunswick à partir d'une empreinte qui représente environ 5 % de toutes les terres de la province. Le ministère de l'Agriculture, de l'Aquaculture et des Pêches prend au sérieux son rôle qui consiste à appuyer l'atténuation des émissions de gaz à effet de serre et à aider les producteurs à s'adapter pour atténuer les répercussions des changements climatiques. Le financement fédéral-provincial dans le cadre de l'Accord de partenariat canadien pour l'agriculture (PCA) (2018-2023) appuie les mesures d'atténuation et d'adaptation aux changements climatiques en agriculture, tout en contribuant à la réalisation des engagements provinciaux dans le cadre de la Transition vers une économie faible en carbone - Plan d'action sur les changements climatiques du Nouveau-Brunswick et appui aux efforts nationaux de lutte contre les changements climatiques. Au cours de l'année civile 2020, le programme a fourni du financement pour l'atténuation des GES – 62 projets ont reçu 75,9 % (642 000 \$) du budget du programme, d'où l'obtention d'un investissement total de 1,8 million de dollars. Les projets comprenaient le drainage des terres, l'agriculture de précision, la planification de la gestion des éléments nutritifs, les vérifications et les améliorations énergétiques et les systèmes d'énergie renouvelable.

De plus, les efforts d'innovation et de recherche sur le potentiel d'atténuation des changements climatiques comprenaient trois projets en cours sur l'emplacement précis des éléments nutritifs et un projet sur les bactéries fixatrices d'azote et les cultures de couverture. En outre, un nouveau projet a été lancé sur l'analyse comparative de plusieurs produits pour les émissions de gaz à effet de serre et le captage du carbone.

GOUVERNEMENT DE LA NOUVELLE-ÉCOSSE

La Nouvelle-Écosse continue de s'engager à renforcer la résilience de ses collectivités, de ses entreprises et de sa population au climat et a mis en œuvre diverses initiatives à l'appui du Cadre pancanadien. Voici quelques exemples de ces initiatives.

Dans le cadre du Fonds d'atténuation et d'adaptation en matière de catastrophes d'Infrastructure Canada, le ministère finance conjointement un projet de 114 millions de dollars visant à améliorer 60 kilomètres de digues et cinq structures de lutte contre les inondations le long de la baie de Fundy au cours des neuf prochaines années. Ces travaux ont commencé en 2019 et protégeront les infrastructures naturelles principalement à des fins publiques. Sans mises à niveau, les sites sont exposés à un risque élevé de dommages causés par les changements climatiques. Ces sites offrent une protection contre les inondations à des dizaines de milliers de résidents et d'entreprises, de vignobles, de sites historiques et du patrimoine mondial, de collectivités mi'kmaq et de terres agricoles.

Les programmes du Partenariat canadien pour l'agriculture appuient une croissance propre et de nombreuses priorités comme les changements climatiques, la conservation des sols et de l'eau et l'innovation. Par exemple, l'Agriculture Energy Partnership (Partenariat énergétique dans le secteur

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agricole) a un gestionnaire de l'énergie sur place embauché par Efficiency NS. Ce partenariat entre le MANE et EfficiencyOne contribuera à réduire l'empreinte de l'électricité et des combustibles fossiles de l'agriculture. Les activités menées dans le cadre de ce programme ont entraîné une réduction de 928 tonnes/an de CO₂. Le *Soil and Water Sustainability program* (programme de durabilité des sols et de l'eau) a versé plus de 304 000 \$ aux agriculteurs de la Nouvelle-Écosse en 2019-2020 pour des projets sur le contrôle de l'érosion, l'amélioration de la santé des écosystèmes riverains et des agroécosystèmes, l'amélioration de la gestion du fumier, l'approvisionnement en eau agricole durable et sur la gestion des puits d'eau (puits, sources), l'amélioration des pratiques et de l'efficacité en matière d'eau, la gestion des eaux agricoles, la gestion des pâturages d'hiver et le contrôle des eaux de ruissellement agricole.

La première version du Programme de leadership en matière d'adaptation aux changements climatiques de l'environnement de la Nouvelle-Écosse s'est déroulée de 2013 à 2018 afin de préparer les ministères du gouvernement de la Nouvelle-Écosse aux changements climatiques. Le MANE a été le premier ministère pilote à participer à l'élaboration d'un plan de préparation aux changements climatiques. La deuxième version de ce programme s'étend de 2019 à 2022 et est financée à hauteur d'environ 7 millions de dollars par le gouvernement de la Nouvelle-Écosse et le gouvernement fédéral. Le but de ce programme de leadership et de renforcement des capacités est de préparer les ministères du gouvernement de la Nouvelle-Écosse, les partenaires communautaires et l'industrie aux répercussions des changements dans un environnement de plus en plus incertain. Le MANE a créé un comité interne de champions de l'adaptation aux changements climatiques et de leur atténuation ainsi que de la durabilité de l'environnement. L'équipe des champions agricoles pour la durabilité de l'environnement a élaboré un plan de travail sur l'adaptation aux changements climatiques qui sera mis en œuvre au cours des prochaines années.

GOVERNEMENT DE L'ÎLE-DU-PRINCE-ÉDOUARD

Le ministère de l'Agriculture et des Terres de l'Î.-P.-É. travaille avec diligence pour appuyer les mesures clés du Cadre pancanadien au sein du secteur agricole. Bon nombre de ces efforts sont appuyés par le Partenariat canadien pour l'agriculture (PCA). Les programmes environnementaux sont une priorité dans le cadre du financement du PCA de l'Î.-P.-É., avec 13,3 millions de dollars répartis sur cinq ans, à sa troisième année. Parmi ces programmes, mentionnons le Programme de gérance agricole, le Programme de développement des cultures vivaces et le Programme des services de diversification des modes d'occupation des sols. Les programmes environnementaux visent à accroître la durabilité de l'environnement et à lutter contre les changements climatiques grâce à un soutien technique et financier permettant d'encourager les producteurs à mettre en œuvre volontairement des pratiques de gestion bénéfiques (PGB).

Le ministère s'est également engagé à accroître sa capacité de trouver des solutions aux changements climatiques par la dotation d'un poste de coordonnateur des changements climatiques pour s'attaquer précisément à ces problèmes. D'autres programmes qui appuient les pratiques de gestion efficaces des GES sont également en cours d'élaboration.

Les programmes environnementaux de gérance agroalimentaire comportent une série d'initiatives visant à accroître la durabilité de l'environnement et à lutter contre les changements climatiques grâce à un soutien technique et financier permettant d'encourager les producteurs à mettre en œuvre volontairement des pratiques de gestion bénéfiques (PGB). Les activités du Programme de gérance agroalimentaire comprennent la conservation des sols, la santé des sols, la gestion des nutriments, la lutte intégrée contre les nuisibles, la gestion des zones riveraines, la qualité de l'eau, la valorisation de l'eau,

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l'efficacité énergétique et l'entreposage à la ferme. Un budget théorique de 8,3 millions de dollars a été établi pour les cinq années visées par le PCA. La participation au programme continue d'être forte, y compris pour les cultures de couverture d'hiver, l'amélioration de l'entreposage du fumier et les structures de contrôle de l'érosion. Environ 150 projets de PGB sont réalisés par les producteurs chaque année dans le cadre du programme.

Les services de diversification des modes d'occupation des sols (SDMOS) offrent aux propriétaires fonciers agricoles de l'aide pour retirer des terres écologiquement vulnérables de la production et comprennent l'expansion des zones tampons et des tournières enherbées, le retrait des terres à forte pente et l'installation d'une structure de conservation des sols. Le budget théorique est fixé à environ 4 millions de dollars sur cinq ans pour les SDMOS. Il appuie actuellement environ 400 clients en retirant de la production plus de 3 800 hectares de terres agricoles.

Le Programme de développement des cultures vivaces est conçu pour encourager d'autres systèmes de production et une production de cultures vivaces plus importante. Les cultures vivaces peuvent augmenter les niveaux de carbone dans le sol et réduire la contamination des cours d'eau et des milieux humides par le contrôle de l'érosion, l'efficacité d'utilisation de l'eau et celle du cycle des nutriments. Un budget théorique d'un total de 875 000 \$ a été établi pour les cinq années visées par le PCA. La participation au programme a été forte jusqu'à maintenant.

Le projet de surveillance de la qualité des sols, lancé en 1998, surveille chaque année l'évolution des niveaux de matière organique dans le sol de l'île. Cette information contribue aux efforts continus déployés pour encourager les pratiques de gestion bénéfiques qui visent à accroître la matière organique du sol. Le dernier rapport d'étape a été publié en septembre 2020.

GOVERNEMENT DE TERRE-NEUVE-ET-LABRADOR

Le Partenariat canadien pour l'agriculture appuie l'investissement dans le Programme sur la durabilité de l'environnement et les changements climatiques, ainsi que le Programme de planification environnementale à la ferme, qui continue de présenter un bon taux de participation, 63 % des fermes commerciales de la province ayant parachevé un plan environnemental de la ferme. Ce nombre peut fluctuer d'une année à l'autre en raison de la baisse ou de la hausse du nombre de fermes. De janvier 2020 à décembre 2020, 28 nouveaux plans environnementaux de la ferme ont été terminés, tandis que 43 entreprises agricoles ont mis à jour leurs plans environnementaux de la ferme existants.

Le Programme sur la durabilité de l'environnement et les changements climatiques a appuyé 21 projets en 2019-2020 et 2020-2021, axés sur les pratiques de gestion bénéfiques environnementales, notamment :

- Travail de conservation du sol/épandage des éléments nutritifs
- Amélioration de la lutte contre les nuisibles et de l'application de pesticides
- Prévention des dommages causés par la faune et protection de celle-ci
- Épandage du fumier sur les terres
- Adaptation aux changements climatiques à la ferme
- Décontamination et gestion des déchets
- Gestion durable de l'irrigation
- Approvisionnement en eau à la ferme et rétention des sources d'eau

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Exemples de projets admissibles dans le cadre du programme (liste non exhaustive) :

- Systèmes d'épandage d'engrais
- Équipement de manutention du fumier
- Système de compostage
- Semoirs sans labour
- Clôtures d'exclusion de la faune

Le ministère des Pêches, des Forêts et de l'Agriculture du gouvernement de Terre-Neuve-et-Labrador continue d'appuyer la recherche sur la croissance propre et les changements climatiques. Par exemple, en 2019-2020 et 2020-2021, le Partenariat canadien pour l'agriculture s'est engagé à financer des projets de recherche d'étudiants des cycles supérieurs sur la mise au point d'une technologie de digestion anaérobie pour améliorer la gestion du fumier. La technologie de digestion biologique réduira les émissions de gaz à effet de serre (GES) provenant de l'entreposage du fumier et de l'épandage du fumier sur les terres. Ces projets visent à réduire les émissions de GES en convertissant le fumier laitier en biogaz par digestion anaérobie.

De plus, le Ministère, en collaboration avec l'Université Memorial de Terre-Neuve – campus Grenfell, en est à sa deuxième année de travail dans le cadre du projet « Low-Input Agriculture in Cool Climate Boreal Ecosystems ». Ce projet est financé dans le cadre du Programme fédéral-provincial des technologies propres en agriculture, dont les coûts sont partagés avec le gouvernement de Terre-Neuve-et-Labrador et le campus Grenfell de l'Université Memorial de Terre-Neuve-et-Labrador, qui contribuent à 52 % au financement de ce projet.

La Newfoundland and Labrador Federation of Agriculture, en collaboration avec le Climate Change Office du gouvernement de Terre-Neuve-et-Labrador, tiendra des consultations virtuelles sur les changements climatiques pour entendre les expériences, préoccupations et objectifs du secteur agricole de Terre-Neuve-et-Labrador afin de renforcer la capacité d'adaptation. Le but de ces consultations est de dresser une liste de 10 risques et possibilités clés liés aux changements climatiques dans le secteur agricole et d'utiliser cette liste pour renforcer la capacité d'adaptation. Cinq séances virtuelles sont prévues pour décembre 2020 et janvier 2021.

GOUVERNEMENT DU YUKON

Politique agricole : La nouvelle politique agricole du Yukon, intitulée *Cultiver notre avenir*, a été publiée en 2020. La politique mise à jour établit les priorités et les mesures du gouvernement du Yukon pour appuyer le développement agricole durable au Yukon au cours de la prochaine décennie. La nouvelle politique du Yukon vise à encourager le développement d'une industrie agricole adaptée aux changements climatiques et à la durabilité de l'environnement. Cet axe transparaît dans les domaines d'action soulignés au chapitre trois : les changements climatiques, les plans environnementaux de la ferme et l'encouragement des pratiques exemplaires de gestion environnementale.

Politiques et engagements face aux changements climatiques : En 2020, le gouvernement du Yukon a lancé sa nouvelle politique intitulée *Notre avenir propre : Une stratégie yukonnaise sur les changements climatiques, l'énergie et l'économie verte*. La politique a été élaborée en partenariat avec les Premières Nations du Yukon, les groupes autochtones transfrontaliers et les municipalités du Yukon sur une période de trois ans. Les mesures que prendra le gouvernement du Yukon pour contrer les effets des changements climatiques comprennent des cibles de réduction des émissions de gaz à effet de serre et d'amélioration de la résilience aux effets des changements climatiques. La nouvelle politique comprend des mesures

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communautaires liées à l'agriculture, comme l'aide au démarrage d'un jardin ou d'une serre communautaire, le soutien à l'achat de produits et de services locaux et des programmes de soutien dirigés par le gouvernement pour les producteurs locaux.

Recherche en agriculture : La ferme de recherche et de démonstration du Yukon poursuit ses essais sur le développement des sols nordiques et l'efficacité des amendements naturels du sol ainsi que ses essais de rendement de nouvelles variétés dans les conditions de culture des régions nordiques. En 2020, le Yukon a entrepris un essai sur le terrain de trois ans avec Agriculture et Agroalimentaire Canada (Direction générale des sciences et de la technologie, Terre-Neuve-et-Labrador) qui vise à améliorer la production alimentaire dans les sols nordiques. L'expérience vise à accroître la production de cultures marginales (haricots nains) et à évaluer des stratégies qui réduisent les pertes liées à l'entreposage après la récolte (pommes de terre).

Stratégie visant les aliments produits au Yukon La stratégie quinquennale visant les aliments produits au Yukon, intitulée *Encourager la production et la consommation d'aliments locaux 2016-2021*, continue d'être activement mise en œuvre et prendra fin en 2021. Plusieurs des initiatives de cette stratégie se poursuivront dans le cadre de la nouvelle politique agricole. La stratégie contribue à l'augmentation de la production, de l'utilisation et de la consommation d'aliments cultivés au Yukon, et participe indirectement à la réduction des émissions de GES provenant du transport en réduisant la quantité d'aliments importés au Yukon par la route de l'Alaska à partir des marchés du Sud.

Aliments traditionnels et locaux : Le Yukon a lancé un nouveau projet de collaboration avec l'ancien ministère des Affaires indiennes et du Nord Canada (AINC) en 2017-2018 (maintenant Affaires autochtones et du Nord Canada) dans le but d'examiner la relation entre les changements climatiques, les aliments traditionnels et la production alimentaire locale dans les collectivités du Yukon. Ce projet pluriannuel devrait prendre fin en mars 2021. La Direction générale de l'agriculture du Yukon fournit également un soutien continu compte tenu de l'intérêt croissant pour les projets agricoles des Premières Nations dans plusieurs collectivités du Yukon.

GOVERNEMENT DES TERRITOIRES DU NORD-OUEST

Aucun renseignement fourni.

GOVERNEMENT DU NUNAVUT

Aucun renseignement fourni.

FEDERAL-PROVINCIAL-TERRITORIAL MINISTERS OF AGRICULTURE
4th PROGRESS REPORT ON THE PAN-CANADIAN FRAMEWORK ON CLEAN
GROWTH AND CLIMATE CHANGE
2020

1. INTRODUCTION

In December 2016, First Ministers adopted the Pan-Canadian Framework on Clean Growth and Climate Change (PCF).¹ The PCF builds on early actions of provincial and territorial governments to reduce greenhouse gas (GHG) emissions, and identifies further actions to be taken across all regions and sectors of the economy, including the agriculture sector, in order to contribute to meeting Canada's emissions reduction target; and seize the economic opportunities associated with clean growth.

The PCF is built on four main pillars:

- Pricing carbon pollution²;
- Complementary actions to further reduce emissions across the economy;
- Measures to adapt to the impacts of climate change and build resilience; and,
- Actions to accelerate innovation, support clean technology, and create jobs.

Federal-Provincial-Territorial (FPT) Ministers of Agriculture recognize that governments have an important role to play to support farmers and agri-food producers to reduce greenhouse gas (GHG) emissions and adapt to climate change. This Fourth Annual Progress Report on Agriculture outlines the agriculture-related actions identified in the PCF and builds on the achievements identified in the previous three annual progress reports.

Canadian farmers and ranchers have long been responsible stewards of the land, and can be part of the transition to a low carbon, climate resilient economy by improving production efficiency and increasing agricultural soil carbon, among others. They have already taken actions to mitigate agricultural GHG emissions, which account for 10% of Canada's total emissions.

Significant achievements to date include:

- Canada is one of few countries that can report both slightly declining emissions since 2005 combined with a net carbon sink from agricultural soils.
- Total agricultural emissions (i.e. from livestock, crops and on-farm fuel use) have been relatively stable since the mid-1990s despite significant growth in production over the same period, indicating decoupling between emissions and production. In 2018, Canadian agriculture

¹ Saskatchewan has not signed on to the PCF, and Alberta and Ontario have since withdrawn from the agreement.

² The federal carbon pricing backstop, which has been in place since January 1, 2019, applies to provinces and territories that choose to adopt it or that propose approaches that do not meet federal stringency requirements.

generated 50% fewer GHG emissions for every dollar of GDP that it generated, compared with 1997.

- Agricultural soils have been removing carbon from the atmosphere since the 1990s due to widespread adoption of land management practices such as no-till, conservation tillage and reduced use of summerfallow. According to the most recent data, agricultural soils were removing slightly more than 6 million tonnes of carbon dioxide equivalent (Mt CO₂e) in 2018, offsetting roughly 8% of annual agricultural emissions.
- Improvements in feeding and breeding lowered emissions by 15% per kilogram of beef over the past 30 years, reducing pressure on land and water at the same time. Similar declining emission intensity has been measured for other livestock.
- Through investments in innovation and sustainable land management practices, recent crop yields have shown more resiliency under severe weather conditions (e.g. drought) when compared to similar conditions in the late 1980s.

Further growth of the sector, for example to meet the ambitious goal set in the Federal Budget 2017 to grow Canada's agri-food exports to at least \$75 billion annually by 2025, while mitigating impacts on climate change, represents an important challenge for continued GHG reductions in the sector. The agricultural measures announced in December 2020 as part of the Government's Strengthened Climate Plan, "A Healthy Environment and a Healthy Economy," will assist the sector in meeting these goals. For example, funding aimed at the development and adoption of innovative, clean technologies, such as those related to precision agriculture, will help the sector tackle this challenge by enhancing carbon storage in soils and lowering GHG emission intensities associated with fertilizer use or with animal production. Also as part of the Strengthened Climate Plan, the Government announced Agriculture and Agri-Food Canada will establish a new Agricultural Climate Solutions program to support the sector's actions on climate change and other environmental priorities towards 2030 and 2050. The agriculture sector can also contribute to GHG emissions reductions through the provision of agri-based bioproducts (e.g. bioplastics, renewable fuels) that can replace emission intensive fossil fuel based inputs.

In parallel, climate change effects on production conditions (e.g., temperatures, precipitation patterns, extreme weather events) are impacting Canadian farmers. Increased risks are anticipated from more frequent and/or intense droughts, floods and wildfires, or from changes in pests, diseases and invasive species occurrences. Conversely, longer growing seasons and an increase in temperature could offer opportunities for diversification in the crop mix and the expansion of crops into non-traditional areas, as well as an extended grazing season.

2. PROGRESS ON AGRICULTURE-RELATED PAN-CANADIAN FRAMEWORK ACTIONS

The PCF identifies the following agriculture-related actions under the pillar of *Complementary actions to further reduce emissions across the economy*:

- **Increasing stored carbon** in agricultural soils to partially offset emissions from the sector: FPT governments work together to protect and enhance carbon sinks, including in forests, wetlands, and agricultural lands. By supporting beneficial management practices (BMPs), governments

assist farmers to enhance carbon sinks through actions such as increasing permanent cover crops, better crop rotations, and conservation tillage;

- **Generating bioenergy and bioproducts** to displace emissions in other economic sectors: FPT governments work together to identify opportunities to produce renewable fuels and bioproducts. Farmers can supply biomass for bioproducts that can be used in place of fossil fuels in other sectors or as feedstocks for renewable energy. Government programming contributes to this transition to a low carbon economy; and
- **Advancing innovation** in GHG-efficient management practices to reduce agricultural emissions and emission intensity: FPT governments work together to enhance innovation to advance GHG-efficient management practices in agriculture. Government investments in research and technology adoption enable farmers to reduce emissions from agriculture through new technologies being developed for livestock and crop production, including precision farming and “smart” fertilizers which time the release to match plant needs, and feed additives and inhibitors that reduce methane production in cattle.

