

Atelier de travail - Biomasse et carboneutralité : Élaboration d'une grille d'évaluation

Discussion 1 - État des lieux

Réactions sur le document de travail

Points forts et points faibles

Enumérer les autres protocoles nationaux les crédits compensatoires et dans le secteur agricole ...

Monétisation des éléments environnementaux... marchés carbone, les crédits compensatoires dans le secteur forestier

Calculs de la comptabilité des émissions carbone - bioénergie

De façon unanime rapport bien rédigé et abordant tous les aspects

Plus de détails sur le Québec

Aborder plus approfondir la question liée au transport (Émissions GES, Coûts) de la biomasse en agriculture et foresterie

Gaps, imprécisions, etc.

Secteurs/filières à détailler/préciser?

Aborder la question de Mesurage dans la notion carboneutralité

Données sur les résidus de culture agricole à regarder

Aborder plus approfondie la question de législation à l'échelle régionale

Aborder plus approfondie la question des sites d'enfouissement

Cv de la production et transformation de la viande et la carboneutralité si pertinent

Autres

Tenir une actualisation annuelle du rapport afin de mettre à la disposition de tous des données et informations récentes

Tenir un rapport annuel sur la biomasse afin d'actualiser les informations et proposer des politiques et des mesures pour atteindre la carboneutralité

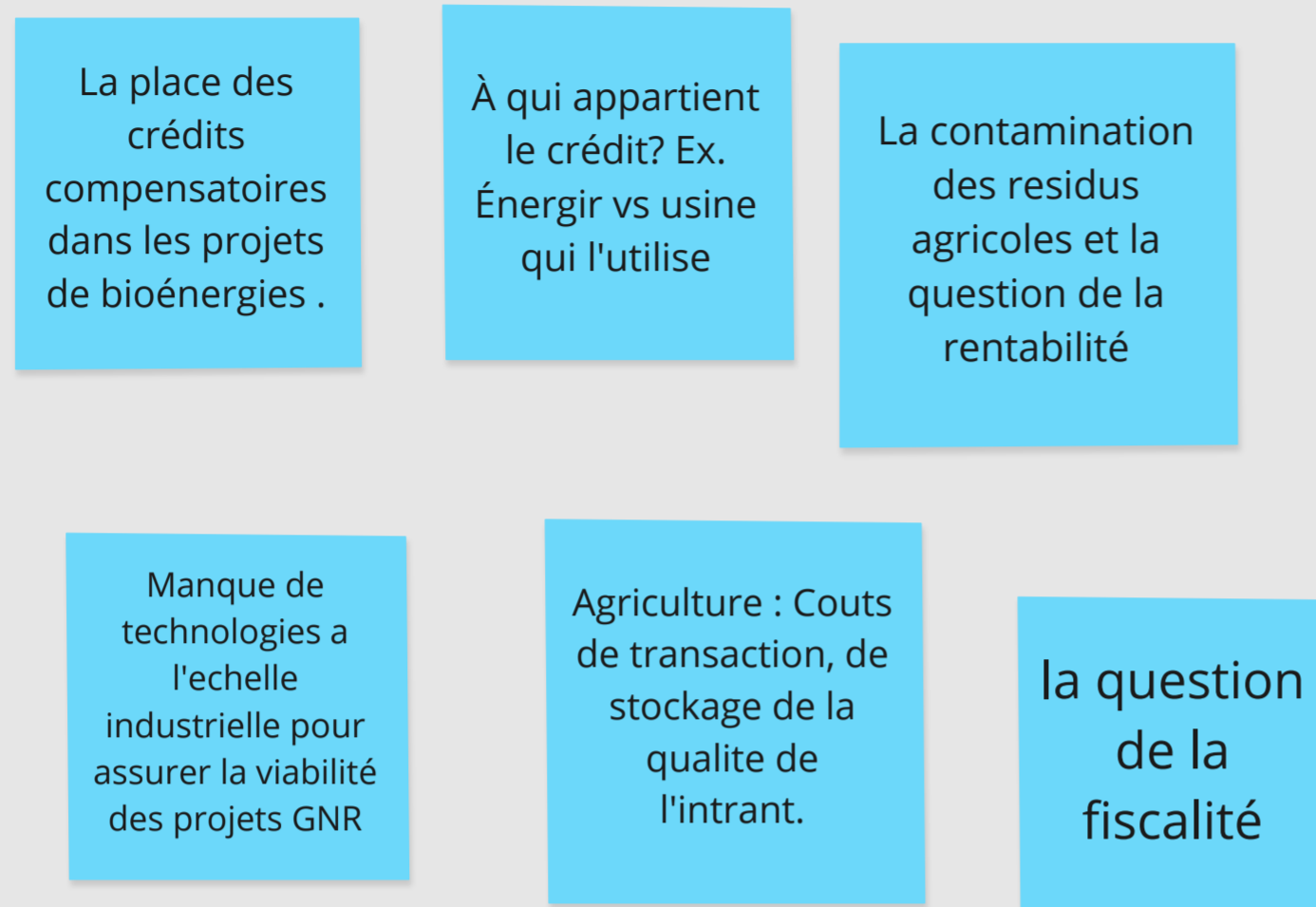
Discussion 2 – Enjeux liés à l’approvisionnement

Disponibilité de la biomasse	Limites	Coûts
<p><i>Y a-t-il des sources plus à risque ? Des sources en croissance?</i></p> <div data-bbox="219 278 479 544"> <p>Enjeu lié au transport : Maximiser la récolte de la biomasse forestière afin de d'optimiser le transport</p> </div> <div data-bbox="499 278 708 492"> <p>Standardisation de l'intensité carbone</p> </div> <div data-bbox="728 266 881 421"> <p>Distorsion dans les prix</p> </div> <div data-bbox="728 463 881 618"> <p>L'enjeu de rentabilité des projets agricoles</p> </div> <div data-bbox="219 660 479 914"> <p>Biometanisation : Saisonnalité, qualité des matières, distorsions dans le prix, les coûts et la distance récupération et transformation</p> </div> <div data-bbox="545 660 805 914"> <p>Enjeu technologique : risques technologiques dans le secteur agricole pourraient ce secteur plus risqué</p> </div> <div data-bbox="234 956 479 1209"> <p>Enjeu de gestion durable des forêts : Gestion efficace des forêts québécoises afin d'éviter les feux de forêts et autres maladies</p> </div> <div data-bbox="545 938 830 1222"> <p>Enjeu de qualité : Les questions sanitaires pour assurer une biomasse de qualité dans le secteur agro-alimentaire</p> </div>	<p><i>Doit-on revoir les seuils de récolte durable? En quoi les aléas climatiques/écologiques pourraient affecter l'approvisionnement?</i></p> <div data-bbox="919 303 1212 470"> <p>Éviter la double comptabilité des émissions GES</p> </div> <div data-bbox="919 495 1212 660"> <p>existence d'autres sources d'approvisionnement</p> </div> <div data-bbox="919 692 1212 857"> <p>Coûts de transaction</p> </div> <div data-bbox="919 882 1256 1197"> <p>Saisonnalité des résidus agricoles liés au stockage et à la contamination, etc</p> </div> <div data-bbox="1296 352 1589 648"> <p>mesures de valeur carbone des carburants fossiles</p> </div> <div data-bbox="1274 704 1582 1017"> <p>Revoir les calculs de décisions de production de la bioénergie</p> </div> <div data-bbox="1296 1061 1589 1227"> <p>Réglementation et standardisation</p> </div>	<p><i>Seuil de tolérance aux variations?</i></p> <div data-bbox="1612 278 1972 635"> <p>La question. de la carboneutralité dans l'approvisionnement : exemple de la carboneutralité du lait</p> </div> <div data-bbox="2002 273 2262 532"> <p>enjeux de certification dans la biométhanisation</p> </div> <div data-bbox="1704 734 2181 1209"> <p>Disponibilité des camionneurs qui entraîne la fermeture des entreprises. Cela conduit à une augmentation de coûts de transports</p> </div>
Compétition		Autres
<p><i>Différentes chaînes de valeur qui utilisent la même ressource?</i></p> <div data-bbox="254 1399 568 1719"> <p>la disponibilité à payer des producteurs</p> </div> <div data-bbox="830 1448 1103 1727"> <p>GNR : la gestion de la ressource</p> </div> <div data-bbox="254 1793 672 2212"> <p>La valeur environnementale de l'intrant</p> </div> <div data-bbox="830 1776 1103 2047"> <p>disponibilité des technologies</p> </div> <div data-bbox="830 2089 1103 2343"> <p>GNR : Manque de la présence du secteur privé</p> </div>		

Discussion 3 – Facteurs de rentabilité/viabilité économique

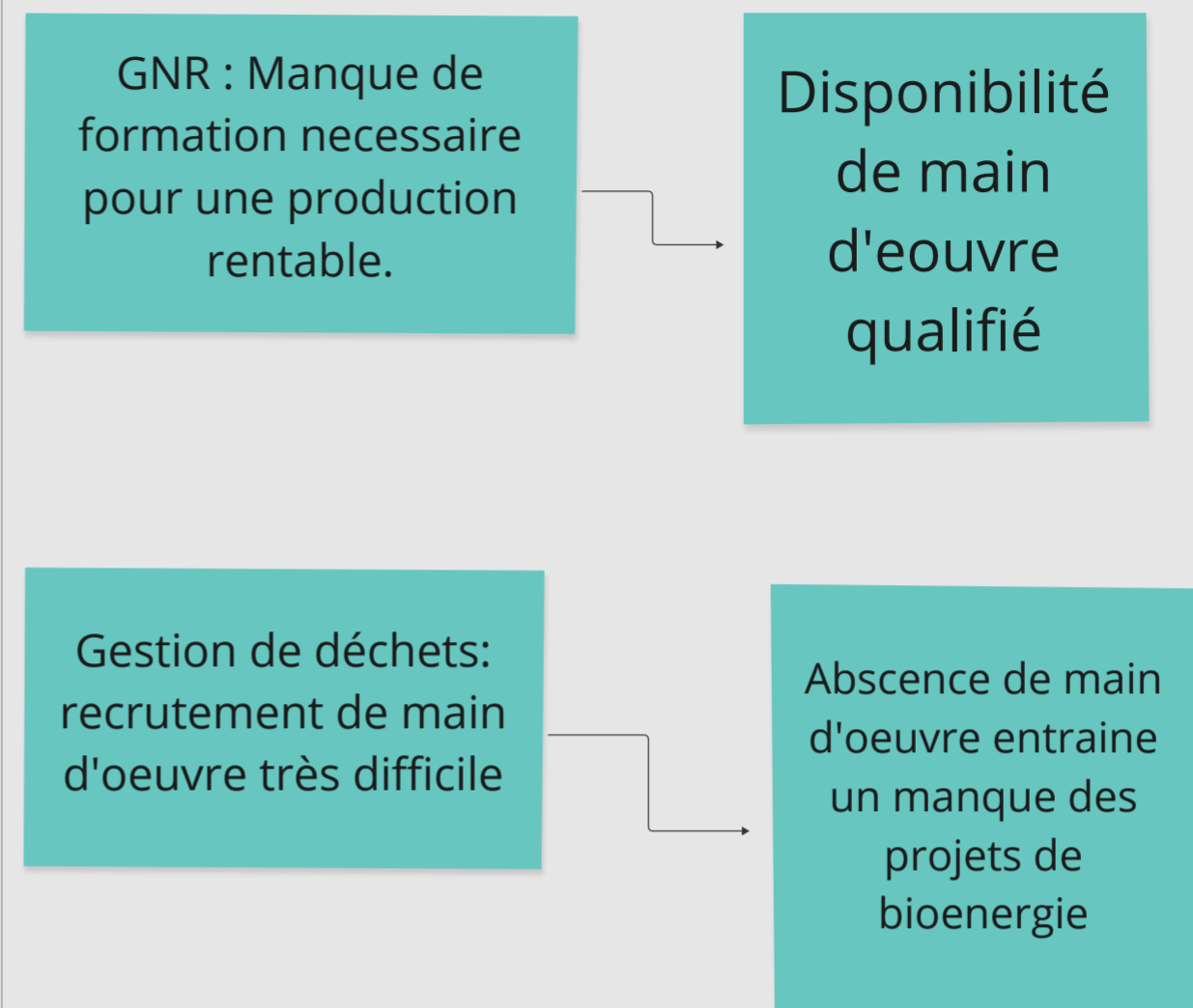
Chaîne de valeur

Maturité de la chaîne de valeur (en place, en développement, inexistante)?
Interdépendances qui affectent sa viabilité?
Exposée à des risques? De quelles natures?



