

ÉNERGIE NB

PLAN INTÉGRÉ DES RESSOURCES DU PROGRAMME DE PARTICIPATION DU PUBLIC

Rapport final

« Ce qui s'est dit »

Présenté par

N|A|T|I|O|N|A|L



«Ce qui s'est dit»

ÉNERGIE NB 2017 – NOTRE AVENIR ÉNERGÉTIQUE

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«Ce qui s'est dit»

MÉTHODOLOGIE

Étant donné que la période de planification du plan intégré des ressources est de 25 ans, il est important pour nous de mieux comprendre ce qui est important pour les clients alors qu'ils envisagent l'avenir énergétique du Nouveau-Brunswick, ainsi que le rôle qu'ils sont prêts à assumer pour atteindre les objectifs compris dans le plan.

La période d'engagement de la clientèle pour le plan intégré des ressources (PIR) s'est déroulée entre le 12 mars 2017 et le 15 mai 2017. La conception du processus d'engagement fut un effort de collaboration entre Énergie NB et NATIONAL. La conception du sondage et l'analyse des données ont été effectuées par Thinkwell Research.

Objectif du processus

- Recueillir des commentaires fondés sur des valeurs auprès de la population du Nouveau-Brunswick sur l'avenir énergétique de la province afin d'éclairer la conception du PIR d'Énergie NB pour 2017.

Objectifs

- Mieux comprendre ce qui est important pour les clients alors qu'ils envisagent l'avenir énergétique du Nouveau-Brunswick, ainsi que le rôle qu'ils sont prêts à assumer pour atteindre les objectifs compris dans le plan.
- Fournir suffisamment d'information contextuelle, appropriée, et facile à comprendre, au sujet du paysage énergétique de la province, la portée du processus du PIR.
- Organiser un processus d'engagement fondé sur les valeurs, en personne et en ligne, afin de permettre aux Néo-Brunswickois de nous faire part de leur perspective, leur expérience, leurs idées, et ce qui leur est le plus important.
- Faire preuve de transparence dans la diffusion des données qui ressortent des efforts de consultation.

«Ce qui s'est dit»

Portée de la participation

Le processus consistait d'un sondage en ligne sur notre site Web www.notreavenirenergetique.ca et des séances d'engagement pour les clients qui ont eu lieu à Fredericton, à Moncton, et à Beresford.

Les efforts du processus d'engagement pour accroître la sensibilisation et inviter les clients à participer ont été répandus par l'entremise de publicités dans les journaux et les médias sociaux (Facebook, Twitter, YouTube), de relations avec les médias, d'invitations directes aux parties prenantes, et d'autres voies de communication d'Énergie NB (site Web, médias sociaux).

Des commentaires ont été recueillis en ligne de 1 221 Néo-Brunswickois, dont 16 % étaient des communautés Malécites et Mi'kMaq (identifiés par les trois premiers chiffres du code postal). Trois séances d'engagement ont eu lieu, auxquelles ont participé 52 personnes au total. Trois organisations d'intervenants ont fait des propositions formelles lors du processus.

Méthode d'engagement en ligne

L'expérience d'engagement en ligne a été conçue pour le grand public. Le contenu a été créé de façon concise et emploie un langage simple. Une vidéo informative a été réalisée afin de fournir un contexte pour la discussion et les questions.

Le sondage était court et les questions étaient directes. Le sondage examinait les points suivants :

- L'abordabilité
- L'énergie propre
- Les options offertes aux clients

Les participants ont également eu la possibilité de répondre à une question ouverte, leur permettant de nous faire part d'autres points importants pour eux. Les données qualitatives ont été codées en catégories significatives sur le plan conceptuel, puis quantifiées par Énergie NB.

Méthode d'engagement en personne

Les séances d'engagement des clients étaient présentées sous forme de « Café du monde ».

Des représentants de l'équipe de direction d'Énergie NB agissaient en tant qu'animateurs. Une présentation de Michael Bourque, directeur de la planification intégrée des ressources, constituait un contexte important pour la discussion. La présentation comprenait un aperçu du PIR, de la situation actuelle, des résultats du processus du PIR de 2015, des options possibles pour l'avenir, et du rôle accru que les clients pourraient jouer.

«Ce qui s'est dit»

Les participants étaient guidés lors de l'exploration des trois questions suivantes :

- En ce qui concerne l'avenir énergétique du Nouveau-Brunswick, qu'est-ce qui est le plus important pour vous ?
- Afin de faire avancer ces priorités, de quoi avons-nous besoin ?
- Qu'est-ce que les clients peuvent faire pour faire avancer ces priorités ?

RÉSULTATS DE LA PARTICIPATION EN LIGNE

Résumé

Selon les résultats, l'énergie propre et l'abordabilité sont d'une grande importance pour les Néo-Brunswickois qui ont participé au sondage. Les participants étaient plutôt d'accord sur ces deux points.

Le seul point sur lequel les gens étaient moins d'accord était l'énoncé suivant : « Je suis disposé à payer plus pour de l'énergie propre ». Cela laisse entendre que, pour certains, il y a des limites concernant la mesure dans laquelle Énergie NB adopte la mesure d'énergie propre.

Il y avait également d'importantes divergences sur plusieurs questions, selon l'âge. Les participants sous l'âge de 35 ans étaient plus d'accords avec les énoncés pour de l'énergie propre, alors que les participants de plus de 55 ans étaient plus en accord avec les énoncés pour de la gestion des coûts (maintenir les tarifs aussi bas que possible, investir dans des solutions pour mieux gérer leur consommation d'énergie, etc.).

Il ne faudrait pas toutefois interpréter ces données comme quoi les plus jeunes participants ne sont pas pour des tarifs bas, ou que les participants plus âgés ne sont pas pour de l'énergie propre. Ces données indiquent tout simplement que les priorités diffèrent selon le groupe d'âge.

Les énoncés avec lesquels les Néo-Brunswickois étaient le plus d'accords étaient les suivants :

«Ce qui s'est dit»

Énergie propre

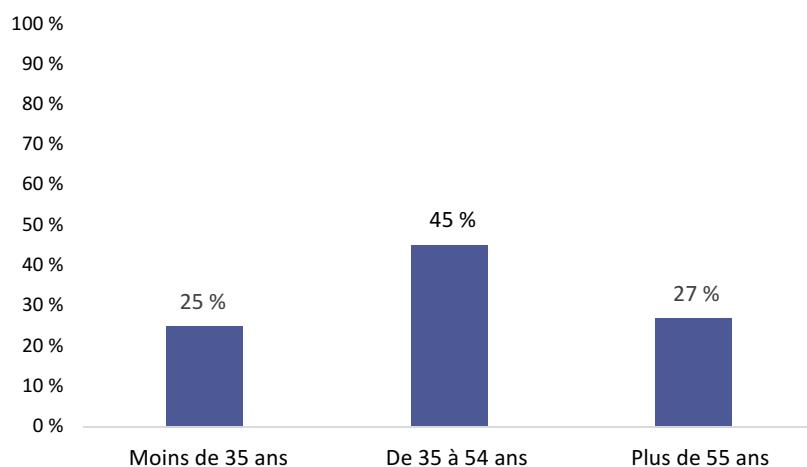
- Je souhaite qu'Énergie NB devienne un chef de file en matière d'efficacité énergétique
- Je suis favorable à diminuer l'utilisation de combustibles fossiles et de faire la transition vers un avenir énergétique plus propre afin de respecter nos engagements en matière de changements climatiques
- Les Néo-Brunswickois ont la responsabilité de faire des changements pour aborder les changements climatiques

Les options offertes aux clients

- Je suis disposé à investir dans l'équipement et la technologie pour gérer mes coûts et ma consommation d'électricité (par exemple l'isolation, les thermostats programmables)

Résultats détaillés

Le plus grand groupe de participants était le groupe d'âge moyen (35 à 54 ans), soit 45 %. Les groupes de moins de 35 ans et de 55 ans représentaient à peu près la même proportion, soit 25 % et 27 % respectivement.



«Ce qui s'est dit»

Abordabilité

Sur une échelle de 1 à 5, où 1 signifie *en désaccord* et 5 signifie *d'accord*, les participants ont dû dire dans quelle mesure ils étaient d'accord avec une série d'énoncés.

Priorité	4-5 (2 priorités)	3	1-2	Je ne sais pas	Moyenne
Je souhaite qu'Énergie NB fasse des investissements pour me fournir plus d'options afin que je puisse mieux gérer mes coûts et ma consommation d'électricité	72 %	17 %	8 %	3 %	4,04
La transition du Nouveau-Brunswick vers un avenir énergétique propre doit minimiser les effets sur les tarifs et l'économie	68 %	20 %	10 %	2 %	3,99
La priorité absolue d'Énergie NB devrait être de maintenir les tarifs aussi bas que possible	63 %	22 %	13 %	2 %	3,88
Je suis ouvert à l'achat d'énergie renouvelable de territoires voisins plutôt que de construire de nouvelles centrales au Nouveau-Brunswick pour maintenir des tarifs stables	50 %	20 %	27 %	3 %	3,38
La priorité absolue d'Énergie NB devrait être le paiement de la dette	42 %	37 %	18 %	4 %	3,35

Énergie propre

Priorité	4-5 (2 priorités)	3	1-2	Je ne sais pas	Moyenne
Je souhaite qu'Énergie NB devienne un chef de file en matière d'efficacité énergétique	86 %	8 %	3 %	3 %	4,49
Je suis favorable à diminuer l'utilisation de combustibles fossiles et de faire la transition vers un avenir énergétique plus propre afin de respecter nos engagements en matière de changements climatiques	79 %	10 %	8 %	2 %	4,29
Les Néo-Brunswickois ont la responsabilité de faire des changements pour aborder les changements climatiques	76 %	13 %	9 %	2 %	4,17
La priorité absolue d'Énergie NB doit être de passer des combustibles fossiles à la production d'énergie propre	74 %	13 %	11 %	2 %	4,12
Je souhaite qu'Énergie NB devienne un chef de file en matière d'énergie propre	73 %	15 %	10 %	2 %	4,15
Il est important que l'électricité consommée au Nouveau-Brunswick soit produite au Nouveau-Brunswick	61 %	19 %	18 %	3 %	3,80
Je suis disposé à payer plus pour de l'énergie propre	51 %	23 %	23 %	2 %	3,51

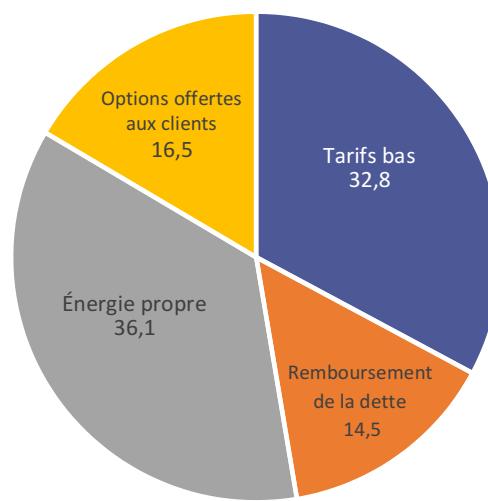
«Ce qui s'est dit»

Options offertes aux clients

Priorité	4-5 (2 priorités)	3	1-2	Je ne sais pas	Moyenne
Je suis disposé à investir dans l'équipement et la technologie pour gérer mes coûts et ma consommation d'électricité (par exemple l'isolation, les thermostats programmables)	77 %	13 %	7 %	3 %	4,19
Je souhaite produire ma propre électricité	71 %	12 %	14 %	4 %	4,07
Je souhaite participer à un programme de tarification au compteur horaire pour gérer mes coûts et ma consommation d'électricité	65 %	16 %	15 %	4 %	3,86
La priorité absolue d'Énergie NB doit être de trouver des solutions pour ses clients afin qu'ils puissent mieux gérer leur consommation d'électricité	64 %	22 %	12 %	3 %	3,86
Je souhaite faire l'achat d'une voiture électrique	50 %	19 %	27 %	4 %	3,40
Je pense que c'est la responsabilité d'Énergie NB de gérer les coûts et la consommation d'électricité de ses clients	44 %	33 %	20 %	4 %	3,36

Établir des priorités

Les participants ont également eu la chance de nous dire l'importance qu'ils accordent aux quatre priorités d'Énergie NB. La priorité à laquelle les participants ont accordé le plus d'importance est l'énergie propre (36,1 %), suivi de près par les tarifs bas (32,8 %). Les participants n'ont pas accordé beaucoup d'importance aux options offertes aux clients (16,5 %) ni au remboursement de la dette (14,5 %).



«Ce qui s'est dit»

Il y avait d'importantes divergences d'âge sur deux points. Conformément aux autres résultats du sondage, les participants de moins de 35 ans avaient tendance à accorder plus d'importance à l'énergie propre (41,8 %) que les participants d'âge moyen (35,6 %) et d'âge plus avancé (32,5 %). En ce qui concerne les tarifs bas, les résultats étaient l'inverse (<35 : 29,7 % ; 35-54 : 32,8 % ; 55+ : 35,5 %).

Autres commentaires

Les participants ont été encouragés de nous faire part de tout autre commentaire en ce qui concerne le développement du PIR d'Énergie NB. Les réponses présentées ci-dessous proviennent de 409 personnes qui ont répondu à cette question.

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Les participants des communautés Malécites et Mi'kMaq ont exprimé que l'énergie propre était d'une grande importance pour eux, ainsi que la capacité de produire de l'énergie pour le réseau.