Governments are investing to take action in these three priority areas, which cover the spectrum of GHG mitigation options in the sector. The Canadian agriculture and agri-food sector’s contribution to the agriculture-related actions identified in the PCF are currently delivered primarily through the five-year Canadian Agricultural Partnership (Partnership) (2018-2023) and further supported through additional, complementary measures to the Partnership.

The Canadian Agricultural Partnership

For over 15 years, FPT agriculture policy frameworks have enhanced policy and regulatory coherence, and ensured a collaborative approach that encourages investment, adaptation and sustainable growth in the sector.

Building on past successes, FPT Ministers of Agriculture launched the *Canadian Agricultural Partnership* (the Partnership) on April 1, 2018. The five-year (2018-2023), \$3 billion investment is designed to strengthen the agriculture, agri-food and agri-based products sector, while ensuring continued innovation, growth, and prosperity.

Three priority areas are identified in the Partnership, all with relevance to the PCF:

- **Growing trade and expanding markets** - Helping the sector to improve competitiveness, growth and adaptability;
- **Innovative and sustainable growth in the sector** - Enhancing the competitiveness of the sector through research, science and innovation, and adoption of innovative products and practices, with an emphasis on the environment and clean growth; and
- **Supporting diversity and a dynamic, evolving sector** - Strengthening the sector by better reflecting the diversity of Canadian communities, enhancing collaboration across different jurisdictions, securing and supporting public trust in the sector, and improving client services.

Over the course of the Partnership, PCF climate actions are being supported by three types of programs:

- **Federal-only programs** that help support resiliency and sustainability of the sector through science, research and adoption of innovative practices and technologies (\$1 billion over five years);
- **FPT cost-shared on-farm programs**³ delivered by provinces and territories (PTs) that build producer awareness of environmental risks and accelerate adoption of technologies and practices to reduce these risks (\$2 billion over five years); and
- **Business Risk Management (BRM) programs** that are demand-driven and help farmers manage significant risks threatening the viability of their operations (approximately \$1.5 billion per year).

The approach adopted by the Partnership focuses efforts on combining on-farm actions with science and innovation in order to address emissions, strengthen resilience, and support growth to help meet a growing global food demand.

The suite of specific programs under the Partnership which support actions to protect and enhance carbon sinks in agriculture, generate bioenergy and bioproducts, advance innovative GHG-efficient management practices, and support climate resilience in agricultural production systems include the following:

- FPT cost-shared on-farm environmental stewardship programs delivered by PTs to support Environmental Farm Plans and adoption of BMPs which have multiple environmental benefits, including soil and water conservation, reductions in emissions and emission intensity, and climate resilience. All provinces support on-farm actions through such programs. Based on analysis conducted in 2020, in the first year of the Partnership (2018-19), farms across Canada implemented over 1800 BMPs that contributed to climate change mitigation and approximately 1200 BMPs addressing climate change adaptation.
- The **AgrilInnovate** program aims to accelerate the commercialization, adoption and/or demonstration of innovative products, technologies, processes or services that increase sector competitiveness and sustainability. Priority areas under AgrilInnovate include: adoption of new or world leading clean technology, including precision agriculture; and increased productivity through advanced manufacturing, automation or robotics.
- The **AgriScience** program aims to accelerate the pace of innovation by providing funding and support for pre-commercial science activities and cutting-edge research that benefits the agriculture and agri-food sector and Canadians. Priority areas under AgriScience include: addressing environmental challenges and adaptation to changing climate, agricultural impacts on air, water and soil; reducing GHG emissions; transforming agricultural products into biofuels; and water management and soil management.

³ FPT cost-shared programs are funded on a 60:40 basis between federal and PT governments.

- The **AgriDiversity** program supports workshops and seminars for youth, women, Indigenous Peoples and other under-represented agricultural producers, to learn about climate-resilient practices, equipment and technologies.

3. GAPS, CHALLENGES AND OPPORTUNITIES

Agriculture is a diverse sector characterized by different types of production systems and growing conditions. Agriculture is also a shared jurisdiction, with provinces and territories essentially being responsible for land use planning and management of natural resources used by agriculture. Unlike many other sectors, most agricultural emissions at the primary production level do not come from energy use but result from biological processes which limits the opportunities for substitution toward low-emitting inputs and production processes.

Opportunities for absolute emissions reductions are regionally variable. Agriculture is only a significant source of GHG emissions for select provinces, including Saskatchewan, Manitoba, and Prince Edward Island. In all other provinces, the agriculture sector's contribution to provincial total emissions was approximately 10% or less.⁴

In order to achieve emission reductions in 2030 relative to 2005 levels, the sector must continue to adopt practices that limit emissions arising from animal and crop production, as well as on-farm fuel and energy use. Emission-declining trends in animal production need to continue through scientific research and innovation into livestock feed and nutrition, as well as animal genetics and breeding. The decarbonization of on-farm fuel use needs to be accelerated, while a trend of increasing emissions in crop production and declining rate of carbon sequestration need to be reversed.

To this end, measures announced as part of the Government of Canada's Strengthened Climate Plan will support emissions reductions in the sector. These measures include a goal to set a national emission reduction target of 30% below 2020 levels from fertilizer application, and funding for a renewal of the Agricultural Clean Technology Program to help reduce emissions associated with livestock production, on-farm fuel or energy use, and crop production.

Additional carbon storage potential in agricultural soils still exists but is relatively limited considering that more than 80% of land prepared for seeding is already under no-till or conservation tillage. Further gains in stored carbon could be made through a variety of agronomic practices, including cover crops, agroforestry, shelterbelts, riparian buffers and improved grassland management. In order to help Canada's farms increase soil carbon sequestration and realize other environmental benefits, the Agricultural Climate Solutions program, announced in November 2020, will support the sector's actions on climate change and other environmental priorities towards 2030 and 2050.

In the medium to long term, some innovative clean technologies hold promise for further emission reductions in the crop sector (e.g. bioengineering, smart fertilizers, sensors, robotics and artificial intelligence), livestock sector (e.g. selecting lower-methane-producing ruminants, developing methane inhibitors, feed supplements, and improving grazing management), and on-farm fuel use (development and commercialization of off-road electric vehicles). The agriculture sector can also contribute to GHG emissions reductions through the provision of agri-based bioproducts (e.g. bioplastics) and renewable fuels that can replace emission intensive fossil fuel based inputs. As future regulation such as the Clean

⁴ National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada (NIR 2020)

Fuel Standard will require increased blending of ethanol and biodiesel, it may provide opportunities for an expanded production of those fuels and feedstocks (e.g., corn, wheat, canola, soy, and biogas from anaerobic digestion).

The application of innovative policy tools (e.g. nudge economics, market-based instruments) may enable further emission reductions beyond those achieved through current incentive-based approach for the adoption of BMPs. Green infrastructure (e.g., wetlands) on agricultural lands can also contribute to broader Government of Canada priorities such as biodiversity conservation, carbon sequestration, water quality, and enhanced flood control, although wetlands can also be a significant source of methane emissions.

4. NEXT STEPS

The Partnership started on April 1, 2018 and will be in place until March 31, 2023. Federal-only and FPT cost-shared programs supporting climate actions in the agriculture sector under the Partnership have been open for applications. Details on the activities and projects funded by complementary programs under the Partnership that have been initiated are available in this report while others will be included in future progress reports.

ANNEX – DETAILED ACTIONS DELIVERED BY FEDERAL, PROVINCIAL AND TERRITORIAL GOVERNMENTS

Measures to support climate actions and clean technologies in the agriculture sector are not limited to the ones initiated under the Partnership. Provinces and territories have various programs and initiatives complementing efforts supported by the Partnership. The focus of these programs and initiatives range from nutrient management and energy efficiency to grassland conservation, local food strategies and agricultural diversification.

GOVERNMENT OF CANADA

Federal programs and initiatives outside of the Partnership that will also contribute to progress on agriculture-related actions identified under the PCF include:

- The **Agricultural Greenhouse Gases Program** is a five-year investment (2016-2021) intended to enhance the understanding and accessibility of agricultural technologies, BMPs, and processes that can be adopted by farmers to mitigate agricultural GHG emissions in Canada. Most projects are led by Canadian universities across the country and fall under one or more of the following four priority areas: livestock systems, cropping systems, agricultural water use efficiency, and agroforestry. This program will end in 2021.
- The **Agricultural Clean Technology (ACT)** program is a three-year investment (2018 – 2021) which aims to support the research, development and adoption of clean technologies through investments in, and promotion of precision agriculture and agri-based bioproducts. These technologies have helped to reduce GHG emissions, generate a wide range of positive impacts, and promote sustainable and clean growth. As the ACT program ends on March 31, 2021, it required that all completed applications were to be submitted by September 30th, 2020 to go forward to application review. As of December 31, 2020, the ACT received a total of 30 applications. Of these, 18 were deemed as complete application packages from which a total of 12 projects have been approved for funding
- A five-year \$70M investment in agricultural discovery science and innovation (2018-2023), announced in Budget 2017, is helping to address priorities such as climate change, soil and water conservation, and biodiversity. Of this investment, \$44M is dedicated to hiring the next generation of federal research scientists and science professionals in emerging fields of agricultural science. The investment also supports the **Living Laboratories Initiative**, an integrated approach to agricultural research that brings farmers, scientists and other stakeholders together to co-develop, test and monitor new practices and technologies on farms. The result of this investment will be more practical technologies and sustainable farming practices adopted more quickly by Canadian farmers. To date, three Living Labs sites have been launched, with the most recent in December 2020 in Quebec.
- The **Canadian Agricultural Strategic Priorities Program** is a \$10 million per year program that, over 5 years (2019-2024), will provide non-repayable contribution funding to facilitate the agricultural sector's ability to address emerging issues and capitalize on opportunities. One of the four priority areas focuses on environmental sustainability with consideration being given to projects that develop or enhance greenhouse gases reduction assessment tools, test innovative

economic models in carbon capture identification and experimental management within the sector, and investigate opportunities for the agriculture sector to provide climate change solutions to other sectors.

- As part of the Government of Canada's Strengthened Climate Plan, *A Healthy Environment and A Healthy Economy*, announced on December 11, 2020, the Government of Canada will invest \$165.7 million over seven years to support the agriculture industry in developing transformative clean technologies and help farmers adopt commercially available clean technology.
- Canada's farms have significant potential to increase soil carbon sequestration and realize other environmental benefits through the adoption of BMPs. In the Fall Economic Statement on November 30, 2020, the Government announced a proposal to provide \$98.4 million over ten years, starting in 2021-22, with \$1.6 million in remaining amortization, to Agriculture and Agri-Food Canada to establish a new Agricultural Climate Solutions program. This fund will leverage \$85 million in existing programming and will be guided by a new Canadian Agri-Environmental Strategy to be developed in collaboration with partners to support the sector's actions on climate change and other environmental priorities towards 2030 and 2050.
- The **Low Carbon Economy Fund**, **Low Carbon Economy Leadership Fund**, and the **Climate Action Incentive Fund** have supported a number of agriculture and agri-food related projects being implemented in several provincial jurisdictions. As of January 2021, there are 172 active funding agreements under CAIF, and seven projects are either active or being finalized under the Low Carbon Economy Fund streams.

Additional details specific to provincial and territorial measures aimed at supporting climate actions in complement to the ones under the Partnership are included below.

GOVERNMENT OF BRITISH COLUMBIA

Provincially, the *Climate Change Accountability Act* commits B.C. to emissions reduction targets of 40% by 2030, 60% by 2040, and 80% by 2050, from 2007 levels. The province's flagship \$908M climate plan, CleanBC, provides a pathway to reduce climate pollution while creating opportunities throughout the province. Agriculture-related measures under CleanBC include development of biofuels and diversion of 95% of organic waste from landfills. The B.C. Ministry of Agriculture, Food and Fisheries (MAFF), through the Canadian Agricultural Partnership (CAP), funds programs that support the implementation of the Pan-Canadian Framework on Clean Growth and Climate Change and CleanBC. These programs contribute to agriculture sector adaptation and resilience, development of clean technology and enhancement of carbon sinks, and growth of sustainable farm businesses. Highlights are discussed below.

Environmental Farm Plan Program (EFP) [\$5.0 M CAP] & Beneficial Management Practices Program (BMP) [\$6.5 M CAP] – In 2020, B.C. invested \$2.34 million in the Environmental Farm Plan (EFP) Program and Beneficial Management Practices (BMP) Program to support the completion of 200 new EFPs and renewal of an additional 148 EFPs, using an updated planning workbook that strengthens integration of climate adaptation and mitigation into EFP planning under CAP. The Beneficial Management Practices Program provided cost-share funding to more than 230 projects to adopt on-farm practices that

contributed to GHG reductions, carbon sequestration, and climate adaptation. Results include: 28 irrigation management plans and 18 irrigation management projects, selected to increase water use efficiency (adaptation); 26 nutrient management plans, helping to optimize nitrogen use to reduce nitrous oxide emissions (mitigation); 18 projects that achieve carbon dioxide emissions reduction through energy efficiency improvements (mitigation); 62 riparian management plans and 27 related BMP projects, including riparian habitat establishment (plantings) projects (mitigation and adaptation); and, 22 grazing management plans to increase soil health and storage of carbon.

A further \$1.9M has been invested for FY 2020/21, of which \$1.6M was invested via B.C.'s 2020 Economic Recovery Plan in support of the On-Farm Innovation Top Up program that promotes implementation of BMPs that help mitigate the impacts of climate change.

Agri-Innovation Program [\$25.8 M CAP] – Since the beginning of CAP, this program has invested over \$1.6M in bioproducts, biogas, and clean technology development for the sector. One project is exploring the potential of seaweed as a cattle feed additive, to reduce methane emissions from enteric fermentation. In 2020 under the CAP agreement, the Canada-BC Agri-Innovation Program (CBCAIP) invested an additional \$2.375M in bioproducts and clean technology projects in the agriculture and agri-foods sector, totalling \$2.9M since the start of CAP. Similarly, the Provincially Significant Projects Program (PSP) invested an additional \$1.0M in FY19/20, totalling \$2.1M since the start of CAP. Under the Partnership, an estimated \$18M will be invested in these two agri-innovation programs, and additional projects that support clean technology in the agriculture sector are expected. Both the Canada-BC Innovation Program and Provincially Significant Projects Program are continuing to accept applications and implement projects through to 2023.

MAFF is investing \$0.7M annually in the enhanced Nutrient Management Program, which supports farmers to manage nutrient application in order to reduce GHG emissions and protect drinking water quality. In 2020, the online application risk management (BC ARM) tool was further developed and improved to support decision-making regarding nutrient management application during shoulder seasons in high precipitation areas. The Ministry has recently completed a biogas handbook to help guide producers in developing new biogas projects. Through the CleanBC Industry Fund for large industrial emitters, two large greenhouses were successful in accessing a combined \$900,000 funding for energy-efficiency upgrades and thermal curtains.

While the aforementioned programs are indicative of progress towards achieving agricultural emissions reduction and enhancing carbon sinks, gaps still exist with respect to estimating, measuring and tracking levels of these emissions in relation to agricultural sub-sectors and farm practices. To address this, MAFF has initiated a project led by the UBC Sustainable Agriculture Landscapes Lab, to identify and assess practices and technologies with the greatest potential to reduce net agricultural GHG emissions in the B.C. context. Linking carbon accounting to farm practice is foundational work that will enable MAFF to support BMPs and technologies that lead to targeted GHG emission reductions for the sector.

CleanBC also includes a commitment to develop a B.C. climate change adaptation strategy based on a province-wide climate risk assessment published in 2019. MAFF participated in inter-agency work to develop the adaptation strategy throughout 2020. Looking ahead, B.C. recognizes the need for investment in adaptation for the agriculture sector to take advantage of season extension and to manage climate change risks such as wildfire, drought, heat, flooding, and pests.

Adaptation is a clear climate priority for the sector, with over \$12M invested in the Ministry's industry-led Climate Change Adaptation Program since 2013 [\$6.6M in CAP], which is delivered through Climate & Agriculture Initiative BC. The Regional Adaptation Program continues to expand its coverage, with the Vancouver Island Regional Adaptation Strategy completed in 2020, and with 22 CAP-funded projects completed, initiated or underway to address the priority adaptation priorities identified in seven other key agricultural regions of the province. The program has considerable strength due to its multi-partner collaborative approach, which actively engages local producer communities, industry organizations, NGOs and governments in the development of the regional strategies and implementation projects. It is anticipated that another 5 to 10 projects will be completed by 2023 in the 8 regions covered by Regional Adaptation Strategies.

Building on projects and resources developed in B.C.'s agricultural Regional Adaptation Program and lessons learned from the 2017 and 2018 B.C. wildfire seasons, B.C.'s climate change adaptation program is rolling-out provincial-scale agricultural wildfire preparedness and mitigation initiatives funded through CAP. In 2020, wildfire preparedness workshops were delivered to agricultural producers in 5 communities, bringing together over 125 producers, wildfire response and emergency management personnel, local government representatives, and provincial agency staff. Complementary to this, in partnership with MAFF and provincial agencies, the BC Cattlemen's Association is testing and piloting the use of grazing to reduce fine fuels in areas surrounding communities. This collaborative approach to adaptation yields synergistic benefits by reducing wildfire fire risk near communities and allowing ranchers to access new forage. Wildfire preparedness workshops aimed at training professionals who can provide one-on-one outreach/support to farmers and ranchers are being planned for 2021/22 and funded through B.C.'s Community Resiliency Investment program.

The Farm Adaptation Innovator Program funds multi-year applied research and demonstration projects that help producers adapt to the impacts of climate change. This program is investing \$1.5M during CAP in 12 climate adaptation applied multi-year research projects, which include several practices investigating enhancement of soil carbon sinks. Current research topics include: modelling wine-grape phenology, deficit irrigation in fruit orchards, on-farm research templates, innovative pasture rejuvenation practices, improving soil management for soil moisture and carbon sequestration, on-farm pest management, and greenhouse innovations for season extension. This program has a strong collaborative focus, with most projects involving partnerships between producer cooperators, researchers, industry associations, educational institutions, and technical experts. Projects approved through FAIP will be underway through to 2023.

B.C.'s Food Security Task Force findings and recommendations report released in 2020 includes recommendations for using technology and innovation to continue strengthening the agriculture sector while addressing climate change.

GOVERNMENT OF ALBERTA

Alberta continues to make progress towards meeting climate change goals. With Alberta's repeal of its carbon levy in May 2019, funding decreased for climate-related programs. Programs were re-organized, with some programs terminating (Farm Energy and Agri-Processing Program and On-Farm Solar Photovoltaics Program) and one new program introduced (Efficient Grain Drying Program).

Alberta's regulated offset system continues under Alberta's Technology Innovation and Emission Reduction program. Alberta's offset program existed under the Specified Gas Emitters Regulation and

the Carbon Competitiveness Incentive Regulation, and provides opportunities for ranchers and farmers to be financially compensated for adopting beneficial management practices that sequester carbon and reduce emissions. Since Alberta's offset system was introduced in 2007, the Conservation Cropping protocol, which incents no-till management, has been the most popular. Alberta has also operationalized offsets for micro generation, fed cattle and biogas. We continue to examine opportunities to develop new agricultural offset protocols.

GOVERNMENT OF SASKATCHEWAN

Saskatchewan continues to fulfill commitments made in ***Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy***. In June of 2020, the province released its second annual Climate Resilience Progress Report. The report identifies targets, baselines, historical trends and the current status for 25 measures of resilience, five of which are focused on the agriculture sector. These are:

1. Total area of agricultural land under permanent cover in Saskatchewan;
2. Total amount of soil organic matter sequestered in cultivated land;
3. Percentage of agricultural land area with a 4R nutrient stewardship plan;
4. Realized net farm income; and
5. Percentage of cultivated land in different types of crops.

Targets are laid out for each of the measures within the framework, and government will continue to report on progress towards each of the targets annually. The province is also planning to hold consultations and develop guidance documents, standards, and the registry in preparation for the rollout of the provincial offset program in 2022.

Investments in **research and development** are leading to new innovations for climate change mitigation and adaptation. In 2019, the Ministry of Agriculture along with the Government of Canada announced \$11 million in funding for 47 crop-related research projects through the Agriculture Development Fund (ADF) for projects in subject areas such as disease control, herbicide resistance, and crop breeding which can help to build climate resilience into the crops sector. In total, ADF has invested over \$7.5 million between 41 projects with various environmental themes related to climate change from 2013 to 2020.