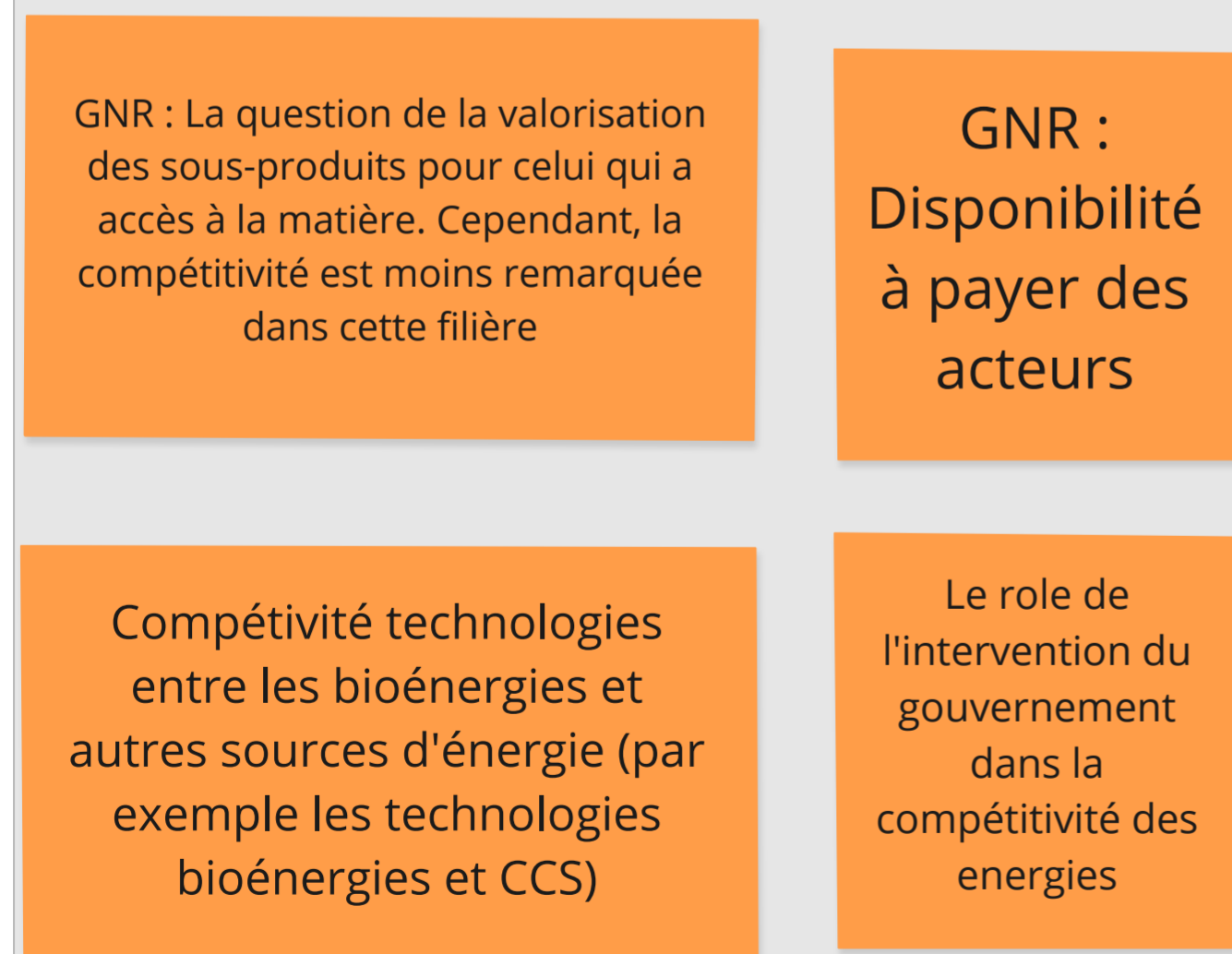
Main d'œuvre

Disponibilité à court et moyen terme?
Enjeux de formation?



Compétition

Compétitivité-prix entre technologies ou avec d'autres sources d'énergie ?
Service/produit de substitution affectant la demande ?



Autres

Nécessité des subventions gouvernementales - peut avoir un impact sur le marché

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Réactions sur le document de travail

Gaps, imprécisions, etc.

Autres

Points forts et points faibles

Secteurs/filières à détailler/préciser?

Discussions des enjeux d'utilisation finale et des approvisionnements durables limités

Bonne base des enjeux concernant les bioénergies

On fait quoi des émissions biogéniques dans les bilans? ça va changer dans le futur?

Faire et comment faire l'arbitrage de l'usage de la biomasse...

- éviter le double comptage des réductions GES : Crédits compensatoires, particulièrement au Qc avec SPEDE, et création de crédits sous le règlement sur les combustibles propres

GAP:
 - Approche régionale
 - Besoin de comprendre EROI (energy return of energy invested)
 - Arbitrage des usages
 - Discussion sur l'efficacité globale des différentes bioénergies/bicombustibles
 - Portrait/cartographie de la chaîne de valeur, d'approvisionnement et des flux
 - Résidus de bois de la construction / démolition
 - Fuites de CH4 dans la chaîne GNR (amont et selon l'utilisation)
 - Enjeux concernant les coûts et prix (de façon général)
 - BioH2 : besoin de CSC pour carboneutralité (ex., projet H2V. le procédé de gaz de synthèse (H2+ CO) avec réaction de gaz à l'eau pour produire de l'H2 pur. Le projet génèrera 960 000 t CO2 qui devront être revalorisées ou captées et stockées)

Besoin feuilles de route de décarbonation

CANADA'S APPROACH TO FOREST CARBON QUANTIFICATION AND ACCOUNTING: KEY CONCERNS, <https://naturecanada.ca/wp-content/uploads/2021/10/Canadas-Approach-to-Forest-Carbon-Quantification-and-Accounting.pdf>

Besoin de tenir compte de l'impact de l'usage des terres

Présentation de la chaîne de valeur des bioénergies/bioproducts... de la matière première aux usages

Tenir compte du rendement énergétique

G7... tonnes de CO2éq. par / \$ PIB

Différentes politiques avec visions qui ne convergent pas nécessairement

Gouvernance: besoin d'entités indépendantes en énergie (Agences)

Menace: est-ce que les économies qui ne tiennent pas compte de l'environnement sont une menace?

Discussion 2 – Enjeux liés à l’approvisionnement

Disponibilité de la biomasse

*Y a-t-il des sources plus à risque ?
Des sources en croissance?*

- Forêts primaires (ex., BC, contrat de granules de bois pour les anciennes centrales au charbon en au Royaume Uni

S'assurer que les contrats signés ne dépassent pas la capacité de la région d'approvisionnement

Être capable de s'ajuster rapidement aux occasions liées aux événements naturels (insectes, feux, etc.)

Besoin d'évaluer les demandes (en PJ) potentiels de bioénergies des différents secteurs (industries, transport routier, maritime, aviation) en fonction de la consommation actuelle et ensuite montrer ce que ça représente par rapport à la production/disponibilité de bioénergie actuelle

Limites

*Doit-on revoir les seuils de récolte durable?
En quoi les aléas climatiques/écologiques pourraient affecter l'approvisionnement?*

Dette carbone reliée au différentes sources (résidus primaires, post-transformation, post-consommation)

Besoin de données :
ex.,
<https://www.anl.gov/esia/reference/renewable-natural-gas-database>

Seuils de récolte liés à fragilité des écosystèmes forestiers devront être mieux réglementé avec l'augmentation de la compétition pour la matière première

Coûts

Seuil de tolérance aux variations?

Démontrer l'impact du prix du carbone sur les énergies fossiles actuellement utilisées et voir la compétitivité des énergies alternatives

Besoin de revoir l'approche à la fiscalité et la tarification énergétique de manière à favoriser l'efficacité énergétique et la conversion à des sources carboneutres

Compétition

Différentes chaînes de valeur qui utilisent la même ressource?

Comment s'assurer que les résidus de transformation du bois soient utilisés de manière optimale

Autres

Le rapport semble optimiste sur le potentiel

Étude biomasse: il faut tenir compte de la partie économique, usages actuels... ce qui est réaliste

Manque de données sur les biomasses urbaines...

Besoin de connaître le coût de production des différents types de biomasse, à partir de "vrais coûts" de la biomasse

Avoir un plan intégré de gestion de ressources naturelles

Avoir une approche régionale (ex., comme pour les réseaux électriques) et approche en phase pour assurer un suivi de la performance environnementale et économique des projets à travers à chaîne de valeur

Discussion 3 - Facteurs de rentabilité/viabilité économique

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Exposée à des risques? De quelles natures?

Rendre conditionnel les investissements dans les industries (ex., eperformance) à la mise en place de système de gestion de l'énergie avant de financer la conversion aux bioénergies et l'H2. (voir exemple de l'Allemagne, p. 45-47 https://energie.hec.ca/wp-content/uploads/2023/05/EEQ2023_WEB.pdf)

Besoin d'une approche basée sur l'amélioration de la productivité énergétique afin de réduire la demande d'énergie pour la création de richesse <https://energie.hec.ca/productiviteenergetique/>

Besoin de tenir compte des externalités dans le prix des énergies consommées

Besoin de contribuer à structurer une chaîne d'approvisionnement

Risque technologique? les technologies de conversion ont de la difficulté à livrer certaines promesses

Besoin de minimiser les pertes aux différentes étapes de la chaîne

Main d'œuvre

Disponibilité à court et moyen terme?
Enjeux de formation?

j'entends depuis des années que les coûts de construction au QC sont plus élevés qu'ailleurs... c'est un frein???

Compétition

Compétitivité-prix entre technologies ou avec d'autres sources d'énergie?
Service/produit de substitution affectant la demande?

Viser les marchés les plus lucratifs... remplacer les énergies les plus dispendieuses

Comité d'attribution des tonnes de biomasse comme c'est le cas avec les MW électriques

Quels marchés sont les plus porteurs? Quelles énergies pour combler ces marchés?
Quels sont nos sans regrets pour nos bioénergies?
Critères? Économique? Environnemental? autre?

Cartographie des sans-regrets (voir Put Dam Institute???)

Autres

Penser en terme de marché de proximité, beaucoup de filière font plus de sens économiquement au niveau local

Penser à l'amélioration des procédés, pas juste comparaison d'un carburant à l'autre



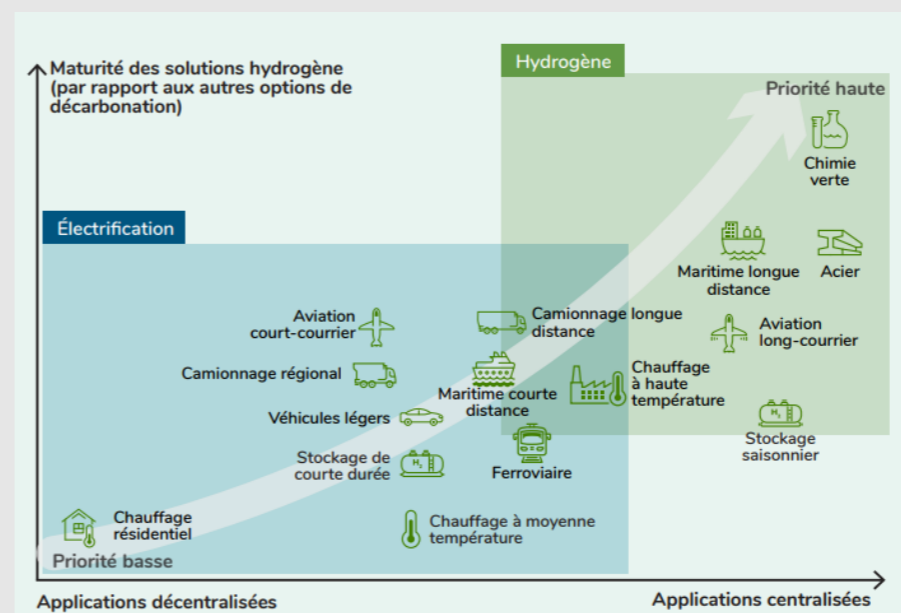
Ne pas seulement récompenser l'usage d'énergies propres, mais aussi la réduction d'énergie

Trouver des mécanismes qui permettent de rendre une PRI intéressante

Industrie 4.0 (5.0) permet de réduire la consommation énergétique, d'être plus efficace... appliquer à tous types d'industries

Avant d'attribuer des fonds pour la conversion, il faut d'abord que le requérant démontre un plan de réduction d'énergie (ex. SOFIAC, grille d'Évaluations)

En même temps, la perfection est l'ennemi du bien



À la base, il faut des données!!! De consommation d'énergie.. on consomme quoi et où? On pourra alors dire quoi faire.

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Gaps, imprécisions, etc.

Autres

Points forts et points faibles

Secteurs/filières à détailler/préciser?

- Approche intéressante, et surtout la discussion de limite de la ressource
- Base essentielle pour alimenter le développement de plans
- GAP : 20 Mt de GES émis par agriculture et déchet au Canada, mais au QC seulement c'est 9 Mt, la proportion est bizarre
- Interdépendance industrielle, agriculture (ex. : la biométhanisation de matière rés. de l'agriculture est une des rares solutions pour réduire les GES de ce secteur); il faudrait un peu plus insister sur le risque des décisions en silo, qui néglige les interdépendances

- Attention à ne pas se concentrer uniquement sur la maximisation de la production d'énergie renouvelable
- Ne pas se laisser aveugler par l'aspect énergétique
- Il y a du travail à faire pour augmenter la productivité forestière
 - disponibilité de biomasse anhydre???
- Utilisation des résidus de construction : problème de tri, enjeu de qualité de la matière; décalage en termes de qualité de la matière entre ce que l'industrie du tri de résidus de construction produit, et les besoins des industries utilisatrices

- Difficulté de faire un rapport avec une pertinence canadienne (ex : règlement de 10 % de GNR au QC, différent ailleurs)
- Enjeu par rapport aux différentes réalités des provinces
- Exemple : Conseil canadien des ministres de l'environnement, rapport décliné par province
- Politiques de recyclage différentes entre les provinces, donc comptabilité à l'échelle nationale peut ne pas offrir un bon portrait

- Préoccupation chaîne de valeur complète (présentement le rendement est mauvais, trop de concentration sur la production), il faut regarder plus le côté usage
- cartographie de la chaîne de valeur
- comment favoriser une approche régionale (exportation internationale, danger!)
- Disponibilité des capitaux
- Rentabilité des projets, modèles des projets
- Réglementation rigide, comment l'adapter
- Enjeu du rôle des différents paliers de gouvernements (fédéral, provincial, autre)
- Perte de la richesse du sol pour l'agriculture, donc enjeu sur le prélèvement de résidus
- Il y a probablement moins de biomasse disponible dans le secteur de l'agriculture que l'on pense!

- Peur des verrous technologiques
- Enjeu sur la disponibilité des données probantes

- Quel niveau d'intervention du gouvernement?
- Faire matrice de faisabilité et de maturité des technologies (maturité technologique, coûts, etc.);
- CANMET, apparemment ils ont réalisé une analyse de maturité (leur parler?)

- Ministère semble fermé au waste-to-energy
- Bois de CRD, filière de récupération très mal structurée au QC (une partie est récupérée par recyc QC, une partie est enfouie, une partie disparaît); projet en cours pour mieux identifier la filière; vraiment un point à faire mieux ressortir dans le rapport
- Les pratiques d'aménagement du territoire s'adaptent, elles sont modulables, pour répondre à la demande, donc on a peut-être plus de ressources disponibles (si on améliore la productivité des forêts exploitées par exemple. Il semble que dans certains pays nordiques la productivité est pas mal plus élevée).