«Ce qui s'est dit»

Catégorie	Intervenants (n=409)
Promotion de l'énergie solaire	20 %
Incitatifs/subventions nécessaires pour la production de l'énergie propre	17 %
L'énergie propre doit être une priorité	11 %
Permettre aux clients de vendre l'énergie excédentaire au réseau	9 %
L'énergie éolienne doit être une priorité	9 %
Garder les tarifs bas/minimiser les augmentations	8 %
Promotion de l'énergie marémotrice/hydroélectrique	5 %
Réduction des salaires de l'administration	5 %
Énergie NB doit être un chef de file/Énergie NB prend du retard	5 %
Énergie NB doit se concentrer sur la création d'emplois/l'amélioration de l'économie	5 %
Investir davantage dans l'énergie nucléaire	5 %
Protection des tarifs pour les propriétaires à faible revenu et les personnes âgées	4 %
Créer plus de possibilités d'éducation/de sensibilisation/d'engagement	4 %
Suggestions liées au sondage	4 %
Une meilleure gestion de la part d'Énergie NB est nécessaire	4 %
Encourager les consommateurs à produire leur propre énergie	4 %
Se concentrer sur les programmes de conservation	4 %
Travailler en collaboration avec d'autres leaders/services publics	3 %
Éviter de faire les mêmes erreurs que l'Ontario	3 %
Mettre l'accent sur l'importance de véhicules électriques	3 %
Éliminer l'énergie nucléaire	3 %
Encourager la consommation en fonction de la période de la journée	3 %
Se concentrer sur le remboursement de la dette	2 %
Féliciter Énergie NB pour le sondage	2 %
Le Rapport d'énergie à domicile est une perte de temps et d'argent	2 %
L'investissement dans l'infrastructure pour les véhicules électriques	2 %
Meilleur leadership gouvernemental	2 %
Éviter l'usage d'énergie éolienne	2 %
Mauvaise gestion de la centrale nucléaire de Point Lepreau	2 %
Maintenir le réseau/réduire le nombre de pannes	2 %
Le gaz naturel doit être une priorité	2 %
Adopter une approche équilibrée et prudente	2 %
Énergie NB est incomptente/corrompue	2 %
Garder la production de l'énergie au NB	2 %
Autres	14 %

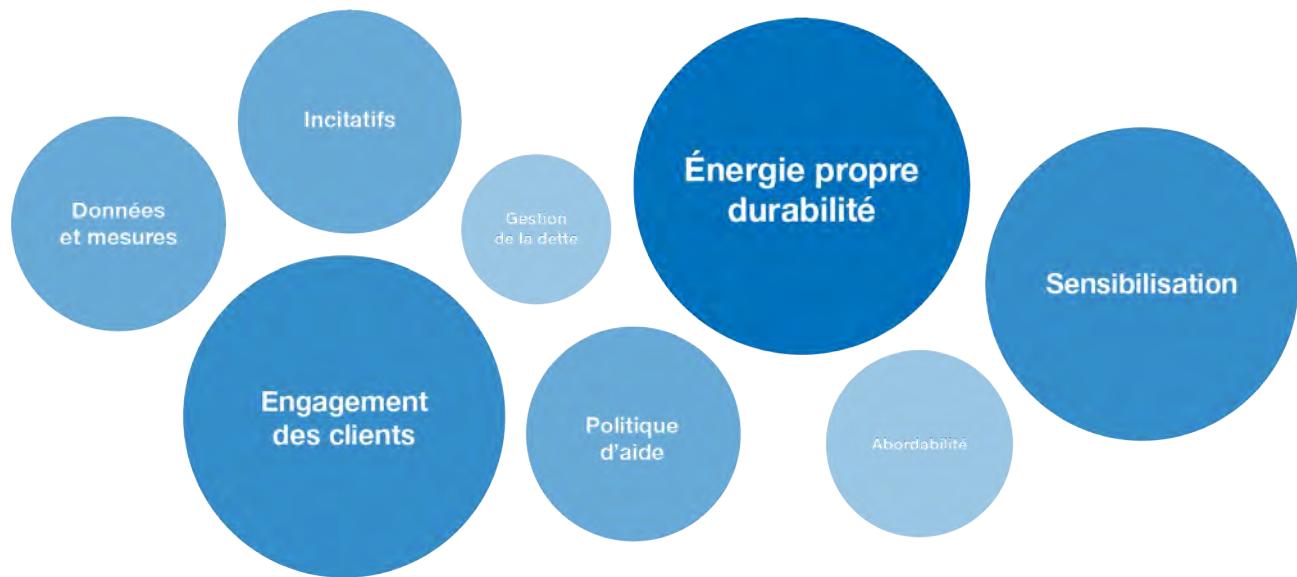


«Ce qui s'est dit»

RÉSULTATS DES SÉANCES D'ENGAGEMENT AVEC LA CLIENTÈLE

Résumé

Lors des séances d'engagement, les clients ont participé à de profondes discussions sur leurs priorités en ce qui concerne l'avenir énergétique du Nouveau-Brunswick. Les thèmes généraux sont représentés ci-dessous.



Résultats détaillés

En ce qui concerne l'avenir énergétique du Nouveau-Brunswick, qu'est-ce qui est le plus important pour vous ?

Voici des commentaires dont les participants nous ont fait part, classés selon le thème :

«Ce qui s'est dit»

Engagement des clients

- Les clients doivent prendre des mesures pour faire partie des solutions futures
- La diversité est importante
- L'engagement communautaire est important
- L'importance des outils conviviaux pour les clients afin qu'ils puissent se renseigner sur les possibilités en matière d'énergie (p.ex. leur consommation)
- La participation des clients (p.ex. projets pilotes)
- La participation de toutes et tous

Sensibilisation

- Le leadership et la sensibilisation d'Énergie NB en matière d'un avenir énergétique durable
- La sensibilisation des clients sur la comparaison des coûts
- La sensibilisation dès un jeune âge
- La sensibilisation sur la consommation (p.ex. visualiser sa consommation)
- La sensibilisation sur le comportement (p.ex. habitudes de consommation)

Énergie propre et durabilité

- L'énergie propre et rentable
- L'environnement et notre responsabilité envers l'environnement
- La réduction ou l'élimination des émissions de carbone
- L'élimination des combustibles fossiles
- Les logements plus durables
- La modernisation
- L'énergie renouvelable
- La résilience contre le changement climatique
- Les crédits de carbone
- Le façonnement d'une nouvelle identité propre et écologique du Nouveau-Brunswick

Abordabilité et gestion de la dette

- Le coût de l'énergie et l'abordabilité
- Le remboursement de la dette
- L'identification des économies
- Les retombées économiques de la centrale de Belledune
- Les tarifs bas et stables
- L'achat en gros afin de garder les tarifs bas

«Ce qui s'est dit»

- Les notifications pour économiser de l'argent grâce à l'aide du réseau intelligent
- Le retour sur les investissements
- L'investissement local à l'aide d'un retour sur les investissements
- La préoccupation du coût réel de l'énergie nucléaire
- La vision à long terme des coûts
- L'investissement
- La vision globale des coûts de production
- La disposition à payer un léger supplément

Incitatifs

- Les incitatifs et les remises
- Énergie NB doit aller de l'avant avec des incitatifs
- Le développement de subventions/d'incitatifs pour encourager les gens à s'engager dans l'énergie éolienne/solaire
- Les programmes d'incitatifs pour les encourager les clients à installer des produits écoénergétiques et à effectuer des projets de construction écoénergétiques — il y a quelque chose pour tout le monde
- Les incitatifs pour encourager les gens à consommer davantage de l'énergie renouvelable
- Les incitatifs financiers afin que les Néo-Brunswickois puissent faire des choix plus responsables en matière d'énergie
- Les incitatifs pour la consommation inférieure à la moyenne

Politique d'aide

- L'engagement des leaders et des politiciens
- L'alimentation de la politique et du « pourquoi »
- Le développement dans le nord de la province
- L'investissement dans le Nouveau-Brunswick et la production de 100 % de l'énergie au Nouveau-Brunswick
- Le Nouveau-Brunswick pourrait devenir le poumon du Canada — les provinces qui émettent des gaz à effet de serre pourront faire l'achat de nos crédits carbone.
- Les politiques gouvernementales qui appuient les projets communautaires
- Les différents ordres du gouvernement doivent s'aligner aux objectifs et aux visions d'Énergie NB

Données et mesures

- Les données en temps réel
- Les notifications et les possibilités d'économiser de l'argent et de réduire sa consommation d'énergie
- Les habitudes orientées par les données
- Les commentaires et les discussions en temps réel



«Ce qui s'est dit»

Premières Nations

Lors de la séance d'engagement à Beresford, les représentants des communautés des Premières Nations ont fait ressortir les priorités suivantes :

- L'inclusion des Premières Nations
- L'énergie verte
- L'abordabilité
- L'environnement
- Le développement dans le nord du Nouveau-Brunswick
- L'ouverture de marchés
- La réduction ou l'élimination des émissions de carbone
- Les subventions ou les incitatifs pour le développement de l'énergie éolienne/solaire

«Ce qui s'est dit»

*Afin de faire avancer ces priorités, de quoi avons-nous besoin ?
Qu'est-ce que les clients peuvent faire pour faire avancer ces priorités ?*

Voici un résumé des réponses recueillies :

RÉPONSE	THÈMES
L'efficacité doit devenir la norme	Énergie propre et durabilité
L'intégration de nouvelles technologies	Énergie propre et durabilité
Encourager les nouvelles sources d'énergie et de chauffage	Énergie propre et durabilité
Transport de l'électricité sans émissions de carbone	Énergie propre et durabilité
Éliminer l'usage du charbon	Énergie propre et durabilité
L'éclairage plus écologique (<i>y compris l'acceptation générale de nouvelles technologies</i>)	Énergie propre et durabilité
Fiabilité (<i>tempêtes plus nombreuses, changement climatique, etc.</i>)	Énergie propre et durabilité
Quitter le réseau — décentralisation	Énergie propre et durabilité
Production distribuée	Énergie propre et durabilité
Indépendance énergétique	Énergie propre et durabilité
Appareils qui s'éteignent	Énergie propre et durabilité
Choix écologiques faciles	Énergie propre et durabilité
L'intégration de la technologie dans les matériaux de construction	Énergie propre et durabilité
Planification énergétique communautaire	Énergie propre et durabilité
Prendre des mesures simples afin d'économiser de l'énergie	Énergie propre et durabilité
Énergie solaire	Énergie propre et durabilité



«Ce qui s'est dit»

RÉPONSE	THÈMES
Rendre plus visible le coût de l'électricité — tarification, etc.	Données et mesures
Programme clairement défini avec des indicateurs clés de rendement	Données et mesures
Factures détaillées	Données et mesures
Résultats démontrés	Données et mesures
Compte-rendu transparent des résultats	Données et mesures
Responsabilité	Données et mesures

RÉPONSE	THÈMES
Sensibilisation pour les personnes aînées (<i>réduction de l'énergie</i>)	Gestion de la dette et abordabilité

RÉPONSE	THÈME
Portail en ligne pour recevoir les idées des clients, faire avancer le changement (<i>s'éloigner des modèles traditionnels</i>)	Engagement des clients
Plus de dialogue avec la communauté	Engagement des clients
Collaboration	Engagement des clients
Plus de participation aux séances de discussion	Engagement des clients
Aider les clients	Engagement des clients
Les clients deviennent les fournisseurs	Engagement des clients



«Ce qui s'est dit»

RÉPONSE	THÈME
Sensibilisation et leadership afin de changer la vision, créer une culture de respect, et diminuer le gaspillage des ressources	Sensibilisation
Information	Sensibilisation
Changer l'éducation pour éviter la construction de nouvelles centrales	Sensibilisation
Programmes de sensibilisation pour les écoles (<i>créés par Énergie NB</i>) et défis énergétiques entre les districts scolaires	Sensibilisation
Sensibilisation pour les personnes aînées (<i>réduction de l'énergie</i>)	Sensibilisation
Dialogue sur les médias sociaux	Sensibilisation

RÉPONSE	THÈME
Crédits pour l'efficacité énergétique en hiver	Incitatifs
Incitatifs pour les granulés de bois et l'isolation pour les maisons	Incitatifs

RÉPONSE	THÈME
Informer notre gouvernement que nous voulons du changement	Politique d'aide
Taxe sur le carbone pour changer les comportements	Politique d'aide
Taxe sur le carbone pour changer les comportements	Politique d'aide

Annexe A

Présenté par

N|A|T|I|O|N|A|L



My name is Chris Rouse with New Clear Free Solutions. We would like to submit our fully integrated resource plan for consideration for your 2017 IRP process. We would like to be assured that this plan be presented to the government of NB as one of their choices in long term planning approval.

This is a link to our latest version of the IRP.

[New Clear Free Solutions 2017 Integrated Resource Plan](#)

In general, renewable energy is the same or lower cost than the fossil fuel and nuclear options. Given that these options are currently less expensive or similar cost there is no need to wait or defer their implementation, and there is no need for significant long term rate increase like currently planned by NB Power. Deferring the transition will only cost more in the long and short run, and is denying NB much needed jobs. It is a false choice to ask NB Brunswicker's if they are willing to pay more for green energy when it is less expensive.

Our plan has been misunderstood as only investing into renewables and not looking at energy efficiency and conservation. Our plan has also been misunderstood as ignoring the other sectors that make up NB emissions such as industry and Transportation. This is not true. There is \$4.7 billion in our plan to be invested in these areas and was the "Dividend" column in our previous plans. This is a fully integrated resource plan for New Brunswick and not just for the electricity sector. NB Power is responsible for both the generation of electricity as well as efficiency programs, and as such we believe the best way to invest the Carbon Tax is through our publicly owned utility for the benefit of all New Brunswicker's.

Some of the money will be used to invest into electrode boilers which is at least a 30% efficiency gain and has huge emissions reductions and will save industry in energy costs compared to what they are currently paying. This is the only credible method for eliminating the emissions from this sector without the extensive use of biofuels. Biofuels is a limited resource and we should be conserving it and using other methods first. The increase in electricity sales will also help with NB Powers bottom line and help keep rates low and stable. The approximate cost to supply all industry in NB with an electrode boiler is approximately \$200 million dollars.

The money will also be used to invest in the shift to electric transportation. This has another huge efficiency gain of more than 30%. At \$300,000 per electric school bus and approximately 1200 school busses, \$360 million of the 4.7 billion could be used to buy all new electric school busses. There are also approximately 1200 commercial busses. An electric commercial bus is approximately \$300,000 more than a normal fossil fuel bus which we can incentivise at a cost of another \$360 million. We can also use some of the revenue to incentivise the shift to electric cars and provide the infrastructure to make the shift like fast charging stations, and home charging stations.

Investing in these efficiencies have large emission reductions and benefits NB Power through increased sales and leads to lower overall energy cost for ratepayers while also maintaining low and stable rates. Investing in efficiency that reduces electricity consumption will make rates higher, choke the cash flow needed to make the transition, generally bad for business and only benefits those who get the efficiency. Also we have a very low carbon grid, already at around 75% carbon free, using less electricity has very little environmental benefits. Due to the high price of gasoline the shift in electric transportation should end up with consumers paying less overall energy cost. If we want to save money using efficiency the transportation sector is the place to do it in.

We should also use some of the money to invest in efficient government buildings that will make them more affordable. We all benefit from an efficient government. We can also offer low interest loans that can be paid back with energy savings and this should start with low income families first. We can invest into efficiency but too much too fast creates a big problem, and it should not be the focal point of our long-term plans like the current RASD program.