Under the Canadian Agricultural Partnership (CAP), the Ministry also provided funding in the 2019-20 fiscal year to the following research institutes and initiatives:

- The Crop Development Centre which is contributing to the development of new crop varieties which may be better suited to a changing climate;
- The Global Institute for Food Security which works to improve the efficiency of crops such as wheat and canola and developing crops with improved drought tolerance;
- The new Livestock and Forage Centre of Excellence which researches improvements in livestock operations, forage production, and grazing land, and
- The Prairie Agriculture Machinery Institute which conducts innovative research in machine technology.

The Ministry offers Environmental Sustainability and Climate Change **programming and extension** support. CAP includes funding for the Farm and Ranch Infrastructure Program (FRWIP) to support the development of secure and sustainable water sources for agriculture. The Farm Stewardship Program provides financial assistance to producers to implement beneficial management practices (BMPs). BMPs such as variable rate mapping and permanent tame and native forage can reduce greenhouse gas

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emissions, sequester carbon, and support resilience. From April 1, 2018 to December 31, 2020, 2,344 FRWIP projects and 907 BMPs were funded. Ministry extension services support producer adoption of BMPs and improved practices and technologies.

In July of 2020, the Saskatchewan government announced the first steps of a generational project that would expand irrigation out of Lake Diefenbaker by 500,000 acres. This project will help to increase drought resilience for the agriculture industry. The Ministry also continues to invest in increased adaptation to climate change through irrigation development programming. From April of 2018 to December of 2020 the Ministry of Agriculture's Irrigation Program provided over \$5 million to 102 irrigation projects, including 39 development and 63 efficiency projects. Additionally, 9,200 acres of irrigation were developed in 2020. This development was both inside and outside irrigation districts.

Saskatchewan producers continue to adopt **improved practices and technologies** that support resilience and emissions reductions. For example, acres in summerfallow have dropped by 94 per cent from 1990 to 2020. Pulse acres have increased significantly from about 400,000 acres in 1990 to 6.38 million acres in 2020, which lowered agricultural emissions from fertilizers by about 2.3 million tonnes. Acres in zero and minimum till have increased from 36 per cent in 1991 to 93 per cent in 2016. In 2018, cultivated agricultural soils sequestered 9.5 million tonnes of CO₂ equivalent. Improved beef and hog efficiencies continue to reduce per unit greenhouse gas emissions.

The Ministry is updating its Environmental Farm Plan (EFP) to provide a more user-friendly tool that will help producers prepare to meet emerging sustainable sourcing requirements in the marketplace. The Ministry's extension staff works to encourage adoption of beneficial management practices, and uptake of the Environmental Farm Plan. Development of the new EFP is ongoing. A final product is expected by the end of 2021.

GOVERNMENT OF MANITOBA

Manitoba established the \$50 million Wetlands GROW Trust in 2020, bringing Manitoba's total investment in trusts that support ecological goods and services to \$204 million. Up to \$8.6 million in interest generated from the Conservation Trust, the GROW Trust, and the Wetlands GROW Trust will be awarded to successful applicants in 2021, supporting wetland restoration and conservation, water retention, perennial cover for soils, and tree planting.

In 2020, the Ag Action Manitoba – Assurance: Beneficial Management Practices (BMP) Activity approved 57 projects, committing over \$500K in funding to enhance environmental performance, including carbon sequestration. Applications for 2021-22 were reviewed in late 2020 and funding will be awarded to successful applicants in the spring of 2021.

Manitoba's 14 Watershed Districts continue to implement a distributed network of water retention structures, enhancing climate resiliency at a local and regional scale. Watershed districts have built 173 water retention projects since 2015, providing 4,135 acre-feet of water storage capacity on the landscape throughout southern Manitoba. In 2020, 46 applications from 13 Watershed Districts to the Watershed Ecological Goods and Services program were approved.

Manitoba invests in research to accelerate sustainable growth in the agriculture and agri-processing sector through innovation. Since 2018, Manitoba has supported 109 agricultural research and

innovation projects under the MB Ag Action – Research and Innovation Activity, including 27 projects approved to begin in 2020. New focus areas for the 2020 intake included:

- Climate Change Adaptation
Developing disruptive innovation technologies and practices that help producers adapt to climate change.
- Environmental Sustainability
Identifying and utilizing food production and processing technologies and practices to improve environmental sustainability
- Food, Diet and Health
Identifying pathways of resource utilization that improve environmental sustainability, human nutrition, policy development and public trust of protein-based food production
- Sustainable Feed Grains Supply and Utilization
Increasing sustainability of livestock feed production and use.

Manitoba has launched the Manitoba Protein Advantage strategy, which includes a focus on sustainability. Sustainability indicators and targets are being developed, including a reduction in the GHG intensity of animal protein production. Through the Sustainable Protein **Challenge Dialogue** – Manitoba is working collaboratively with stakeholders to **create an Action Framework** to position the province as a global leader in sustainable protein and develop a network of collaborators within which a range of sustainable protein initiatives can be mobilized.

GOVERNMENT OF ONTARIO

Ontario farmers and agri-food businesses have a keen interest in and understand the importance of protecting farmland along with using resources, such as soil and water, sustainably to secure the long-term productive capacity of the agri-food sector. That's why they continue to do their part to help deliver on the Made-in-Ontario Environment Plan. Through the application of innovative technologies and best practices farmers are able to produce more with less space, less waste and fewer resources, improving (or minimizing) their impact on the environment. With the support of Ontario's suite of stewardship programs, and Ontario's agri-food research investments including the 'The Ontario Agri-Food Innovation Alliance', Ontario's agri-food sector continues to demonstrate environmental leadership in addressing climate change and other environmental challenges.

The Made-in-Ontario Environment Plan commits to: "Continue to support programs and partnerships intended to make the agriculture and food sectors more resilient to current and future climate impacts. We will support on-farm soil and water quality programming and work with partners to improve agricultural management practices." OMAFRA is delivering on the agriculture commitment in the Plan through implementation of 'New Horizons: Ontario's Agricultural Soil Health and Conservation Strategy'; soil and water CAP programing; and support of sector led initiatives (see subsequent rows for details). Launched in January 2020, OMAFRA is collaborating with members of the multi-stakeholder Soil Action Group to develop an implementation plan to follow through on actions underway and coordinate actions of shared interest to further advance the goals and objectives within the Soil Strategy.

The Ontario Ministry of Agriculture, Food and Rural Affairs invests in environmental stewardship activities through the Canadian Agricultural Partnership and other programs that enhance water quality and soil health while providing important co-benefits to climate change.

Year two and three results of the CAP Environmental Stewardship programs include:

- OMAFRA paid out \$5.1 million in cost-share fund to farmers to support completion of 552 on-farm environmental improvement projects between April 2019 to March 2020. Projects include planting of cover crops, purchasing conservation tillage equipment and implementing erosion control structures.
- OMAFRA has committed up to \$5.9 million in cost-share funds to farmers to support the completion of an additional 593 projects on farms between April 2020 and March 2021.
- OMAFRA has committed up to \$1.26M in CAP cost-share funding to sector organizations and collaborations in CAP year 2 to support 10 projects valued at \$2.1 million.
- In CAP year three, OMAFRA has committed up to \$167,475 in CAP cost-share funding to sector organizations to support 3 projects valued at \$597,500.
- In CAP year two (April 2019 to March 2020) 685 total participants in Environmental Farm Plan (EFP) workshops and electronic workbooks. 563 new verified complete EFP Action plans were developed by participating farmers.
- In CAP year three (April 2020 to September 2020), an additional 21 participants in EFP workshops and electronic workbooks and 10 new verified complete EFP Action Plans were developed. COVID-19 has limited results in this area.

As part of Ontario's update to the Agri-Suite tool a new greenhouse gas (GHG) calculator will be designed and added to assist farmers in identifying the sources of GHG emissions at a farm level, encourage adoption of best practices and help quantify GHG emission reduction opportunities on farms.

As well, Ontario is investing \$5.75 million into the multi-year On-Farm Applied Research and Monitoring (ONFARM) demonstration project and involves the collaboration with various agricultural and conservation partners. The project includes key activities such as developing comprehensive, science-based methods to measure soil health in Ontario and evaluating the use of various Best Management Practices (BMPs) for improved soil health and water quality. Applied research and monitoring sites are being established to facilitate peer-to-peer knowledge transfer and capacity-building in the agricultural sector.

The Greenhouse Competitiveness and Innovation Initiative, Phase 2 intake (closed July 2020) awarded \$3.6 million to approved projects, several of which supported sector investments in sustainability and innovation to optimize inputs, increase resource use efficiencies (e.g. energy, heat) and support long-term resiliency and competitiveness.

In January 2020, OMAFRA posted proposed regulatory changes that would make it easier and faster for farmers to establish on-farm, RNG-generating anaerobic digesters – helping them expand in the emerging renewable natural gas market in Ontario. These proposed changes will encourage the recycling of nutrients to generate clean energy, encourage the return of organic materials to agriculture land to build soil health and fertility for crop production and help promote new economic development opportunities for the rural sector.

These Ontario Agri-Food Innovation Alliance and OMAFRA's Open Research Programs are ongoing. Within the broader mandate to support agri-food innovation in Ontario, OMAFRA-funded research and innovation programs address climate change priorities through specific projects focused on emission reduction, climate adaptation and resilience, best practice and clean technology development and

commercialization, besides knowledge translation and transfer and, training of highly qualified personnel.

1. During 2020, the Ontario Agri-Food Innovation Alliance funded 20 research projects (\$2.57 million OMAFRA funding) addressing climate change in Ontario's agri-food sector.
2. In 2020, OMAFRA's open research program funded one research project (\$100,000) addressing climate change.

In addition, the Ministry supports the agri-food industry in providing leadership on efforts contributing to multiple environmental benefits including: 4R Nutrient Stewardship led by 4R Ontario which contributes to reducing GHGs; the Thames River Phosphorus Reduction Collaborative; the Timing Matters Initiative; and the Ontario Cover Crop Strategy led by Grain Farmers of Ontario.

In 2020, OMAFRA recognized Burnbrae Farms Limited with an Excellence in Agriculture Award for their leadership in sustainable energy solutions. Burnbrae Farms Limited is the largest solar-powered egg farm in Canada and shares its surplus power with the adjoining farm. The sustainable energy solution in this farm consists of four barns that utilize high-efficiency motors, lighting and ventilation systems to ensure minimal power usage to run the equipment. The farm operates off the grid and is powered by solar energy using solar panels located on the roof.

In addition, organizations such as Provision Coalition are helping Ontario food and beverage companies to be leaders in sustainability including the reduction of food loss and waste, climate change mitigation and responsible sourcing.

GOVERNMENT OF QUEBEC

In 2020, the bio-food sector saw the launch of important new initiatives to address climate change. These new initiatives demonstrate Quebec's commitment to supporting agricultural producers in adopting agri-environmental practices and stimulating innovation.

New policies announced in 2020:

1- Plan d'agriculture durable 2020–2030 (PAD)

The PAD was announced last October and aims to accelerate the adoption of responsible and effective agri-environmental practices. It places agricultural businesses at the heart of the action. The PAD calls for investments totalling \$125 million over the next five years. This includes targets for soil quality, water quality, management of nitrogen fertilizers, and biodiversity. These targets also have a positive impact on reductions in greenhouse gas (GHG) emissions and the adaptation of agricultural systems to climate change. The budget will be broken down as follows: \$70 million for the recognition of agri-environmental practices implemented by passionate, competent and innovative producers; \$30 million for knowledge development; and \$25 million for knowledge transfer, training and support, in addition to the amounts invested in the various programs of the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation (MAPAQ). This plan fulfills two objectives of the *Politique bioalimentaire 2018–2025 – Alimenter notre monde* (hereinafter the *Bio-Food Policy*) by helping to encourage concerted approaches to protect health and the environment, in addition to strengthening the implementation of responsible business practices.

2- Plan pour une économie verte and its implementation plan

In November 2020, Quebec announced the new *Plan pour une économie verte* (PEV). This plan provides for investments of nearly \$6.7 billion over the next five years, the funding for which is mainly associated with carbon market revenues accumulated in the *Fonds d'électrification et de changements climatiques* (formerly known as the *Fonds vert*). The first 2021–2026 PEV implementation plan provides for \$32.8 million for actions aimed at reducing GHG emissions linked to agricultural production. These measures will complement the actions that will be carried out under the PAD. New measures also target bioenergy development, research and development, and carbon storage in forests and natural environments.

3- Stratégie de croissance des serres au Québec 2020–2025

On November 27, 2020, Quebec's Minister of Agriculture, Fisheries and Food, André Lamontagne, and Quebec's Minister of Energy and Natural Resources, Jonatan Julien, presented the new *Stratégie de croissance des serres au Québec 2020–2025 – Pour une plus grande autonomie alimentaire*, which aims to double the volume of greenhouse cultivation in Quebec by 2025. By adding the amounts invested directly for the *Stratégie de croissance des serres* (\$91 M) to those reserved for the three-phase network extension program (\$21 M), the government is investing more than \$112 M to achieve the objectives set.

In support of the *Stratégie*, Hydro-Québec will grant the province's 1,000 greenhouse producers a preferential electricity rate of 5.59 ¢/kWh for photosynthetic lighting and heating for their facilities, as authorized by the Régie de l'énergie's decision on December 1, 2020. The rate eligibility threshold will be lowered from 300 kW to 50 kW, allowing smaller businesses to participate. Large greenhouse companies consuming more than 5,000 kW will now also have access to this rate.

The development of the greenhouse sector will focus on renewable energy sources recognized for their low environmental footprint, thereby contributing not only to economic recovery, but also to food self-sufficiency in Quebec.

Measures in effect in 2020:

The *2013–2020 Climate Change Action Plan* will end in March 2021. This plan provides for an investment of nearly \$8 million in measures to reduce GHG emissions in the agricultural sector, and \$4.9 million in specific measures to adapt the agricultural sector to climate change. Eighteen projects were underway in 2020. A call for projects was launched during the summer of 2020 as part of the new *Programme d'appui à la lutte contre les changements climatiques en agriculture*. New projects are expected to start in 2021.

The *2013–2020 Climate Change Action Plan* will end in March 2021. This plan provides for an investment of nearly \$8 million in measures to reduce GHG emissions in the agricultural sector, and \$4.9 million in specific measures to adapt the agricultural sector to climate change. Eighteen projects were underway in 2020. A call for projects was launched during the summer of 2020 as part of the new *Programme d'appui à la lutte contre les changements climatiques en agriculture*. New projects are expected to start in 2021.

The *Prime-Vert 2018–2023* program also provides for the funding of measures with a positive impact on the reduction of GHG emissions and on adaptation to climate change. During 2020, more than \$4.4 million in financial assistance was provided for the following measures:

- Soil conservation practices and works (this measure includes funding for the establishment of cover crops);

- Sustainable agri-environmental developments integrating trees and shrubs and promoting biodiversity;
- Equipment allowing the band application of fertilizers in horticultural crops;
- Equipment for optimal management of irrigation water.

The Government of Quebec is also continuing to invest to encourage responsible soil health practices. Actions enabled during the 2018–2023 period include increasing the rate of assistance to businesses for targeted consulting services in soil health and conservation in order to support more than 15 soil health knowledge development and transfer projects.

The *Plan de soutien aux investissements en agriculture contribuant à l'adaptation des entreprises en matière de bien-être animal et d'efficacité énergétique* (PSI) offers three programs for agricultural businesses. The *Programme d'aide aux investissements en matière de bien-être animal et d'efficacité énergétique* provides direct financial assistance for eligible investments for the modernization of production facilities through the construction of new buildings, the renovation of buildings or the acquisition and installation of fixed production equipment.

Over 4,300 general eligibility forms have been submitted for the PSI, and 62% of the projects presented include measures aimed at improving the energy efficiency of businesses. The total budget for the PSI as a whole is \$195 million. All three programs have been extended for one year and will end on March 31, 2023.

All of these measures stem from the *Politique bioalimentaire 2018–2025* and its *Plan d'action 2018–2023 pour la réussite de la Politique bioalimentaire*, which was made public on January 29, 2020. Note that the *Bio-Food Policy* offers 69 courses of action grouped into 16 objectives under the following four orientations:

1. Food products that meet consumers' needs;
2. Prosperous, sustainable and innovative companies;
3. Attractive and responsible businesses; and
4. Dynamic territories that contribute to bio-food prosperity.

One of the *Policy's* seven targets is to increase the share of Quebec agricultural and food-processing businesses that have implemented responsible business practices. These practices include soil quality, water quality, management of pesticides and fertilizers, biodiversity, reduction of GHGs, adaptation to climate change and energy efficiency.

GOVERNMENT OF NEW BRUNSWICK

Agriculture contributes 4% of New Brunswick's GHG emissions from a footprint that represents approximately 5% of all land in the province. The Department of Agriculture, Aquaculture and Fisheries takes seriously its role in supporting the mitigation of greenhouse gas emissions and helping producers adapt to lessen the impacts from climate change. Federal – Provincial funding under the Canadian Agricultural Partnership Agreement (CAP) (2018-2023) supports actions on agricultural climate change mitigation and adaptation, while contributing to the achievement of provincial commitments within Transitioning to a Low-Carbon Economy - New Brunswick's Climate Change Action Plan and supporting national efforts against climate change. In the calendar year 2020, the program has provided funding for

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GHG mitigation – 62 projects received 75.9 per cent (\$642,000) of the program budget. This leveraged a total investment of \$1.8 million. Projects included land drainage, precision farming, nutrient management planning, energy audits and upgrades and renewable energy systems.

As well, innovation and research efforts with climate change mitigation potential included three on-going projects on precision nutrient placement and one project each on nitrogen fixing bacteria and cover crops. Additionally, a new project was initiated on benchmarking several commodities for greenhouse gas emission and carbon capture.

GOVERNMENT OF NOVA SCOTIA

Nova Scotia continues to commit itself to increasing the climate resilience of our communities, businesses and people, and has implemented various initiatives that support the Pan-Canadian Framework. Some examples of these initiatives include:

Under the Infrastructure Canada Disaster Adaptation Mitigation Fund, the department is jointly funding a \$114M project to upgrade 60 kilometres of dyke and five flood control structures along the Bay of Fundy over the next nine years. This work began in 2019 and will protect natural infrastructure primarily for public use. Without upgrades, the sites are at high risk of damage from climate change. These sites provide flood protection to tens of thousands of residents and businesses, vineyards, historical and world heritage sites, Mi'kmaq communities and farmland.

The Canadian Agricultural Partnership programs support clean growth and many target priorities such as climate change, soil and water conservation, and innovation. One example is the Agriculture Energy Partnership with an Onsite Energy Manager that has been hired by Efficiency NS. This partnership between NSDA and EfficiencyOne will help reduce agriculture's electricity and fossil fuel footprint. Activities under this program have resulted in a reduction of 928 tonnes/y of CO₂. The Soil and Water Sustainability program provided over \$304K to NS farmers in 2019/2020 for projects on erosion control, enhancing riparian and agroecosystem health, improved manure management, sustainable agricultural water supply and water well management (wells, springs), improved water practices and efficiencies, field water management, winter pasture management, and farmyard run-off control.

The 1st iteration of the NS Environment Climate Adaptation Leadership Program ran from 2013-2018 to help prepare NS government departments for Climate Change. The NS Department of Agriculture was the first 'pilot' department to participate in the development of a climate readiness plan. The 2nd iteration of this program runs from 2019-2022 and is funded by \$7M + (cash and in-kind) from Nova Scotia government and federal sources. The purpose of this leadership capacity-building program is to help prepare NS government departments, community partners and industry for the impact of a changes in an increasingly uncertain environment. NSDA has created an internal committee of champions for climate change adaptation and mitigation, and environmental sustainability. The Agricultural Champions for Environmental Sustainability (ACES) team has developed a Climate Change Adaptation Workplan has currently implementing this over the next few years.

GOVERNMENT OF PRINCE EDWARD ISLAND

The PEI Department of Agriculture & Land is diligently working towards supporting Pan-Canadian Framework key measures within the agricultural industry. Many of these efforts are supported under the Canadian Agricultural Partnership (CAP). Environmental programs are a priority under PEI's CAP

funding, with \$13.3 million allocated over the five-year agreement, which is in its third year. Some of these programs include the Agriculture Stewardship Program, the Perennial Crop Development Program, and the Alternative Land Use Services Program. These programs contribute to environmental sustainability and address climate change through technical and financial support to encourage producers to voluntarily adopt Beneficial Management Practices (BMPs).

The Department has also committed to expanding its capacity in finding solutions to climate change by adding a role for a climate change coordinator to specifically tackle these issues. Further Programs that support GHG-efficient management practices are also under development.