- Usage de sable comme litière pour le fumier, cela le rend inutilisable; la gestion avec l'eau rend aussi inutilisable; donc les chiffres de matières sont probablement gonflés
- Difficultés techniques/ d'opérationnalisation de la récolte de résidus d'agriculture
 - Une liste d'usages sans regrets
- Coût de la biomasse (récolte, transformation, conditionnement)
- dans les conclusions : mettre des perspectives; à court terme ça ne va pas beaucoup bouger mais à plus long terme il y a plus d'options

Discussion 2 – Enjeux liés à l’approvisionnement

Disponibilité de la biomasse	Limites	Coûts
<p><i>Y a-t-il des sources plus à risque ? Des sources en croissance?</i></p> <ul style="list-style-type: none"> - Il n'existe pas de projet de biogaz rentables seulement avec du fumier, il faut de la paille et/ou des céréales. Il faut un engagement long terme des agriculteurs (de l'approvisionnement env. 20 ans), nécessaire pour débloquer le financement - augmentation de la productivité énergétique, efficacité dans le transport - Les biocarburants dans le transport lourd peut-être pas le meilleur usage - Déchets municipaux intéressants, mais les appels à projets au plus bas soumissionnaires posent problème et les contrats trop courts (en général 3 à 4 ans) <ul style="list-style-type: none"> - Le municipal encourage le compostage, c'est une pratique qui compétitionne avec les filières énergétiques, manque de cohérence - efficacité énergétique de la biométhanisation vs performance émissions GES. <ul style="list-style-type: none"> - Attention à ne pas démoniser l'exportation - rendement énergétique et carbone des produits du bois exporté - Qu'est-ce qui se passe si le marché européen augmente de beaucoup, quels sont les impacts pour le Québec <ul style="list-style-type: none"> - Dégradation des arbres (fin de vie) vs autre usage, quel impact carbone? <ul style="list-style-type: none"> - Granule : produite à partir sciure <ul style="list-style-type: none"> - nécessité d'adaptation du secteur de la transformation du bois (matériau et énergie) car les écosystèmes vont être différents (essences d'arbres différentes), ça va rester une source importante malgré les feus de forêt - Critères de priorisation, en ce moments les priorités sont en conflit, un besoin d'harmonisation - Bois de "déconstruction" (post consommation), (<u>Voir réseau environnement qui a un groupe de réflexion sur la question</u>) - Il n'y pas de règles pour le moment sur les chantiers pour la gestion du bois d'œuvre, ni les autres matériaux - Bois de CRD, rapport de recycQC 	<p><i>Doit-on revoir les seuils de récolte durable? En quoi les aléas climatiques/écologiques pourraient affecter l'approvisionnement?</i></p> <ul style="list-style-type: none"> - Feu de forêt : aménagement du territoire pour meilleure protection des communautés, éclaircis de zones, pas de preneurs de ce combustible pour le moment; bois affecté par le feu dégradé pour les usages conventionnels (bois d'œuvre), a plus de valeur pour la bioénergie - Parc immobilier Nord américain, a un besoin énorme, enjeu de disponibilité de la matière (bois d'œuvre) - Optimisation multicritère - S'inspirer des 3RVE (réduire, réutiliser, recycler, etc.) <ul style="list-style-type: none"> - Identifier la où il y le plus de valeur ajoutée, pas seulement économique, - Farnam exemple de cristallisation du marché, un premier projet peut cannibaliser la ressource - La biomasse résiduelle se transporte mal, 8 km c'est le max (aspect économie et e - Attention à ne pas confondre le marché européen et Nord américaine (on peut difficilement faire de la culture énergétique intercalaire) <ul style="list-style-type: none"> - France 25 million d'hectares agricoles, le Québec c'est 8 millions (au début du siècle c'était 4 fois plus) - critère d'analyse : surface par joule par type d'énergie - Étude de l'ADEME sur la biométhanisation - prélèvement de matière vs épandage de digesteur (matière organique plus stable) impact la biodiversité des sols - écosystème des prairie bonne performance pour la bioénergie et meilleur pour les sols -Bilan environnemental annuel des agriculteurs - Le système manque d'agilité pour le moment (pratiques forestière) - Chantier sur la gestion de la forêt - Économie et réglementaire doit suivre 	<p><i>Seuil de tolérance aux variations?</i></p>
Compétition	Autres	
<p><i>Différentes chaînes de valeur qui utilisent la même ressource?</i></p>		

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- La prévisibilité et la clarté de la t de CO2 est importante!!!!
- Plus de protocole permettant de générer des crédits compensatoires
- Le marché du carbone joue un rôle de plus en plus prépondérant
- Ça prend des points d'ancrage; prendre des hypothèses de base générant le plus grand consensus et construire la (ou les grilles) à partir de cela.
- Produits (nouvelle filière de bout en bout) vs coproduits (résidus d'une autre filière)
 - 10 % du maïs du Québec est dirigé pour de l'éthanol
 - Enjeu de contamination du digestat
- limitation : La réglementation sur la contamination (atmosphérique?) des produits
- GNR: Énergir acheteur unique, pas de compétition, connexion au réseau aux frais du producteur (à l'opposé, HQ prend en charge la connexion pour les parc éoliens), dans les bioénergies, la connectivité c'est 20 à 25 % du projet; les coûts de construction au QC sont très élevés, plus qu'ailleurs dans le monde
 - Termes des contrats publics pas appropriés
 - Compétition projets municipaux vs projets privés
- Enjeu de viabilité des projets GNR au niveau des connexion à cause de la taille et configuration du réseau de gaz
- Utilisation sur place du biogaz? Présentement 7 à 16 \$/GJ le propane vs 45 \$/GJ; exemple de l'Allemagne : biométhane
- Pas beaucoup de marge d'amélioration pour le coûts de production de GNR à partir de résidus agricoles
- Coût des changements de pratiques (passage de culture annuelles, à des cultures pérennes), etc.)
 - Enjeu de localisation des ressources et de la demande;
 - Pour les biocarburants ça prend une très grande échelle, pour être viable

Main d'œuvre

Disponibilité à court et moyen terme?
Enjeux de formation?

Main d'œuvre

- Essai fait par FP innovation pour estimer les coûts: certains résultats indique une non rentabilité, mais sans tenir compte de la courbe d'apprentissage de la main d'œuvre, de l'innovation pour la machinerie
- Pas de compétences pour la construction d'usine de biométhanisation au QC
- Enjeu autour de la réglementation de la RBQ : il n'est pas possible de faire appel à des entreprises étrangères
- Différence du ratio capital/travail selon les filières
- Enjeu de main d'œuvre se "gère" car dans la durée de planification du projet, on l'intègre mais ce n'est pas central, et pas spécifique à ce secteur
- industrie de récolte primaire est essentielle car il ne peut pas y avoir de nombreux joueurs qui prélèvent en mm temps
- Industrie de récolte primaire structurante
- Faire attention au débalancement de la chaîne existante
- le modèle maïs+++/soja+ + cochon exporté en asie : c'est un modèle qui coûte cher à la société québécoise. Est-ce un modèle qu'on veut garder
- Exemple de codépendance : papetier et cogénération. Plus de papier, plus d'électricité

Compétition

Compétitivité-prix entre technologies ou avec d'autres sources d'énergie ?
Service/produit de substitution affectant la demande ?

Autres

- Plénière
- Valorisation
- Dépend de l'utilisation : ex. biomasse pour chauffage pour gérer la pointe, ça vaut 120 \$/kWh
- Potentiel de réduction de GES émis
- Pour les industriels : ils ont besoins d'acheter le GNR avec tous les attributs environnementaux sinon c'est du GN à 5 fois le prix
- Approche volumétrique vs qualité; transformer l'objectif volumétrique en cible de GES à réduire (point de vue de consommateurs industriels)
- La réglementation est parfois trop rigide
- le prix le plus bas n'est pas toujours le premier choix (industrie)
- Le marché du SPEDE n'offre pas assez de prévisibilité
- taux de retour énergétique
- Marché du gaz quelques gros acteurs, leur valeur = leur réseau; ils vont défendre leur modèle
- Acceptabilité sociale : enjeu chaîne de logistique

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Discussion 1 - État des lieux

Réactions sur le document de travail

Gaps, imprécisions, etc.

Autres

Points forts et points faibles

Secteurs/filières à détailler/préciser?

Devrait couvrir également:

- (1) Usage à l'interne de la scierie et pâtes et papiers est occulté
- (2) Chaudières industrielle avec biomasse versus efficacité énergétique (possible de libérer des volumes qui peuvent être utilisés ailleurs)
- (3) Volet granules un peu occulté ; donne une mauvaise presse aux granules dans le rapport alors que dans des analyses faites c'est ce qui offre un bon potentiel de décarbonation au Québec en bioénergie
- (4) 3,5 m de tonnes de résidus en forêt est laissé là

Points positifs

- (1) Donne une bonne vision pan-canadienne

Tarifification carbone au niveau international versus au niveau québécois génère une exportation de notre décarbonation en Europe (qui valorise davantage la décarbonation)

concurrence internationale vs réglementation nationale

Plus de détails sur les usages non-énergétiques?

Les émissions liées à la récolte: demandent des changements de pratique

Mousse de spheigne?

portraits provinciaux

Mauvaises perceptions des granules: usage local vs exportation

Revenue recycling

Taxe carbone qui fonctionne celle de Suède (réforme du système fiscal: plus tu fais des efforts, moins tu vas payer des taxes)

Plafonnement des émissions est aussi un must en combinaison avec la taxe carbone

Pression sur les sols: manque de matières organiques synergie

Discussion 2 - Enjeux liés à l'approvisionnement

Disponibilité de la biomasse

Y a-t-il des sources plus à risque ?
Des sources en croissance?

récolte des bandes riveraines élargies
- enjeu de coûts
+ qualité de l'eau

résidus agricoles et fumiers pour production de méthane (Energie+NaturEnergy)

Productivité de l'usage de l'énergie à réfléchir avant même de penser à ajouter des flux énergétiques nouveaux

Bilan humide global négatif dans le secteur agricole - sans même tenir compte des futurs projets de biométhane

Optimisation des procédés (pâtes et papier pour aller chercher des valorisation de flux)

est-ce que ça existe de la biomasse agricole? Sachant que tout prélèvement appauvrit le sol.

Limites

Doit-on revoir les seuils de récolte durable?
En quoi les aléas climatiques/écologiques pourraient affecter l'approvisionnement?

Coûts associés au produit qui souhaite entrer dans le circuit court (coûts importants) :ex: dans le cas des bandes riveraines élargies (transformer des herbes en granules ... coûts de la biomasse à l'entrée et défis de transformation)

revoir les normes sur les résidus forestiers

Est-ce que le gouvernement est suffisamment impliqué dans le décisionnel des projets qui se concrétiseront pour limiter le monopole des ressources à un joueur?

5 ans de bois d'oeuvre a brûlé cette année (10% est récupérable pour le bois d'oeuvre)

Bon travail fait actuellement par le MAPAQ pour voir ce qui est "récoltable" pas le droit de coupe le problème, mais l'accès à ces résidus en mettant les bonnes pratiques (EROI) : ce qu'on fait avec ces résidus ensuite

Coûts

Seuil de tolérance aux variations?

Point en lien avec feux de forêt: **Il n'y a pas de chemins qui va se rendre**

déséquilibre du marché si variation de production (ex dans le papier)

Compétition

Différentes chaînes de valeur qui utilisent la même ressource?

Monopole comme Énergir qui souhaite prendre les résidus pour faire certains projets de très grande ampleur: cela peut-il cannibaliser une ressource sur une utilisation première versus d'autres plus "utiles" qui peut arriver ensuite?

Déficit de litière pour l'élevage certains utilisent des déchets de construction...

Autres

Relation avec les communautés autochtones

1 M de tonnes qui pourraient être mieux utilisées

Discussion 3 – Facteurs de rentabilité/viabilité économique

Chaîne de valeur

Main d'œuvre

Maturité de la chaîne de valeur (en place, en développement, inexistante)?
 Interdépendances qui affectent sa viabilité?
 Exposée à des risques? De quelles natures?

Disponibilité à court et moyen terme?
 Enjeux de formation?

Ne pas négliger la diversité des biomasses différentes à traiter (copeaux, sciures, écorces, billots)

Se concentrer sur les circuits courts

La sécurisation de la chaîne de valeur
 la compétition entre producteur
 l'intégration verticale aide à la prévisibilité, au détriment de la rentabilité instantanée

Cogénération: pas en mode cogénération toute l'année si pas de demande de chaleur (actuellement on est à 22% d'efficacité)

Compétition

Autres

Compétitivité-prix entre technologies ou avec d'autres sources d'énergie?
 Service/produit de substitution affectant la demande?

GN encore moins cher de l'électricité et délais de raccordement HQ>Energir

Papeteries jouent avec les taux pour produire plus ou moins de copeaux

Industrie granules invitée pour la 1er fois au comité gouv sur la ressource: on craint la compétition avec l'industrie de la transformation

Course aux investissements dans nouvelles industries = sous investissement dans l'industrie existante

Retourner au protocole de Kyoto et les accords de Marakech

La notion de bois sans valeur

DIVERSION: Intérêt de l'hydrogène (exagéré) dans un contexte québécois

Papeteries jouent avec les taux pour produire plus ou moins de copeaux

100 kt de variation suffit à déséquilibrer le marché

Importance de discriminer les usages pour ne pas que les usages énergétiques des ressources alimentaires viennent créer des problématiques de sécurité alimentaire!

biométhane agricole: le business case pour l'agriculteur: potentiel fertilisant plus élevé que celui du fumier...

destruction du tissu socio économique si transformation de l'industrie vers la bioénergie la notion de coproduit

Établir des priorités d'usage par type de produit

Percevoir des gros joueurs comme co-développeurs de solutions de pointe

Loi sur les combustibles propres ou l'huile de canola est transigé de façon commune pour alimentation ou énergétique (PBME DE CONCENTRATION À L'UTILISATION DE L'HUILE DE CANOLA SELON \$\$\$)

Granule vendu à 200\$/t

Energie = oligopole les modèles d'affaires teintent l'analyse du secteur (Energir=propriétaire de tuyaux...)

Faut le faire en priorité pour le GNR prioriser l'industrie plutôt que le résidentiel où des alternatives existent

cibles volumétriques vs intensité carbone l'industrie veut plutôt une intensité carbone alors que les producteurs aiment la cible volumétrique

Garantie de prêt sur 20 ans pour contrer le court terme et prendre en compte les attributs environnementaux

Workshop - Biomass and carbon neutrality : Putting in place an evaluation framework

Discussion 1 – Current state report

Comments on the shared report

Gaps, uncertainties, etc.

Additional comments

Strengths and weaknesses

GREEN
CHEMISTRY

best end
use : energy
or anything
else ?