We think NB Power should not be trying to change human behavior to accommodate their grid, although we do believe in education that may help integrate renewables. We object to time of use pricing as NB Power is telling me I must pay more to eat and shower at my normal times. NB Power should be focusing on demand side management technology that is transparent to the user and doesn't require behavior changes such as are award winning Power Shift Atlantic program, which NB Power has now defunded.

There is also ample money for climate change mitigation as the effects of global warming have already begun to affect New Brunswick.

We also think that people generating their own electricity is a large issue for NB Power especially if rates keep rising like currently planned. We suggest NB Power adopt the solar city business model for people who want to generate their own power. We also think the community power be limited as NB Power is community power. However, if there is a program most community energy projects are 70% debt financed and this source of financing should be the Carbon tax so that we all benefit.

We would like NB Power to consider all our evidence, IR's and testimony from the EUB matter 336 as part of this submission, as we made our detailed concerns very well known to senior management during that process. We requested that the board order NB Power to have a detailed stakeholder consultation with us, but their final decision has yet to be released. We would very much welcome and request a more detailed consultation about the IRP with NB Power. Interventions are by nature confrontational and we hope that our critique is not taken personally as it is meant to help and in the public's best interest

Both economic experts at the hearings thought that the best way to get NB Power out of the financial troubles was a large immediate rate increase because of the compounding nature of it. The carbon tax gives this large initial influx of cash recommended by them while keeping electricity rates low and stable.

We request that an option to phase nuclear out by 2030 be considered in the IRP. As stated by NB Powers own expert at the EUB hearings, the closing of Point Lepreau for any number of reasons poses a large financial risk on the Province. NB Power should be examining the potential early retirement of Lepreau. Nuclear technology has underperformed in every aspect of building and operating a generating plant and lifespan should not be overestimated either. From cost over runs, schedule delays, poor performance, increase ongoing capital cost and issues with waste and safety still not adequately addressed, NB Power has no logical reason for pursuing nuclear. It is an industry in decline and NB does not have enough money to prop up this failing industry. Given the recent bankruptcy of Toshiba there is currently not even any technology to buy. We cannot afford to be another nuclear guinea pig in NB. There is no technical need for nuclear power and we already have too much baseload. We request that geothermal be used to replace any base load requirements, as it is the same or less cost and more scalable to the size of our needs. According to the 2014 IRP we have a comparable geothermal resource to California.

As pointed out during the EUB hearings we have concerns with the fundamentals of NB Powers current business plans starting with NB Powers lack of vision, IRP methodology and concerns with the three strategic objectives and general management of our publicly owned utility. These concerns were mirrored by almost all interveners.

We also have the impression that NB Power is not properly using its strategist software and this software is largely responsible for our concerns with NB Powers three key strategies. Given the recent property tax software creating significant issues in the province we are also concerned with misunderstood software at NB Power. We object to NB Power blindly following the directions given by this piece of software.

We request that NB Power assess return on investment and not only the lowest cost option for this IRP process. The results of the IRP are currently being misrepresented as Net Present Value which they are not. Not considering lost revenue for the RASD program is a huge problem with the current 2014 IRP. While the RASD program claims to have saved approximately \$450 million over 25 years it did not consider the lost revenue from the 2TWh of efficiency that the program enabled. This is approximately \$200 million per year in lost revenue every year to save \$450 million over 25 years. Lost revenue puts undue pressure on rate and jeopardizes the legislated requirement of low and stable rates.

We also object to the use of 100% debt financing for the WACC in the strategist software. NB Power should be using the actual capital structure in their modeling and using 0% ROI for their equity.

If NB Power would like to optimize the Carbon Tax and Investment plan we have submitted we recommend that NB Power use a WACC of 0% in their strategist software.

We strongly object to the focus on debt repayment. Even NB Powers own economic expert agreed that debt repayment should only be done with any money that is left over. Debt repayment is the tail wagging the dog. NB Power has a legislated equity target and not a debt reduction target. There should be no focus on debt repayment. NB Powers current focus should be return on investment. Our largest financial risk in the province is the performance of Point Lepreau and debt repayment does nothing to mitigate this risk. We risk paying down a bunch of debt to build equity then losing all the equity when Lepreau has to be shut down for one reason or another or our coal plant has to be shut down. Paying down debt is essentially investing in the bad past investments that NB Power has made that are causing all the risk.

Thank you for this opportunity to submit our thoughts on NB Powers future.

Regards

Chris Rouse

New Clear Free Solutions



New Clear Free **SOLUTIONS**

Transitioning To A Low Carbon Economy Carbon Tax and Investment Plan 2017 Integrated Resource Plan

The purpose of New Clear Free Solutions is to:

Provide energy oversight to the public and official decision makers using objective scientific, regulatory and financial information.

The objective of New Clear Free Solutions is to:

Ensure safe, affordable, and sustainable energy solutions for the public and environment.

IF YOU FOCUS ON THE PROBLEM, YOU CAN'T SEE THE SOLUTION. NEVER FOCUS ON THE PROBLEM.

Year-Technology Type	Carbon Tax \$/Year \$20/Ton	Revenue From Investments – (O&M+Fuel) \$/Year	Total Investment \$/Year	Dividend
2016 Hydro	\$300,000,000	\$0	\$300,000,000	
2017 Hydro	\$300,000,000	\$28,691,000	\$328,691,000	
2018 Wind	\$300,000,000	\$60,125,911	\$360,125,911	
2019 Wind	\$300,000,000	\$103,258,780	\$403,258,780	
2020 Wind	\$300,000,000	\$151,557,743	\$451,557,743	
2021 Natural Gas	\$300,000,000	\$205,641,552	\$505,641,552	
2022 Solar	\$300,000,000	\$207,440,231	\$507,440,231	
2023 Bio	\$300,000,000	\$234,443,008	\$234,443,008	\$300,000,000
2024 Bio	\$300,000,000	\$232,451,644	\$232,451,644	\$300,000,000
2025 Geothermal	\$300,000,000	\$230,477,194	\$330,477,194	\$200,000,000
2026 Geothermal	\$300,000,000	\$284,071,813	\$384,071,813	\$200,000,000

Economy Wide Carbon Tax \$20-30/Ton



Public Investment Through NB Power



Reinvestment
ROI-O&M-Fuel-Dividend

Fuel Shift
Efficiency
Adaptation

Uncertainty

Displaced Cost +
Increased Sales From
Fuel Shift=ROI

Power Purchase Agreements



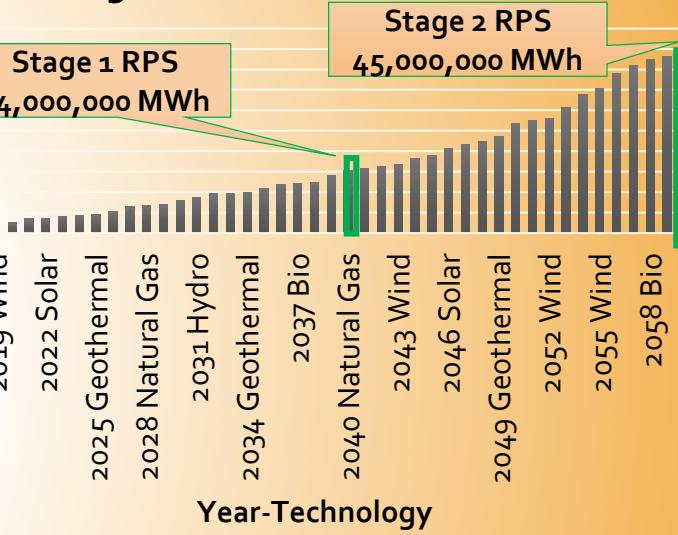
- * Solar Power
- * Wind Farms
- * Hydro
- * Geothermal

Summary



	Stage 1 Renewable Portfolio Standard 14,000,000 MWh/Year By 2040		Stage 2 Renewable Portfolio Standard 45,000,000 MWh/Year By 2060	
	% Generation	Capacity MW	% Generation	Capacity MW
Wind	30%	1,199	45%	5,779
Hydro	25%	999	10%	1,284
Solar	5%	320	15%	3,082
Geothermal	30%	533	20%	1,142
Bio	5%	320	5%	1,027
Natural Gas	5%	1,749	5%	6,235
Storage Tesla Power Wall	NA	400	NA	2,312

Integrated Resource Plan



IRP Financial Details

Year	Stage 1 RPS 2040	Stage 2 RPS 2060
Lifespan	30	30
Annual MWh	14,000,000	45,000,000
Total System Rate (PPA) \$/MWh	\$100.00	\$100.00
Total System Cost @ 0% Interest \$/MWh	\$46.02	\$49.11
Total Revenue \$/Year	\$1,400,000,000	\$4,500,000,000
Total System Capital Investment \$/Lifespan	\$10,519,002,664	\$38,649,355,023
Average Capital Investment \$/Year	\$350,633,422	\$1,288,311,834
Total Fixed O & M \$/Year (Generation)	\$190,299,020	\$655,488,139
Total Fuel \$/Year	\$51,730,000	\$166,275,000
Total Transmission Cost \$/MWh	\$3.69	\$3.69
Transmission Cost \$/Year	\$51,660,000	\$166,050,000
Total O & M \$/Year	\$241,959,020	\$821,538,139
Total Annual Expense \$/Year	\$644,322,442	\$2,276,124,973
Total Net Earnings (Interest) \$/Year	\$755,677,558	\$2,223,875,026.64
Total Net Profit/Interest \$/Lifespan	\$22,670,326,743	\$66,716,250,799
Total Dividend \$/Lifespan	\$4,310,000,000	\$27,374,153,558

Carbon Tax and Investment Plan Features

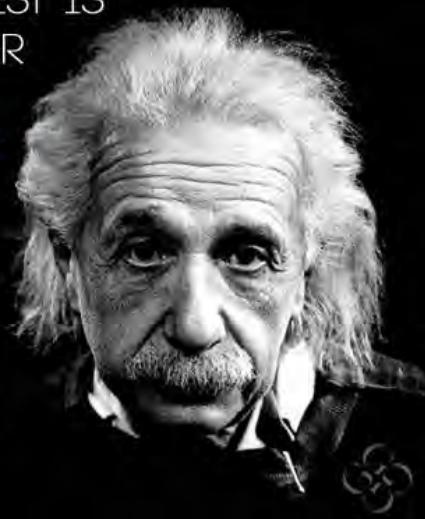
- Taxes the Problem and invests in the solutions
- Fully integrated plan for all sectors
- Creates much needed jobs in a multi-decade construction boom
- Compound interest is fueled with savings from displacing fossil fuels and purchased power and increased sales from fuel switching of the industrial heat and steam and automotive sectors to electricity.
- Lowest cost policy option and not dependant on the technology mix (Technology Neutral)
- Freezes electricity rates well into the future and is less than the current business as usual rate increases being proposed by NB Power (lower cost than doing nothing)
- Transition to debt free NB Power (Currently 95% in debt)
- No early retirement for existing power plants (No Premature Job Losses)
- Focuses on displacing fossil fuels not fossil fuel capacity. (Capacity doesn't emit CO₂ and fixed O and M is a small cost) This also addresses what happens when the wind doesn't blow.
- Significant new source of revenue for province. (\$1 to \$2 Billion Per Year for NB)
- Prioritizes Investments over subsidies/incentives
- Focuses on the efficiency gains in the transition of industrial heat and steam and transportation sectors. Reducing electricity usage has little environmental impacts and significant detrimental economic consequences.
- Minimal behavioural changes, focuses on transition from dirty energy to clean energy
- Fuels economic growth during multi decade construction boom
- Guaranteed to work if the policy is adhered too. All variables affect only "when" the objective is achieved not "if" the objective is achieved

Carbon Tax and Investment Plan

UNBSJ Professor of Economics, Dr. Rob Moir. "The concept of reinvesting in environmentally-friendlier energy production and energy efficiency to create a compound interest effect is founded economic theory. As such this policy should be considered by all provinces and not only New Brunswick."

"COMPOUND INTEREST IS THE EIGHTH WONDER OF THE WORLD. HE WHO UNDERSTANDS IT, EARNS IT ... HE WHO DOESN'T ... PAYS IT."

-ALBERT EINSTEIN



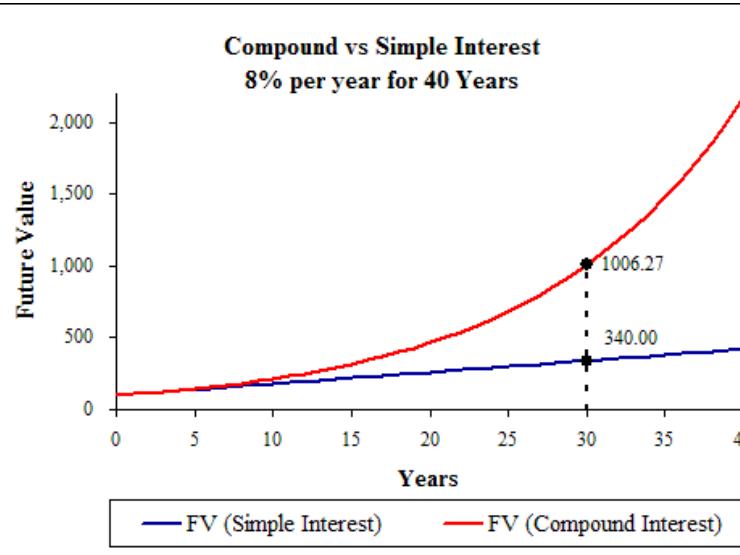
Amount

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

Principal

rate of interest
time in years
number of times per year, interest is compounded

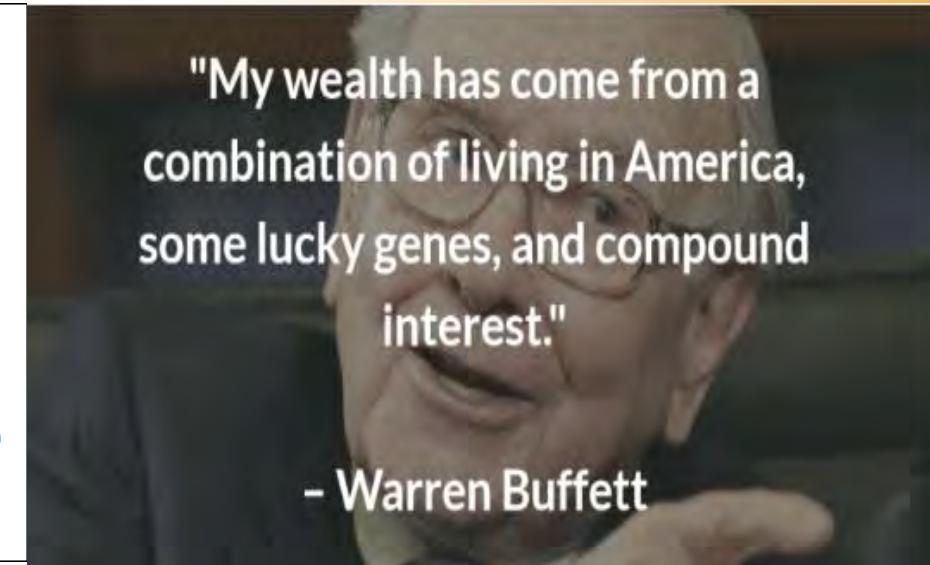
© mathwarehouse.com



NB Power System Planning Engineer Darren Clark: "We reviewed Mr. Rouse's model and functionally I believe the majority of what he is setting out to do, the model is accomplishing."