The Agriculture Stewardship Program is a suite of initiatives designed to increase environmental sustainability, climate change mitigation and adaptation by providing technical and financial support to encourage producers to voluntarily implement Beneficial Management Practices (BMPs). Activities include soil conservation, soil health, nutrient management, integrated pest management, riparian management, water quality, water efficiency, energy efficiency and on-farm storage. A notional budget of a total of \$8.3 million was set for over the five year CAP agreement. Program uptake continues to be strong; including in areas for winter cover crop, improved manure and silage storage, and soil erosion control structures. Approximately 150 Beneficial Management Practices projects are completed by producers each year under the program.

The Alternative Land Use Services (ALUS) Program provides agricultural landowners with assistance to remove environmentally sensitive land from production and includes expanding buffer zones and grassed headlands, retiring high-sloped land, and installing soil conservation structures. The notional budget is set at approximately \$4 million over the five year CAP agreement for the ALUS program. It currently supports approximately 400 clients with the removal of over 3,800 hectares of farm land from production.

The Perennial Crop Development Program is designed to encourage additional perennial crop production and production systems. Perennial crops can increase carbon levels in the soil and reduce contamination of watercourses and wetlands through erosion control, water-use efficiency, and nutrient cycling efficiency. A notional budget of a total of \$875,000 was set for over the five year CAP agreement. Program uptake has been strong to date.

The Soil Quality Monitoring (SQM) project—launched in 1998—monitors changes in soil organic matter levels across the Island each year. This information contributes to ongoing efforts to encourage and incentivize beneficial management practices that aim to increase soil organic matter. The latest status report was published September 2020.

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

The Canadian Agricultural Partnership supports investment towards the Environmental Sustainability and Climate Change Program, as well as the Environmental Farm Planning Program, which continues to have a good uptake with 63 per cent of the commercial farms in the province having completed an Environmental Farm Plan. This number can fluctuate on a yearly basis with decline and/or incline in farm numbers. From January 2020 to December 2020, 28 new Environmental Farm Plans were completed, while 43 farming enterprises updated their existing Environmental Farm Plans.

The Environmental Sustainability and Climate Change Program supported 21 projects in 2019-20 and 2020-21 that focused on environmental Beneficial Management Practices including:

- Conservation tillage/nutrient placement;
- Improved pest management/pesticide application;
- Wildlife damage prevention/protection;
- Manure land application;
- On-farm climate change adaptation;
- Product and waste management;
- Sustainable irrigation management; and
- On-farm water supply and retention.

Projects funded under this program include but are not limited to:

- Fertilizer application systems;
- Manure-handling equipment;
- Composting system;
- No-till seeders; and
- Wildlife exclusion fencing.

The Department of Fisheries, Forestry and Agriculture of the Government of Newfoundland and Labrador continues to support research into clean growth and climate change. For example, in 2019-20 and 2020-21, the Canadian Agricultural Partnership committed funding towards graduate student research projects investigating the development of anaerobic digestion technology to improve manure management. Bio-digestion technology will reduce greenhouse gas (GHG) emissions from both the storage of manure and spreading of manure on land. These projects aim to reduce the release of GHGs by converting dairy manure to a biogas through anaerobic digestion.

In addition, the Department, in collaboration with the Memorial University of Newfoundland – Grenfell Campus, is in its second year of work towards the project “Low-Input Agriculture in Cool Climate Boreal Ecosystems.” This project is funded through the Federal-Provincial cost-shared Agricultural Clean Technology Program, with the province (Government of Newfoundland and Labrador and the Memorial University of Newfoundland – Grenfell Campus) contributing 52 per cent of the funding for this project.

The Newfoundland and Labrador Federation of Agriculture, in conjunction with the Climate Change Office of the Government of Newfoundland and Labrador, will be hosting virtual climate change consultations to hear experiences, concerns and objectives of the agriculture sector in Newfoundland and Labrador to build adaptation capacity. The purpose of the consultations is to create a list of 10 key risks and opportunities of climate change in the agriculture sector, and utilize that list to build adaptation capacity. Five virtual sessions are scheduled for December 2020 and January 2021.

GOVERNMENT OF YUKON

Agriculture Policy – Yukon’s new Agriculture Policy, entitled *Cultivating Our Future*, was released during 2020. The updated policy sets out Yukon government priorities and actions for supporting sustainable agriculture development in the Yukon over the next decade. Yukon’s new policy aims to encourage the development of an agriculture industry that is responsive and adaptable to climate change and supports environmental sustainability. This is seen through the action areas highlighted in chapter three: Climate Change, Environmental Farm Plans and Encouraging Environmental Best Management Practices.

Climate Change policy: In 2020 the Government of Yukon launched its new policy, entitled *Our Clean Future: A Yukon strategy for climate change, energy and a green economy*. The policy was developed in partnership with Yukon First Nations, transboundary Indigenous groups and Yukon municipalities over the course of 3 years. Actions the Government of Yukon will take to address the impacts of climate change includes targets to reduce greenhouse gas emissions and improve resilience to the impacts of climate change. The new policy includes agriculture related community based actions such as assistance to start a community garden or greenhouse, support for purchasing local products and services, and government led support programs for local producers.

Agricultural Research: Yukon's research and demonstration farm continues trials on northern soil development, effectiveness of natural soil amendments and performance trials of new varieties under our northern growing conditions. In 2020 Yukon continued work on the three year northern field trial with Agriculture and Agri-Food Canada (Science and Technology Branch, Newfoundland) that looks at improving food production in northern soils. The experiment looks at increasing production of marginal crops (bush beans) and evaluating strategies that reduce post-harvest storage losses (potatoes)

Local Food Strategy: The five-year strategy for Yukon (entitled *Encouraging the Production and Consumption of Yukon-Grown Food 2016–2021*) continued to be actively implemented in 2020 and will conclude during 2021. Several of the initiatives in this strategy will carry forward under the new Agriculture Policy. The strategy is contributing to the increase in production, use and consumption of Yukon-grown food, and indirectly is helping to reduce transportation GHGs by reducing the amount of food imported into the Yukon up the Alaska Highway from southern markets.

Traditional and Local Foods: Yukon began a new collaborative project with the former department of Indian and Northern Affairs Canada (INAC) in 2017-2018 to explore the relationship between climate change, traditional foods, and local food production in Yukon communities. This multi-year project is scheduled to conclude in March 2021. Yukon Agriculture Branch has also been providing ongoing support during 2020 to a growing number of First Nation farming projects in several Yukon communities.

GOVERNMENT OF NORTHWEST TERRITORIES

No input provided.

GOVERNMENT OF NUNAVUT

No input provided.

Letter from CHFCA re Hydrogen BC Strategy

From: Mark Kirby <MKirby@CHFCA.ca>
To: Premier@gov.bc.ca, jeri.minister@gov.bc.ca, LBR.Minister@gov.bc.ca, Minister.TRD@gov.bc.ca, Nathan.Cullen.mla@leg.bc.ca, George Heyman (env.minister@gov.bc.ca) <env.minister@gov.bc.ca>, Bowinn.Ma.MLA@leg.bc.ca, Bruce Ralston (EMPR.Minister@gov.bc.ca) <EMPR.Minister@gov.bc.ca>, Selina Robinson (FIN.Minister@gov.bc.ca) <FIN.Minister@gov.bc.ca>, AGR.minister@gov.bc.ca, CITZ.minister@gov.bc.ca, FLNR.minister@gov.bc.ca, Rob Fleming (Minister.Transportation@gov.bc.ca) <Minister.Transportation@gov.bc.ca>, AEST.minister@gov.bc.ca, TAC.Minister@gov.bc.ca, IRR.Minister@gov.bc.ca, Pam.Alexis.mla@leg.bc.ca, Cullen, Nathan LASS:EX <Nathan.Cullen.MLA@leg.bc.ca>, Transportation, Minister TRAN:EX <Minister.Transportation@gov.bc.ca>, Alexis, Pam LASS:EX <Pam.Alexis.MLA@leg.bc.ca>, Minister, TACS TACS:EX <TACS.Minister@gov.bc.ca>, Minister, IRR IRR:EX <IRR.Minister@gov.bc.ca>, Minister, AEST AEST:EX <AEST.Minister@gov.bc.ca>, Minister, FIN FIN:EX <FIN.Minister@gov.bc.ca>, Minister, CITZ CITZ:EX <CITZ.Minister@gov.bc.ca>, Minister, FLNR FLNR:EX <FLNR.Minister@gov.bc.ca>, Minister, AFF AFF:EX <AFF.Minister@gov.bc.ca>, Ma.MLA, Bowinn LASS:EX <Bowinn.Ma.MLA@leg.bc.ca>, Minister, EMLI EMLI:EX <EMLI.Minister@gov.bc.ca>, Minister, ENV ENV:EX <ENV.Minister@gov.bc.ca>, OfficeofthePremier, Office PREM:EX <Premier@gov.bc.ca>, Minister, LBR LBR:EX <LBR.Minister@gov.bc.ca>, Minister, TRD JERI:EX <trd.minister@gov.bc.ca>, Minister, JERI JERI:EX <JERI.Minister@gov.bc.ca>
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Sent: April 10, 2021 5:32:04 PM PDT
Attachments: HyBC Letter re H2 Strategy Apr 2021signed.pdf

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Dear Mr. Premier and Honourable Members of the Cabinet Committee on the Economy,

Please find attached a letter from the Canadian Hydrogen and Fuel Cell Association regarding the BC Hydrogen Strategy.

We appreciate your consideration of our recommendations. Thank you.

With my regards,

Mark Kirby
President/CEO

Canadian Hydrogen and Fuel Cell Association (CHFCA)
660-475 West Georgia Street, Vancouver BC V6B 4M9
Office: (604) 283-1040 | Fax: (604) 683-6345 | Mobile: (604) 657-8190

March 31, 2021

VIA E-MAIL

The Honourable John Horgan, M.L.A. and The Cabinet Committee on the Economy
The BC Provincial Legislature
501 Belleville St
Victoria, BC V8V 2L8

Dear Premier Horgan and Honourable Ministers:

RE: Release of BC's Hydrogen Strategy and Support for Hydrogen and Fuel Cells in BC

Hydrogen BC (HyBC) applauds and supports CleanBC and the associated actions and policy of the BC government in support of GHG mitigation and a clean environment. These actions have made BC a leader, attracting investment and jobs in the cleantech sector generally and the hydrogen and fuel cell sector specifically. We see this reflected in the investments in companies, in fueling stations and hydrogen vehicle fleet deployments. We also see it in the planned investments in Power-to-Gas projects throughout the province.

However, global activity in the hydrogen energy sector is growing at an amazing rate. In Canada, activity is ramping up in Quebec, Alberta and elsewhere, and this activity is turning into major projects. BC needs to move forward to keep pace and ensure the conditions are in place to attract more investment to BC. Also, BC's commitment to net-zero 2050 recognizes the urgent need to completely decarbonize all sectors – no protected industries or partial measures – and to do it quickly. Hydrogen is essential to achieve this and today we are falling behind competing jurisdictions in ensuring low-cost, clean hydrogen is available for industry and consumers.

The recent release of the federal government's Hydrogen Strategy for Canada makes it more imperative. An aligned BC Strategy will attract investment that can be leveraged with federal support.

For the reasons above, Hydrogen BC and our member companies urge the BC government to take the following actions:

1. Release the BC Hydrogen Strategy, strongly affirming hydrogen's key role as a pathway to net-zero and the provinces intent to align with the Federal Hydrogen Strategy.
2. Focus policy and financial support on ensuring low-cost, clean hydrogen is available to support both domestic and export needs, with the immediate focus on developing Hydrogen Hubs and merchant hydrogen supply.

3. Support clean hydrogen from all pathways, including from fossil fuels with carbon management, including hydrogen shipped via truck, ship, rail or pipeline and in any form: liquid, high-pressure gas, ammonia or methanol.
4. Continue supporting hydrogen demand through incentives and by removing barriers to hydrogen applications in transportation and heating
5. Promote BC globally, in partnership with other provinces and the federal government, as the best source of clean hydrogen in the world.

These activities discussed further in the attachments to this letter, will position BC to attract investment and achieve meaningful decarbonization.

We look forward to action by the government on these measures. We also hope to see your support for actions by provincial crown corporations, regulatory agencies, and municipalities in line with the above.

We would be pleased to discuss further with you and key individuals in your ministries.

Thank you for your kind consideration of Hydrogen BC's recommendations.

Yours Sincerely,


Colin Armstrong
Chair, Hydrogen BC

François Girard
François Girard
Chair, CHFCA


Mark Kirby
Pres/CEO CHFCA

About Hydrogen BC

Hydrogen BC is the regional branch of the Canadian Hydrogen and Fuel Cell Association (CHFCA) in British Columbia. Established with the support of the BC Government, Hydrogen BC is comprised of a public-private partnership with the mandate to promote the rollout of fuel cell electric vehicles (FCEVs) and hydrogen fueling stations (HFS) in the province. In addition, Hydrogen BC works to ensure safe operation of HFS & FCEVs by sharing best practices developed in Canada and abroad while working with other industries to forecast demand for low-carbon hydrogen.

CC: The Cabinet Committee on the Economy

Honourable Ravi Kahlon (Chair)
Honourable Harry Bain
Honourable George Chow
Honourable Nathan Cullen
Honourable George Heyman
Honourable Bowinn Ma
Honourable Bruce Ralston
Honourable Selina Robinson

Honourable Lana Popham (Vice Chair)
Honourable Lisa Beare
Honourable Katrine Conroy
Honourable Rob Fleming
Honourable Anne Kang
Honourable Melanie Mark
Honourable Murray Rankin
MLA: Pam Alexis

Summary of Recommendations

Area	Recommendations
BC's Hydrogen Strategy	• Launch and publicize BC's hydrogen strategy
Low-cost, Clean Hydrogen	• Financial support to de-risk merchant plant construction • The province and key government agencies to promote a flagship transportation project at a suitable Hub location: rail, marine and/or heavy-duty transportation to provide a baseload for merchant liquid hydrogen production • Provide funding for the development of Hydrogen Hub projects • Capacity-based LCFR credits (the California model) • Guaranteed offtake agreements at Hubs or from government agencies
Supporting Demand for Clean Hydrogen	• Ensure provincial agencies: BC Ferries, BC Transit, Translink, etc. and municipalities to consider fuel cell electric vehicles for their fleets and require studies of full fleet conversion to net-zero to qualify for provincial funding support. • For fleet evaluations, update GHG calculation approach to reflect clean hydrogen capacity that is pending – not legacy high-carbon hydrogen supply that will be phased out • Continue and expand ZEV mandates/subsidies for light-duty and heavy-duty road and marine vehicles • Engage with national working groups and municipalities in support of volume purchases of trucks, buses to ensure availability and reduce costs for FCEV • Continue and expand BC's renewable content mandate • Set a target date for 100% net-zero gaseous fuel in BC's natural gas lines • Implement regulations to prepare for a future 100% net-zero gaseous fuel: ○ Requirement for new gas pipelines to be hydrogen compatible. ○ Requirement for new appliances to be dual-fuel compatible (hydrogen/natural gas)
Clean Hydrogen from All Production Pathways	• Support production of clean hydrogen from all pathways • Cooperate with the federal government on development of clean hydrogen standards
Hydrogen Exports	• Partner with AB and Canada to promote BC as the best source for clean hydrogen • Fast-track development of an initial hydrogen export project in the Prince Rupert/Kitimat area using hydro power in partnership with importing nations – use to develop critical technology and knowhow in export technology • State the government's support for green and blue hydrogen production in the Northeast and a hydrogen pipeline to the Coast, taking advantage of the existing right-of-way for NG lines.

Attachment 1: BC's Hydrogen Strategy

The prompt release by the BC government of its hydrogen strategy will highlight the importance of hydrogen and fuel cells and will help stimulate investment in hydrogen energy projects. With the federal government's release of the Hydrogen Strategy for Canada, it is important for BC to capitalize on the incredible momentum for hydrogen. Aligning will attract investment, government funding and jobs to BC.

Communicating the Importance of Hydrogen & Fuel Cell Solutions

As little as two years ago, it was possible to think of achieving our climate goals with a combination of energy efficiency, natural gas and some electrification. No more. Now we need to focus on net-zero pathways: a combination of clean power, hydrogen, biofuels, and sequestration, including the transformation to net-zero of all transportation, all heating, and all energy exports. Hydrogen plays a major role.

More recently, while accepting the key role that hydrogen will play in decarbonizing key sectors, some parties have suggested that the use of hydrogen be somehow restricted only to areas where it is essential, while other means, e.g.: electrification and biofuels, are used preferentially. This is an undue restriction on choice, which makes no sense economically or environmentally and will delay the transition to net zero.

With the release of the Hydrogen Strategy for Canada, the federal government joined other countries around the world in acknowledging the importance of hydrogen to Canada and the world's energy future. In combination with the revised Climate Plan, it spells out policy, actions and funding support needed to spur hydrogen energy commercialization. This is an important step, but it needs to be backed with an aligned BC strategy.

Hydrogen BC and its members meet regularly with industry and stakeholders. Given the rapid progress in hydrogen, many BC residents, municipalities, and industries are not yet aware of the key role it will play. They are unaware of progress in fuel cell technology and products. They are unsure if the province is committed to ensuring cost-effective clean hydrogen is available and will provide long-term support for fueling stations and other investments. As such, they are reluctant to commit to hydrogen, even when they realize it may be a good solution for them.

A case in point is recent meetings with municipalities by the CHFCA's Urban Transit Task Force. Done in partnership with Natural Resources Canada, Canadian Urban Transit Association (CUTA) and the Canadian Urban Transit Research & Innovation Consortium (CUTRIC), the meetings presented information on fuel cell electric buses, trucks and hydrogen supply to assist municipalities in achieving their climate goals. The two most common issues:

1. Lack of knowledge about the commercial readiness of fuel cell electric buses and trucks, exacerbated by the misunderstanding that the Whistler fuel cell bus project from 2010-13 was a failure, instead of a vital and necessary step forward that directly led to the thousands of buses on the road worldwide¹;

¹ [Legacies of the 2010 Olympic Games in Whistler are powering more than nostalgia - CHFCA](#)

2. The lack of clean, reliable, low-cost hydrogen in BC.

Taskforce members were able to address the first concern very effectively, building excitement about fuel cell buses, trucks and how they will be cost-effective and efficient options to help them electrify their fleets. However, it will take the province committing to support hydrogen energy to address the second.

Similar concerns are voiced by truckers, miners, airlines, railways and the marine sector. Unless they are aware of the solution and have confidence that fuel cell products and cost-effective clean hydrogen will be available, they will not commit to transforming their sectors.

Another case is in building and residential heat. Municipalities have ambitious climate plans driven by the demands of their constituents. A cost-effective, net-zero gaseous heating fuel, comprised of renewable natural gas and hydrogen, would backstop energy efficiency and electrification plans, providing a safe, cost-effective, reliable, and convenient alternative for many homes and businesses. However, municipalities need to be educated and assured that it is an environmentally sound approach, a viable path to net zero that will be supported by the provincial government on a clear and reasonable timeline.

The release and promotion of BC's Hydrogen Strategy will be a key step in moving these issues forward, communicating the opportunity and signaling the BC government's commitment to hydrogen energy as an important piece of BC's clean energy future.

Stimulating Investment

The Hydrogen Council, a global association of leading energy, chemical, OEMs and other companies in the hydrogen value chain, reports that in the past year, announced investments in hydrogen energy projects are up 60% to \$300 billion globally². In Canada, we see announcements of projects in Quebec and Alberta driven by the availability of low-cost, clean hydrogen. These include the \$900 million Enkema project, the Evolugen/Gazifère 20 MW Power-to-Gas project in Gatineau, the Rio Tinto partnership to explore low-carbon iron ore production, plus the Canada-Germany pact to develop hydrogen exports, all driven by Quebec and Hydro Quebec's commitment to delivering low-cost clean hydrogen.

In Alberta, we see projects locating to the Heartland to take advantage of the low-cost clean hydrogen produced from natural gas, including CP Rail, bus projects, clean ammonia, power generation and heavy-duty trucking. Multi-hundred-million-dollar projects are moving forward to increase hydrogen capacity and install a liquefier. Ontario is now entering the picture, developing clean production opportunities around their nuclear, hydro, and petrochemical industries, plus applications in buses, trucking, gas blending and steel.

BC can maximize investment in this province by aligning with the Hydrogen Strategy for Canada, sending a clear policy signal to industry that it will ensure conditions are right for investment here.