Sectors/industries to be detailed/specified

long carbon chains underutilized in number of sectors
using half of what is available
we need more information
StatCan data not enough we need more data
availability of the pulp
it's Regional: competition for the biomass
Crown land vs private land important
some private lands are not managing their woodlots

higher private lands in this regions compared to the rest of Canada . Managed
very differently
40000 private woodlot
different regulatory aspects in this region compared to others

there is a zone of crown land not being cut because of quality of logs and species
million cubic meter is being undercut

focus is always on the crown land
problem with private land : you can't guarantee supply so you cannot build an
industry based on that

branches not utilized now
how to increase supply

logging residues challenge more
economical : with offer and
demand the economics will
change. We have a better net
price when we sell internally

circularity component

comment on the report : using
agricultural lands for biofuels

undeutilized famrland here, lack of food
production

jurisdictional approach for regulations

wen can use biogaz here but cant sell it.
major issues

gaz sector is not recognizing RNG here .
Single owner can use it but can't sell it

Discussion 2 - Supply issues

Biomass availability

Are any biomass sources high-risk?
Growing sources of supply?

biochar for carbon storage

carbon intensity should be looked at more
also for manure that is one of the determining
factors for feasibility

Biochar : expensive to move it around

boilers regulations : can't buy a boiler from europe
and use it here then cost of appliances going up

it cost alot of money to import the heating boiler from
europe

its both provincial and federal
appliances even residential
approval challenges

the aggregation. might not have enough supply
In NB smaller agricultural sector
But there is potential for growth
NB moving towards SSO

contamination for organic waste

need for substitute for fertilizers

for biogaz problem of aggregating the supply

Boundaries

Should we review the sustainable harvest thresholds?
How could climate/ecological hazards affect supply?

solutions for phasing out coal

most in Canada are gen not cogen

same t of biomass going to cogen or other ..
3 to 1 ratio

gen Drax 30 to 33% efficiency
cogen the efficiency goes up to 60%

decentralizing
look at europe, many cogen
using biomass for heating betetr solution

Drax targeting eastern canada
we should use the pellets more here instead of
exporting

the storms
the pest issues

droughts is one issue

Market access related to crown lands

Costs

Fluctuation tolerance threshold?

wastewater and sludge

for CRD

Dr Beth Mason at Nova Scotia

in NB there is alot of sources of
biomass but from biorproducts
perspectives, is it better to use it
for energy or chemicals ?

spraying to kill the hardwoods. they have
alot of softwood plantations
here they are still allowed to spray

hemp being used in concrete structures
there are regulation changes

help with rotation crops. The lands need
the boost

land based proteins for agriculture

in the seeds

Competition

Different value chains using the same resource?

process heat

in NB no holistic energy strategy
there needs to be a coordonated
energy planning

how do you decarbonize
agriculture
not targeting the right use of
diesel (they are targeting the
trucks that use diesel)

alot of technologies being
developed
what can help structure NB and
give it more visibility ?
efficiency agency

you wont find biofurnaces being
offered by efficiency agency
provinces werent pushing
biomass because it wasnt
recognized by federal

stop spraying for softwood plantations

In NB one of the most forest dependent
province

One player holds more than half of it

they lost 4 to 5 pulp mills in NB

it has been stable over the last 10 years

There is no integrated vision on a
provincial basis

in Nb pulp
mills manage
for volume
not quality

nova scotia
innovation hub
looking at solutions

The avenue report
Nova scotia

Additional comments

if you use forest biomass for energy you
will be in competition with pulp mills

traditional backstop for peak demand
was that if we dont have it we will but it
from Quebec. However now it will be
different because they cannot do that
anymore

in atlantic canada bigger peak now

energy sovereignty : if we look to buying
from others

For pellets one
factor to take into
consideration is
the transportation

wood pellets in canada is
driven by regulations in
other country so we are
depending on them

bioenergy use missing
we are depending on pulp
mills

Discussion 3 – Economic viability/profitability factors

Value chain

*Value chain maturity (actual, developing, non-existent)?
Interactive relationships that affect its viability?
Faced with risks? What kinds of risks?*

- for wood pellets : depending on europe
- we need to revise the legislation
- if we want to increase the production of wood pellets, we need to create a pull internally
- Biogas: confident with market opportunities. issues with coordination with identification of opportunities

- in the biogas agriculture sector : instead of spreading manure they can develop new solutions
- composting not an environmentally good solution

- european standards are always above canadian and US standards but there are still problems with that
- standards are not a great barrier but we are not helping companies overcome it

- having Nova Scotia as a partner would help better collaboration regionally would help the sectors
- one set of rules for companies coming to operate

Labour

*Short and medium-term availability?
Training issues?*

- for training: we need to train for forest management
- general training for woodland owners
- A lot of knowledge missing there
- tracking output and productivity
- political wedge issue
- forest management vs private woodland owners
- problem of management and inventory on private lands compared to crown lands
- you have to manage on a landscape level for carbon
- with productivity we can do more with private lands if we overcome these issues

labour is a big problem both for training issues and having enough people

Competition

*Price competitiveness between technologies and with other energy sources?
Substitute service/product affecting demand?*

- focus on the impact, on the gain, what is the net gain if we produce hydrogen
- energy pricing not taken into consideration if we dont have a levelized pricing
- for carbon pricing
- all the pellets need to be certified to go to europe now so they need to analyze how much carbon
- foresce
- 50 c kwh its viable if you are trying to support new solutions
- if it can offset the CAPEX

- we should target the solution that has the best impact on the environment
- biomass are great in certain place - prioritising where biomass is king
- biomass used to be 60% efficiency with boilers now its close to 100
- biomass is an under represented as a short term solution

Additional comments

- how do you justify paying the price for higher price RNG
- for the farmer: what is being sold is after the energy needs are already met
- keeping the environmental benefits for the farmer and the milk for them to be net zero
- what's an equivalent cost per BTU (alternatives for natural gas for example)
- wood pellets: not benefiting from the environmental credits. They sell the pellets and Drax benefit from that
- a wood pellet industry is decreasing the amount of pellets they are selling to Europe and starting to sell more locally
- If our energy costs are equivalent to Europe it will change things to wood pellets
- If there could be an agreement to shift the credits between the buyer and seller
- carbon offsets might not be surviving for long time : the objective was to help with the transition

price of heating boilers if we can import them from europe

Workshop - Biomass and carbon neutrality : Putting in place an evaluation framework

Discussion 1 - Current state report

Comments on the shared report

Strengths and weaknesses

Great to have all concerns and uncertainties in the report

Gaps, uncertainties, etc.

Sectors/industries to be detailed/specified

Forest fires GHG emissions

Additional comments

Nobody knows about agricultural residues which are available

No harnessing gas from residues. They are just decomposing

Small farms, you cannot tell them how to use their byproducts

incertanties around data in federal government

Clean electricity regulation might not be effective as it thought of feasible

No sure about residential energy need in the future

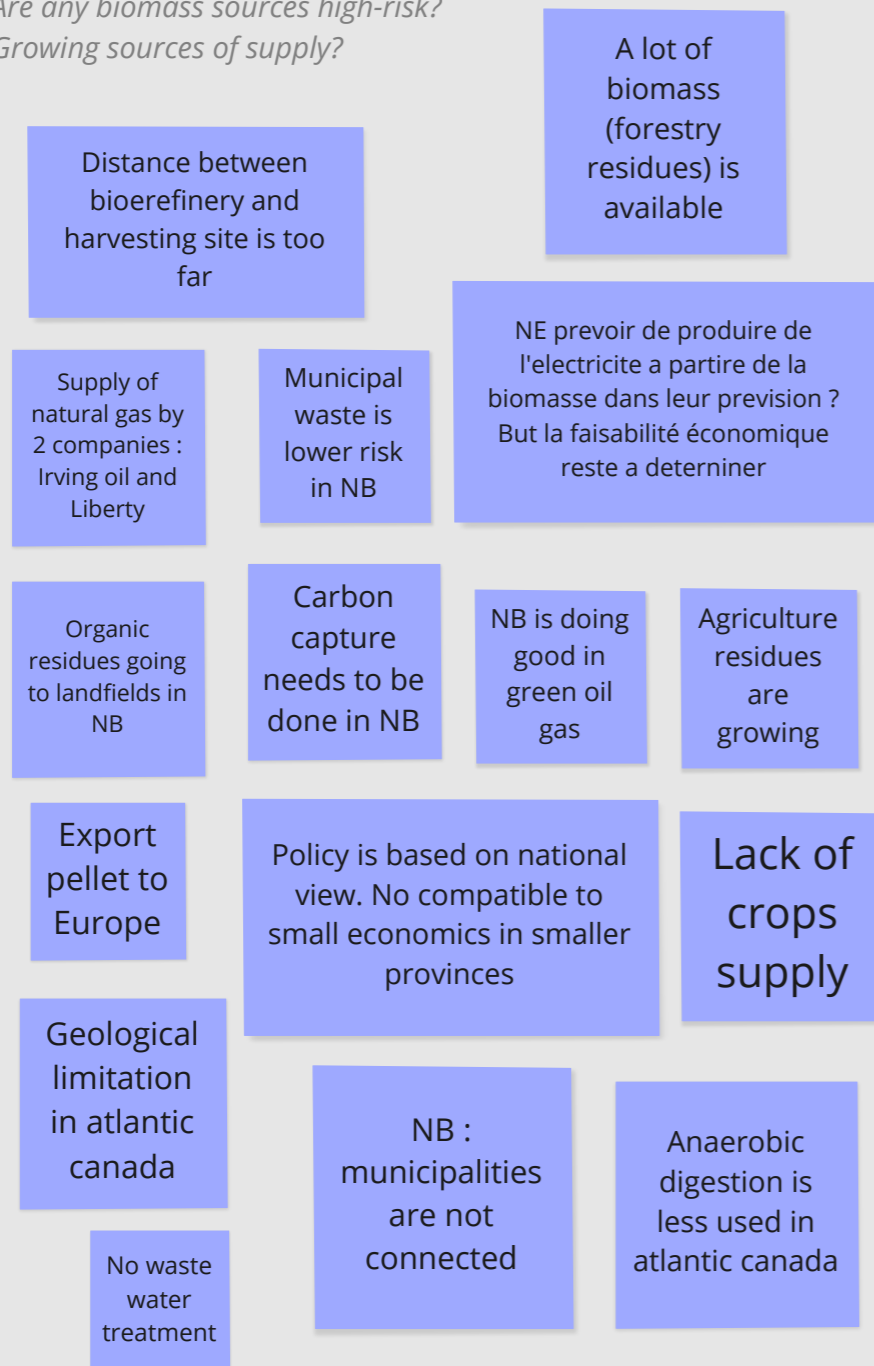
biomass utilisation is the same as long time ago

NB doesn't have large farms

Discussion 2 – Supply issues

Biomass availability

Are any biomass sources high-risk?
Growing sources of supply?



Boundaries

Should we review the sustainable harvest thresholds?
How could climate/ecological hazards affect supply?



Costs

Fluctuation tolerance threshold?

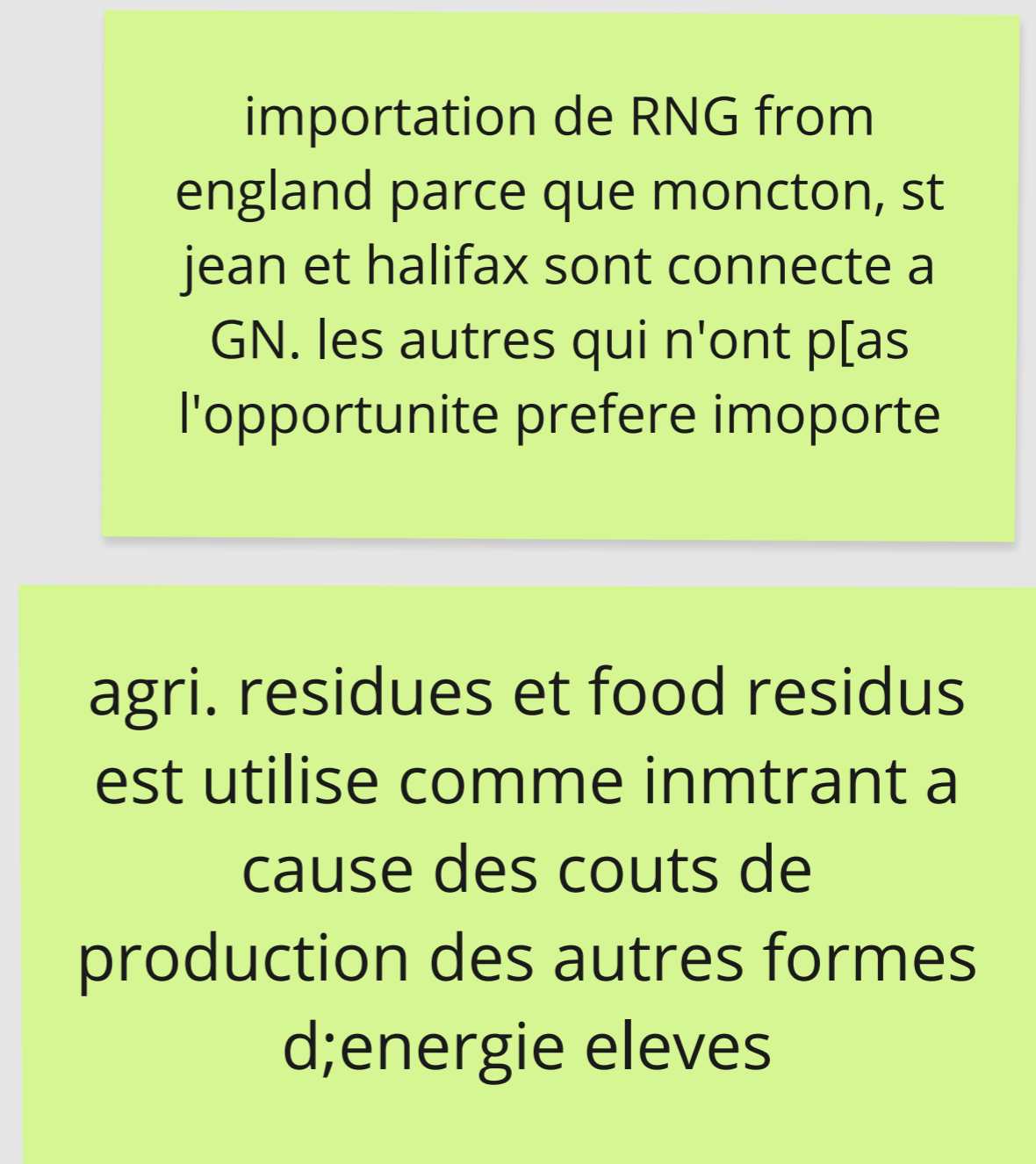


Competition

Different value chains using the same resource?