"My wealth has come from a combination of living in America, some lucky genes, and compound interest."

- Warren Buffett



Modeling Objectives

The general purpose of the modeling is to reasonably demonstrate using todays technology and todays costs and todays rates that New Brunswick can reasonably transition to a low carbon economy by investing the carbon tax into renewable energy and fuel switching technologies such as electrode boilers and electric cars.



Stage 1 Renewable Portfolio Standard (Green The Grid)

The objective of this renewable portfolio standard (RPS) is to green the current “electricity” consumption to 95% renewable by 2040. 2014-2015 was used as the test year for comparison to the business as usual.

Stage 2 Renewable Portfolio Standard (Fuel Shift or Electrification)

The objective of this renewable portfolio standard is shift all remaining fossil fuel usage to 95% green “energy” by 2060 at the same or less cost than the fossil fuel equivalent. Stage 2 does not require the completion of stage 1 before commencing. The transition to stage 2 can begin as long as the fuel switch has a net carbon reduction. This is essentially the electrification of our transportation and industrial heat/steam.

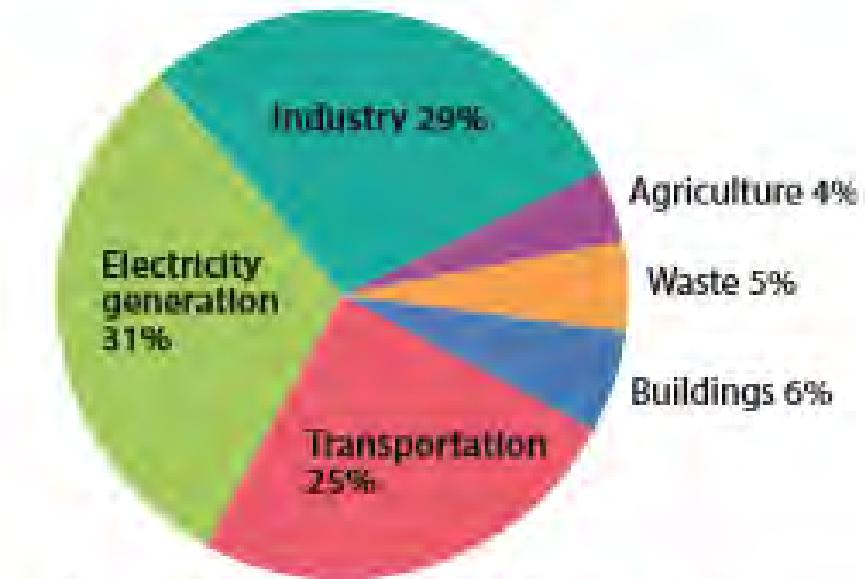
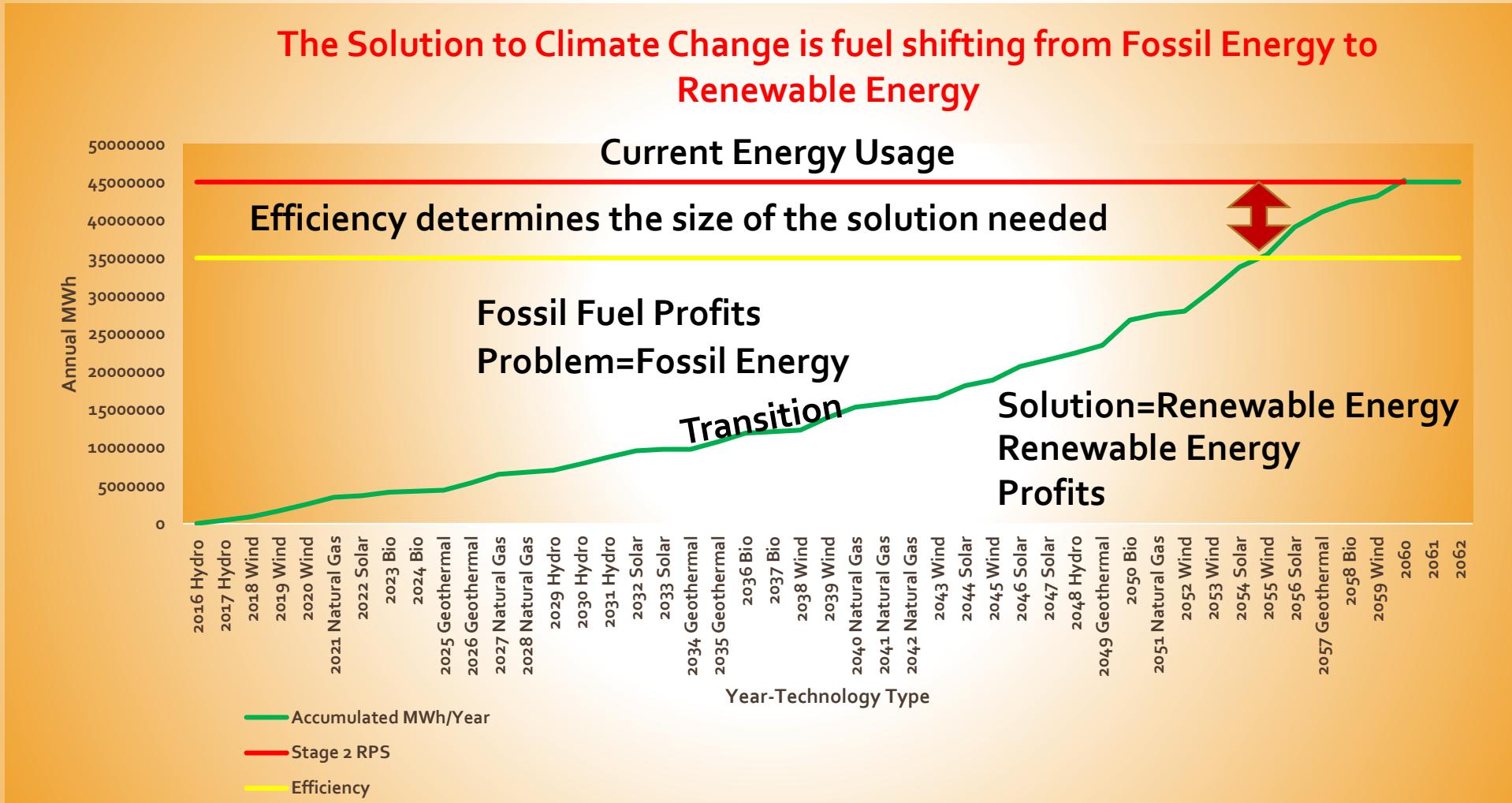


Figure 1: Distribution of GHG emissions in New Brunswick
Source: Environment Canada

The Solution = Renewable Energy



Technical Barriers? NO

Supply Side

- Hydro
- Wind
- Solar
- Geothermal
- Biofuels
- Smart Grids
- Storage Thermal/Battery
- High Capacity Very Low Capacity Factor FF plants
- Enough Resources

Specs



Technology
Wall mounted, rechargeable lithium ion battery with liquid thermal control.

Models
10 kWh \$3,500
For backup applications
7 kWh \$3,000
For daily cycle applications

Warranty
Ten year warranty with an optional ten year extension.

Efficiency
92% round trip DC efficiency.

Power
2.0 kW continuous, 3.3 kW peak.

Voltage
350 – 450 volts.

Current
5 amp nominal, 8.5 amp peak output.

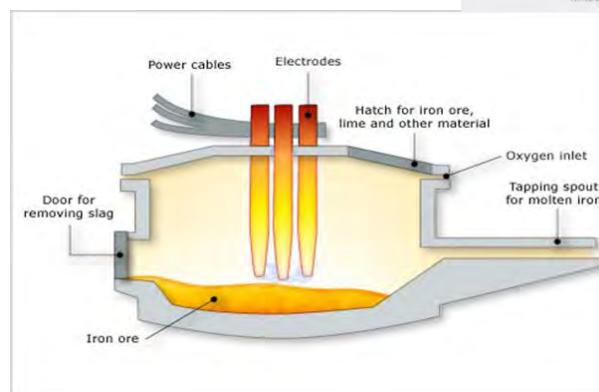


Technology will only get better with time

Demand Side

At Least 30% efficiency Gain in Electric Car and Electrode Boilers

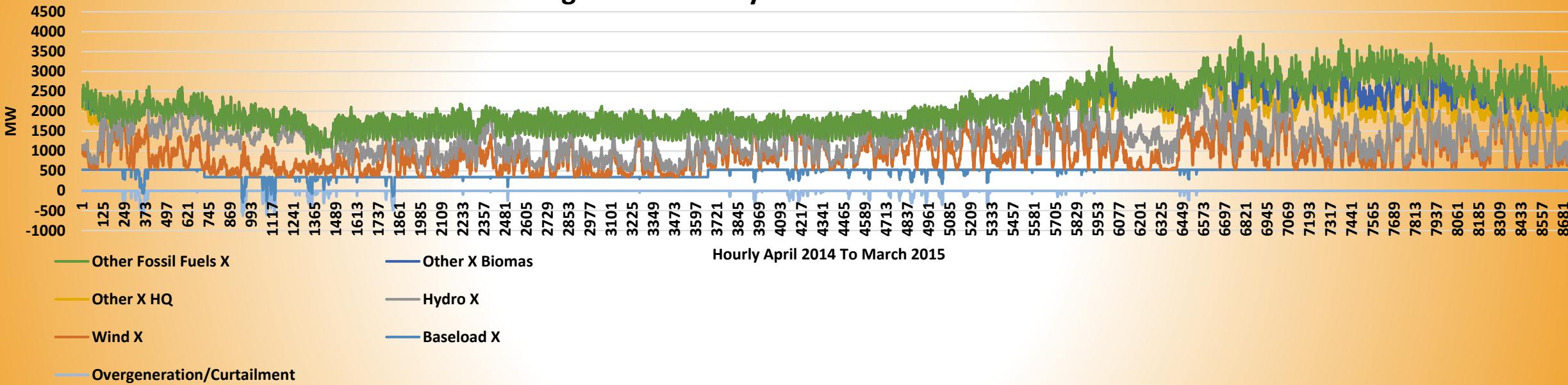
- Electrode Boilers
- Electric Cars
- Electric Trains
- Electric Busses
- Electric Arc Furnace
- Heat Pump



Stage 1 RPS Investment Details

In Province Generation	% Generation	Capacity MW	Capacity Factor	Capital Cost \$/MW	Total Capital Cost \$	Total MWh/Year	Fixed O & M \$/kw	Total Fixed O & M \$/Year	Fuel Cost \$/MWh	Total Fuel Cost \$/Year
Wind	30.0%	1,168	0.40	\$1,664,000	\$1,944,372,603	4,094,400	45.98	\$53,727,315	0	\$0
Hydro	25.0%	974	0.40	\$2,411,000	\$2,347,697,489	3,412,000	14.7	\$14,314,041	0	\$0
Solar	0.0%	0	0.25	\$2,480,000	\$0	0	21.33	\$0	0	\$0
Geothermal	30.0%	530	0.88	\$2,687,000	\$1,423,918,864	4,094,400	116.12	\$61,535,340	0	\$0
Bio	5.0%	330	0.24	\$3,765,000	\$1,242,761,783	682,400	108.63	\$35,856,896	35	\$23,884,000
Natural Gas	5.0%	1,604	0.05	\$664,000	\$1,064,792,792	682,400	6.65	\$10,663,964	70	\$47,768,000
Hydro Quebec	5.0%	1,000	NA	NA	NA	682,400	NA	NA	38.9	\$26,545,360
Storage Tesla Power Wall II		800	NA	\$1,600,000	\$1,280,000,000	NA	0	\$0		
Dividends (Energy Efficiency, Conservation, Fuel Switching, Adaptation)					\$4,770,000,000					