Recommendation

- **Launch and publicize BC's hydrogen strategy.**

² [Hydrogen Insights 2021 - Hydrogen Council](#)

Attachment 2: Low-cost Clean Hydrogen

Low-cost, clean hydrogen is the key enabler for the commercialization of hydrogen energy applications in transportation, heating, and industrial processing. Fortunately, it can and is being made available today around the world with current hydrogen production and distribution technology. Unfortunately, BC has lagged in access to hydrogen. This will need to change for BC to realize the full economic and environmental benefits of hydrogen energy.

The BC government is supporting hydrogen production projects by providing low carbon fuel credits and is evaluating direct financial support. Further support in de-risking demand and supporting Hydrogen Hub development is needed to stimulate additional investment.

Hydrogen Supply

Clean hydrogen supply is a critical need. This is best supplied via 3 overlapping and complementary methods:

1. Trucked High-Pressure Gaseous or Liquid Hydrogen
2. Onsite or Power-to-Gas Hydrogen
3. Hydrogen Hubs

This combination can cost-effectively supply BC's needs for transportation, heating, and industrial processing and as volumes grow sufficiently in coming decades can be connected via pipeline to form a regional grid.

Direct financial support and demand guarantees are needed to support investment in all three methods. This investment will lead to private sector investment.

Trucked High-Pressure Gaseous and Liquid Hydrogen

BC has a small high-pressure gaseous hydrogen distribution capability in the Lower Mainland centred around a small electrolyzer at Powertech. This is being expanded and other gaseous distribution centres are in development in Richmond, Prince George, and Nanaimo. Gaseous supply is suitable for small users such as early light-duty fueling stations and demonstration projects. However, distribution and handling costs make high pressure gaseous distribution uneconomical for larger users or longer distances.

For larger light duty stations and most heavy-duty applications, liquid hydrogen will be the optimal supply mode. It enables compact, high capacity and modest capital fueling stations for larger users. It is the direction most forklift, light-duty and bus fueling stations in the US are going. Liquid hydrogen plant capacity in the US is currently doubling as suppliers invest to meet growing demand – and unlike the liquid hydrogen plants of 50 years ago, the new capacity is predominantly low-carbon.

Currently, the closest liquid hydrogen capacity to BC is a new clean hydrogen plant being built by Air Liquide in Las Vegas NV – a US\$200 million investment. Ballard Power is currently BC's only liquid customer, supplied with liquid hydrogen from Linde's plant in California – an older plant with high carbon intensity. New large users could be supplied from the US for a period, but local liquid supply would be cheaper and more reliable.

A plant in BC could be low-cost and clean, supplying not only BC needs, but also the Pacific Northwest of the USA. Interest is growing among global industrial gas companies and BC companies to develop a project in North Vancouver. However, it will only happen if there is confidence in demand. That demand would quickly materialize if there were one or two significant transportation application projects. For example:

- 20+ buses with Translink or BC Transit
- A short-haul ferry project with BC Ferries
- A commuter rail project such as the West Coast Express, Squamish or Surrey LRT
- A heavy-duty truck project at the Port or connecting with AB or California.

Getting any such project underway will require provincial support.

Recommendations

- **Financial support to de-risk merchant plant construction**
- **The province and key government agencies to promote a flagship transportation project at a suitable Hub location: rail, marine and/or heavy-duty transportation to provide a baseload for merchant liquid hydrogen production**

Onsite or Power-to-Gas

Onsite or power-to-gas production is characterized by a large-scale hydrogen plant – electrolysis or other – directly connected to a large hydrogen user: e.g.: a refinery, gas blending or major transportation user: e.g.: Parkland refinery in Burnaby. These larger applications typically demand lower-cost hydrogen than can be supplied via trucked-in merchant hydrogen. However, they are often backed up with merchant hydrogen for the reliability of supply.

The major opportunities for growth of on-site production are:

- Power-to-Gas projects to meet BC's renewable content standards for natural gas.
- Bio-fuel or biochemical projects, similar to the Enkern project in Quebec.
- Large transportation applications with multiple vehicles: mines, large bus depots, major truck depots, etc.

It should be noted that large transportation companies: transit agencies, shippers, truck lines, often have no interest in owning and operating hydrogen plants and are often space, power or operator constrained. This opens the opportunity for third-party ownership and operation.

Hydrogen Hubs

A Hydrogen Hub combines onsite supply with 2 or more users connected via pipeline, building scale to lower cost. Such hubs have developed naturally around clusters of chemical and refining activity – such as in Sarnia and Edmonton. Since hydrogen cost is a major barrier, hubs are an opportunity to stimulate hydrogen energy deployment by clustering applications around a low-cost supply point.

The Hydrogen Strategy for Canada has identified the development of Hydrogen Hubs as a priority. They are an opportunity to accelerate deployment – particularly for trucking, bus, or other heavy-duty

applications where fuel cost will be a primary consideration and individual operators will not have the capability or interest to manage a hydrogen production operation.

Ideally, such applications are connected via pipeline to the Hub but integrating high-pressure gaseous distribution can extend the range of the hub to support local satellite fueling stations.

An established Hub could also support research and demonstration of pilot hydrogen production/application technologies and be used to develop and train skilled personnel. They are also seen as providing the backbone for an eventual regional hydrogen pipeline grid.

In BC, Hubs are being considered based on the following hydrogen production sites:

- The Lafarge plant in Richmond
- The Harmac Pacific pulp mill in Nanaimo
- The ERCO chlorate plant in North Vancouver
- The BC Chemicals plant in Prince George
- The Penticton First Nations location in Kelowna

Recommendations

- **Provide funding for the development of Hydrogen Hub projects**

Demand

Growing hydrogen demand is the flip side of the coin. With cost effective hydrogen supply in place, BC will be well positioned to stimulate demand. And BC has already put in place policy and incentives that will help grow demand in transportation and heating. Additional steps are needed which are discussed separately, but these are within the control of the province.

Demand risk is one of the biggest barriers to private sector financing. This is an area in which government backstopping will help unlock private capital for hydrogen infrastructure.

Recommendations

- **Capacity-based LCFR credits (the California model)**
- **Guaranteed offtake agreements at Hubs or from government agencies**

Attachment 3: Supporting Demand for Clean Hydrogen

Hydrogen and Fuel Cell Products and Hydrogen Fueling Stations are Coming.

Cost-effective hydrogen supply is needed to complement the hydrogen and fuel cell products and the hydrogen fueling stations that are being deployed in BC. Hydrogen products and processes are ready for commercial deployment or are coming quickly.

Fuel Cell Vehicles

Fuel cell electric buses and cars are already fully commercial electric vehicles that are on track to have lower lifecycle cost than battery, gasoline, or diesel vehicles, while offering zero emissions, lower maintenance, cold weather performance, longer range and fast-fill capability. We can expect the same performance and features for fuel cell electric trucks, trains, planes, marine vessels, and off-road equipment as they come available within the next few years.

Evaluation of Mix of Battery and Fuel Cell Vehicles

The goal is fleet electrification. It is not battery versus fuel cells; it is battery AND fuel cells versus internal combustion engines. Battery, trolley, and fuel cell electric vehicles complement each other, providing a complete solution for all transportation needs. In addition, the combination of a clean power grid and a clean hydrogen grid will provide the lowest overall cost for infrastructure to achieve net-zero 2050.

In recognition of this, fleet owners should be encouraged to choose the best solution for their operations based on economics, operational efficiency and total cost of ownership. Both approaches are zero-emission; both slash GHG emissions; both are on the path to net zero. Fleet operators should not be expected to parse the diminishing differences in GHG impact based on today's grid and hydrogen supply modes (which will change) or attempt to make misleading calculations of relative electrical efficiency.

In addition, fleets should consider full fleet conversion to net-zero. Greenwashing by deploying 2-3 battery vehicles on special routes is easy but may lead to a dead end. The same goes for natural gas conversions. Full fleet conversion to net-zero is much more difficult and usually, when full conversion costs are considered, including charging infrastructure, productivity, vehicles required, emergency coverage, etc., the result is a mix of battery and fuel cell vehicles.

Recommendations

- **Ensure provincial agencies: BC Ferries, BC Transit, Translink, etc. and municipalities to consider fuel cell electric vehicles for their fleets and require studies of full fleet conversion to net-zero to qualify for provincial funding support**
- **For fleet evaluations, update GHG calculation approach to reflect clean hydrogen capacity that is pending – not legacy high-carbon hydrogen supply that will be phased out**

Fuel Cell Vehicle Availability and Affordability

BC is a small market on the global scale. Work is needed to ensure fuel cell products are available in BC and that we are not at the back of the queue for this vital technology. To obtain support from OEMs for BC deployments, the most important issue is ensuring we have access to hydrogen. Fueling infrastructure is also key, especially for light-duty vehicles and trucks. Appropriate policy and incentive is also needed.

Hydrogen/diesel ICE vehicles can provide an important transition while fuel cell vehicles are developed, demonstrated, and deployed.

Recommendations

- **Continue and expand ZEV mandates/subsidies for light-duty and heavy-duty road and marine vehicles**
- **Engage with national working groups and municipalities in support of volume purchases of trucks, buses to ensure availability and reduce costs for FCEV**

Fueling Infrastructure

Hydrogen fueling stations and battery charging stations, both light and heavy duty are also coming, due in part to the leadership of the BC government with its funding support for light and heavy-duty stations.

Again, it is not hydrogen versus charging: both are needed to provide a complete electric vehicle solution. The combination will provide the lowest overall cost when considering the total cost to produce, distribute and dispense the energy. In the case of hydrogen fueling stations, they have the advantage that, while costly, they can fuel many vehicles, so as the numbers of vehicles increase, the cost per vehicle drops – to the point that for fleets of large vehicles, such as buses, hydrogen fueling is far cheaper than charging. With low-carbon fuel credits, hydrogen fueling stations can provide a positive business case. Over time, as vehicle number increase, HFS will be self-financing, eliminating the need for government support.

Of course, building the fleet numbers takes time and the fueling stations are needed in advance, so HyBC is grateful to the BC government for the support for the construction of hydrogen fueling stations.

Recommendations

- **Continue and expand light and heavy-duty hydrogen fueling station funding.**
- **Continue LCFS credits for fueling stations.**

Heating

There is ample room for growth in demand for clean hydrogen for heating applications, driven by BC's renewable content mandate for natural gas. Hydrogen/RNG content can increase and eventually displace natural gas. This will provide millions of BC residents and SME with the convenient and cost-effective choice for their path to net zero heating: electrification and/or net-zero gaseous fuel. With these options at their disposal, public acceptance of net-zero requirements will grow.

Recommendations

- **Continue and expand BC's renewable content mandate**
- **Set a target date for 100% net-zero gaseous fuel in BC's natural gas lines**
- **Implement regulations to prepare for a future 100% net-zero gaseous fuel:**
 - **Requirement for new gas pipelines to be hydrogen compatible**
 - **Requirement for new appliances to be dual-fuel compatible (hydrogen/natural gas)**

Attachment 4: Clean Hydrogen from All Production Pathways

A distracting issue has arisen in op-eds, conferences and letters to government that threatens to slow progress in hydrogen, to the detriment of achieving our critical climate change goals. That is the “green vs. blue” debate.

Some groups are asserting that only certain types of clean hydrogen are acceptable – hydrogen that is produced from renewable energy or “green” hydrogen. So-called “blue” hydrogen, produced from fossil fuels with carbon management, is not acceptable - even though it can be produced with low GHG emissions. There is no dispute that this will make clean hydrogen scarce and more expensive, but this is somehow deemed acceptable.

It should be noted that the world is in a climate crisis and hydrogen is a vital part of the solution and will account for as much as 25% of GHG reductions.

The biggest barrier to the adoption of hydrogen energy is cost. Restricting production pathways will stifle creativity, increase costs for Canadian and slow our transition to net zero. Equally important, it will prevent Canada exporting our low-cost energy resources as clean hydrogen other countries who do not have the energy resources to produce their own hydrogen – preventing them from transitioning to a low carbon future.

A scrutiny of hydrogen production pathways is called for, to certify and document the total emissions that occur in the production and distribution of hydrogen. But relying on “colour” is not appropriate. There are too many variables in the production and distribution pathways of all types of hydrogen to rely on simple classification. International standards are needed for what constitutes “clean” hydrogen and empirical measurement of the carbon intensity of each source to ensure it complies. Europe has already made a start on this. The Canadian federal government is participating through the International Partnership for Hydrogen Energy.

Optionally, the standards get progressively tougher over time. And there should be a steep cost – in terms of a price on carbon and/or clean fuel standard credits – on any residual GHG emissions.

Producers of blue hydrogen, or “clean” hydrogen from fossil fuels with carbon management, should expect scrutiny of the fuel production pathways, of the conversion process and of the carbon capture and management process – whether that is storage, use or production of chemicals.

One of the strengths of hydrogen is that it is inclusive. It benefits all industries, all sectors, all regions and can be produced from all our energy resources. The oil & gas industry that can produce low-cost, clean hydrogen from fossil fuels and stands to benefit from its sales. This will help in the transition of the sector. In addition, energy companies have the assets, the financial and the technical resources to make the transition to clean hydrogen possible and can thereby contribute to solving the problem that originated with coal, oil and gas extraction.

No production pathway is perfect and no industry blameless. The recent devastation caused by the overharvesting of balsa wood in the Amazon for wind turbine blades does not mean we should stop

making wind turbines. It means we should monitor, regulate as necessary and ensure it is done sustainably.

Developing fossil-based hydrogen will not adversely affect the future of the green hydrogen sector. There are too many regions of the world with low-cost renewable power where green hydrogen will be the low-cost way to produce – including Eastern and Northern Canada. This green capacity will build out over time and the costs will continue to come down – eventually to the point that it is the low-cost way to make hydrogen everywhere. Developing hydrogen infrastructure: pipelines, export terminals and (most importantly) demand on the back of fossil fuel hydrogen will benefit the buildout of renewable power and green hydrogen capacity.

Recommendation

- **Support production of clean hydrogen from all pathways**
- **Cooperate with the federal government on development of clean hydrogen standards**

Attachment 5: Exports of Hydrogen and Hydrogen-derived Products

Hydrogen

There is considerable activity globally related to international hydrogen exports due to the expectation it will grow to be a major energy commodity. Some regions: notably Europe, Japan and Korea, are jockeying to arrange low-cost supply chains for clean hydrogen imports. Many are emphasizing “green”, but pragmatically acknowledge that what they need is clean, low-cost hydrogen. Green is preferred as a long term solution, but it is not clear what premium they will be willing to pay – if any. Blue hydrogen is quite acceptable – especially if it can be delivered at low cost. This has even been acknowledged by Germany.

Other countries, notably Spain, Portugal, North Africa, Australia and Chile are striving to be supplier of choice, with Australia establishing an early lead due to its partnership with Japan to ship liquid hydrogen.

Of note is the recent Canada/Germany agreement to develop hydrogen supply from Quebec and Labrador for export to Europe. Other evidence this is real:

- The \$350 million Japan-Australia coal to liquid hydrogen project
- Australia’s investment in preliminary engineering for hydrogen export terminals
- Development of hydrogen transport ships by GEV, Kawasaki
- Rotterdam’s plans for 20 million tonnes/year of hydrogen imports

Considerable uncertainty remains about the specifics of how hydrogen will be shipped (liquid, gas or carrier) and how soon the market will develop. Some estimate that significant volumes will not materialize until post 2030. However, given the long lead time to develop customers and projects, if Canada wants to be a significant player – an objective of the Hydrogen Strategy for Canada - then action is needed in the short term. Plus, in the countries that are actively promoting exports, the activity around exports is prompting domestic activity and attracting investment in hydrogen.

Hydrogen-derived Chemicals

Activity in chemicals and biofuels derived from hydrogen is more concrete. The main reason is the supply chains and transportation methods are more mature.

- Air Products 1 GW power-to-ammonia plant in Saudi Arabia
- Enerkem’s \$0.9 B bio-methanol plant in Varennes
- Edmonton Global’s efforts to export “blue” ammonia

Challenge: Cost and Volume

It is quickly becoming apparent that countries are only taken seriously as hydrogen exporters if they can show a path to very large volumes at very low cost. For green hydrogen, that means GW-scale power directly connected and dedicated to hydrogen production. For blue hydrogen it means low-cost NG with access to large-scale CCUS.

For logistics, this requires pipeline access to a major export terminal. These are costly and take time to build.

Made-in BC Solution

BC can meet all of these requirements: faster and more cost-effectively than perhaps any other region in the world.

- Blue hydrogen can be sourced from Alberta – the world’s low-cost producer – or CCU/S capacity could be installed in Northeast BC or in combination with BC’s suitable mineral deposits.
- Green hydrogen could be made from dedicated large-scale wind production in the NE or offshore.
- BC’s existing low-cost hydro power is the key competitive advantage. It can be used to get initial projects underway, utilizing BC’s current surplus:
 - Initial production could be located on the coast in advance of pipeline construction from AB or northeast BC
 - As dedicated wind came online, hydro would be offloaded, to avoid tying up BC’s valuable hydro power in the long-term offshore hydrogen production
 - However, hydro power could still be used to smooth production enabling good electrolyzer utilization – a vital competitive advantage
- This combination provides multiple benefits:
 - Lowest cost and cleanest hydrogen in the world
 - Short-term use of BC’s surplus hydro
 - The ability to move quickly and develop a dominant position in green hydrogen supply – attracting investment and jobs
 - Enables development of BC’s wind resource – primarily to produce hydrogen but also able to supply BC grid needs when required
 - Allows BC to use its hydro resources in the most valuable way – as on-demand power able back up renewable power production in BC and the US.
- The combination of blue and green provides even more benefits as the world’s best source for the clean hydrogen:
 - Scale to build infrastructure (pipelines, terminals, ships)
 - The ability to meet customer preferences for production pathway
 - Massive global GHG reductions, realized through access to cost-effective hydrogen

Recommendations

- **Partner with AB and Canada to promote BC as the best source for clean hydrogen**
- **Fast-track development of an initial hydrogen export project in the Prince Rupert/Kitimat area using hydro power in partnership with importing nations – use to develop critical technology and knowhow in export technology**
- **State the government’s support for green and blue hydrogen production in the Northeast and a hydrogen pipeline to the Coast, taking advantage of the existing right-of-way for NG lines.**

MEDIA RELEASE: Surrey Board of Trade Says New BC Government Fund 'InBC' Means Opportunities for Surrey and the Cascadia Economic Region

From: Anita Huberman <anita@businessinsurrey.ca>
To: Anita Huberman <Anita@businessinsurrey.com>
Sent: April 27, 2021 11:52:19 AM PDT

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FOR IMMEDIATE RELEASE – APRIL 27, 2021

Surrey Board of Trade Says New BC Government Fund 'InBC' Means Opportunities for Surrey and the Cascadia Economic Region

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MORE INFORMATION: <https://news.gov.bc.ca/releases/2021PREM0030-000775>

-30-

Anita Huberman, 604-634-0342, anita@businessinsurrey.com

^[1] <https://news.gov.bc.ca/files/BC-Economic-Framework-2019-20.pdf>

^[2] https://blog.gov.bc.ca/app/uploads/sites/436/2019/02/CleanBC_Full_Report_Updated_Mar2019.pdf



**H. CAPTAIN (ROYAL CANADIAN NAVY) ANITA PATIL
HUBERMAN**
CHIEF EXECUTIVE OFFICER

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On the Territory of the Coast Salish Peoples

Strengthening the BC LCFS

From: Ian Thomson <ithomson@advancedbiofuels.ca>
To: John Horgan <premier@gov.bc.ca>, geoff.meggs@gov.bc.ca, Andrew.Cuddy@gov.bc.ca, christine.white@gov.bc.ca, Alyssa.Hrenyk@gov.bc.ca, rebecca.ponting@gov.bc.ca, nicole.e.hansen@gov.bc.ca, Hrenyk, Alyssa ENV:EX <Alyssa.Hrenyk@gov.bc.ca>, Hansen, Nicole E MCF:EX <Nicole.E.Hansen@gov.bc.ca>, Ponting, Rebecca JERI:EX <Rebecca.Ponting@gov.bc.ca>, OfficeofthePremier, Office PREM:EX <Premier@gov.bc.ca>, Cuddy, Andrew EMLI:EX <Andrew.Cuddy@gov.bc.ca>, White, Christine FIN:EX <Christine.White@gov.bc.ca>, Meggs, Geoff PREM:EX <Geoff.Meggs@gov.bc.ca>
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Sent: May 13, 2021 12:21:28 PM PDT
Attachments: LCFS Letter Premier.Ministers_13.05.2021.pdf

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Honourable Premier and Cabinet colleagues,

Please find attached a letter of support for updating and strengthening the BC LCFS. This will accelerate the adoption of clean fuels and incent new clean tech investments in the province and support the CleanBC objectives.