Additional comments



Discussion 3 – Economic viability/profitability factors

Value chain

Value chain maturity (actual, developing, non-existent)?
Interactive relationships that affect its viability?
Faced with risks? What kinds of risks?

In forestry there are no issue.
But in bioenergy there are some issues, not supply chain issues but issues link to regulations

la quantité limité des autres ressources (agri. manure, etc..) pour ptoduirre de la bioenergie. Ce qui revient plus cher

Une gramnde entreprise foreetiere qui possede toute la chaine de valeur. A cause de non regulation du gouv. pour regular la situation : Oligipole (3 entreprises forestieres; seulement une grande). Ils ont leurs propres terres en plus des terres forestieres de la courronne. Ce qui empêchent les autres entreprises d'être compétitives sur le marché)

Policy and electriciy rate.

Gov gave big players (dominant player who can easily effect or eliminate threats) allocations.

No suppliws chain issues for forestrt

energy price

electricity rate

6 landfills

lack of opportunity

Value chain maturity : forestry biomass value chain is growing and reached the maturity. But others value chains no; some are limited, young or developping, ost is the boundary not technology. Other boundaries. According to the company it could be cost and lack of knowledge.

Production tax credit is not huge to allowed the bioenergy projects

Interactive relationships : energy prices, carbon procing, lack of opportunities presented by government.

Labour

Short and medium-term availability?
Training issues?

lack of HR so labour could be issue.

Need buyers (demand issue, not it's most export); Irving is the dominant player who owns all value chain itself

Competition

Price competitiveness between technologies and with other energy sources?
Substitute service/product affecting demand?

Substitute service/product affecting demand : industry based carbon offset; lack of GDP consideration of each province in federal modeling; no complainece market; constant policy signals; gov need to have long terme views; there is not clean energy strategy in province; and NB : doesn't have industrialisation policy yet.

Electricity is cheaper here so there is no traditionally competitiveness

Additional comments

No carbon offsert prgram because of samll economic , many organisation can live the province.

NB don't have industrialisation policy

lack of consistent policy

smaller farms ->lack of data

Workshop - Biomass and carbon neutrality : Putting in place an evaluation framework

Discussion 1 - Current state report

Comments on the shared report

Gaps, uncertainties, etc.

Additional comments

Strengths and weaknesses

Sectors/industries to be detailed/specified

brussel effect EU
take into account the EU
regulations (scope 1 2 3)
Border tax adjustment EU

supply chain not only the direct
emissions
take into account the business as
usual
pollution Nox SOx from biomass
and more pollution

granular data of the use of land
classification of that land

Different data from NRCAn and agriculture ministry
term of forest waste
consider using residuals
what is missing : wildfires
more than 25 times of harvest burned in one year of
wildfires
concept of climate smart forestry
sweden and finland look at that
3 steps process
national adaptation strategy we need to speed up

suggest the term of carbon neutral to change from the
title to net zero
from the ecosystem value not focus on carbon beyond
carbon
clean water clean air
other voluntary measures from ECCC
voluntary code of practice for pulp and paper
recognize the policy measures that exist
some duplications
what exists right now
biomass is already really expensive if we increase the
price we wont use it
take into consideration the
/beccs appot=rtunity for export
veru high

Discussion 2 - Supply issues

Biomass availability

*Are any biomass sources high-risk?
Growing sources of supply?*

very high capacity plant for BECCS
not enough supply for a large plant like that?
beccs hub with pulp and paper
capacity limitation for beccs
90000 tonnes per year for atikokan
very low capacity plant
integrated company vs sawmill company
only for residuals of wood
transformation

Boundaries

*Should we review the sustainable harvest thresholds?
How could climate/ecological hazards affect supply?*

biochar plant in ontario

electrifying the
transportation sector

federal ITCs
need to build more homes

Costs

Fluctuation tolerance threshold?

in LCA for biomass take
into consideration the
carbon that decomposes
and captured in soil
dynamic LCA studies not
enough to capture the
temporality

Competition

Different value chains using the same resource?

where is the forest being harvested to
understand how it affects the emissions

biomass the last unit to run because it is
very expensive and limited supply
federal itc for clean manufacturing
doesnt include biomass
30% tax credit
itc could be game changer in terms of
supply
in combination with supply and housing
issues and others
CCFDs
ITC was canada's response to IRA

Additional comments

Biomass for
electricity is one
of the most
expensive for
electricity in
Ontario

Discussion 3 – Economic viability/profitability factors

Value chain

*Value chain maturity (actual, developing, non-existent)?
Interactive relationships that affect its viability?
Faced with risks? What kinds of risks?*

beccs very regional specific
because of the geography

smart policies is one of
points that could help
overcome the challenges
for BECCS deployment

Labour

*Short and medium-term availability?
Training issues?*

EU taxonomy

iLUC huge impact on
the GHG emissions
the viability of
BECCS and iLUC

Competition

*Price competitiveness between technologies and with other energy sources?
Substitute service/product affecting demand?*

reporting
practices right
now and the
impact on export
of resources to
other countries

Additional comments

biocrude is also flexible

federal procurement
to help incentivize the
private sectors to
invest in those areas

Workshop - Biomass and carbon neutrality : Putting in place an evaluation framework

Discussion 1 - Current state report		
Comments on the shared report	Gaps, uncertainties, etc.	Additional comments
<p><i>Strengths and weaknesses</i></p> <div data-bbox="179 644 805 1272" style="background-color: #ffffcc; padding: 10px; margin-bottom: 10px;"> <p>no company uses straw on a continuous basis economy of scale doesnt apply to agriculture very broad some data are not very recent sequestration in LULUCF for agri and emissions in agriculture sector difference in soils and regions very technical who is the audience land use change wildfire emissions control burning in forest sector</p> </div> <div data-bbox="179 1315 805 1942" style="background-color: #ffffcc; padding: 10px;"> <p>yukon progressive with biomass regional issue wildfire mitigation more detail in the report ion the land use side hWP if we suddenly pay carbon tax on bioenergy it will change everything for biomass investments and producers prepare net zero for change in governments and politics - investments for short term targets BECCS and hydrogen production one outcome but some studies include less hydrogen</p> </div>	<p><i>Sectors/industries to be detailed/specified</i></p> <div data-bbox="1061 878 1884 1708" style="background-color: #ffffcc; padding: 10px; margin: 10px auto; width: 80%;"> <p>what we will do : the driver will be the economics 25% of crop residues could be used mill waste to include the data in the report how much available considering logistics to get the crop residues in practice we dont have much agriculture residues cost of recovery whats economically available point to the economics - investing in biomass</p> </div>	<div data-bbox="2031 868 2816 1666" style="background-color: #ffffcc; padding: 10px; margin: 10px auto; width: 80%;"> <p>pretreatments cost energy cost also concept of logistics add it to the report the billion ton study high level spacial granularity updated regularly</p> </div>

Discussion 2 - Supply issues

Biomass availability

Are any biomass sources high-risk?
Growing sources of supply?

ethanol relying on imports
cost competitiveness of the US ethanol
light naphta from coprocessing renewable diesel

how much more could we harvest from cereal and oilseed crops ?
energy in the system with nitrogen
part of the lifecycle carbon intensities of the fuels
summer fallow
change in land use for increasing the crops use for fuels ?
challenge with logging residues - technology not there yet to produce with that instead of

Boundaries

Should we review the sustainable harvest thresholds?
How could climate/ecological hazards affect supply?

we used to export more canola
alot more canola oil available for fuels
the are trying to find more uses for the meal of canola instead of the oil

right carbon pricing signal for BECCS before it takes off

the 1500 PJ could decrease with electrification - decrease of a need for liquid fuels

agriculture good source of biomass - annual
energy crops perennial on marginal lands - alot more energy
we could improve the soil health ?

Costs

Fluctuation tolerance threshold?

in field pyrolysis
we cannot super some technologies in remote areas
in terms of insurance
from 200-300 miles material to the plant for pellets and low quality
camelina not major food crop - challenges for acceptance by growers nervous about it because its new
cover crops that doesnt go away
farmers need to be sure about what they grow
risk aversion with new crop regimes not knowing what the prices will be
they have storage they can wait and then sell it

Competition

Different value chains using the same resource?

high value products use for biomass resources
(switchgrass,)
build the resiliency of the crops
increase of supply in mitigating the wildfire treatments (thinning)
risk - carbon accounting if it counts as emissions when doing that thinning
produce pellets and store them for resiliency in agriculture biomass during drought years

pellet is enabler technology - economy to go forward
compliance credits to kick start the bioeconomy if they give it to certain projects

Additional comments

custom harvest and pelletisation of agricultural biomass and send it to storage and build the supply chain to start the bioeconomy with agr pellets
for decarbonization the marine sector there are some of the material that could be used - hard to decarbonize sector that wont be able to electrify
unharvested wood impact on the GHG - reporting will reflect the increase on the emissions
wood from the CRD - the biomass will decompose more slowly so to take into consideration on the GHG impact

Discussion 3 - Economic viability/profitability factors

Value chain

Value chain maturity (actual, developing, non-existent)?
Interactive relationships that affect its viability?
Faced with risks? What kinds of risks?

industry in newfoundland for hydrogen (brea renewables ?)

technology risks on cellulosic its still there

study by Advanced biofuels Canada for CAPEX of projects like renewable diesel

any project for renewable diesel or SAF more vertically integrated in these supply chains

some heating oils that could be used in marine because they could be more easily used there

byproducts stream : very little credit they don't finance it they dont count on these values because if the clean fuel regulations is gone in 2 years these values are gone, the policy risk here is important

is it worth it to try to make RNG from wood waste do they want to enter the competition for the fiber or they could give them the methane and help them in the refineries
RNG is very versatile platform for MSW and manure less competition but it is limited the feedstocks might go to the methanol or RNG but it will stay in the energy
farmers will plan next year's crop depending what the market is now
they could take the canola acres and put them into wheat depending on the market it self regulates

camelina and carenata are facing the same challenge maybe if they ask farmers to grow a crop but then the project doesnt need it - the farmer will have his crop without any market the agriculture market is structured in a certain way shoulder season crops - intercropping - using existing acres - farmers wait until the prices are high and then they can sell the crop when there is less crops
agricultural markets are very good in delivering feedstocks used cooking oil we wont have more

Labour

Short and medium-term availability?
Training issues?

we have to create the labour supply we dont have AD operators right now no one has been trained for

forest land management is also very labor intensive and it's not very stable if the policy changes maybe these jobs won't be there

if you want to build in Canada its more expensive - its a challenge to get stuff built and that would impact the cost of labor and that would be the challenge

farmers would have also problem to recruit people

some discussions about chips and pellets competing

companies have licenses and they connect their business infrastructure to that license - what they do with the residuals its their choice
the licensees hold the control of the competition
first nations engagement - landscape use will change - but now the licensee will control now

for about 20% more CAPEX you could produce the most of the SAF in their output

the platforms are very flexible and could produce what is required -its up to policy designs to put the good priority and the producers will follow because they are flexible
the technologies that will work are the ones that work in that environment (flexible to the market and the demand depending on the prices - diesel vs SAF vs others). Same refineries as the oil refineries

connection between HWP in the emissions accounting and the use of biomass for bienergy is important

Competition

Price competitiveness between technologies and with other energy sources?
Substitute service/product affecting demand?

connection between biomass use and LULUCF the approach now cant stop harvesting old growth for energy happen
CFR include in the criteria land use change and biodiversity canada's feedstocks will be available to the world and the rest of the world will want the feedstocks
EU has the tightest criteria for biomass and if we dont use it someone will
volumetric mandate vs carbon intensity mandate
land use play a big role in reduction of carbon intensity - depending on the feedstocks if there is land use it increase the CI

what's the way forward with the policies:
contracts for difference

carbon intensity signal is here to stay

the danger for food vs fuel is there - it puts pressure on the agriculture

Additional comments

big deal for ethanol keeping the CI down

BECCS high capture rate (clean stream and easy to pull off)

the geology is good but the economics are not for the CCS with the ethanol plants (where are they ?)
very well understood technology that could be deployed (check how much they are sequestering)

if ethanol need to reduce the CI

there are technologies that dont need the pipelines and they take the CO2 and turn it into synfuel (dont need the pipeline)

FT synthetic fuels the technology it has been there for a long time

in the gulf there are incredible projects around synfuels for synfuels to make them more economic : make it react before it becomes CO2 (while its carbon monoxide)
transporting gas is easier than transporting liquids

to quantify the value of the carbon it wont get a lot of traction because what we will do with that other than informational

the biomass inventory

the value of the carbon is included in modeling lifecycle analysis

Workshop - Biomass and carbon neutrality : Putting in place an evaluation framework

Discussion 1 - Current state report

Comments on the shared report

Gaps, uncertainties, etc.

Additional comments

Strengths and weaknesses

Sectors/industries to be detailed/specified

TRL availability

land use change methodology/regulation

Add some end use application/sectors

missing a definition of sustainability

Must flesh out the end use demand
E.g. how much land would be needed to fulfill the need

missing some estimates on available quantities

Boundaries, assumption
LCA+landuse change

Role/effect of wildfires

CI is hard to evaluate

LCA framework mandated by ICAO

Currently Europe is only banning some feedstock without any objective evidences of CI

Photosynthesis efficiency:
0.6W/m

Discussion 2 - Supply issues

Biomass availability

Boundaries

Costs

Are any biomass sources high-risk?
Growing sources of supply?

Should we review the sustainable harvest thresholds?
How could climate/ecological hazards affect supply?

Fluctuation tolerance threshold?

More
canola will
be used

Competition

Additional comments

Different value chains using the same resource?

CORSEA?

IRA: affect
fuels more
than feed
stock

where will demand
come from

domestic production
vs import

CI is the
current metric
to compare
fuels

Industry is going
to renewable
diesel

danger of
having
prescriptive
policy

3 criterias:
CI (ISO
1465?), cost,
availability

Discussion 3 – Economic viability/profitability factors

Value chain

*Value chain maturity (actual, developing, non-existent)?
Interactive relationships that affect its viability?
Faced with risks? What kinds of risks?*

20 years payback
for bioenergy vs 5
years in forestry

Mostly
vertically
integrated
industry

Ian to provide
a study on bio
production
forecast

Labour

*Short and medium-term availability?
Training issues?*

missing some trained
people (e.g. anaerobic
digester operator)

already
shortage of
workforce.

competition with
oilsand sector: farmers
having trouble to get
workers

Competition

*Price competitiveness between technologies and with other energy sources?
Substitute service/product affecting demand?*

Interest for bioenergy
from farmers rised
when China banned
canola import

Decatur CCS
plant, DOE
project, 1Mt!