Stage 1 RPS Hourly Generation Stacked



Business As Usual Comparison			
Assumptions	Year	Stage 1 IRP 2040	2014-15 NB Power Annual Report
Based on US Gov EIA Annual Energy Outlook 2016	Lifespan	30	NA
2014-2015 NB Power Annual Report	Annual MWh In Province	13,648,000	13,648,000
2014-2015 NB Power Annual Report	Annual MWh Export	4,575,000	4,575,000
2014-2015 NB Power Annual Report	Total Generation	18,223,000	18,223,000
Stage 1 RPS Mix No Capacity Value for Wind or Solar	Firm Capacity MW	4,237	NA
2014-2015 NB Power Annual Report	Firm Capacity Requirment MW	4,000	4,000
Does not include Interconnects	Total In Province Capacity MW	5,406	NA
Total Annual In Province Revenue Divided by Annual In Province MWh Generation	Total System Rate (PPA) \$/MWh	\$100.67	\$100.67
Total Annual Export Revenue Divided by Annual Export MWh Generation	Export Rate \$/MWh	\$75.63	\$75.63
2014-2015 NB Power Annual Report	Annual Export Revenue	\$346,000,000.00	\$346,000,000.00
2014-2015 NB Power Annual Report	Annual In Province Revenue \$/Year	\$1,374,000,000.00	\$1,374,000,000.00
2014-2015 NB Power Annual Report	Total Revenue \$/Year	\$1,791,000,000	1,791,000,000
Total Revenue/Year * Lifespan	Total Revenue \$/Lifespan	\$53,730,000,000	NA
Calculated Annual Export Cost Divided by Annual MWh Export	Export Total Cost \$/MWh	\$62.30	\$62.30
2014-2015 NB Power Annual Report	Annual Export Cost	\$285,000,000.00	\$285,000,000.00
Difference between revenue and cost	Export Margin	\$61,000,000.00	\$61,000,000.00
Total Annual Expense Divided By Total MWh Production Over Lifespan	Total System Cost \$/MWh	\$77.70	\$91.00
Total Capital Investment Stage 1 RPS	Total System Capital Investment \$/Lifespan	\$9,303,543,531	NA
Straight Line Amortization Over Life of the assets	Depreciation and Amortization Expense \$/Year	\$310,118,118	\$239,000,000
US Gov EIA Annual Energy Outlook 2016 and Energy Mix	Total Fixed O & M \$/Year (Generation)	\$176,097,556	NA
CTIP uses US Gov EIA Annual Energy Outlook 2016 fuel cost and 2014-2015 NB Power Annual Report	Total Fuel and Purchased Power Including Exports \$/Year	\$383,197,360	\$826,000,000
Based on Total Fuel Cost/Year * Lifespan	Total Fuel \$/Lifespan	\$11,495,920,800	NA
Approximate cost based on working papers provided by NB Power	Total Transmission/Distribution O&M Cost \$/MWh	\$14.00	NA
Approximate cost based on working papers provided by NB Power	Transmission And Distribution O&M Cost \$/Year	\$191,072,000	NA
Based on Total Fixed O & M (Generation)+Transmission Cost/Year	Total O & M \$/Year	\$367,169,556	\$477,000,000
Based on Total O & M/Year * Lifespan	Total O & M \$/Lifespan	\$11,015,086,676	NA
Based on Total O & M/Year + Total Fuel/Year + Average Capital Investment/Year	Total Annual Expense \$/Year	\$1,060,485,034	NA
Based on Total Annual Expense/Year * Lifespan	Total Expense \$/Lifespan	\$31,814,551,006	NA
It is assumed that all of the debt will eventually be paid off, but may not be untill after the transition is complete.	Debt to Equity Ratio	0:100	96:4
Based on 2015 NB Power Annual Report	Financing Cost/Interest	\$0	\$229,000,000
2014-2015 NB Power Annual Report	Taxes	\$37,000,000	\$37,000,000
It is assumed that all of the debt will eventually be paid off, but may not be untill after the transition is complete.	Net Debt	\$0	\$4,913,000,000
CTIP does not include infatiorary Increases, while the NB Power 10 Year Plan does.	Rate Increases	4-5% Once	2% Annually Forever
Based on Total Revenue/Year - Total Annual Expense/Year	Total Net Earnings (Interest) \$/Year	\$693,514,966	\$73,000,000
Based on Total Net Earnings * Lifespan	Total Net Profit/Interest \$/Lifespan	\$20,805,448,994	NA
Based on Integrated Resource Plan.	Total Dividends Paid during IRP	\$4,770,000,000	NA

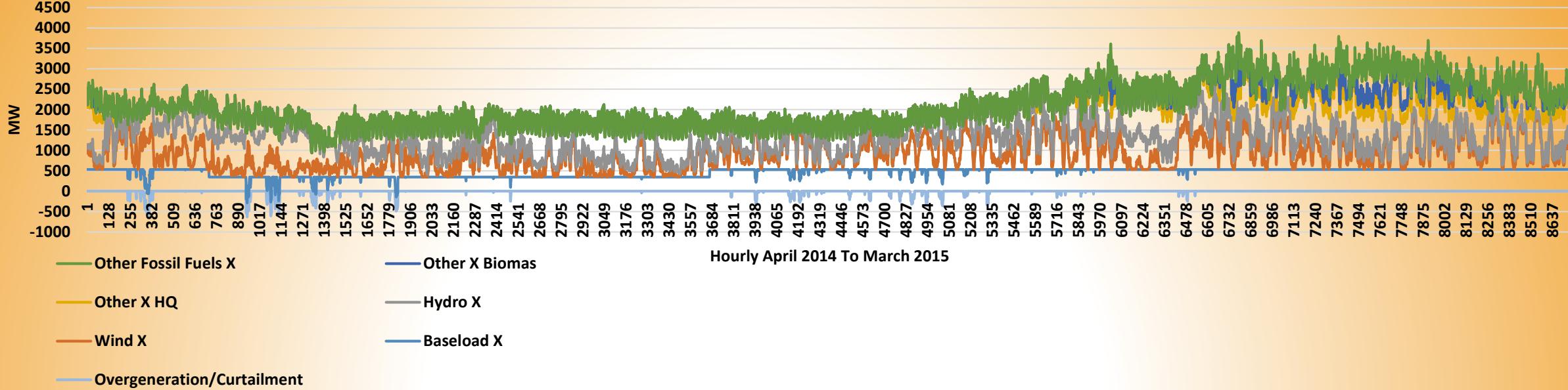
Integrated Resource Plan										Blue=Calculated		Yellow=Policy		Grey=Cost and Performance Data US Government 2016 Energy Outlook.							
Year-Technology Type	Accumulated MWh/Year	Carbon Tax \$/Year \$24/Ton	Accumulated Reinvestent \$/Year	Total Investment \$/Year	Dividend/Investment Energy Efficiency/ Mitigation	Technology Type Stage 1	Capacity Factor	In Service Capital Cost	Fixed O & M \$/kw	Fuel Cost \$/M Wh	Capacity MWh	Total Fixed O & M \$/Year	Total Fuel Cost \$/Year	Generation MWh/Year	Income From Investment	PPA \$/MWh	Income Minus (O & M + Fuel)				
2016 Hydro	0	\$370,000,000	\$0	\$370,000,000		Hydro	0.40	\$2,411,000	14.7	0	153	\$2,255,910.41	\$0	537,735	\$26,349,034	49	\$24,093,123				
2017 Hydro	537,735	\$370,000,000	\$24,093,123	\$394,093,123		Hydro	0.40	\$2,411,000	14.7	0	163	\$2,402,807.51	\$0	572,751	\$28,064,792	49	\$25,661,984				
2018 Wind	1,110,486	\$370,000,000	\$49,755,107	\$369,755,107	\$50,000,000	Wind	0.34	\$1,664,000	45.98	0	222	\$10,217,151.35	\$0	661,826	\$32,429,478	49	\$22,212,327				
2019 Wind	1,772,312	\$370,000,000	\$71,967,434	\$391,967,434	\$50,000,000	Wind	0.34	\$1,664,000	45.98	0	236	\$10,830,927.06	\$0	701,584	\$34,377,617	49	\$23,546,690				
2020 Wind	2,473,896	\$370,000,000	\$95,514,124	\$415,514,124	\$50,000,000	Wind	0.34	\$1,664,000	45.98	0	250	\$11,481,574.18	\$0	743,730	\$36,442,786	49	\$24,961,212				
2021 Natural Gas	3,217,627	\$370,000,000	\$120,475,336	\$340,475,336	\$150,000,000	Natural Gas	0.04	\$664,000	6.65	70	513	\$3,409,881.00	\$12,577,077	179,673	\$8,803,954	49	-\$7,183,004				
2022 Geothermal	3,397,299	\$370,000,000	\$113,292,332	\$293,292,332	\$190,000,000	Geothermal	0.90	\$2,687,000	116.12	0	109	\$12,674,769.49	\$0	860,557	\$42,167,295	49	\$29,492,525				
2023 Bio	4,257,856	\$370,000,000	\$142,784,857	\$212,784,857	\$300,000,000	Bio	0.25	\$3,765,000	108.63	35	57	\$6,139,394.17	\$4,331,995	123,771	\$6,064,792	49	-\$4,406,596				
2024 Wind	4,381,627	\$370,000,000	\$138,378,261	\$208,378,261	\$300,000,000	Wind	0.34	\$1,664,000	45.98	0	125	\$5,757,952.18	\$0	372,977	\$18,275,875	49	\$12,517,923				
2025 Wind	4,754,605	\$370,000,000	\$150,896,184	\$217,896,184	\$303,000,000	Wind	0.34	\$1,664,000	45.98	0	131	\$6,020,953.45	\$0	390,013	\$19,110,648	49	\$13,089,694				
2026 Geothermal	5,144,618	\$370,000,000	\$163,985,878	\$333,985,878	\$200,000,000	Geothermal	0.90	\$2,687,000	116.12	0	124	\$14,433,360.70	\$0	979,957	\$48,017,897	49	\$33,584,536				
2027 Bio	6,124,575	\$370,000,000	\$197,570,414	\$567,570,414	\$0	Bio	0.25	\$3,765,000	108.63	38.9	151	\$16,375,876.26	\$12,842,468	330,141	\$16,176,887	49	-\$13,041,457				
2028 Wind	6,454,715	\$370,000,000	\$184,528,958	\$354,528,958	\$200,000,000	Wind	0.34	\$1,664,000	45.98	0	213	\$9,796,419.16	\$0	634,573	\$31,094,065	49	\$21,297,645				
2029 Hydro	7,089,288	\$370,000,000	\$205,826,603	\$506,826,603	\$69,000,000	Hydro	0.40	\$2,411,000	14.7	0	210	\$3,090,149.76	\$0	736,591	\$36,092,949	49	\$33,002,799				
2030 Hydro	7,825,879	\$370,000,000	\$238,829,403	\$539,829,403	\$69,000,000	Hydro	0.40	\$2,411,000	14.7	0	224	\$3,291,369.65	\$0	784,555	\$38,443,197	49	\$35,151,828				
2031 Hydro	8,610,434	\$370,000,000	\$273,981,230	\$574,981,230	\$69,000,000	Hydro	0.40	\$2,411,000	14.7	0	238	\$3,505,692.28	\$0	835,643	\$40,946,486	49	\$37,440,794				
2032 Natural Gas	9,446,077	\$370,000,000	\$311,422,024	\$381,422,024	\$300,000,000	Natural Gas	0.04	\$664,000	6.65	70	574	\$3,819,964.55	\$14,089,638	201,281	\$9,862,746	49	-\$8,046,856				
2033 Geothermal	9,647,357	\$370,000,000	\$303,375,168	\$73,375,168	\$600,000,000	Geothermal	0.90	\$2,687,000	116.12	0	27	\$3,170,943.26	\$0	215,292	\$10,549,312	49	\$7,378,369				
2034 Natural Gas	9,862,649	\$370,000,000	\$310,753,537	\$180,753,537	\$500,000,000	Natural Gas	0.04	\$664,000	6.65	70	272	\$1,810,257.56	\$6,676,992	95,386	\$4,673,894	49	-\$3,813,355				
2035 Geothermal	9,958,035	\$370,000,000	\$306,940,182	\$26,940,182	\$650,000,000	Geothermal	0.90	\$2,687,000	116.12	0	10	\$1,164,232.94	\$0	79,046	\$3,873,250	49	\$2,709,017				
2036 Bio	10,037,081	\$370,000,000	\$309,649,199	\$79,649,199	\$600,000,000	Bio	0.25	\$3,765,000	108.63	35	21	\$2,298,085.66	\$1,621,543	46,330	\$2,270,161	49	-\$1,649,468				
2037 Bio	10,083,411	\$370,000,000	\$307,999,731	\$227,999,731	\$450,000,000	Bio	0.25	\$3,765,000	108.63	35	61	\$6,578,382.67	\$4,641,748	132,621	\$6,498,447	49	-\$4,721,684				
2038 Geothermal	10,216,032	\$370,000,000	\$303,278,047	\$623,278,047	\$50,000,000	Geothermal	0.90	\$2,687,000	116.12	0	232	\$26,935,261.19	\$0	1,828,777	\$89,610,079	49	\$62,674,818				
2039 Wind	12,044,809	\$370,000,000	\$365,952,865	\$435,952,865	\$300,000,000	Wind	0.34	\$1,664,000	45.98	0	262	\$12,046,341.78	\$0	780,314	\$38,235,372	49	\$26,189,030				

Sensitivity Analysis

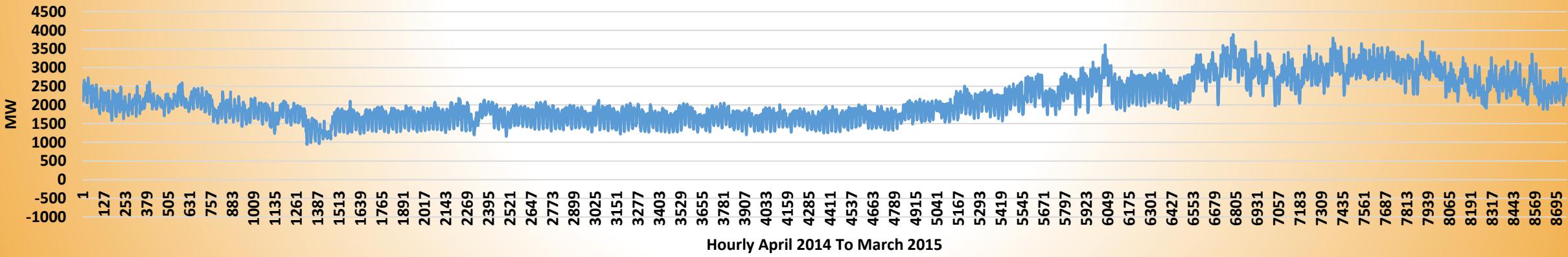
Sensitivity Case	Base Case Net Earnings	Business As Usual Net Earnings	Plus 10%-Net Earnings	Minus 10%-Net Earning	Plus 10% Difference From Base Case	Minus 10% Difference From Base Case
Captial Cost	\$693,514,966	\$73,000,000	\$662,503,155	\$724,526,778	-\$31,011,812	\$31,011,812
Wind Capacity Factor	\$693,514,966	\$73,000,000	\$704,291,306	\$680,343,885	\$10,776,340	-\$13,171,082
Fixed O and M	\$693,514,966	\$73,000,000	\$675,905,211	\$711,124,722	-\$17,609,756	\$17,609,756
Fuel Cost	\$693,514,966	\$73,000,000	\$683,695,230	\$703,334,702	-\$9,819,736	\$9,819,736
Lifespan	\$693,514,966	\$73,000,000	\$721,707,523	\$659,057,398	\$28,192,556	-\$34,457,569
Demand	\$693,514,966	\$73,000,000	\$762,208,949	\$624,781,097	\$68,693,982	-\$68,733,869
Rates	\$693,514,966	\$73,000,000	\$830,894,486	\$556,023,766	\$137,379,520	-\$137,491,200
Best/Worst Case Scenario	\$693,514,966	\$73,000,000	\$514,259,696	\$863,011,068	-\$179,255,271	\$169,496,101

Demand and Rates have the largest effects on the plan. Reducing Demand has significant impacts on the financial health of NB Power and generally lower demand = increase in rates. We strongly disagree with the reduce part of the RASD program at this current time.