British Columbia's clean tech sectors strongly support the BC LCFS. Clean fuels, such as advanced biofuels, renewable natural gas/biogas, sustainable aviation fuel, electricity, and hydrogen, are the most effective carbon reduction tool in the CleanBC toolkit. We look forward to continued collaboration with the Province to support CleanBC and the LCFS.

On behalf of the signatories,

Ian Thomson
President, Advanced Biofuels Canada

To:
Honourable John Horgan, Premier of British Columbia
Honourable Bruce Ralston, Minister of Energy Mines and Low Carbon Innovation
Honourable George Heyman, Minister of Environment and Climate Change Strategy
Honourable Ravi Kahlon, Minister of Jobs, Economic Recovery and Innovation
Honourable Rob Fleming, Minister of Transportation and Infrastructure

Cc:

Honourable Selina Robinson, Minister of Finance

Honourable Lana Popham, Minister of Agriculture

Mr. Fazil Mihlar, Deputy Minister, Ministry of Energy, Mines and Low Carbon Innovation

Mr. Kevin Jardine, Deputy Minister, ENV

Ms. Bobbi Plecas, Deputy Minister, Ministry of Jobs, Economic Recovery and Innovation

Ms. Kaye Krishna, Deputy Minister, Transportation and Infrastructure

May 13, 2021.

Honourable John Horgan, Premier of British Columbia
Honourable Bruce Ralston, Minister of Energy Mines and Low Carbon Innovation
Honourable George Heyman, Minister of Environment and Climate Change Strategy
Honourable Ravi Kahlon, Minister of Jobs, Economic Recovery and Innovation
Honourable Rob Fleming, Minister of Transportation and Infrastructure

Dear Premier and Cabinet colleagues,

Re: CleanBC – Amending the Low Carbon Fuel Standard

Our organizations thank you again for setting new 2030 LCFS targets in July of last year, and for continuing to strengthen CleanBC to fulfil its key role in lower transportation emissions and the transition to a clean economy.

We are writing to encourage your continued work to strengthen the province's existing low-carbon fuel standard statute and regulation. Consultations in Fall 2019 were intended to provide new compliance options, to contain costs, and to create new revenue streams to build more clean fuel production and distribution capacity in BC. We believe that a modernized LCFS will enable full 2030 compliance and accelerate the pace of clean fuel investment in the province.

The clean transportation investments that our organizations support include a broad range of low-carbon clean fuels (advanced biofuels, biogas, electricity, hydrogen, sustainable aviation fuels), zero emission vehicles (electric and hydrogen fuel cell vehicles), cleantech innovations and infrastructure to supply fuels to power low carbon transportation in BC.

We are seeing mounting evidence that the LCFS regulation is a foundation for attracting private sector investment in zero- and low-emitting clean transportation in the province. Amending the regulation as soon as possible will provide sufficient lead time for energy-related investments to contribute meaningfully to our 2030 targets and support sustainable job creation in our green recovery.

We offer our ongoing support to meeting the province's climate objectives and economic goals, and look forward to our future discussions with you.

Sincerely,

[signatories below]

Cc:

Honourable Selina Robinson, Minister of Finance
Honourable Lana Popham, Minister of Agriculture
Mr. Fazil Mihlar, Deputy Minister, Ministry of Energy, Mines and Low Carbon Innovation
Mr. Kevin Jardine, Deputy Minister, ENV
Ms. Bobbi Plecas, Deputy Minister, Ministry of Jobs, Economic Recovery and Innovation
Ms. Kaye Krishna, Deputy Minister, Transportation and Infrastructure

Ian Thomson
President
Advanced Biofuels Canada



Mark Kirby
President & Chief Executive Officer
Canadian Hydrogen & Fuel Cell
Association



Daniel Breton
President & Chief Executive Officer
Electric Mobility Canada



Scott Stanners
Executive Director
BC Bioenergy Network



Merran Smith
Executive Director
Clean Energy Canada



Karen Tam Wu
Regional Director, B.C.
Pembina Institute



Jennifer Green
Executive Director
Canadian Biogas Association



Ian Bruce
Acting Executive Officer
David Suzuki Foundation



Marion Town
Director, Climate and Environment
Vancouver Airport Authority



Broader issues than new construction solar energy system rebates, Ref: 113752

From: info@rivervalleyranch.ca
To: EMLI EAED Correspondence EMLI:EX
<MEM.EAED.Correspondence@gov.bc.ca>
Cc: De Carolis, Laura EMLI:EX <Laura.DeCarolis@gov.bc.ca>,
ENV.Minister@gov.bc.ca, AGR.Minister@gov.bc.ca, Minister, AFF AFF:EX
<AFF.Minister@gov.bc.ca>, Minister, ENV ENV:EX
<ENV.Minister@gov.bc.ca>
Sent: July 12, 2021 10:11:47 PM PDT
Attachments: 568488413.png

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Dear Mr. Gosman,

Thank you for writing. Yes, I am happy that my petitioning that began in 2020 has seemingly spearheaded a change in Clean BC policy regarding energy efficiency support for new off-grid homes in 2021. Ms. de Carolis has provided exceptional help and support in this regard.

The rest of the policies I still find wanting. Since there has already been much support for indigenous communities through various government grants for PV solar systems, this is obviously seen as a priority for the province. Off-grid farms should be prioritized for electrification as well, and this includes our buildings/processing systems/irrigation/ and tractors/equipment charging stations.

The example of the off-grid farm being the only system left standing in Lytton and providing emergency help, food and services to the community demonstrates real life utility. Reducing farm use of diesel is so much more impactful than a tweak to a city home already on the "clean energy" BC Hydro grid.

Following on that, I fail to comprehend the link between on one hand having surplus BC Hydro "clean energy" and then offering various incentives to use less BC Hydro "clean energy" with supporting heat pumps but not supporting use of solar energy (whether it be PV or thermal collectors). This seems a very clear issue for those who would otherwise have to use diesel.

Whole farm communities and ALR land were buried and continue to be buried in the creation of "clean energy" to have this Hydro surplus. That is close to home for us as it includes what was buried under our own Kootenai Reservoir and the continued ripping away of more ALR land year after year with mismanagement of existing dam levels. Why would the province not prioritize better support for what little farm land and farm operations we have in BC?

It could go beyond the narrow "net zero" concept BC has subscribed to.

Sincerely,

Aileen Collings

River Valley Ranch

Fort Steele, BC

Tel. (250) 333-8807



On Mon, 12 Jul 2021 21:38:17 +0000 "EMLI EAED Correspondence EMLI:EX" wrote:

Ref: 113752

Aileen Collings

Dear Ms. Collings:

Honourable George Heyman, Minister of Environment and Climate Change Strategy forwarded to the Ministry of Energy, Mines and Low Carbon Innovation a copy of your March 26, 2021 email regarding the CleanBC Better Homes New Construction Program and the availability of solar energy system rebates.

Firstly, thank you for building a high-performance farmhouse powered by clean energy. As you may know, the Province's CleanBC plan aims to make every building more efficient by improving the BC Building Code and increasing efficiency standards until every new building is "net-zero energy ready" by the year 2032. Owner builders such as yourself are helping achieve this goal.

I understand your frustration with the lack of rebates for electric, high-performance homes in areas of the province that are not connected to the electricity grid. The Province's intent is to offer rebates to all residents of British Columbia. I am pleased to inform you that the CleanBC Better Homes New Construction Program is now able to provide rebates for eligible homes in off-grid areas where customers will not be establishing a utility account. I understand that Laura De Carolis, Senior Energy Efficiency Coordinator - Residential, has followed-up with you by email to further discuss next steps, including how to submit your application.

You've also identified that there is a lack of provincial incentives for solar energy systems. BC Hydro currently has a surplus of highly reliable, low cost, and clean electricity. This surplus is enough to move us towards our CleanBC goals in the near and medium term. In grid-connected areas, installing a solar energy system would have minimal greenhouse gas (GHG) emissions benefits. As such, neither the Province nor utilities offer incentives, grants, or discounts for the purchase and/or installation of other types of alternative electricity generation, such as solar panels.

I recognize that there are GHG emission savings benefits from installing solar energy systems in areas that would otherwise use diesel power. British Columbia provides a provincial sales tax exemption on certain renewable energy equipment, including but not limited to solar energy equipment and wind-powered generating equipment. For details, please see Bulletin PST 203 - Energy, Energy Conservation and the ICE Fund Tax (pg. 10), available at: <https://www2.gov.bc.ca/gov/content/taxes/sales-taxes/pst/publications>.

Additionally, through the Canada Greener Homes Grant, the Government of Canada recently announced funding for energy efficiency, resiliency measures, and solar PV system rebates through the Canada Greener Homes Grant. However, please note that these new rebates are only available for existing homes, defined as greater than six months old based on the date of occupancy of the first homeowner. For more information, please visit: www.canada.ca/greener-homes-grant.

I hope this explanation is helpful to you and look forward to your CleanBC Better Homes New Construction Program application. Thank you for writing and sharing your views.

Sincerely,

Nat Gosman

Executive Director – Built Environment Branch

Electricity and Alternative Energy Division

Ministry of Energy, Mines and Low Carbon Innovation

FEDERAL-PROVINCIAL-TERRITORIAL MINISTERS OF AGRICULTURE
4th PROGRESS REPORT ON THE PAN-CANADIAN FRAMEWORK ON CLEAN
GROWTH AND CLIMATE CHANGE
2020

1. INTRODUCTION

In December 2016, First Ministers adopted the Pan-Canadian Framework on Clean Growth and Climate Change (PCF).¹ The PCF builds on early actions of provincial and territorial governments to reduce greenhouse gas (GHG) emissions, and identifies further actions to be taken across all regions and sectors of the economy, including the agriculture sector, in order to contribute to meeting Canada's emissions reduction target; and seize the economic opportunities associated with clean growth.

The PCF is built on four main pillars:

- Pricing carbon pollution²;
- Complementary actions to further reduce emissions across the economy;
- Measures to adapt to the impacts of climate change and build resilience; and,
- Actions to accelerate innovation, support clean technology, and create jobs.

Federal-Provincial-Territorial (FPT) Ministers of Agriculture recognize that governments have an important role to play to support farmers and agri-food producers to reduce greenhouse gas (GHG) emissions and adapt to climate change. This Fourth Annual Progress Report on Agriculture outlines the agriculture-related actions identified in the PCF and builds on the achievements identified in the previous three annual progress reports.

Canadian farmers and ranchers have long been responsible stewards of the land, and can be part of the transition to a low carbon, climate resilient economy by improving production efficiency and increasing agricultural soil carbon, among others. They have already taken actions to mitigate agricultural GHG emissions, which account for 10% of Canada's total emissions.

Significant achievements to date include:

- Canada is one of few countries that can report both slightly declining emissions since 2005 combined with a net carbon sink from agricultural soils.
- Total agricultural emissions (i.e. from livestock, crops and on-farm fuel use) have been relatively stable since the mid-1990s despite significant growth in production over the same period, indicating decoupling between emissions and production. In 2018, Canadian agriculture

¹ Saskatchewan has not signed on to the PCF, and Alberta and Ontario have since withdrawn from the agreement.

² The federal carbon pricing backstop, which has been in place since January 1, 2019, applies to provinces and territories that choose to adopt it or that propose approaches that do not meet federal stringency requirements.

generated 50% fewer GHG emissions for every dollar of GDP that it generated, compared with 1997.

- Agricultural soils have been removing carbon from the atmosphere since the 1990s due to widespread adoption of land management practices such as no-till, conservation tillage and reduced use of summerfallow. According to the most recent data, agricultural soils were removing slightly more than 6 million tonnes of carbon dioxide equivalent (Mt CO₂e) in 2018, offsetting roughly 8% of annual agricultural emissions.
- Improvements in feeding and breeding lowered emissions by 15% per kilogram of beef over the past 30 years, reducing pressure on land and water at the same time. Similar declining emission intensity has been measured for other livestock.
- Through investments in innovation and sustainable land management practices, recent crop yields have shown more resiliency under severe weather conditions (e.g. drought) when compared to similar conditions in the late 1980s.

Further growth of the sector, for example to meet the ambitious goal set in the Federal Budget 2017 to grow Canada's agri-food exports to at least \$75 billion annually by 2025, while mitigating impacts on climate change, represents an important challenge for continued GHG reductions in the sector. The agricultural measures announced in December 2020 as part of the Government's Strengthened Climate Plan, "A Healthy Environment and a Healthy Economy," will assist the sector in meeting these goals. For example, funding aimed at the development and adoption of innovative, clean technologies, such as those related to precision agriculture, will help the sector tackle this challenge by enhancing carbon storage in soils and lowering GHG emission intensities associated with fertilizer use or with animal production. Also as part of the Strengthened Climate Plan, the Government announced Agriculture and Agri-Food Canada will establish a new Agricultural Climate Solutions program to support the sector's actions on climate change and other environmental priorities towards 2030 and 2050. The agriculture sector can also contribute to GHG emissions reductions through the provision of agri-based bioproducts (e.g. bioplastics, renewable fuels) that can replace emission intensive fossil fuel based inputs.

In parallel, climate change effects on production conditions (e.g., temperatures, precipitation patterns, extreme weather events) are impacting Canadian farmers. Increased risks are anticipated from more frequent and/or intense droughts, floods and wildfires, or from changes in pests, diseases and invasive species occurrences. Conversely, longer growing seasons and an increase in temperature could offer opportunities for diversification in the crop mix and the expansion of crops into non-traditional areas, as well as an extended grazing season.

2. PROGRESS ON AGRICULTURE-RELATED PAN-CANADIAN FRAMEWORK ACTIONS

The PCF identifies the following agriculture-related actions under the pillar of *Complementary actions to further reduce emissions across the economy*:

- **Increasing stored carbon** in agricultural soils to partially offset emissions from the sector: FPT governments work together to protect and enhance carbon sinks, including in forests, wetlands, and agricultural lands. By supporting beneficial management practices (BMPs), governments

assist farmers to enhance carbon sinks through actions such as increasing permanent cover crops, better crop rotations, and conservation tillage;

- **Generating bioenergy and bioproducts** to displace emissions in other economic sectors: FPT governments work together to identify opportunities to produce renewable fuels and bioproducts. Farmers can supply biomass for bioproducts that can be used in place of fossil fuels in other sectors or as feedstocks for renewable energy. Government programming contributes to this transition to a low carbon economy; and
- **Advancing innovation** in GHG-efficient management practices to reduce agricultural emissions and emission intensity: FPT governments work together to enhance innovation to advance GHG-efficient management practices in agriculture. Government investments in research and technology adoption enable farmers to reduce emissions from agriculture through new technologies being developed for livestock and crop production, including precision farming and “smart” fertilizers which time the release to match plant needs, and feed additives and inhibitors that reduce methane production in cattle.

Governments are investing to take action in these three priority areas, which cover the spectrum of GHG mitigation options in the sector. The Canadian agriculture and agri-food sector’s contribution to the agriculture-related actions identified in the PCF are currently delivered primarily through the five-year Canadian Agricultural Partnership (Partnership) (2018-2023) and further supported through additional, complementary measures to the Partnership.

The Canadian Agricultural Partnership

For over 15 years, FPT agriculture policy frameworks have enhanced policy and regulatory coherence, and ensured a collaborative approach that encourages investment, adaptation and sustainable growth in the sector.

Building on past successes, FPT Ministers of Agriculture launched the *Canadian Agricultural Partnership* (the Partnership) on April 1, 2018. The five-year (2018-2023), \$3 billion investment is designed to strengthen the agriculture, agri-food and agri-based products sector, while ensuring continued innovation, growth, and prosperity.

Three priority areas are identified in the Partnership, all with relevance to the PCF:

- **Growing trade and expanding markets** - Helping the sector to improve competitiveness, growth and adaptability;
- **Innovative and sustainable growth in the sector** - Enhancing the competitiveness of the sector through research, science and innovation, and adoption of innovative products and practices, with an emphasis on the environment and clean growth; and
- **Supporting diversity and a dynamic, evolving sector** - Strengthening the sector by better reflecting the diversity of Canadian communities, enhancing collaboration across different jurisdictions, securing and supporting public trust in the sector, and improving client services.

Over the course of the Partnership, PCF climate actions are being supported by three types of programs:

- **Federal-only programs** that help support resiliency and sustainability of the sector through science, research and adoption of innovative practices and technologies (\$1 billion over five years);
- **FPT cost-shared on-farm programs**³ delivered by provinces and territories (PTs) that build producer awareness of environmental risks and accelerate adoption of technologies and practices to reduce these risks (\$2 billion over five years); and
- **Business Risk Management (BRM) programs** that are demand-driven and help farmers manage significant risks threatening the viability of their operations (approximately \$1.5 billion per year).

The approach adopted by the Partnership focuses efforts on combining on-farm actions with science and innovation in order to address emissions, strengthen resilience, and support growth to help meet a growing global food demand.

The suite of specific programs under the Partnership which support actions to protect and enhance carbon sinks in agriculture, generate bioenergy and bioproducts, advance innovative GHG-efficient management practices, and support climate resilience in agricultural production systems include the following:

- FPT cost-shared on-farm environmental stewardship programs delivered by PTs to support Environmental Farm Plans and adoption of BMPs which have multiple environmental benefits, including soil and water conservation, reductions in emissions and emission intensity, and climate resilience. All provinces support on-farm actions through such programs. Based on analysis conducted in 2020, in the first year of the Partnership (2018-19), farms across Canada implemented over 1800 BMPs that contributed to climate change mitigation and approximately 1200 BMPs addressing climate change adaptation.
- The **AgrilInnovate** program aims to accelerate the commercialization, adoption and/or demonstration of innovative products, technologies, processes or services that increase sector competitiveness and sustainability. Priority areas under AgrilInnovate include: adoption of new or world leading clean technology, including precision agriculture; and increased productivity through advanced manufacturing, automation or robotics.
- The **AgriScience** program aims to accelerate the pace of innovation by providing funding and support for pre-commercial science activities and cutting-edge research that benefits the agriculture and agri-food sector and Canadians. Priority areas under AgriScience include: addressing environmental challenges and adaptation to changing climate, agricultural impacts on air, water and soil; reducing GHG emissions; transforming agricultural products into biofuels; and water management and soil management.

³ FPT cost-shared programs are funded on a 60:40 basis between federal and PT governments.

- The **AgriDiversity** program supports workshops and seminars for youth, women, Indigenous Peoples and other under-represented agricultural producers, to learn about climate-resilient practices, equipment and technologies.

3. GAPS, CHALLENGES AND OPPORTUNITIES

Agriculture is a diverse sector characterized by different types of production systems and growing conditions. Agriculture is also a shared jurisdiction, with provinces and territories essentially being responsible for land use planning and management of natural resources used by agriculture. Unlike many other sectors, most agricultural emissions at the primary production level do not come from energy use but result from biological processes which limits the opportunities for substitution toward low-emitting inputs and production processes.

Opportunities for absolute emissions reductions are regionally variable. Agriculture is only a significant source of GHG emissions for select provinces, including Saskatchewan, Manitoba, and Prince Edward Island. In all other provinces, the agriculture sector's contribution to provincial total emissions was approximately 10% or less.⁴

In order to achieve emission reductions in 2030 relative to 2005 levels, the sector must continue to adopt practices that limit emissions arising from animal and crop production, as well as on-farm fuel and energy use. Emission-declining trends in animal production need to continue through scientific research and innovation into livestock feed and nutrition, as well as animal genetics and breeding. The decarbonization of on-farm fuel use needs to be accelerated, while a trend of increasing emissions in crop production and declining rate of carbon sequestration need to be reversed.

To this end, measures announced as part of the Government of Canada's Strengthened Climate Plan will support emissions reductions in the sector. These measures include a goal to set a national emission reduction target of 30% below 2020 levels from fertilizer application, and funding for a renewal of the Agricultural Clean Technology Program to help reduce emissions associated with livestock production, on-farm fuel or energy use, and crop production.

Additional carbon storage potential in agricultural soils still exists but is relatively limited considering that more than 80% of land prepared for seeding is already under no-till or conservation tillage. Further gains in stored carbon could be made through a variety of agronomic practices, including cover crops, agroforestry, shelterbelts, riparian buffers and improved grassland management. In order to help Canada's farms increase soil carbon sequestration and realize other environmental benefits, the Agricultural Climate Solutions program, announced in November 2020, will support the sector's actions on climate change and other environmental priorities towards 2030 and 2050.

In the medium to long term, some innovative clean technologies hold promise for further emission reductions in the crop sector (e.g. bioengineering, smart fertilizers, sensors, robotics and artificial intelligence), livestock sector (e.g. selecting lower-methane-producing ruminants, developing methane inhibitors, feed supplements, and improving grazing management), and on-farm fuel use (development and commercialization of off-road electric vehicles). The agriculture sector can also contribute to GHG emissions reductions through the provision of agri-based bioproducts (e.g. bioplastics) and renewable fuels that can replace emission intensive fossil fuel based inputs. As future regulation such as the Clean

⁴ *National Inventory Report, 1990-2018: Greenhouse Gas Sources and Sinks in Canada (NIR 2020)*

Fuel Standard will require increased blending of ethanol and biodiesel, it may provide opportunities for an expanded production of those fuels and feedstocks (e.g., corn, wheat, canola, soy, and biogas from anaerobic digestion).