Costs
higher in
Canada
than US

ILAC?

Additional comments

Example de la Californie
CARB : “decarb will be with
electrification and cellulosic
ethanol”; this is not what
happend.

Not much co-process
production (for
renewable diesel)

Workshop - Biomass and carbon neutrality : Putting in place an evaluation framework

Discussion 1 - Current state report		
Comments on the shared report	Gaps, uncertainties, etc.	Additional comments
<p><i>Strengths and weaknesses</i></p> <div data-bbox="119 745 518 972"> <p>More explanation about the forestry products markets</p> </div> <div data-bbox="599 672 905 987"> <p>More information on agricultural residus data</p> </div> <div data-bbox="186 1138 579 1364"> <p>More explanation (details) on agricultural residus</p> </div> <div data-bbox="623 1123 885 1388"> <p>Less informations on RNG</p> </div> <div data-bbox="151 1472 544 1698"> <p>Clean feedstock to use the technologies</p> </div> <div data-bbox="605 1453 899 1752"> <p>Manitoba has the huge quantity of agricultural biomass</p> </div> <div data-bbox="101 1780 497 2007"> <p>Reference for BC forestry have conversation with FPIinnovations</p> </div> <div data-bbox="646 1785 859 2000"> <p>There are more information on RIN</p> </div>	<p><i>Sectors/industries to be detailed/specified</i></p>	<div data-bbox="2061 623 2740 1009"> <p>BC residus forestier sont eligible pour les credits carbone. Mais pour l'instant personne ne le fait</p> </div> <div data-bbox="2047 1015 2740 1414"> <p>Il existe des modeles qui prennent en compte les emissions sur toute la chaine d'approvisionnement de toutes les formes de biomasse en BC</p> </div> <div data-bbox="2047 1420 2702 1787"> <p>Le marche de RNG est devenu plus complique a cause des reglementations qui ne sont obien fixes \xees</p> </div> <div data-bbox="2166 1802 2562 2028"> <p>Technologies required policies</p> </div>

Discussion 2 - Supply issues

Biomass availability	Boundaries	Costs
<p><i>Are any biomass sources high-risk? Growing sources of supply?</i></p> <p>the supply is fonction pof the feedstock quality. So qualituy is very important when we talk about biomass</p> <p>feedstock cost</p> <p>25% de residus a ne pas recolter sur les sites forestiers</p> <p>tous les matieres premieres ne sop nt paas</p> <p>forestry biomass is the most used like biomass</p> <p>technologies are most of supply issue . Depending of the objective de reduce the carbone</p> <p>biomasse forestiere est plus a rsique que la biomasse agricole compte des feux de forets, les maladies et autres</p>	<p><i>Should we review the sustainable harvest thresholds? How could climate/ecological hazards affect supply?</i></p> <p>Les decisions economiques quide3nt la pluaprt des decisions d'approvisionnement de la biomasse</p> <p>Politics</p>	<p><i>Fluctuation tolerance threshold?</i></p> <p>tansportation cost</p>
Competition	Additional comments	
<p><i>Different value chains using the same resource?</i></p> <p>forestry license tpour reciperrer la biomass et cel aprend de l'argent</p> <p>Et responsable de la reposusee de la forêt</p>		

Discussion 3 – Economic viability/profitability factors

Value chain

Value chain maturity (actual, developing, non-existent)?
Interactive relationships that affect its viability?
Faced with risks? What kinds of risks?

encourage
incentive,
politics, n
policies
prospectives

attaract
capital and
profitable
operation

socail
acceptability
because of the
committed with
people

carbon
credit
market

Clean fuel
regulation

Economic
viability
depended on
the policies

CAPEX

Technologies
cost

Exiatent
supply
chIN

Labour

Short and medium-term availability?
Training issues?

In
agricultural
it's the
saisonnality

Lack of
equipment in
abgricultural
sector

labour e=will not be a problem
but the supply chain
(consumers) and the feedstocks
because we don' t need many
workers in bioenergy facilities

Competition

Price competitiveness between technologies and with other energy sources?
Substitute service/product affecting demand?

Additional comments

Workshop - Biomass and carbon neutrality : Putting in place an evaluation framework

Discussion 1 - Current state report									
Comments on the shared report			Gaps, uncertainties, etc.			Additional comments			
<i>Strengths and weaknesses</i>			<i>Sectors/industries to be detailed/specified</i>						
residues from forestry	forest bedding?	from a policy perspective . support	residue from crops. should we leave them or remove them?	variability of available biomass	wrong assumption that the biomass is sitting away with no purpose	land use? competitiveness	are there higher value products (e.g. wood pellet)	who owns the space? consensus between federal and provincial government	only x amount of waist. low value products from industry -eg. woodpellets. should we add higher value? policy incentives
we cant just drag all the waste	in terms of competitiveness marketplace	using European models for north america	what are the by products that can be upgraded.	food security?	unintended consequences	manure, is more consistant than any other thing in the industry	variability vs availability.	climate effect on crops	
the distribution of responsibilities in alberta	biomass work consequences in sequestrating carbon	crop diversity, impact soil health.	policy-water use?	water access, water credits?	How society will be learning bioeconomy	how elastic is the bio ag sector?	impact on biodiversity.	intended policy outcomes. e.g. food guides. bias (Ottawa)	
assumption that is carbon neutral, what about the greens when they are growing. how is that shared between the value chain.	re- doing the projections with different potential scenarios from year to year (yields)	model predictions of biomass availability?	measure of soil impact	cost/benefit model.	tame and native pasture impact?	must include water use	Education		
definition of waste!	provide examples of governance issues	distributed responsibilities	coordinating between private and public sector	affordable energy	economical sustainability	carbon intensive product is gone from the farm	net positivity for society	how do we get aviation fuels sustainable. how does the ag sector play a role in that	

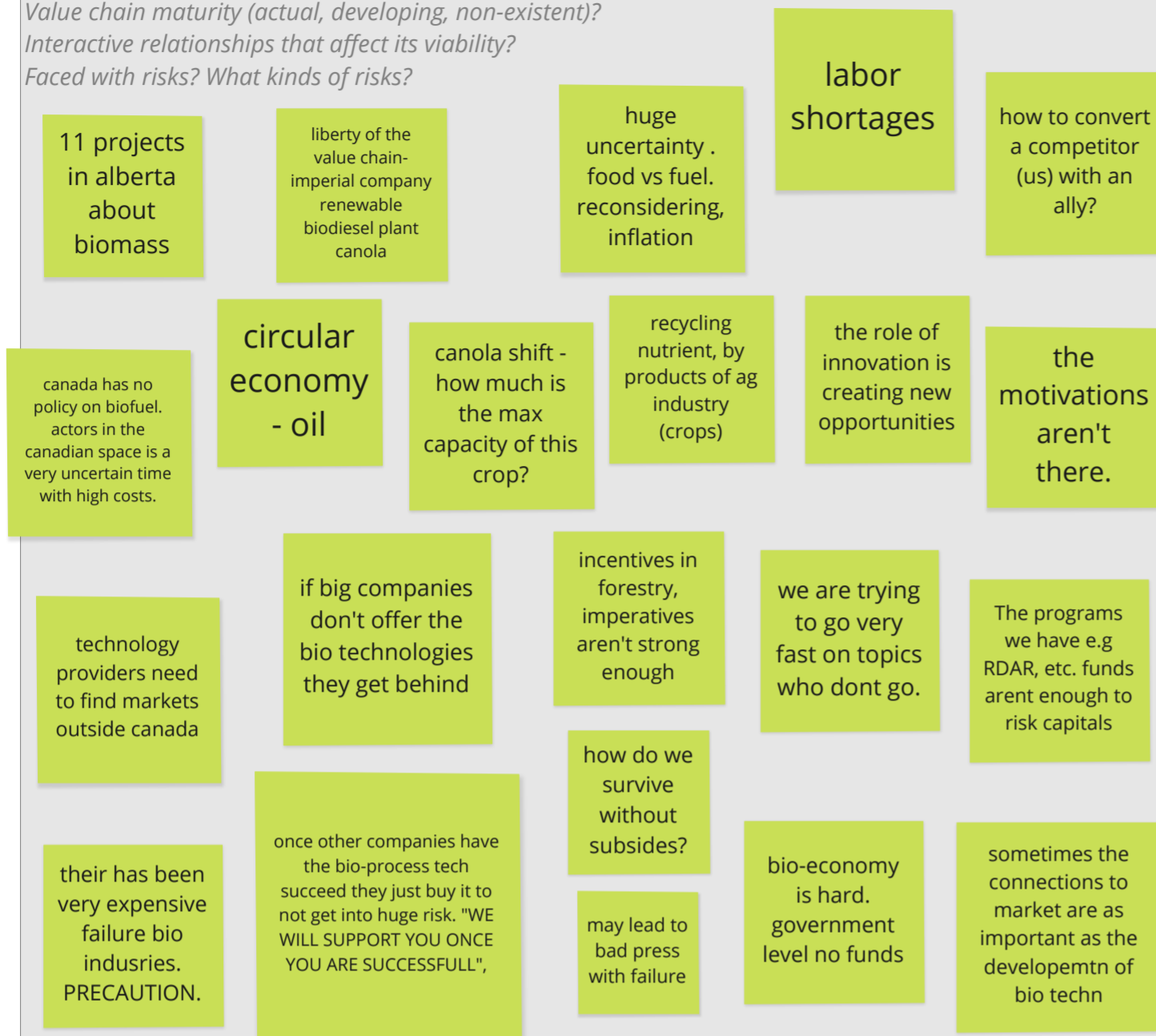
Discussion 2 - Supply issues

Biomass availability	Boundaries	Costs	
<p><i>Are any biomass sources high-risk? Growing sources of supply?</i></p> <p>all feedstocks are high risks, incentives of policy makers. farmers need sell 100% of their produce</p> <p>collaboration between sectors.</p> <p>by products-use parts for food and other for biofuels</p> <p>how do we combine the sectors. nutrients.</p> <p>hard to quantify, not only consider GHG emissions</p> <p>Its not only about net 0, biodiversity, available residuals, food security, water security etc.</p> <p>green bins</p> <p>government incentives may also be dangerous</p> <p>support farmers from year to year</p> <p>whole life cycles</p> <p>food security for CANADA</p> <p>aviation high-risk</p> <p>LOCAL food security costs</p> <p>woodpellets exports as high risk</p>	<p><i>Should we review the sustainable harvest thresholds? How could climate/ecological hazards affect supply?</i></p> <p>infraestructure issues</p> <p>are we modeling climate impact>?</p> <p>wildfires? forest fires. how will these affect in 50 years</p> <p>fiber demand depending for their content composition</p> <p>varies of course year to year</p> <p>what are the numbers projections</p> <p>policy perspective ag and environment</p>	<p><i>Fluctuation tolerance threshold?</i></p> <p>if manure is turned into gas. costs?</p> <p>incertaintly of the farmers on their scenario yearly plan</p> <p>complementarity issues . supply demand and price</p> <p>value of international vs value of national market</p>	<p>manure- infraestructure, transport, fertilizer</p> <p>reducing transportation in supply chains</p> <p>commodity variable prices-</p> <p>inestability of carbon market "artificial"</p>
Competition		Additional comments	
<p><i>Differente value chains using the same resource?</i></p> <p>mushrooms? use of competition for use of residuals</p> <p>use of fertilizer-different crop requirements</p> <p>ag. crops</p> <p>ag waste-manure only costs is expensive co-digestion.</p> <p>any left over of processing. find other markets for by products</p> <p>cautions of what is waste and if it is available</p> <p>ethanol from corn is different from other crops. not standardize it.</p> <p>if a grain isnt best quality, doesn't fit human food certain category, what other sales are they accounted.</p>		<p>the forest industry doesn't have value chain clear</p> <p>recycling furnitures. second hand stores</p> <p>infraestructure</p> <p>large scale deployment-capital funding and insurance</p> <p>optimistic view vs reality is different-caution</p> <p>how can we minimize that "waste". change it as a residuals or by products.</p> <p>regenerative ag practices</p> <p>in a large scale without "baby sitting" a big company. e.g composting.</p>	

Discussion 3 – Economic viability/profitability factors

Value chain

Value chain maturity (actual, developing, non-existent)?
Interactive relationships that affect its viability?
Faced with risks? What kinds of risks?