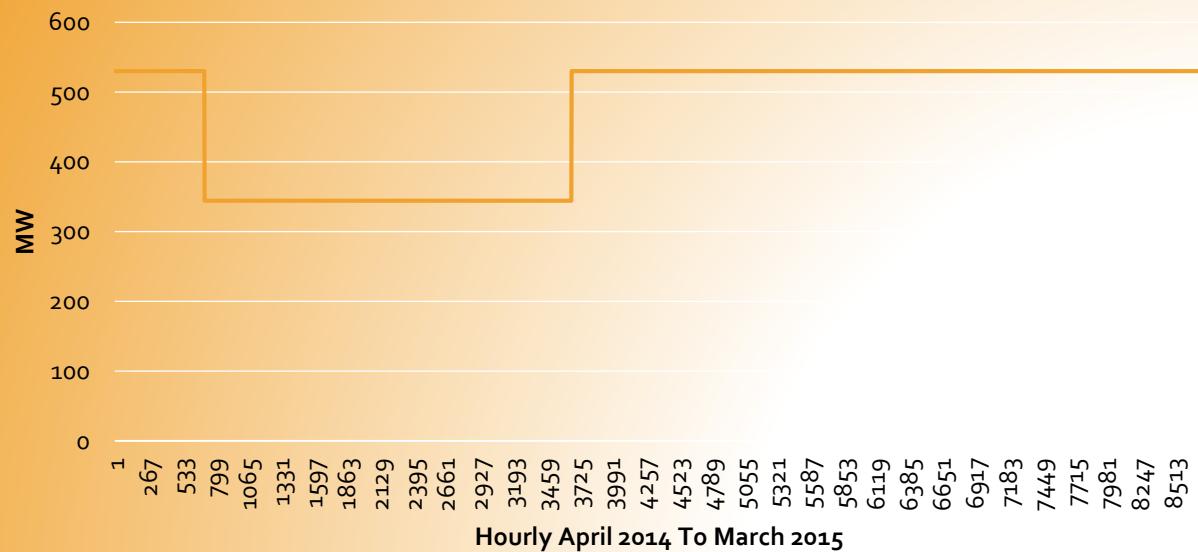
Stage 1 RPS Hourly Generation Stacked



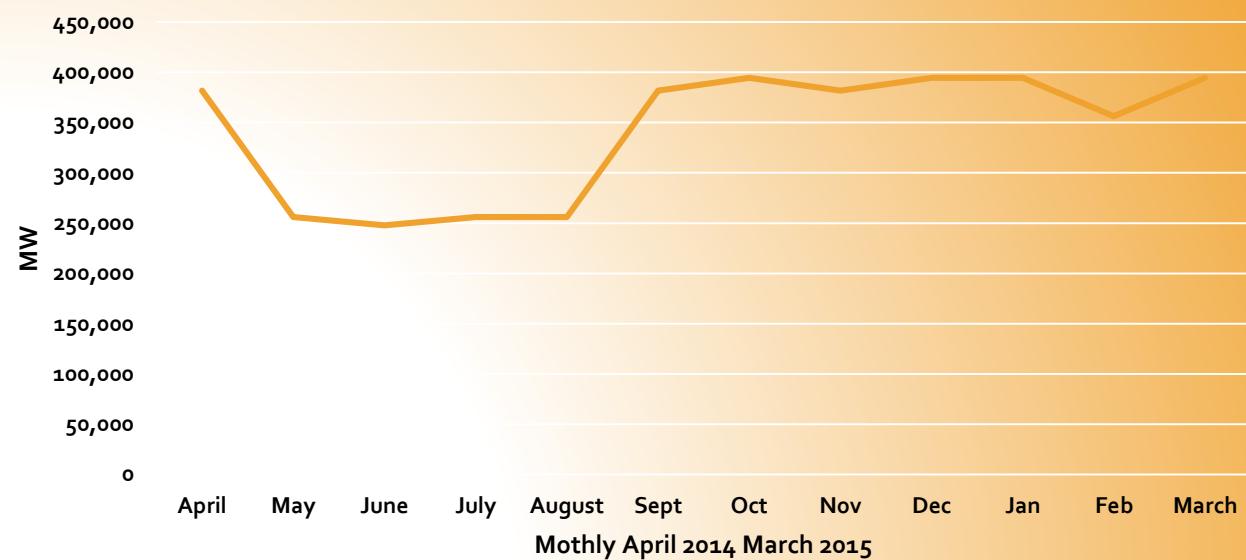
Total Demand BAU



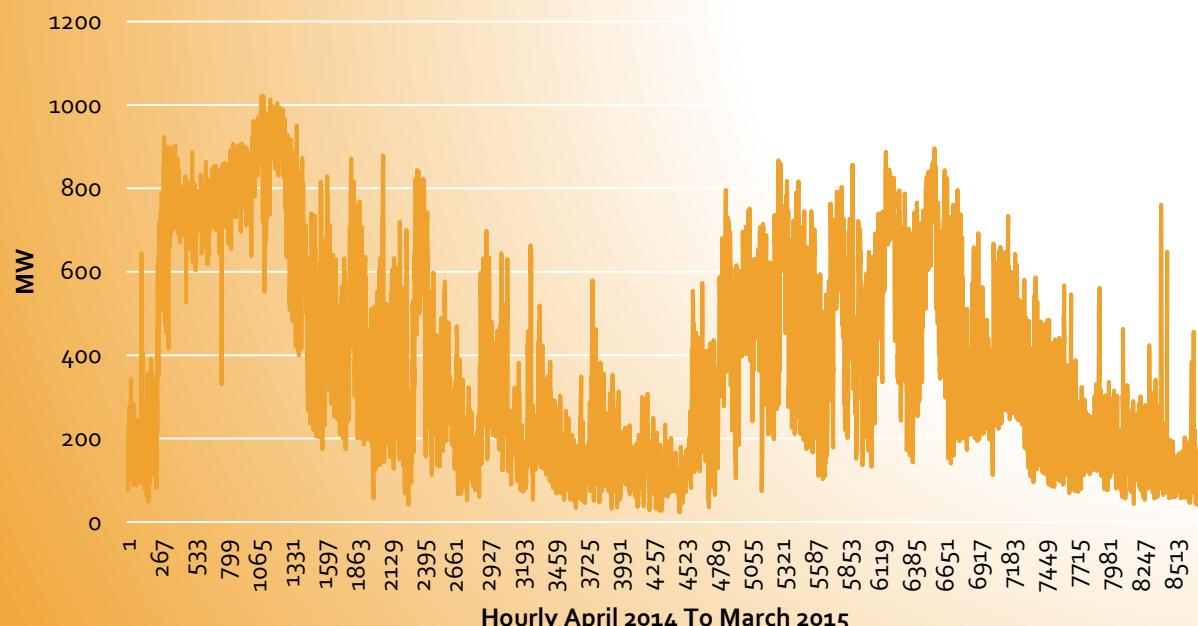
Baseload X



Baseload X



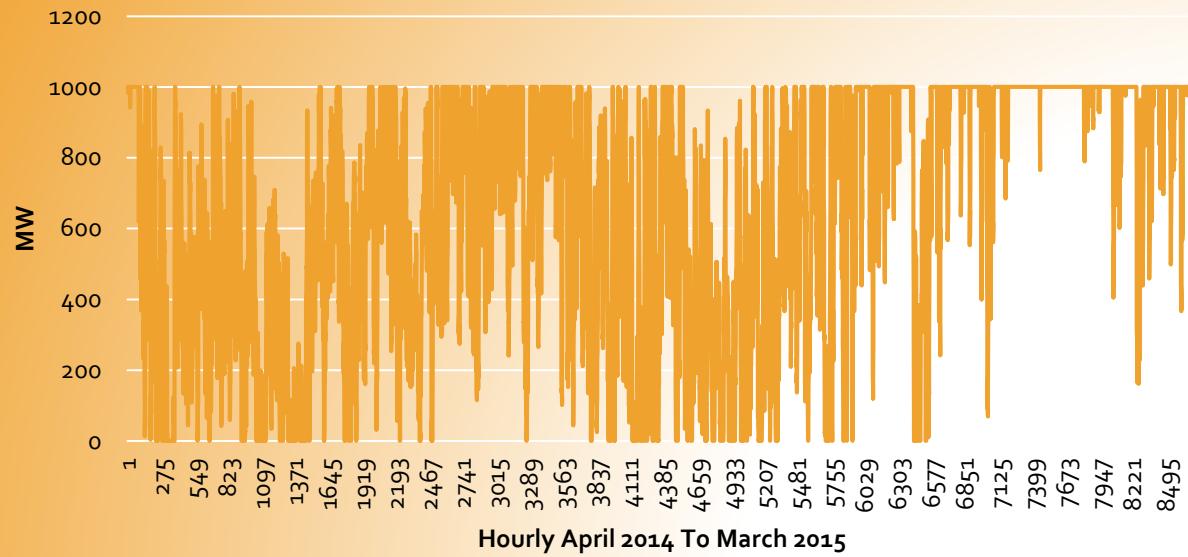
Hydro X



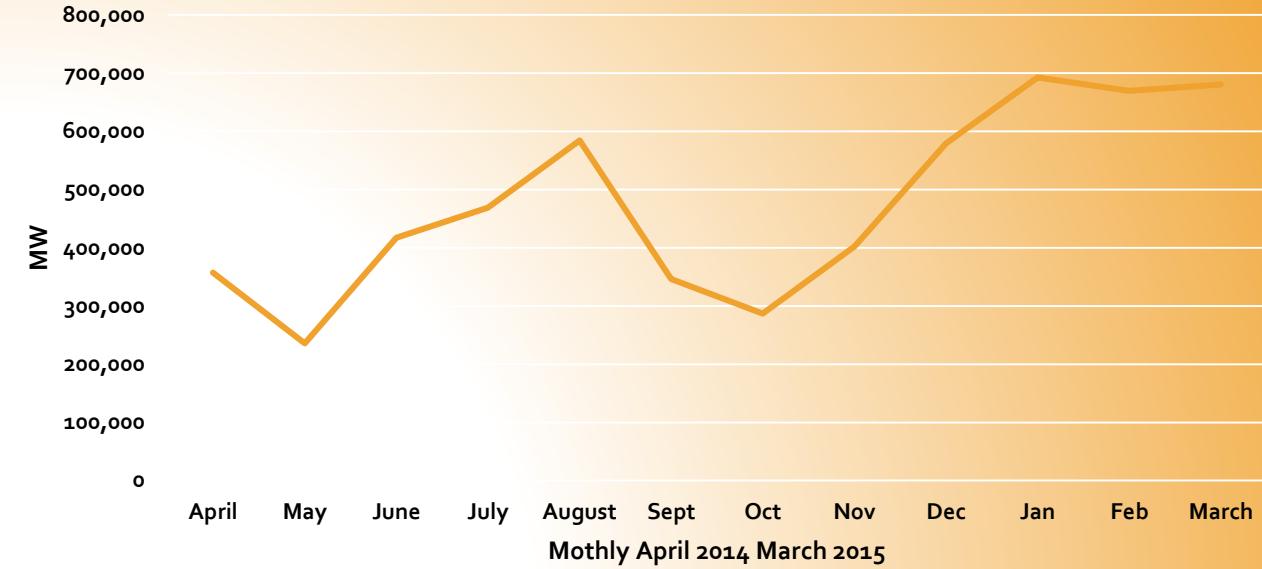
Hydro X



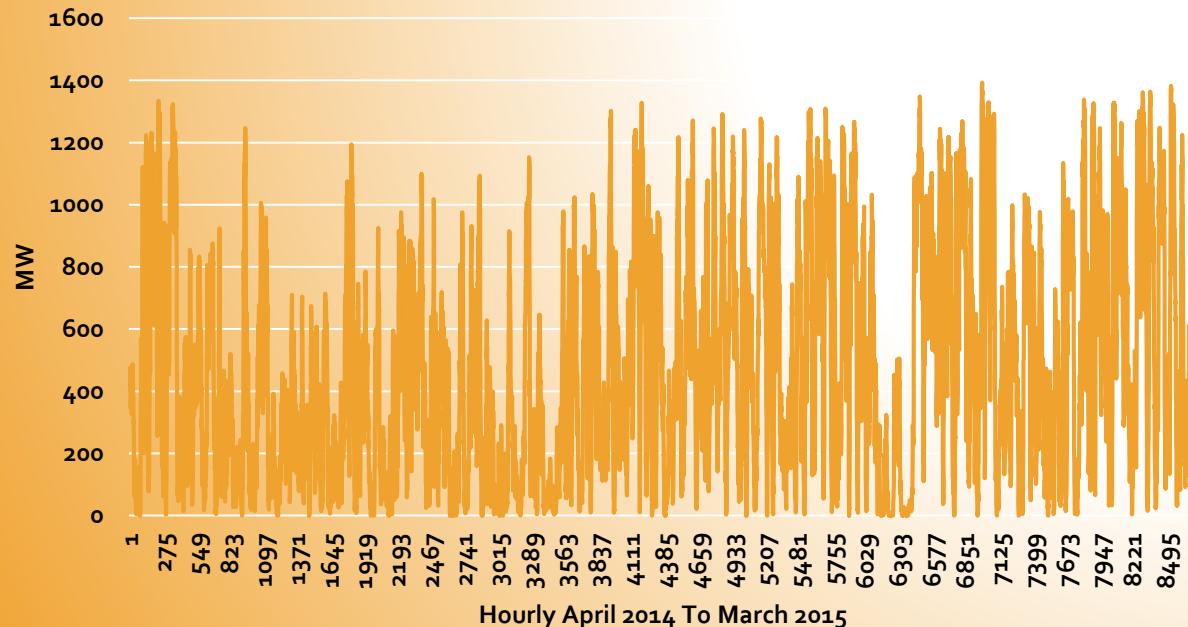
Other X HQ



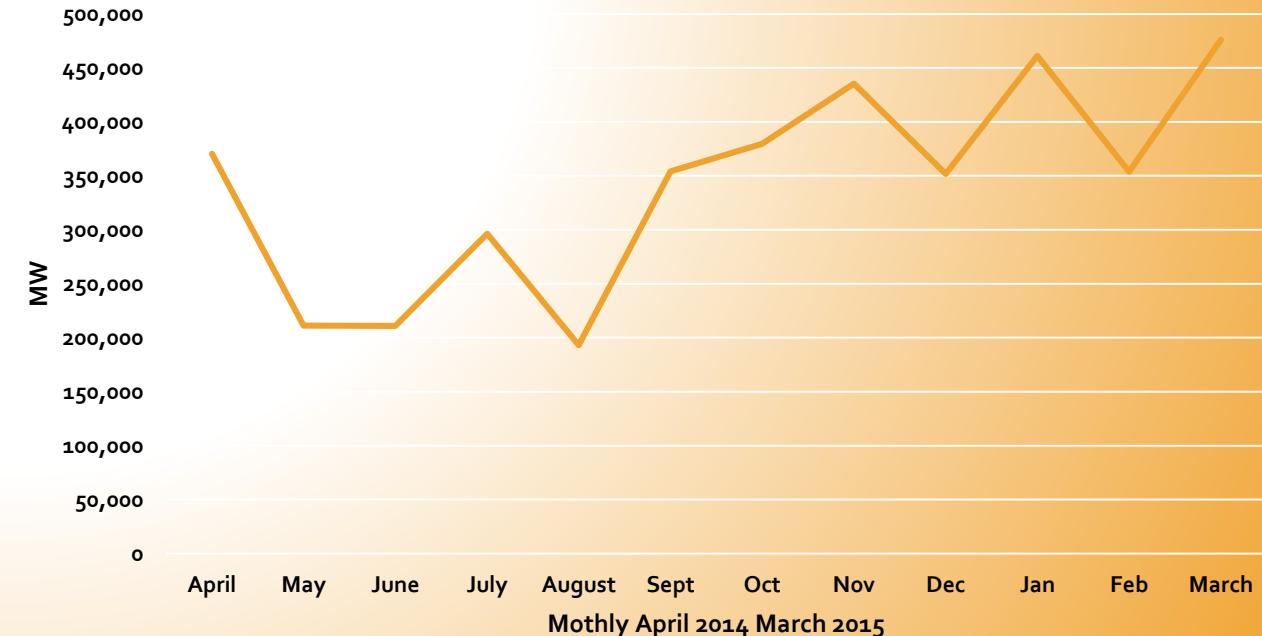
Other HQ X



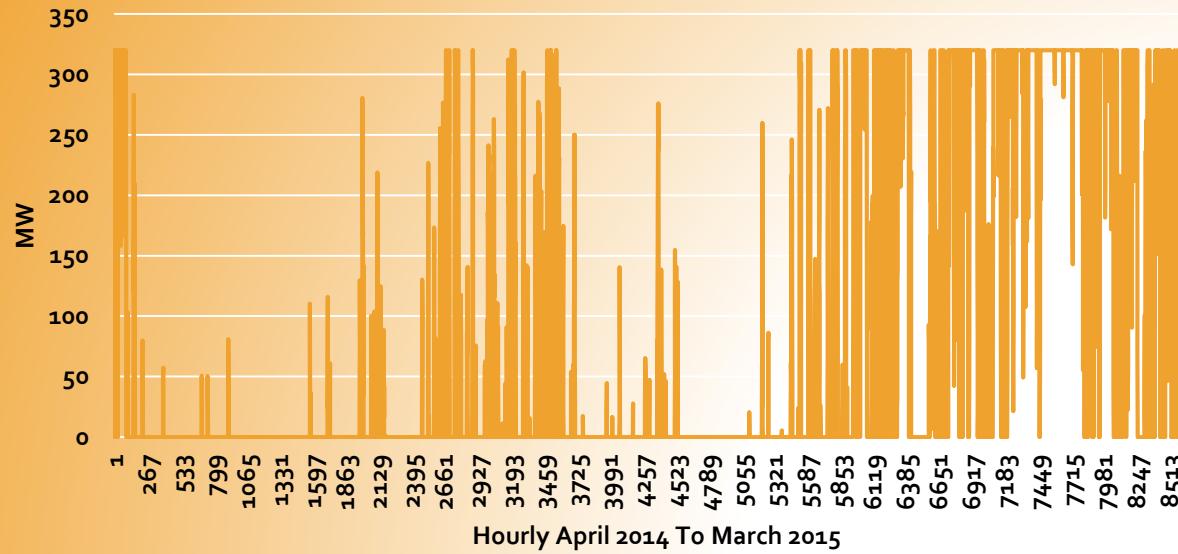
Wind X



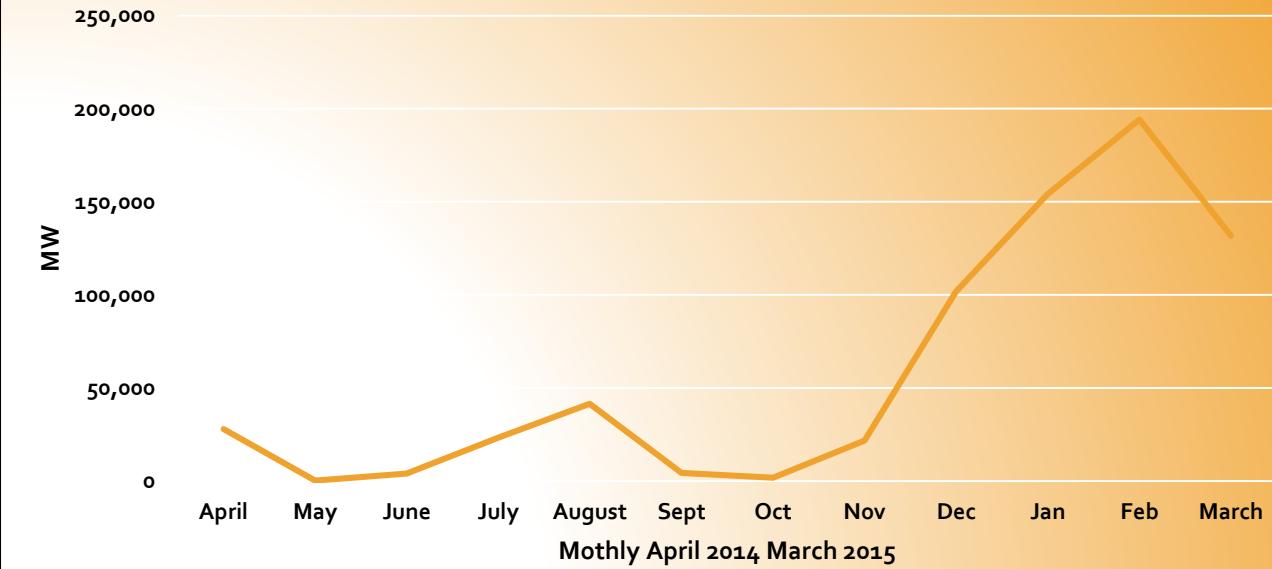
Wind X



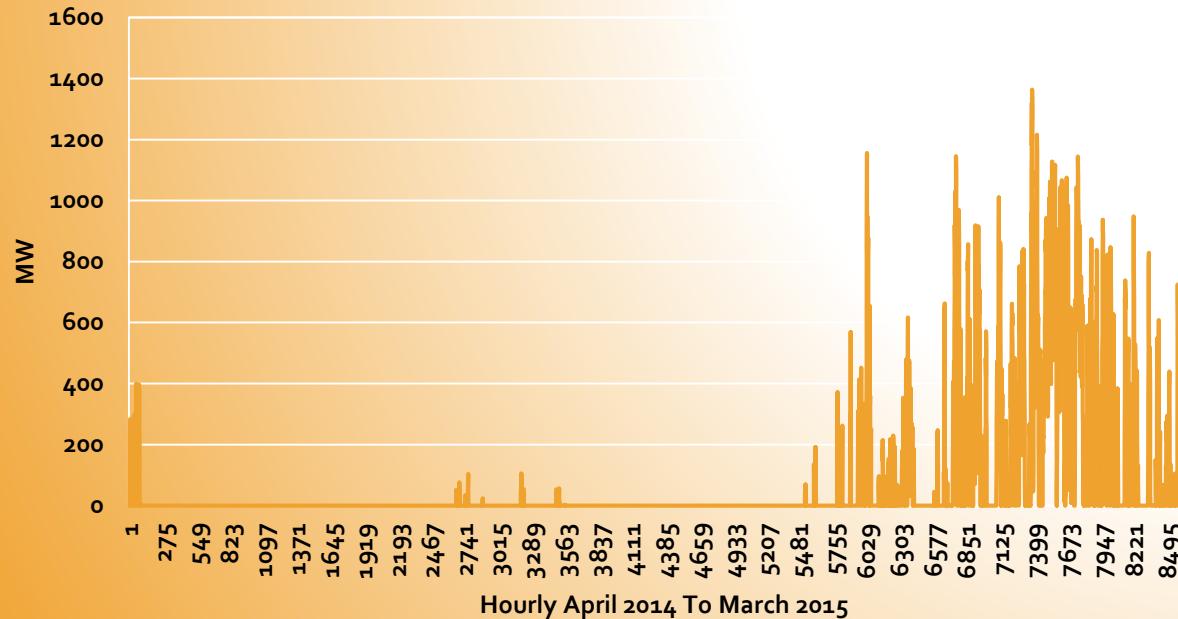
Other X Biomass



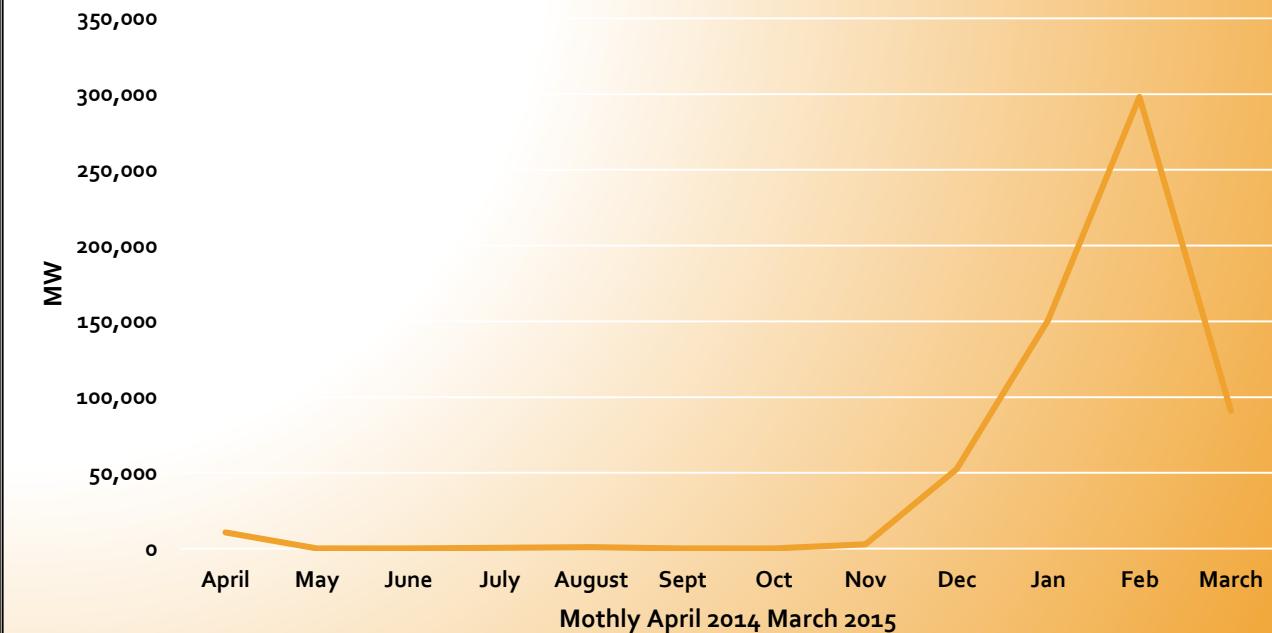
Biomass X



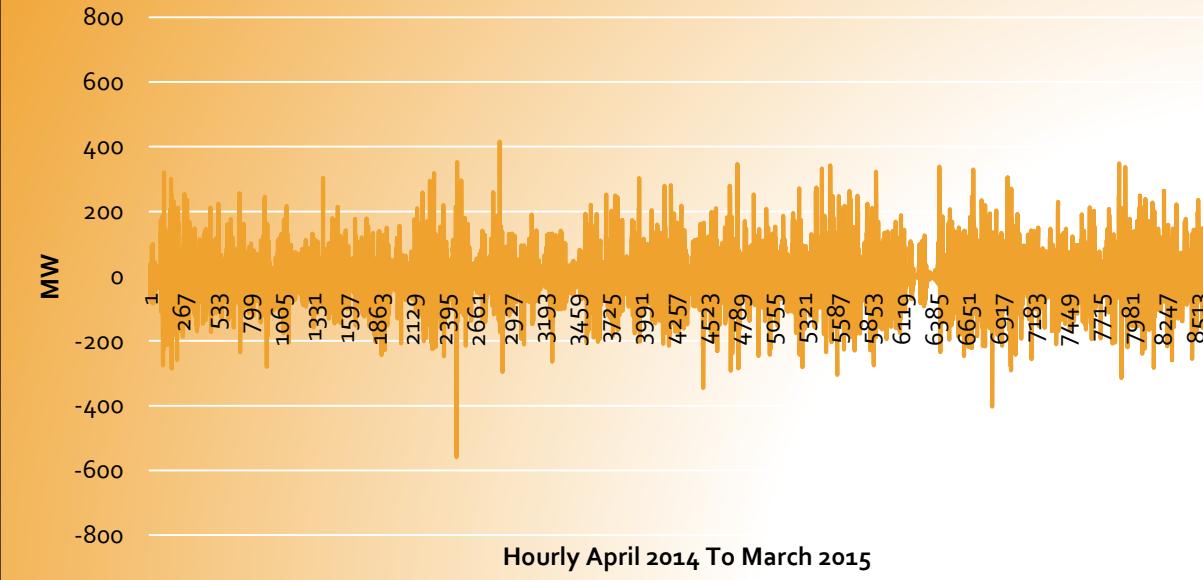
Other Fossil Fuels X



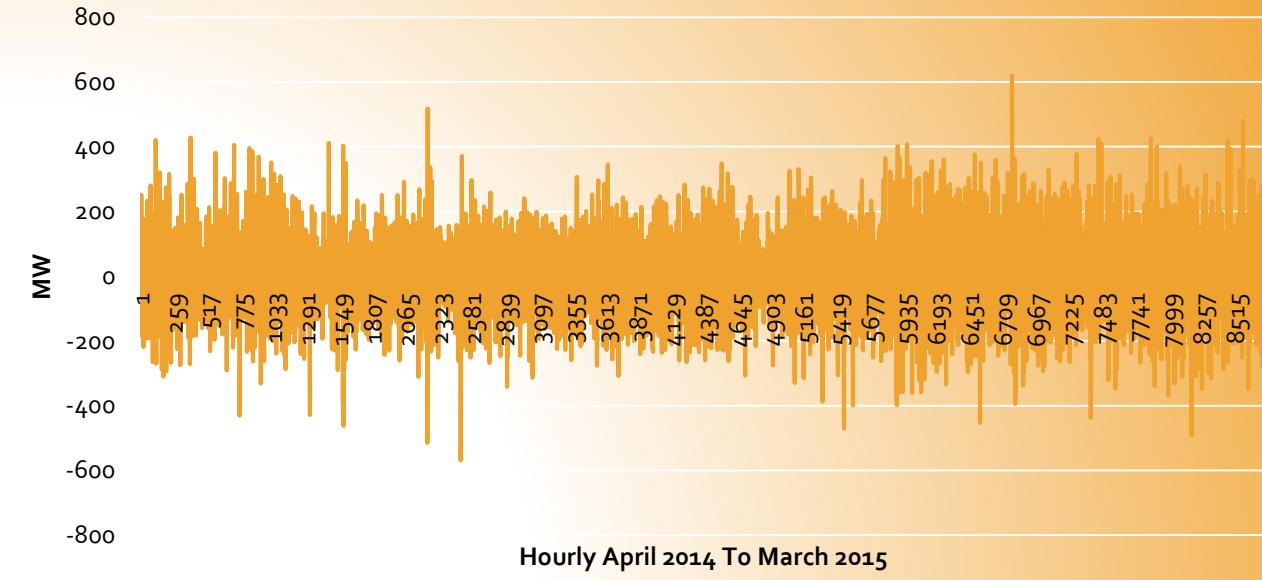
Other Fossil Fuel X



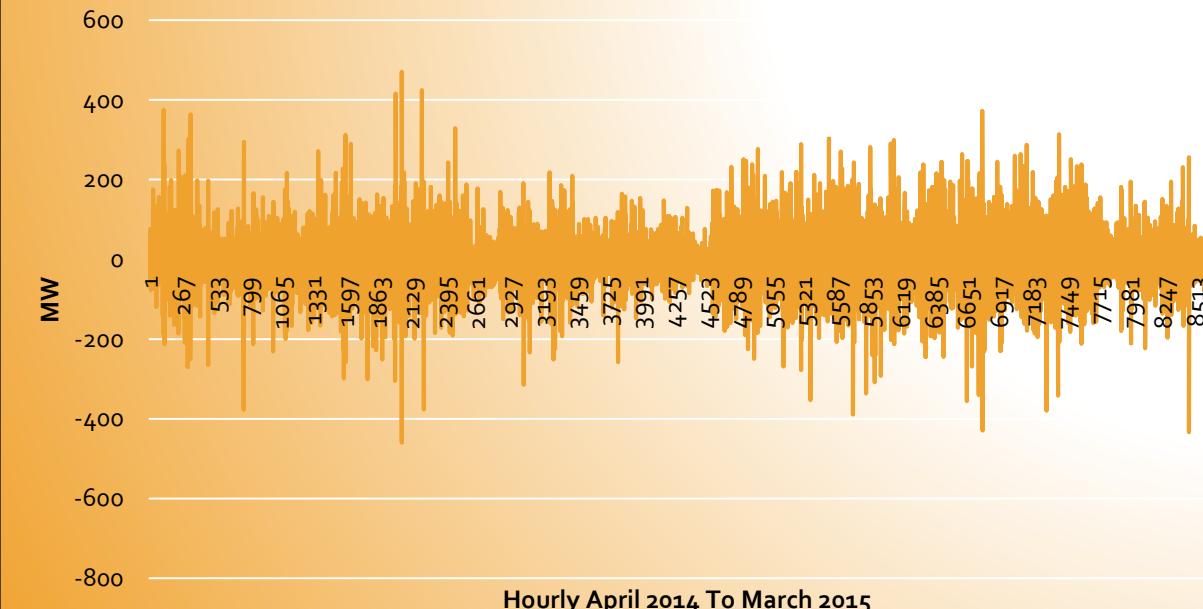
Wind Power Hourly Change



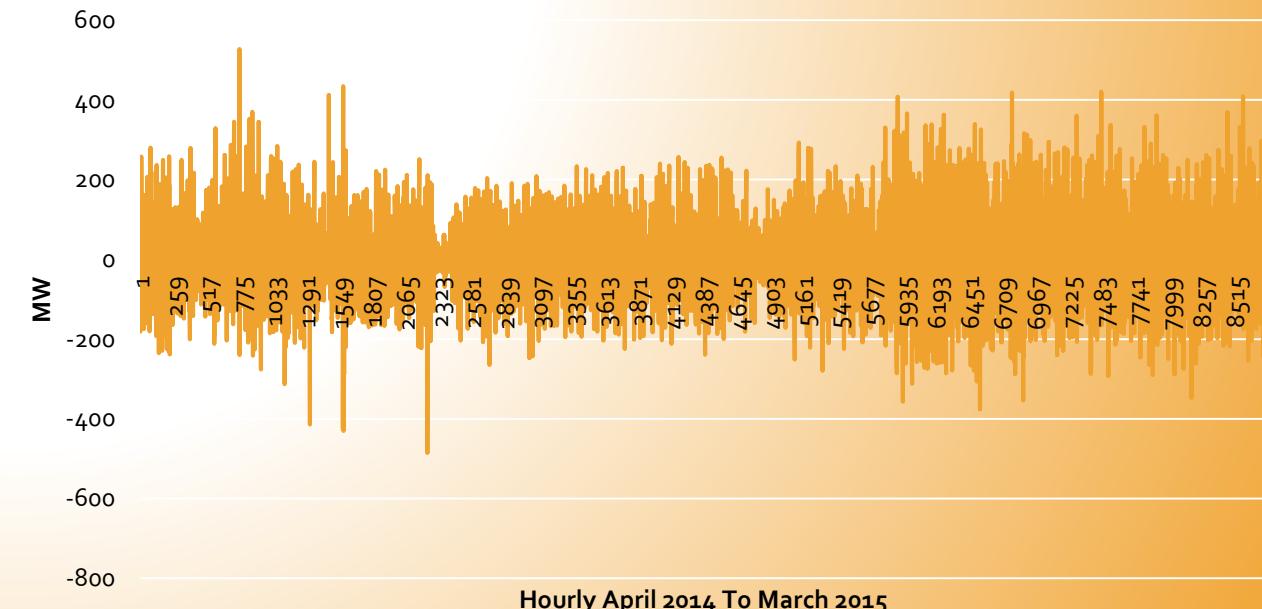
Other X Hourly Change

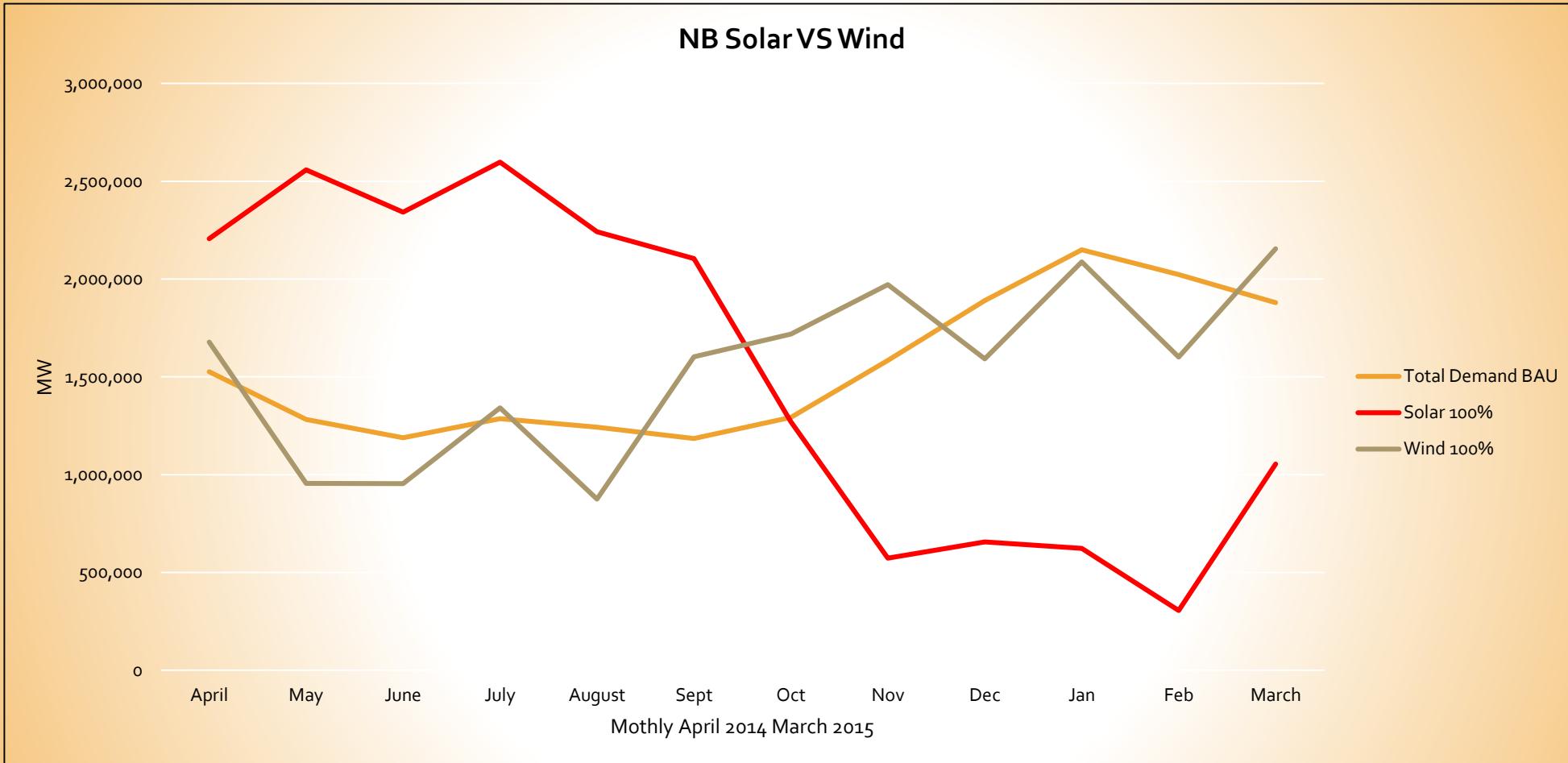


Hydro X Hourly Change



Other Hourly Change BAU





The above graph uses actual monthly Wind and Solar profiles scaled up to be 100% of our current usage. Please note that wind power closely matches our current energy usage while solar is opposite. It is much easier to integrated resources who's profiles closely match our usage. Hot climates generally will use more solar while colder northern climates more wind.