The application of innovative policy tools (e.g. nudge economics, market-based instruments) may enable further emission reductions beyond those achieved through current incentive-based approach for the adoption of BMPs. Green infrastructure (e.g., wetlands) on agricultural lands can also contribute to broader Government of Canada priorities such as biodiversity conservation, carbon sequestration, water quality, and enhanced flood control, although wetlands can also be a significant source of methane emissions.

4. NEXT STEPS

The Partnership started on April 1, 2018 and will be in place until March 31, 2023. Federal-only and FPT cost-shared programs supporting climate actions in the agriculture sector under the Partnership have been open for applications. Details on the activities and projects funded by complementary programs under the Partnership that have been initiated are available in this report while others will be included in future progress reports.

ANNEX – DETAILED ACTIONS DELIVERED BY FEDERAL, PROVINCIAL AND TERRITORIAL GOVERNMENTS

Measures to support climate actions and clean technologies in the agriculture sector are not limited to the ones initiated under the Partnership. Provinces and territories have various programs and initiatives complementing efforts supported by the Partnership. The focus of these programs and initiatives range from nutrient management and energy efficiency to grassland conservation, local food strategies and agricultural diversification.

GOVERNMENT OF CANADA

Federal programs and initiatives outside of the Partnership that will also contribute to progress on agriculture-related actions identified under the PCF include:

- The **Agricultural Greenhouse Gases Program** is a five-year investment (2016-2021) intended to enhance the understanding and accessibility of agricultural technologies, BMPs, and processes that can be adopted by farmers to mitigate agricultural GHG emissions in Canada. Most projects are led by Canadian universities across the country and fall under one or more of the following four priority areas: livestock systems, cropping systems, agricultural water use efficiency, and agroforestry. This program will end in 2021.
- The **Agricultural Clean Technology (ACT)** program is a three-year investment (2018 – 2021) which aims to support the research, development and adoption of clean technologies through investments in, and promotion of precision agriculture and agri-based bioproducts. These technologies have helped to reduce GHG emissions, generate a wide range of positive impacts, and promote sustainable and clean growth. As the ACT program ends on March 31, 2021, it required that all completed applications were to be submitted by September 30th, 2020 to go forward to application review. As of December 31, 2020, the ACT received a total of 30 applications. Of these, 18 were deemed as complete application packages from which a total of 12 projects have been approved for funding
- A five-year \$70M investment in agricultural discovery science and innovation (2018-2023), announced in Budget 2017, is helping to address priorities such as climate change, soil and water conservation, and biodiversity. Of this investment, \$44M is dedicated to hiring the next generation of federal research scientists and science professionals in emerging fields of agricultural science. The investment also supports the **Living Laboratories Initiative**, an integrated approach to agricultural research that brings farmers, scientists and other stakeholders together to co-develop, test and monitor new practices and technologies on farms. The result of this investment will be more practical technologies and sustainable farming practices adopted more quickly by Canadian farmers. To date, three Living Labs sites have been launched, with the most recent in December 2020 in Quebec.
- The **Canadian Agricultural Strategic Priorities Program** is a \$10 million per year program that, over 5 years (2019-2024), will provide non-repayable contribution funding to facilitate the agricultural sector's ability to address emerging issues and capitalize on opportunities. One of the four priority areas focuses on environmental sustainability with consideration being given to projects that develop or enhance greenhouse gases reduction assessment tools, test innovative

economic models in carbon capture identification and experimental management within the sector, and investigate opportunities for the agriculture sector to provide climate change solutions to other sectors.

- As part of the Government of Canada's Strengthened Climate Plan, *A Healthy Environment and A Healthy Economy*, announced on December 11, 2020, the Government of Canada will invest \$165.7 million over seven years to support the agriculture industry in developing transformative clean technologies and help farmers adopt commercially available clean technology.
- Canada's farms have significant potential to increase soil carbon sequestration and realize other environmental benefits through the adoption of BMPs. In the Fall Economic Statement on November 30, 2020, the Government announced a proposal to provide \$98.4 million over ten years, starting in 2021-22, with \$1.6 million in remaining amortization, to Agriculture and Agri-Food Canada to establish a new Agricultural Climate Solutions program. This fund will leverage \$85 million in existing programming and will be guided by a new Canadian Agri-Environmental Strategy to be developed in collaboration with partners to support the sector's actions on climate change and other environmental priorities towards 2030 and 2050.
- The **Low Carbon Economy Fund**, **Low Carbon Economy Leadership Fund**, and the **Climate Action Incentive Fund** have supported a number of agriculture and agri-food related projects being implemented in several provincial jurisdictions. As of January 2021, there are 172 active funding agreements under CAIF, and seven projects are either active or being finalized under the Low Carbon Economy Fund streams.

Additional details specific to provincial and territorial measures aimed at supporting climate actions in complement to the ones under the Partnership are included below.

GOVERNMENT OF BRITISH COLUMBIA

Provincially, the *Climate Change Accountability Act* commits B.C. to emissions reduction targets of 40% by 2030, 60% by 2040, and 80% by 2050, from 2007 levels. The province's flagship \$908M climate plan, CleanBC, provides a pathway to reduce climate pollution while creating opportunities throughout the province. Agriculture-related measures under CleanBC include development of biofuels and diversion of 95% of organic waste from landfills. The B.C. Ministry of Agriculture, Food and Fisheries (MAFF), through the Canadian Agricultural Partnership (CAP), funds programs that support the implementation of the Pan-Canadian Framework on Clean Growth and Climate Change and CleanBC. These programs contribute to agriculture sector adaptation and resilience, development of clean technology and enhancement of carbon sinks, and growth of sustainable farm businesses. Highlights are discussed below.

Environmental Farm Plan Program (EFP) [\$5.0 M CAP] & Beneficial Management Practices Program (BMP) [\$6.5 M CAP] – In 2020, B.C. invested \$2.34 million in the Environmental Farm Plan (EFP) Program and Beneficial Management Practices (BMP) Program to support the completion of 200 new EFPs and renewal of an additional 148 EFPs, using an updated planning workbook that strengthens integration of climate adaptation and mitigation into EFP planning under CAP. The Beneficial Management Practices Program provided cost-share funding to more than 230 projects to adopt on-farm practices that

contributed to GHG reductions, carbon sequestration, and climate adaptation. Results include: 28 irrigation management plans and 18 irrigation management projects, selected to increase water use efficiency (adaptation); 26 nutrient management plans, helping to optimize nitrogen use to reduce nitrous oxide emissions (mitigation); 18 projects that achieve carbon dioxide emissions reduction through energy efficiency improvements (mitigation); 62 riparian management plans and 27 related BMP projects, including riparian habitat establishment (plantings) projects (mitigation and adaptation); and, 22 grazing management plans to increase soil health and storage of carbon.

A further \$1.9M has been invested for FY 2020/21, of which \$1.6M was invested via B.C.'s 2020 Economic Recovery Plan in support of the On-Farm Innovation Top Up program that promotes implementation of BMPs that help mitigate the impacts of climate change.

Agri-Innovation Program [\$25.8 M CAP] – Since the beginning of CAP, this program has invested over \$1.6M in bioproducts, biogas, and clean technology development for the sector. One project is exploring the potential of seaweed as a cattle feed additive, to reduce methane emissions from enteric fermentation. In 2020 under the CAP agreement, the Canada-BC Agri-Innovation Program (CBCAIP) invested an additional \$2.375M in bioproducts and clean technology projects in the agriculture and agri-foods sector, totalling \$2.9M since the start of CAP. Similarly, the Provincially Significant Projects Program (PSP) invested an additional \$1.0M in FY19/20, totalling \$2.1M since the start of CAP. Under the Partnership, an estimated \$18M will be invested in these two agri-innovation programs, and additional projects that support clean technology in the agriculture sector are expected. Both the Canada-BC Innovation Program and Provincially Significant Projects Program are continuing to accept applications and implement projects through to 2023.

MAFF is investing \$0.7M annually in the enhanced Nutrient Management Program, which supports farmers to manage nutrient application in order to reduce GHG emissions and protect drinking water quality. In 2020, the online application risk management (BC ARM) tool was further developed and improved to support decision-making regarding nutrient management application during shoulder seasons in high precipitation areas. The Ministry has recently completed a biogas handbook to help guide producers in developing new biogas projects. Through the CleanBC Industry Fund for large industrial emitters, two large greenhouses were successful in accessing a combined \$900,000 funding for energy-efficiency upgrades and thermal curtains.

While the aforementioned programs are indicative of progress towards achieving agricultural emissions reduction and enhancing carbon sinks, gaps still exist with respect to estimating, measuring and tracking levels of these emissions in relation to agricultural sub-sectors and farm practices. To address this, MAFF has initiated a project led by the UBC Sustainable Agriculture Landscapes Lab, to identify and assess practices and technologies with the greatest potential to reduce net agricultural GHG emissions in the B.C. context. Linking carbon accounting to farm practice is foundational work that will enable MAFF to support BMPs and technologies that lead to targeted GHG emission reductions for the sector.

CleanBC also includes a commitment to develop a B.C. climate change adaptation strategy based on a province-wide climate risk assessment published in 2019. MAFF participated in inter-agency work to develop the adaptation strategy throughout 2020. Looking ahead, B.C. recognizes the need for investment in adaptation for the agriculture sector to take advantage of season extension and to manage climate change risks such as wildfire, drought, heat, flooding, and pests.

Adaptation is a clear climate priority for the sector, with over \$12M invested in the Ministry's industry-led Climate Change Adaptation Program since 2013 [\$6.6M in CAP], which is delivered through Climate & Agriculture Initiative BC. The Regional Adaptation Program continues to expand its coverage, with the Vancouver Island Regional Adaptation Strategy completed in 2020, and with 22 CAP-funded projects completed, initiated or underway to address the priority adaptation priorities identified in seven other key agricultural regions of the province. The program has considerable strength due to its multi-partner collaborative approach, which actively engages local producer communities, industry organizations, NGOs and governments in the development of the regional strategies and implementation projects. It is anticipated that another 5 to 10 projects will be completed by 2023 in the 8 regions covered by Regional Adaptation Strategies.

Building on projects and resources developed in B.C.'s agricultural Regional Adaptation Program and lessons learned from the 2017 and 2018 B.C. wildfire seasons, B.C.'s climate change adaptation program is rolling-out provincial-scale agricultural wildfire preparedness and mitigation initiatives funded through CAP. In 2020, wildfire preparedness workshops were delivered to agricultural producers in 5 communities, bringing together over 125 producers, wildfire response and emergency management personnel, local government representatives, and provincial agency staff. Complementary to this, in partnership with MAFF and provincial agencies, the BC Cattlemen's Association is testing and piloting the use of grazing to reduce fine fuels in areas surrounding communities. This collaborative approach to adaptation yields synergistic benefits by reducing wildfire fire risk near communities and allowing ranchers to access new forage. Wildfire preparedness workshops aimed at training professionals who can provide one-on-one outreach/support to farmers and ranchers are being planned for 2021/22 and funded through B.C.'s Community Resiliency Investment program.

The Farm Adaptation Innovator Program funds multi-year applied research and demonstration projects that help producers adapt to the impacts of climate change. This program is investing \$1.5M during CAP in 12 climate adaptation applied multi-year research projects, which include several practices investigating enhancement of soil carbon sinks. Current research topics include: modelling wine-grape phenology, deficit irrigation in fruit orchards, on-farm research templates, innovative pasture rejuvenation practices, improving soil management for soil moisture and carbon sequestration, on-farm pest management, and greenhouse innovations for season extension. This program has a strong collaborative focus, with most projects involving partnerships between producer cooperators, researchers, industry associations, educational institutions, and technical experts. Projects approved through FAIP will be underway through to 2023.

B.C.'s Food Security Task Force findings and recommendations report released in 2020 includes recommendations for using technology and innovation to continue strengthening the agriculture sector while addressing climate change.

GOVERNMENT OF ALBERTA

Alberta continues to make progress towards meeting climate change goals. With Alberta's repeal of its carbon levy in May 2019, funding decreased for climate-related programs. Programs were re-organized, with some programs terminating (Farm Energy and Agri-Processing Program and On-Farm Solar Photovoltaics Program) and one new program introduced (Efficient Grain Drying Program).

Alberta's regulated offset system continues under Alberta's Technology Innovation and Emission Reduction program. Alberta's offset program existed under the Specified Gas Emitters Regulation and

the Carbon Competitiveness Incentive Regulation, and provides opportunities for ranchers and farmers to be financially compensated for adopting beneficial management practices that sequester carbon and reduce emissions. Since Alberta's offset system was introduced in 2007, the Conservation Cropping protocol, which incents no-till management, has been the most popular. Alberta has also operationalized offsets for micro generation, fed cattle and biogas. We continue to examine opportunities to develop new agricultural offset protocols.

GOVERNMENT OF SASKATCHEWAN

Saskatchewan continues to fulfill commitments made in ***Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy***. In June of 2020, the province released its second annual Climate Resilience Progress Report. The report identifies targets, baselines, historical trends and the current status for 25 measures of resilience, five of which are focused on the agriculture sector. These are:

1. Total area of agricultural land under permanent cover in Saskatchewan;
2. Total amount of soil organic matter sequestered in cultivated land;
3. Percentage of agricultural land area with a 4R nutrient stewardship plan;
4. Realized net farm income; and
5. Percentage of cultivated land in different types of crops.

Targets are laid out for each of the measures within the framework, and government will continue to report on progress towards each of the targets annually. The province is also planning to hold consultations and develop guidance documents, standards, and the registry in preparation for the rollout of the provincial offset program in 2022.

Investments in **research and development** are leading to new innovations for climate change mitigation and adaptation. In 2019, the Ministry of Agriculture along with the Government of Canada announced \$11 million in funding for 47 crop-related research projects through the Agriculture Development Fund (ADF) for projects in subject areas such as disease control, herbicide resistance, and crop breeding which can help to build climate resilience into the crops sector. In total, ADF has invested over \$7.5 million between 41 projects with various environmental themes related to climate change from 2013 to 2020.

Under the Canadian Agricultural Partnership (CAP), the Ministry also provided funding in the 2019-20 fiscal year to the following research institutes and initiatives:

- The Crop Development Centre which is contributing to the development of new crop varieties which may be better suited to a changing climate;
- The Global Institute for Food Security which works to improve the efficiency of crops such as wheat and canola and developing crops with improved drought tolerance;
- The new Livestock and Forage Centre of Excellence which researches improvements in livestock operations, forage production, and grazing land, and
- The Prairie Agriculture Machinery Institute which conducts innovative research in machine technology.

The Ministry offers Environmental Sustainability and Climate Change **programming and extension** support. CAP includes funding for the Farm and Ranch Infrastructure Program (FRWIP) to support the development of secure and sustainable water sources for agriculture. The Farm Stewardship Program provides financial assistance to producers to implement beneficial management practices (BMPs). BMPs such as variable rate mapping and permanent tame and native forage can reduce greenhouse gas

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emissions, sequester carbon, and support resilience. From April 1, 2018 to December 31, 2020, 2,344 FRWIP projects and 907 BMPs were funded. Ministry extension services support producer adoption of BMPs and improved practices and technologies.

In July of 2020, the Saskatchewan government announced the first steps of a generational project that would expand irrigation out of Lake Diefenbaker by 500,000 acres. This project will help to increase drought resilience for the agriculture industry. The Ministry also continues to invest in increased adaptation to climate change through irrigation development programming. From April of 2018 to December of 2020 the Ministry of Agriculture's Irrigation Program provided over \$5 million to 102 irrigation projects, including 39 development and 63 efficiency projects. Additionally, 9,200 acres of irrigation were developed in 2020. This development was both inside and outside irrigation districts.

Saskatchewan producers continue to adopt **improved practices and technologies** that support resilience and emissions reductions. For example, acres in summerfallow have dropped by 94 per cent from 1990 to 2020. Pulse acres have increased significantly from about 400,000 acres in 1990 to 6.38 million acres in 2020, which lowered agricultural emissions from fertilizers by about 2.3 million tonnes. Acres in zero and minimum till have increased from 36 per cent in 1991 to 93 per cent in 2016. In 2018, cultivated agricultural soils sequestered 9.5 million tonnes of CO₂ equivalent. Improved beef and hog efficiencies continue to reduce per unit greenhouse gas emissions.

The Ministry is updating its Environmental Farm Plan (EFP) to provide a more user-friendly tool that will help producers prepare to meet emerging sustainable sourcing requirements in the marketplace. The Ministry's extension staff works to encourage adoption of beneficial management practices, and uptake of the Environmental Farm Plan. Development of the new EFP is ongoing. A final product is expected by the end of 2021.

GOVERNMENT OF MANITOBA

Manitoba established the \$50 million Wetlands GROW Trust in 2020, bringing Manitoba's total investment in trusts that support ecological goods and services to \$204 million. Up to \$8.6 million in interest generated from the Conservation Trust, the GROW Trust, and the Wetlands GROW Trust will be awarded to successful applicants in 2021, supporting wetland restoration and conservation, water retention, perennial cover for soils, and tree planting.

In 2020, the Ag Action Manitoba – Assurance: Beneficial Management Practices (BMP) Activity approved 57 projects, committing over \$500K in funding to enhance environmental performance, including carbon sequestration. Applications for 2021-22 were reviewed in late 2020 and funding will be awarded to successful applicants in the spring of 2021.

Manitoba's 14 Watershed Districts continue to implement a distributed network of water retention structures, enhancing climate resiliency at a local and regional scale. Watershed districts have built 173 water retention projects since 2015, providing 4,135 acre-feet of water storage capacity on the landscape throughout southern Manitoba. In 2020, 46 applications from 13 Watershed Districts to the Watershed Ecological Goods and Services program were approved.

Manitoba invests in research to accelerate sustainable growth in the agriculture and agri-processing sector through innovation. Since 2018, Manitoba has supported 109 agricultural research and

innovation projects under the MB Ag Action – Research and Innovation Activity, including 27 projects approved to begin in 2020. New focus areas for the 2020 intake included:

- Climate Change Adaptation
Developing disruptive innovation technologies and practices that help producers adapt to climate change.
- Environmental Sustainability
Identifying and utilizing food production and processing technologies and practices to improve environmental sustainability
- Food, Diet and Health
Identifying pathways of resource utilization that improve environmental sustainability, human nutrition, policy development and public trust of protein-based food production
- Sustainable Feed Grains Supply and Utilization
Increasing sustainability of livestock feed production and use.

Manitoba has launched the Manitoba Protein Advantage strategy, which includes a focus on sustainability. Sustainability indicators and targets are being developed, including a reduction in the GHG intensity of animal protein production. Through the Sustainable Protein **Challenge Dialogue** – Manitoba is working collaboratively with stakeholders to **create an Action Framework** to position the province as a global leader in sustainable protein and develop a network of collaborators within which a range of sustainable protein initiatives can be mobilized.

GOVERNMENT OF ONTARIO

Ontario farmers and agri-food businesses have a keen interest in and understand the importance of protecting farmland along with using resources, such as soil and water, sustainably to secure the long-term productive capacity of the agri-food sector. That's why they continue to do their part to help deliver on the Made-in-Ontario Environment Plan. Through the application of innovative technologies and best practices farmers are able to produce more with less space, less waste and fewer resources, improving (or minimizing) their impact on the environment. With the support of Ontario's suite of stewardship programs, and Ontario's agri-food research investments including the 'The Ontario Agri-Food Innovation Alliance', Ontario's agri-food sector continues to demonstrate environmental leadership in addressing climate change and other environmental challenges.

The Made-in-Ontario Environment Plan commits to: "Continue to support programs and partnerships intended to make the agriculture and food sectors more resilient to current and future climate impacts. We will support on-farm soil and water quality programming and work with partners to improve agricultural management practices." OMAFRA is delivering on the agriculture commitment in the Plan through implementation of 'New Horizons: Ontario's Agricultural Soil Health and Conservation Strategy'; soil and water CAP programing; and support of sector led initiatives (see subsequent rows for details). Launched in January 2020, OMAFRA is collaborating with members of the multi-stakeholder Soil Action Group to develop an implementation plan to follow through on actions underway and coordinate actions of shared interest to further advance the goals and objectives within the Soil Strategy.

The Ontario Ministry of Agriculture, Food and Rural Affairs invests in environmental stewardship activities through the Canadian Agricultural Partnership and other programs that enhance water quality and soil health while providing important co-benefits to climate change.