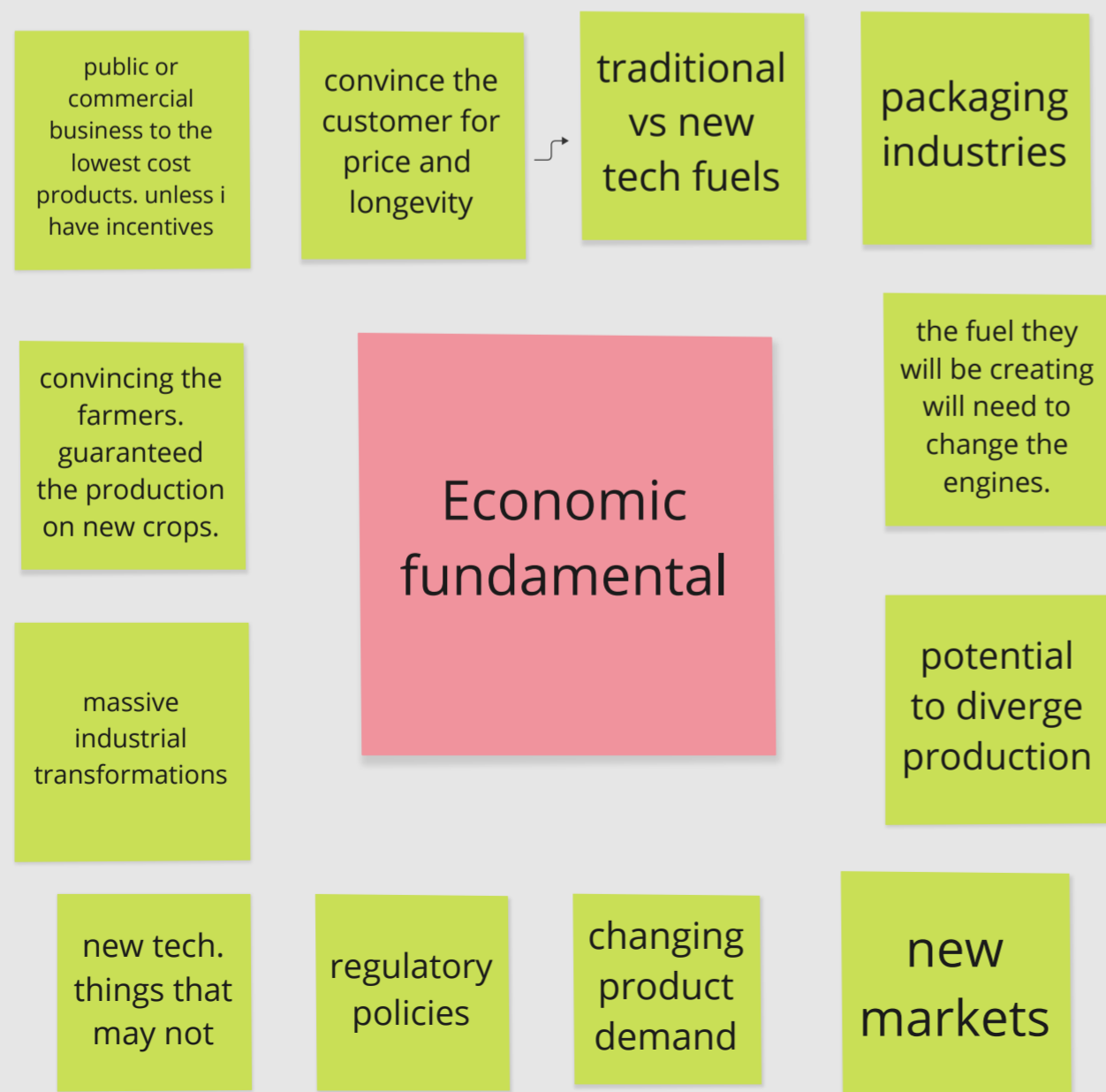
Labour

Short and medium-term availability?
Training issues?

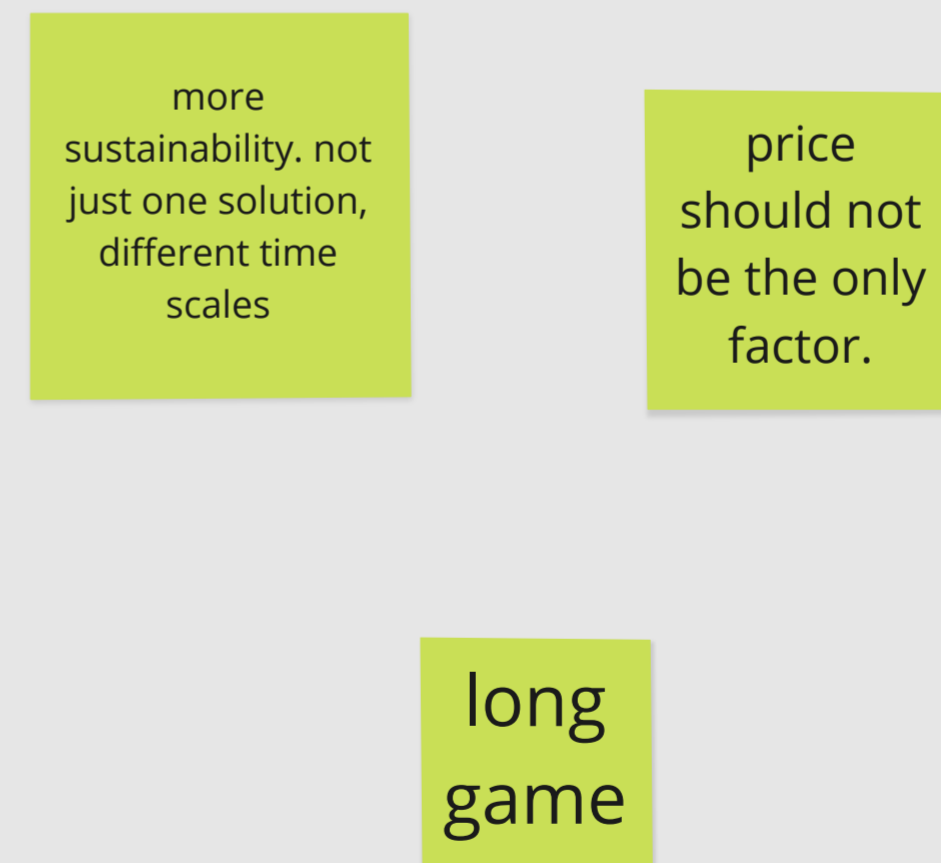


Competition

Price competitiveness between technologies and with other energy sources?
Substitute service/product affecting demand?



Additional comments



Workshop - Biomass and carbon neutrality : Putting in place an evaluation framework

Discussion 1 - Current state report		
Comments on the shared report	Gaps, uncertainties, etc.	Additional comments
<p><i>Strengths and weaknesses</i></p> <p>good overview Cu unclear value chains esp. forestry waste, how get it and to transport Not much thought about using Hemp biomass. Alberta produces a lot Weakness: not knowing about hemp It is enlightening at the basic level Not much detail on sector and specific industries Everything related to Biomass should be used for energy is a bad assumption Technologies not mapped with biomass resources Where the crops and residues go and what are the markets is not clear but is important</p> <p>Awareness is lacking. Focusing more on biomass that sequesters carbon is more important Report doesn't talk about Who is going to do it e.g. govt. farmers ect . Green premiums: Is that economically right to make that switch Biomass piece is less volatile than lipids . It should be less volatile. The grid is distributed and how would the farmers put infrastructure to manage all of it. Current regulations play a big role and affect biomass availability not enough on economics of producing biomass Are there policies on how to get waste out of the forest</p>	<p><i>Sectors/industries to be detailed/specified</i></p> <p>A heat map of how accessible is carbon (in biomass) would be great Using technologies such as satellites and drones to get more information on Carbon Hemp has not been considered and excess is burnt. No govt. policy in place although it has over 25000 uses. Supply chain gaps in biofuel industry Do that have the capacity to scale up the facilities to get economies of scale. Currently it is all pilot scale. What does industry needs to scale is missing Carbon footprint of the biomass supply chain isn't clear Sustainability certification for aviation industry needs to consider the dynamics of biomass industry Province wise issues in forest based residue harvesting Labor shortage could be an issue</p>	<p>Farmers don't know about the value. Some consideration given to future e.g. demographics, other future technologies, insulating and heating tech that may decrease the need for biomass based energy How is Canada making it better for everyone involved in the supply chain?</p>

Discussion 2 – Supply issues

Biomass availability

*Are any biomass sources high-risk?
Growing sources of supply?*

Challenges: Cost of transporting biomass esp. from forests
Water maybe a big challenge for crops
Crop residue is needed in the fields and for livestock so the supply is already constrained
Long term harvest can deplete soil health
Crop residue use is not sustainable
Hay has high domestic demand, canola has export demand.
These are exposed to market risks from domestic and international factors

Solution: Hub and Spoke model to deal with supply constraints
Forest waste is abundant and can be used for long term
Use waste which has the least competition followed by forest waste
Prioritize biomass relative to the technology that is available. E.g. Manure is easier to be processed

Boundaries

*Should we review the sustainable harvest thresholds?
How could climate/ecological hazards affect supply?*

Crop specific feedstocks have high supply risks.
Policies and regulations in Alberta do not favor biomass industry.
Economics is the biggest determinant for technology investments and production of biofuels

Challenges: International conflicts shift focus back to food security than feedstock supply for biofuels
A lot of biofuels are exported as we lack a market for those products.
Policy support is required.

Solutions:
Municipalities have the higher potential to supply waste, not farms
100% of waste can be targeted.
For other sources, the use goes where there is more value
Cost and content of energy is different for each biomass source and manure offers high value in terms of both

Costs

Fluctuation tolerance threshold?

There is high volatility in grain prices and are also affected by the developments in US market.

How much risk can bioproduct producers take depends on risk mitigation and risk sharing mechanisms and policy support

Competition

Different value chains using the same resource?

Companies and industries are already bidding for manure and waste

Additional comments

Discussion 3 – Economic viability/profitability factors

Value chain

Value chain maturity (actual, developing, non-existent)?
Interactive relationships that affect its viability?
Faced with risks? What kinds of risks?

Share risk! Put funding mechanisms in place!
Reduce cost volatility

In AB we want to have zero petroleum products by 2050. Why are we pushing for biodiesel? Biofuels can be produced cheaper in US and Brazil as land is cheap, we can't we just import it? Imported emissions?? CBAMs! RFS are the same so won't make much difference. Plus we want to create jobs in Canada esp. for those displaced from oil and gas
Are we affecting sustainability of the food system?
Decarbonize or ensure food security? More efficient feedstock, economic incentives to determine where to use feedstock optimally and balance food security and environmental sustainability
Lipids are a low hanging fruit
Used cooking oil use would help spare feedstock for alternative fuel production
What % of the energy portfolio is bioenergy going to represent?
Affordability - all external costs must be accounted for
Policy and social acceptability are the challenges in meeting net zero. Overcoming the hurdles to share infrastructure to mutual benefit.
Diversity of crops production will bring resilience to the system in terms of soil health, and producing biomass. But we will have to develop alternative mechanisms to sequester carbon if we take out all the residue from fields to produce bioproducts. What would be the optimal price of crop residue?
The policy is without systems thinking!

What time horizon are we looking at. We will also have to consider projections of tech advancements, new markets etc to make sure we do it right and get results when we want them

Prime land being uses, marginal land being taken over. Efficiency improvements is mitigating the risk of marginal lands being taken over

Price is the biggest incentive for producers. And they don't want to care about environmental impact

Demand for Canola will be pulled in all directions

Labour

Short and medium-term availability?
Training issues?

Prime land being uses, marginal land being taken over. Efficiency improvements in

Community needs to part of the process
GHG, water, land use, biodiversity assessment are important from economic and social perspectives
Besides education, transparency is also lacking
Educating farmers on diversifying crops to meet both food and energy needs. And providing them incentives.
Crop markets are extremely volatile. And there is no right answer as to what BMP is optimal

Go holistic!!!

nutrient value on per ton basis of residue is \$40/ton. Cheaper to buy synthetic fertilizer!!!

Competition

Price competitiveness between technologies and with other energy sources?
Substitute service/product affecting demand?

What should BMP take into consideration?

how can we have a shared pool of risks?

land is a scarce resource, forcing to grow on marginal land.

demand for canola will exceed canadian production capacity

Additional comments

"canadian canola is the most sustainable production in the world"

what % of energy can come from biomass

Alberta paid for crop residue to stay on the ground up until now; now they could be paid to send it to biofuel production.

communication/language problem: ex. fertilizer reduction vs fertilizer related emissions

Final Session: Competition in technologies using the same resources.
Canola for exports is a competition for domestic biofuel market
Measurement of value of biogenic carbon stock is a challenge? Cost vs benefit of use must be determined
Supply Chain Emissions: Large distance between production and feedstock source may end up in more net emissions than mitigated by recycling.
Supply chain costs may render biomass processing businesses unviable
Carbon Neutrality:
Are we considering all the socio economic elements and making the optimal use of investment to achieve/contribute to net zero. Value of carbon is one metric to determine that.
Behavioral change and right set of regulations and policies can help
Financial levers to incentivize adoption of technologies for economics to work and to enable vibrancy of communities. In forestry those levers may be different but they need to be recognized.
Consolidation across industries now and in 10 years from now to be considered for the evaluation framework
Long term goals are not politically aligned. Also a challenge

Workshop - Biomass and carbon neutrality : Putting in place an evaluation framework

Discussion 1 – Current state report											
Comments on the shared report				Gaps, uncertainties, etc.				Additional comments			
<i>Strengths and weaknesses</i>				<i>Sectors/industries to be detailed/specified</i>							
Strengths of the report: Uncertainties and concerns. Where are the gaps	Report used information publically available online.	Are biomass products increasing or decreasing in production. There is a lot of uncertainties in markets such as hemp	How do you define residues? Everything left over in the harvest field that could be used for bio fuels	Participants felt that some of their industries would be hard to capture on this report as they don't have available data	Urban and rural waste opportunities need further discussion	Nutrient recycling impacts a lot of sectors	Lack of action in Alberta on specific items such as waste use cases.	<p>Bio-ember in montreal. Had plenty of funding and was bought out. Example of roll the dice projects that didn't have sustainable gating to make it profitable</p> <p>- would be a good contact</p> <p>Natural products Canada. good contact</p> <p>Statistics Canada survey would provide good data.</p> <p>Eco-mat- food dehydrators, instead of shipping the food waste they allow it to be better combusted, They exist in Calgaries Northeast</p>			
The costs of shipping for products such as plastics to bio fuel can be tricky	Needs to be a large focus on if the economics are there for biomass products	Need to examine if there is economic feasibility vs greenhouse gasses.	Is there enough from residual harvest field to actually produce bio fuels	Opportunities for use. Fibre has a lot of use-cases. There is a growth in sales yet a decline in production.	Small businesses are challenged to do things at scale, bench to pilot to commercialization challenges.	We need to take a historical lens and discover what has worked and what hasnt in the past	Competing priorities of food production vs biomass products.				
How can a producer scale to export or to manufacture.	Are other countries and markets out pricing Canadas ability to compete on the international market.	Is there a concern between the food vs fuel discussion. Is it food security with excess going to fuel	Biggest issues are collection and costs, and the inconsistent quality.	There is a lot of good innovatrive technology out there but the profitability needs to be there or it wouldn't work. You need to be able to convince producers that they can produce a product profitably.	How does land use policy impact this dynamic. How is Canada ensuring security. How do we accomidate for challenges such as drought or floods	How do we balance the production of products such as using manure for electricity or fertilizer. What are the alternatives and how do they compare.	Many variables come into play. The nitrogen requirements from Canada to reduce by 2030, but that will have major impacts on our global trade partners and smaller impacts on Canada.				
Multiple levels of science, can we take a lens for food security, energy security, water security. Can we see the tradeoffs and the different perspectives	Needs to be a place for food security and that portfolio to be reflected in the report	Grain > fuel creates sustainability challenges for the food security industry	Measuring Carbon Credits with any sort of accuracy. The varasity of the system and how to measure	Food stock competition will change how industries operate and will create competing priorities.	Economics are there for wood pellets but has there been an overall of greenhouse gas. Are they using carbon capture	How do you make the math work for both emissions and production and economics.	What infastructure is needed to meet the challenges				
Greenhouse gas prioritization has created food security challenges.	Forest Waste, how sustainable is it to continue to use wood at the rate and how will that impact our trading relationships or sustainability.	How much waste we are using and how efficient we are. What is the impact	Mention of carbon market in the report but not full analysis.	Fluctuating quanities	How to deal with variability in production and competing uses.	Shortage of straw due to drought lead to tensions especially when it is being tried to used in several ways	Volatility of economics and supply chains				
Biofuel from dehydrated food can be used to fuel remote locations	Measurement and reporting of Carbon credits and greenhouse gas emissions will change analysis	Full cycle analysis is needed to ensure that the impacts are fully captured.	Using a CBA, for mineral extraction, waste, and other bioproducts.		Common challenges on the zero-net emissions is impacted by a variety of factors from other products,						

Discussion 2 - Supply issues

Biomass availability

Are any biomass sources high-risk?
Growing sources of supply?