Year two and three results of the CAP Environmental Stewardship programs include:

- OMAFRA paid out \$5.1 million in cost-share fund to farmers to support completion of 552 on-farm environmental improvement projects between April 2019 to March 2020. Projects include planting of cover crops, purchasing conservation tillage equipment and implementing erosion control structures.
- OMAFRA has committed up to \$5.9 million in cost-share funds to farmers to support the completion of an additional 593 projects on farms between April 2020 and March 2021.
- OMAFRA has committed up to \$1.26M in CAP cost-share funding to sector organizations and collaborations in CAP year 2 to support 10 projects valued at \$2.1 million.
- In CAP year three, OMAFRA has committed up to \$167,475 in CAP cost-share funding to sector organizations to support 3 projects valued at \$597,500.
- In CAP year two (April 2019 to March 2020) 685 total participants in Environmental Farm Plan (EFP) workshops and electronic workbooks. 563 new verified complete EFP Action plans were developed by participating farmers.
- In CAP year three (April 2020 to September 2020), an additional 21 participants in EFP workshops and electronic workbooks and 10 new verified complete EFP Action Plans were developed. COVID-19 has limited results in this area.

As part of Ontario's update to the Agri-Suite tool a new greenhouse gas (GHG) calculator will be designed and added to assist farmers in identifying the sources of GHG emissions at a farm level, encourage adoption of best practices and help quantify GHG emission reduction opportunities on farms.

As well, Ontario is investing \$5.75 million into the multi-year On-Farm Applied Research and Monitoring (ONFARM) demonstration project and involves the collaboration with various agricultural and conservation partners. The project includes key activities such as developing comprehensive, science-based methods to measure soil health in Ontario and evaluating the use of various Best Management Practices (BMPs) for improved soil health and water quality. Applied research and monitoring sites are being established to facilitate peer-to-peer knowledge transfer and capacity-building in the agricultural sector.

The Greenhouse Competitiveness and Innovation Initiative, Phase 2 intake (closed July 2020) awarded \$3.6 million to approved projects, several of which supported sector investments in sustainability and innovation to optimize inputs, increase resource use efficiencies (e.g. energy, heat) and support long-term resiliency and competitiveness.

In January 2020, OMAFRA posted proposed regulatory changes that would make it easier and faster for farmers to establish on-farm, RNG-generating anaerobic digesters – helping them expand in the emerging renewable natural gas market in Ontario. These proposed changes will encourage the recycling of nutrients to generate clean energy, encourage the return of organic materials to agriculture land to build soil health and fertility for crop production and help promote new economic development opportunities for the rural sector.

These Ontario Agri-Food Innovation Alliance and OMAFRA's Open Research Programs are ongoing. Within the broader mandate to support agri-food innovation in Ontario, OMAFRA-funded research and innovation programs address climate change priorities through specific projects focused on emission reduction, climate adaptation and resilience, best practice and clean technology development and

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commercialization, besides knowledge translation and transfer and, training of highly qualified personnel.

1. During 2020, the Ontario Agri-Food Innovation Alliance funded 20 research projects (\$2.57 million OMAFRA funding) addressing climate change in Ontario's agri-food sector.
2. In 2020, OMAFRA's open research program funded one research project (\$100,000) addressing climate change.

In addition, the Ministry supports the agri-food industry in providing leadership on efforts contributing to multiple environmental benefits including: 4R Nutrient Stewardship led by 4R Ontario which contributes to reducing GHGs; the Thames River Phosphorus Reduction Collaborative; the Timing Matters Initiative; and the Ontario Cover Crop Strategy led by Grain Farmers of Ontario.

In 2020, OMAFRA recognized Burnbrae Farms Limited with an Excellence in Agriculture Award for their leadership in sustainable energy solutions. Burnbrae Farms Limited is the largest solar-powered egg farm in Canada and shares its surplus power with the adjoining farm. The sustainable energy solution in this farm consists of four barns that utilize high-efficiency motors, lighting and ventilation systems to ensure minimal power usage to run the equipment. The farm operates off the grid and is powered by solar energy using solar panels located on the roof.

In addition, organizations such as Provision Coalition are helping Ontario food and beverage companies to be leaders in sustainability including the reduction of food loss and waste, climate change mitigation and responsible sourcing.

GOVERNMENT OF QUEBEC

In 2020, the bio-food sector saw the launch of important new initiatives to address climate change. These new initiatives demonstrate Quebec's commitment to supporting agricultural producers in adopting agri-environmental practices and stimulating innovation.

New policies announced in 2020:

1- Plan d'agriculture durable 2020–2030 (PAD)

The PAD was announced last October and aims to accelerate the adoption of responsible and effective agri-environmental practices. It places agricultural businesses at the heart of the action. The PAD calls for investments totalling \$125 million over the next five years. This includes targets for soil quality, water quality, management of nitrogen fertilizers, and biodiversity. These targets also have a positive impact on reductions in greenhouse gas (GHG) emissions and the adaptation of agricultural systems to climate change. The budget will be broken down as follows: \$70 million for the recognition of agri-environmental practices implemented by passionate, competent and innovative producers; \$30 million for knowledge development; and \$25 million for knowledge transfer, training and support, in addition to the amounts invested in the various programs of the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation (MAPAQ). This plan fulfills two objectives of the *Politique bioalimentaire 2018–2025 – Alimenter notre monde* (hereinafter the *Bio-Food Policy*) by helping to encourage concerted approaches to protect health and the environment, in addition to strengthening the implementation of responsible business practices.

2- Plan pour une économie verte and its implementation plan

In November 2020, Quebec announced the new *Plan pour une économie verte* (PEV). This plan provides for investments of nearly \$6.7 billion over the next five years, the funding for which is mainly associated with carbon market revenues accumulated in the *Fonds d'électrification et de changements climatiques* (formerly known as the *Fonds vert*). The first 2021–2026 PEV implementation plan provides for \$32.8 million for actions aimed at reducing GHG emissions linked to agricultural production. These measures will complement the actions that will be carried out under the PAD. New measures also target bioenergy development, research and development, and carbon storage in forests and natural environments.

3- Stratégie de croissance des serres au Québec 2020–2025

On November 27, 2020, Quebec's Minister of Agriculture, Fisheries and Food, André Lamontagne, and Quebec's Minister of Energy and Natural Resources, Jonatan Julien, presented the new *Stratégie de croissance des serres au Québec 2020–2025 – Pour une plus grande autonomie alimentaire*, which aims to double the volume of greenhouse cultivation in Quebec by 2025. By adding the amounts invested directly for the *Stratégie de croissance des serres* (\$91 M) to those reserved for the three-phase network extension program (\$21 M), the government is investing more than \$112 M to achieve the objectives set.

In support of the *Stratégie*, Hydro-Québec will grant the province's 1,000 greenhouse producers a preferential electricity rate of 5.59 ¢/kWh for photosynthetic lighting and heating for their facilities, as authorized by the Régie de l'énergie's decision on December 1, 2020. The rate eligibility threshold will be lowered from 300 kW to 50 kW, allowing smaller businesses to participate. Large greenhouse companies consuming more than 5,000 kW will now also have access to this rate.

The development of the greenhouse sector will focus on renewable energy sources recognized for their low environmental footprint, thereby contributing not only to economic recovery, but also to food self-sufficiency in Quebec.

Measures in effect in 2020:

The *2013–2020 Climate Change Action Plan* will end in March 2021. This plan provides for an investment of nearly \$8 million in measures to reduce GHG emissions in the agricultural sector, and \$4.9 million in specific measures to adapt the agricultural sector to climate change. Eighteen projects were underway in 2020. A call for projects was launched during the summer of 2020 as part of the new *Programme d'appui à la lutte contre les changements climatiques en agriculture*. New projects are expected to start in 2021.

The *2013–2020 Climate Change Action Plan* will end in March 2021. This plan provides for an investment of nearly \$8 million in measures to reduce GHG emissions in the agricultural sector, and \$4.9 million in specific measures to adapt the agricultural sector to climate change. Eighteen projects were underway in 2020. A call for projects was launched during the summer of 2020 as part of the new *Programme d'appui à la lutte contre les changements climatiques en agriculture*. New projects are expected to start in 2021.

The *Prime-Vert 2018–2023* program also provides for the funding of measures with a positive impact on the reduction of GHG emissions and on adaptation to climate change. During 2020, more than \$4.4 million in financial assistance was provided for the following measures:

- Soil conservation practices and works (this measure includes funding for the establishment of cover crops);

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- Sustainable agri-environmental developments integrating trees and shrubs and promoting biodiversity;
- Equipment allowing the band application of fertilizers in horticultural crops;
- Equipment for optimal management of irrigation water.

The Government of Quebec is also continuing to invest to encourage responsible soil health practices. Actions enabled during the 2018–2023 period include increasing the rate of assistance to businesses for targeted consulting services in soil health and conservation in order to support more than 15 soil health knowledge development and transfer projects.

The *Plan de soutien aux investissements en agriculture contribuant à l'adaptation des entreprises en matière de bien-être animal et d'efficacité énergétique* (PSI) offers three programs for agricultural businesses. The *Programme d'aide aux investissements en matière de bien-être animal et d'efficacité énergétique* provides direct financial assistance for eligible investments for the modernization of production facilities through the construction of new buildings, the renovation of buildings or the acquisition and installation of fixed production equipment.

Over 4,300 general eligibility forms have been submitted for the PSI, and 62% of the projects presented include measures aimed at improving the energy efficiency of businesses. The total budget for the PSI as a whole is \$195 million. All three programs have been extended for one year and will end on March 31, 2023.

All of these measures stem from the *Politique bioalimentaire 2018–2025* and its *Plan d'action 2018–2023 pour la réussite de la Politique bioalimentaire*, which was made public on January 29, 2020. Note that the *Bio-Food Policy* offers 69 courses of action grouped into 16 objectives under the following four orientations:

1. Food products that meet consumers' needs;
2. Prosperous, sustainable and innovative companies;
3. Attractive and responsible businesses; and
4. Dynamic territories that contribute to bio-food prosperity.

One of the *Policy's* seven targets is to increase the share of Quebec agricultural and food-processing businesses that have implemented responsible business practices. These practices include soil quality, water quality, management of pesticides and fertilizers, biodiversity, reduction of GHGs, adaptation to climate change and energy efficiency.

GOVERNMENT OF NEW BRUNSWICK

Agriculture contributes 4% of New Brunswick's GHG emissions from a footprint that represents approximately 5% of all land in the province. The Department of Agriculture, Aquaculture and Fisheries takes seriously its role in supporting the mitigation of greenhouse gas emissions and helping producers adapt to lessen the impacts from climate change. Federal – Provincial funding under the Canadian Agricultural Partnership Agreement (CAP) (2018-2023) supports actions on agricultural climate change mitigation and adaptation, while contributing to the achievement of provincial commitments within Transitioning to a Low-Carbon Economy - New Brunswick's Climate Change Action Plan and supporting national efforts against climate change. In the calendar year 2020, the program has provided funding for

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GHG mitigation – 62 projects received 75.9 per cent (\$642,000) of the program budget. This leveraged a total investment of \$1.8 million. Projects included land drainage, precision farming, nutrient management planning, energy audits and upgrades and renewable energy systems.

As well, innovation and research efforts with climate change mitigation potential included three on-going projects on precision nutrient placement and one project each on nitrogen fixing bacteria and cover crops. Additionally, a new project was initiated on benchmarking several commodities for greenhouse gas emission and carbon capture.

GOVERNMENT OF NOVA SCOTIA

Nova Scotia continues to commit itself to increasing the climate resilience of our communities, businesses and people, and has implemented various initiatives that support the Pan-Canadian Framework. Some examples of these initiatives include:

Under the Infrastructure Canada Disaster Adaptation Mitigation Fund, the department is jointly funding a \$114M project to upgrade 60 kilometres of dyke and five flood control structures along the Bay of Fundy over the next nine years. This work began in 2019 and will protect natural infrastructure primarily for public use. Without upgrades, the sites are at high risk of damage from climate change. These sites provide flood protection to tens of thousands of residents and businesses, vineyards, historical and world heritage sites, Mi'kmaq communities and farmland.

The Canadian Agricultural Partnership programs support clean growth and many target priorities such as climate change, soil and water conservation, and innovation. One example is the Agriculture Energy Partnership with an Onsite Energy Manager that has been hired by Efficiency NS. This partnership between NSDA and EfficiencyOne will help reduce agriculture's electricity and fossil fuel footprint. Activities under this program have resulted in a reduction of 928 tonnes/y of CO₂. The Soil and Water Sustainability program provided over \$304K to NS farmers in 2019/2020 for projects on erosion control, enhancing riparian and agroecosystem health, improved manure management, sustainable agricultural water supply and water well management (wells, springs), improved water practices and efficiencies, field water management, winter pasture management, and farmyard run-off control.

The 1st iteration of the NS Environment Climate Adaptation Leadership Program ran from 2013-2018 to help prepare NS government departments for Climate Change. The NS Department of Agriculture was the first 'pilot' department to participate in the development of a climate readiness plan. The 2nd iteration of this program runs from 2019-2022 and is funded by \$7M + (cash and in-kind) from Nova Scotia government and federal sources. The purpose of this leadership capacity-building program is to help prepare NS government departments, community partners and industry for the impact of a changes in an increasingly uncertain environment. NSDA has created an internal committee of champions for climate change adaptation and mitigation, and environmental sustainability. The Agricultural Champions for Environmental Sustainability (ACES) team has developed a Climate Change Adaptation Workplan has currently implementing this over the next few years.

GOVERNMENT OF PRINCE EDWARD ISLAND

The PEI Department of Agriculture & Land is diligently working towards supporting Pan-Canadian Framework key measures within the agricultural industry. Many of these efforts are supported under the Canadian Agricultural Partnership (CAP). Environmental programs are a priority under PEI's CAP.

funding, with \$13.3 million allocated over the five-year agreement, which is in its third year. Some of these programs include the Agriculture Stewardship Program, the Perennial Crop Development Program, and the Alternative Land Use Services Program. These programs contribute to environmental sustainability and address climate change through technical and financial support to encourage producers to voluntarily adopt Beneficial Management Practices (BMPs).

The Department has also committed to expanding its capacity in finding solutions to climate change by adding a role for a climate change coordinator to specifically tackle these issues. Further Programs that support GHG-efficient management practices are also under development.

The Agriculture Stewardship Program is a suite of initiatives designed to increase environmental sustainability, climate change mitigation and adaptation by providing technical and financial support to encourage producers to voluntarily implement Beneficial Management Practices (BMPs). Activities include soil conservation, soil health, nutrient management, integrated pest management, riparian management, water quality, water efficiency, energy efficiency and on-farm storage. A notional budget of a total of \$8.3 million was set for over the five year CAP agreement. Program uptake continues to be strong; including in areas for winter cover crop, improved manure and silage storage, and soil erosion control structures. Approximately 150 Beneficial Management Practices projects are completed by producers each year under the program.

The Alternative Land Use Services (ALUS) Program provides agricultural landowners with assistance to remove environmentally sensitive land from production and includes expanding buffer zones and grassed headlands, retiring high-sloped land, and installing soil conservation structures. The notional budget is set at approximately \$4 million over the five year CAP agreement for the ALUS program. It currently supports approximately 400 clients with the removal of over 3,800 hectares of farm land from production.

The Perennial Crop Development Program is designed to encourage additional perennial crop production and production systems. Perennial crops can increase carbon levels in the soil and reduce contamination of watercourses and wetlands through erosion control, water-use efficiency, and nutrient cycling efficiency. A notional budget of a total of \$875,000 was set for over the five year CAP agreement. Program uptake has been strong to date.

The Soil Quality Monitoring (SQM) project—launched in 1998—monitors changes in soil organic matter levels across the Island each year. This information contributes to ongoing efforts to encourage and incentivize beneficial management practices that aim to increase soil organic matter. The latest status report was published September 2020.

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

The Canadian Agricultural Partnership supports investment towards the Environmental Sustainability and Climate Change Program, as well as the Environmental Farm Planning Program, which continues to have a good uptake with 63 per cent of the commercial farms in the province having completed an Environmental Farm Plan. This number can fluctuate on a yearly basis with decline and/or incline in farm numbers. From January 2020 to December 2020, 28 new Environmental Farm Plans were completed, while 43 farming enterprises updated their existing Environmental Farm Plans.

The Environmental Sustainability and Climate Change Program supported 21 projects in 2019-20 and 2020-21 that focused on environmental Beneficial Management Practices including:

- Conservation tillage/nutrient placement;
- Improved pest management/pesticide application;
- Wildlife damage prevention/protection;
- Manure land application;
- On-farm climate change adaptation;
- Product and waste management;
- Sustainable irrigation management; and
- On-farm water supply and retention.

Projects funded under this program include but are not limited to:

- Fertilizer application systems;
- Manure-handling equipment;
- Composting system;
- No-till seeders; and
- Wildlife exclusion fencing.

The Department of Fisheries, Forestry and Agriculture of the Government of Newfoundland and Labrador continues to support research into clean growth and climate change. For example, in 2019-20 and 2020-21, the Canadian Agricultural Partnership committed funding towards graduate student research projects investigating the development of anaerobic digestion technology to improve manure management. Bio-digestion technology will reduce greenhouse gas (GHG) emissions from both the storage of manure and spreading of manure on land. These projects aim to reduce the release of GHGs by converting dairy manure to a biogas through anaerobic digestion.

In addition, the Department, in collaboration with the Memorial University of Newfoundland – Grenfell Campus, is in its second year of work towards the project “Low-Input Agriculture in Cool Climate Boreal Ecosystems.” This project is funded through the Federal-Provincial cost-shared Agricultural Clean Technology Program, with the province (Government of Newfoundland and Labrador and the Memorial University of Newfoundland – Grenfell Campus) contributing 52 per cent of the funding for this project.

The Newfoundland and Labrador Federation of Agriculture, in conjunction with the Climate Change Office of the Government of Newfoundland and Labrador, will be hosting virtual climate change consultations to hear experiences, concerns and objectives of the agriculture sector in Newfoundland and Labrador to build adaptation capacity. The purpose of the consultations is to create a list of 10 key risks and opportunities of climate change in the agriculture sector, and utilize that list to build adaptation capacity. Five virtual sessions are scheduled for December 2020 and January 2021.

GOVERNMENT OF YUKON

Agriculture Policy – Yukon’s new Agriculture Policy, entitled *Cultivating Our Future*, was released during 2020. The updated policy sets out Yukon government priorities and actions for supporting sustainable agriculture development in the Yukon over the next decade. Yukon’s new policy aims to encourage the development of an agriculture industry that is responsive and adaptable to climate change and supports environmental sustainability. This is seen through the action areas highlighted in chapter three: Climate Change, Environmental Farm Plans and Encouraging Environmental Best Management Practices.

Climate Change policy: In 2020 the Government of Yukon launched its new policy, entitled *Our Clean Future: A Yukon strategy for climate change, energy and a green economy*. The policy was developed in partnership with Yukon First Nations, transboundary Indigenous groups and Yukon municipalities over the course of 3 years. Actions the Government of Yukon will take to address the impacts of climate change includes targets to reduce greenhouse gas emissions and improve resilience to the impacts of climate change. The new policy includes agriculture related community based actions such as assistance to start a community garden or greenhouse, support for purchasing local products and services, and government led support programs for local producers.

Agricultural Research: Yukon's research and demonstration farm continues trials on northern soil development, effectiveness of natural soil amendments and performance trials of new varieties under our northern growing conditions. In 2020 Yukon continued work on the three year northern field trial with Agriculture and Agri-Food Canada (Science and Technology Branch, Newfoundland) that looks at improving food production in northern soils. The experiment looks at increasing production of marginal crops (bush beans) and evaluating strategies that reduce post-harvest storage losses (potatoes)

Local Food Strategy: The five-year strategy for Yukon (entitled *Encouraging the Production and Consumption of Yukon-Grown Food 2016–2021*) continued to be actively implemented in 2020 and will conclude during 2021. Several of the initiatives in this strategy will carry forward under the new Agriculture Policy. The strategy is contributing to the increase in production, use and consumption of Yukon-grown food, and indirectly is helping to reduce transportation GHGs by reducing the amount of food imported into the Yukon up the Alaska Highway from southern markets.

Traditional and Local Foods: Yukon began a new collaborative project with the former department of Indian and Northern Affairs Canada (INAC) in 2017-2018 to explore the relationship between climate change, traditional foods, and local food production in Yukon communities. This multi-year project is scheduled to conclude in March 2021. Yukon Agriculture Branch has also been providing ongoing support during 2020 to a growing number of First Nation farming projects in several Yukon communities.

GOVERNMENT OF NORTHWEST TERRITORIES

No input provided.

GOVERNMENT OF NUNAVUT

No input provided.