Limited export of Canola oil can only meet the internal Canada demands rather than largely export. Canola meal will be the primary exports.

Where do various industry players stand on this. There are several emerging companies that are hesitant to have a negative impact on the industry.

Is this industry growing or is it growing due to subsidy.

large scale policy decisions made in a silo

Tech, innovation and process are just maintaining levels of production rather than growing.

If you increase production you have more biomass

What if we were to protect prime farming land specifically for food production

What is the non-food biomass that is economically feasible

The price of food is directly impacted by some of these tradeoffs

From the Ag sector. One of the biggest challenges is the reliability of supply

As population grows how can we utilize the municipal products as biomass products that can be better used

Need for infrastructure challenges to meet the economical demands. What is the environmental impact of transporting products long distance.

Wastewater is a potential growth source. Is there an opportunity there after water treatment, is there a mechanism to use biodigesters in waste water

Regionalization and BMP are very different across Canada. Large Variety

Forestry sector is a major source of biomass, and 40% of product is waste. So there is need to accommodate for that

Does forestry have a better use-case here in Canada. Major role to play and a potential to divert existing forestry biomass

Transportation challenges of the forestry biomass is a larger challenge in Quebec

Targeting producers through education is necessary to grow biomass supply

Boundaries

Should we review the sustainable harvest thresholds?
How could climate/ecological hazards affect supply?

How far does the industry push food insecurity in Canada.

Challenges to production capacity.

Variance in production can throw the market out of equilibrium

Water access, climate and land use use is pushing and creating challenges

Providing tax advantages or regulatory frameworks to ensure food security.

You will inherently have variability due to crop rotation and producer choices and economics.

Food insecurities in Canada already exist and biomass production could exacerbate this problem in the debate

Costs

Fluctuation tolerance threshold?

How do we account for the best use case of a product

How do you build a model to measure the impact of producing or not producing

If we are bringing in replacement grain or reducing herd sizes are we actually having economic gains

How do you make biomass diversion economically attractive for producers

Are investments in bio-energy factoring in the evolution of the feed stock.

Require to deliver an x-amount of tons per year with economic factors determining who takes on the risk

Various elements will have impacts on planting decisions, and there is a need to outcompete on other markets. How do we accommodate the social costs and ensure the inventory and supply are managed

How do we account for net-zero and what is the market for negative emissions. The further negative carbon the more credit you create.

Additional revenues will need to be balanced with opportunity costs and the government policy / Leaving crop residue on has a benefit of reducing fertilizer costs

Competition

Different value chains using the same resource?

Do you take into consideration the use-cases of the land and the economics

How do we incent farmers to use it for pristine ag land and used for foods

Ethanol production in the U.S is subsidized creating challenges for competition

Do we account for the consequences of what happens with our food products.

Choices are affecting food security and creating challenges in various markets

BRM, can have a substantial impact on what is grown. There is less variability

Assumption in discussion that its food vs fuel, some are not interacting with food markets

Impact on international relations between the government, however countries seem to prioritize basic human needs

What is the biomass sector by sector, where is the available sustainably available

Ratio of possible diversion by region, crop and year

Short-term profitability are still longterm in nature due to the length of growing time. You aren't incentivized by short-term volatility

Sector by sector, region by region analysis would be good. Is there a better biomass alternative for the products. Assessment of availability and supply of non-used biomasses

Food security > trade and free market

Canola farmers our compete ranchers.

Life-cycle analysis from seed to combustion, you make more money based on lower carbon intensity is factored into investment decisions.

Additional comments

what proportion of the industry is going to actually engage in these practices. BMP, no till, Biomass diversion

Assumptions made: Crops residue federally we have a voluntary set of regulations on fertilizer. Removing emissions on fertilizer will be put against energy policy

How do you get adoption of diversion for biomass and focus on the largest producers.

BRM: Business Risk Management

Producers are producing more than one type of crop and they shouldn't be perceived as just a canola farmer

Differing producer outlooks, based on stages of career leading to challenges in managing biomass availability. Where does it come from and is it negatively impacting the emissions

Is there a role for the Canadian AG sector to play in growing the CAD biomass economy, several reasons why that is not the case. Need the reason to say yes. Profitability?

Discussion 3 – Economic viability/profitability factors

Value chain

Value chain maturity (actual, developing, non-existent)?
Interactive relationships that affect its viability?
Faced with risks? What kinds of risks?

Energy required to produce biomass products into energy products. What is the net gain? How does it compare to fossil fuels

What are the other inputs needed to produce certain biomass products?

What do we need to put the biomass industry in place

A lot of risks around delivering the feedstock in your contract. There's no alternative feedstock but there are qualitative impacts in these products.

It's cheaper to produce ethanol from corn than it is from straw. How do we incentivize that and what do we do when it all goes into the same market.

Biomass conversion products are not economically viable, there is need for a booster to make the products viable.

Are there risk management tools around this, do we have an insurance plan for biomass products and agreements.

Need for a created protocol from the provincial government to recognize the market challenges. Offset generation side protocols

Way more energy intensive to use biomass products so there is more of a need to balance the policy. There is a limited tax policies

What is the net impact and is it negative when you factor in what farmers save

Hard to have a long-term reliable source of feedstock

Biodigester market works in the U.S. because of the heavy subsidies.

20-25k head of cattle needed to make a biodigester work on farm

What is the optimal mix of biomass input for other energy creation and what is the efficiency

The value of the carbon credits trade may be restricted by the need for offsets in other sectors.

Loss of biodiversity on agricultural lands due to a shift in focus to biomass production emphasis

Do we need to set aside a quota for food and biodiversity. Is the market going to be fluid or will it be more restricted.

What product is developed will come down to which is most economic, but government will likely push one direction or another.

The economics aren't self-sustaining and there is no domestic market demand we need policy to stick handle these industries forward

Global shifts will have major impacts on gov subsidies for biomass products.

Communication and political risks, there is a need for long-term plans but governments don't make long-term investments

AG residue will be the highest risk and the most energy intensive

Closed on-farm systems may provide a solid business case for this but they are traditionally heavily subsidized

In terms of highest risk AG is highest, social risks. Food security and profitability will result in high critique due to food security challenges.

The variability in supply year in and year out and variability in demand makes biomass products in the AG sector incredibly difficult. The economics and sustainability are difficult and agriculture is one of the highest risk products.

We need to figure in the risk associated with climate change. There are challenges in honouring a contracts due to climate challenges. Sustainable harvest thresholds

Labour

Short and medium-term availability?
Training issues?

Labour challenges exist across the ag sector

Need for highly skilled labour will be a large challenge.

Biomass products are creating labour demand which may drive rural economic development

Depends on oil and gas and whether the market is stealing workers from rural work

Does this add to the costs and make it more expensive

How can we reverse engineer biomass workers with the existing skillsets but how do we incentivize it.

Competition

Price competitiveness between technologies and with other energy sources?
Substitute service/product affecting demand?

Market mechanisms, credits that are stackable to allow the market to produce at an affordable rate. These structures would help.

How can Tier help Alberta remain competitive in the offset market

There needs to be a cost structure in mind so that sectors can be adequately compared and having money wasted on inefficiencies.

Main challenges: what point do the incentives become too much

Everything has a price point but it's not always clear as it's opaque.

Are we forcing a market that doesn't have longevity.

Are there better uses of government money, smart policy choices are needed that aren't vote driven

How can we make these products viable and how can we incent a product that's 5-10x more expensive to make.

The food vs fuel isn't factored into the conversation. Is there a better use for these biomass products.

We can't assume that energy is the only industry that benefits from biofuels.

The cost is going to change in the longer term depending on demand for biomass products

What are the competing priorities, how can we balance soil health with government energy incentives

What is the maximum gain? What do we want to actually achieve.

How much can we spend on this to make it actually make sense

We need to classify what is waste. Manure is valuable, at what point is waste wasteful and has no value to the generator.

What are the incentives we need to prime the market? Tax incentives, how to do we avoid just exporting to other biomass economies at a cheaper rate

If there's a cost to remove then its waste

What's the profitability angle of replacing straw with fertilizer

It is up to the producers to know the value of the biomass products, there's no published price on these products, they are closed transactions. Do we need opacity, and is the value farm to farm dependant or region to region dependant

RNG has to be reliable and consistent so there is gonna be a market for that reliability and consistency.

Life cycle assessments provide a variable analysis and a CI score, this can help provide more clarity and these agreements stretch 20 years which you can't find for feedstock

Have we put a value on biomass products like straw. Where is the value and what is undervalued? If you come along and offer to pay there may be a change in perception.

Looking at a by-sector assessment to see where the costs still exist for removal. How do we target cost to production vs high demand biomass products.

Additional comments

Challenges identified at the start

sectors are very fragmented

Massive volume available how do we balance taking out vs leaving in natural cycle

Solution needs to be Canadian Oriented and not reflect the UK

Land use needs to enable food security.

How do we keep the industry local and Canadian based

education on how of these products can be used

Profitability

How do we get government to participate in these conversations

Ensuring food security and energy needs are both prioritized

Look at the infrastructure put in place and see how Hemp can be used as a replacement for traditional biomass products

Value chain around sustainable fuels. How do we decarbonize challenging sectors such as aviation. How do we activate advance bio feed stocks. How do we make it affordable

Workshop - Biomass and carbon neutrality : Putting in place an evaluation framework

Discussion 1 - Current state report

Comments on the shared report	Gaps, uncertainties, etc.	Additional comments
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<p><i>Strengths and weaknesses</i></p> <p>2. policy piece is missing, regulation information. policy and regulation information is missing</p> <p>1.nicely put together, quantitative information, comprehensive report.</p> <p>2.W. economical viability of a particular sector is missing.</p> <p>2.S. Well written</p> <p>3.W. Economic viability piece is disregarded. report on commercial viability is missing.</p> <p>3.s. information was good.</p> <p>region to region assessment needs to be done in the report</p> <p>information on risk and uncertainties for each energy sector is missing</p> <p>life cycle assement of each source is missing.</p> <p>we can not compare all crops, needs to have economic viability of each crop is missing</p> <p>balance needs to be done between food sector and bio fuel sector</p>	<p><i>Sectors/industries to be detailed/specified</i></p> <p>Differentiation between crop and manure is missing</p> <p>the report doesn't talk about the water and its use in all the energy production process</p> <p>not much knowledge how much can be produced from agriculture sector, lack of education.</p> <p>uncertainties are more in the agriculture sector</p> <p>uncertainty in the agriculture due to alot of pressure in the ag-sector.</p> <p>nutrient management information Gap is very high.</p> <p>economic impact assessment should be done from crop to crop</p> <p>policy wide uncertainties due to change in frequent policies. huge uncertainty</p>	<p>diffusion of technology and information is a challenge</p> <p>trust issue from the producers side for the changing policies</p> <p>risks associated with the ag-sector is framing the valuable framework.</p>
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Discussion 2 - Supply issues

Biomass availability	Boundaries	Costs
<p><i>Are any biomass sources high-risk? Growing sources of supply?</i></p> <p>change in the forest management perspective is uncertain which will ultimately impact the supply issue.</p> <p>1. All feedstocks are high risk. Farmer needs to know their how much product is sold.</p> <p>challenge in accounting the economics of the logistics associated.</p> <p>have to keep track of costs and benefits associated with each sector.</p> <p>food security is another main challenge.</p> <p>high risk in terms of soil health</p> <p>wood is a high risk.</p>	<p><i>Should we review the sustainable harvest thresholds? How could climate/ecological hazards affect supply?</i></p> <p>complementarities within the agricultures sector needs to be highlighted.</p> <p>more focus need to be crop rotation, need to account the soil health and availability of water.</p> <p>viability of each crop in terms of processing the crop is a bigger challenge.</p>	<p><i>Fluctuation tolerance threshold?</i></p>
Competition		Additional comments
<p><i>Different value chains using the same resource?</i></p> <p>comparison of the demand from the domestic market and international market.</p> <p>proper management of resources should be taken care of.</p> <p>waste management issues from different sectors</p> <p>cautious in terms of assessing different value chains within the industry.</p> <p>minimizing waste and changing it into something productive</p> <p>information on the market residual</p>		

Discussion 3 – Economic viability/profitability factors

Value chain	Labour
<p><i>Value chain maturity (actual, developing, non-existent)? Interactive relationships that affect its viability? Faced with risks? What kinds of risks?</i></p> <div data-bbox="247 331 1303 1208"> <p>biggest challenge is accounting/counting how much energy is require to produce bio-energy.</p> <p>what is optimal mix of inputs to produce energy?</p> <p>lack of subsidies in Canada. Govt. need to subsidize and inentivize.</p> <p>use of waste from the energy</p> <p>what is maximum we can do in terms of production that is economically viable.</p> <p>need the cost benefit analysis of each sector</p> <p>identify what is waste? all waste is not wasteful. need to be efficient in terms of using the waste.</p> <p>Crop insurance premiums for producers</p> <p>as an industry valuing each bi-product is necessary. manure and straw is usually undervalued</p> <p>account for CC in interrupting the value chain and long term economic viability.</p> </div>	<p><i>Short and medium-term availability? Training issues?</i></p> <div data-bbox="1342 355 2269 1098"> <p>Lack of long term plan in the energy sector which is risk for the sector.</p> <p>highly skilled labor is necessary</p> <p>adding more labor will be costly.</p> <p>availability of labor is challenge</p> </div>
Competition	Additional comments
<p><i>Price competitiveness between technologies and with other energy sources? Substitute service/product affecting demand?</i></p>	