Hon. Donald Arseneault
Minister of Energy and Mines
PO Box 6000
Fredericton, NB, E3B 5H1
tyler.campbell@gnb.ca

Dear Minister and subsequent ministers of the Province of New Brunswick:

We are a group of 12 New Brunswick citizens randomly selected as part of a research project at the University of New Brunswick. The group deliberated over the weekend of October 3 and 4, 2015, to develop a 25-year electrical energy vision for the province.

We believe that there is a strong and immediate need for action on climate change and effort is needed toward the reduction of greenhouse gas emissions. Specifically, we are interested in the integration of renewable systems such as hydro, solar, wind, tidal, and biomass, while minimizing the use of non-renewable resources.

We respectfully present the following recommendations to maintain an affordable and renewable energy system, progressively built into the retirement of current assets over time.

- All major policy decisions regarding the future of the electricity systems should be open and transparent.
- Partnering and sharing assets with the Atlantic region (including options south of the border) will improve efficiency and reliability of the system.
- Grid reliability can be improved by including small sustainable systems to provide more flexibility.

The consensus of the committee is to establish pilot projects to implement these system changes, by setting up studies in the municipalities, including solar, wind, home-based energy systems, and consideration for electric cars (for example, the Halifax Solar City and Property Assessment Clean Energy program). We believe the benefits of this program will include employment, high skilled jobs, local training and will keep our youth in the province.

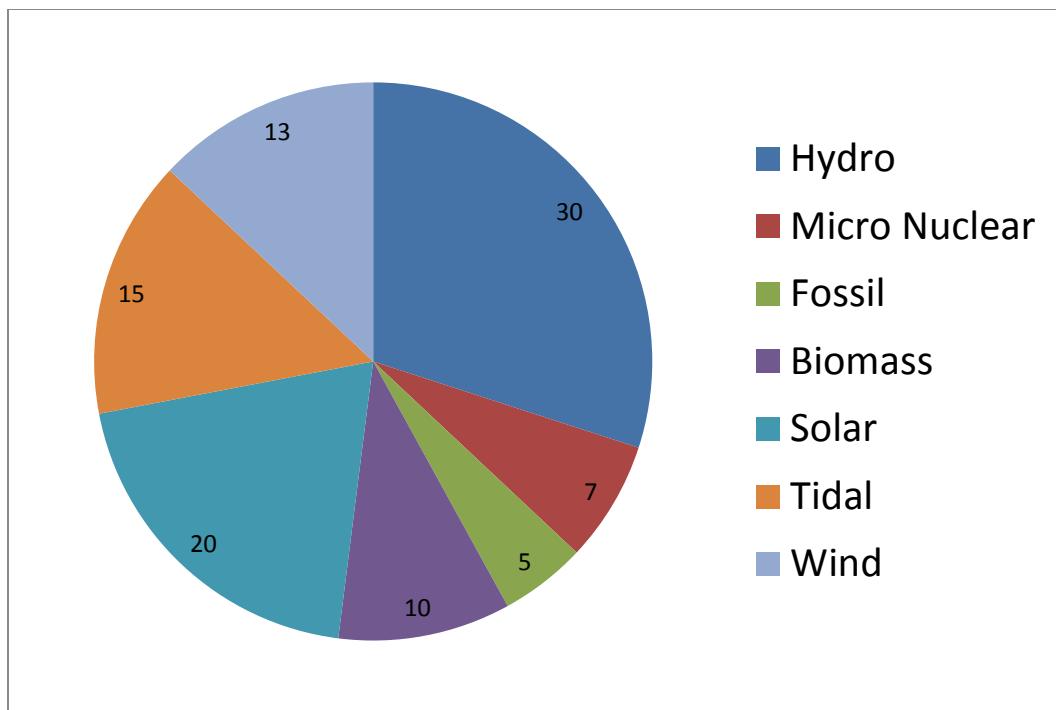
The size of the system will ultimately be affected by greater efficiency in the current system and electrification to support non-fossil fuel based transportation technologies. We also recognize there will be great gains made by energy saving technologies including reducing and shifting demand.

We have taken into consideration concerns for sustainability, climate change, cost effectiveness, and we are sensitive to the continuity and the reliability of the current electrical infrastructure in the Province of New Brunswick.

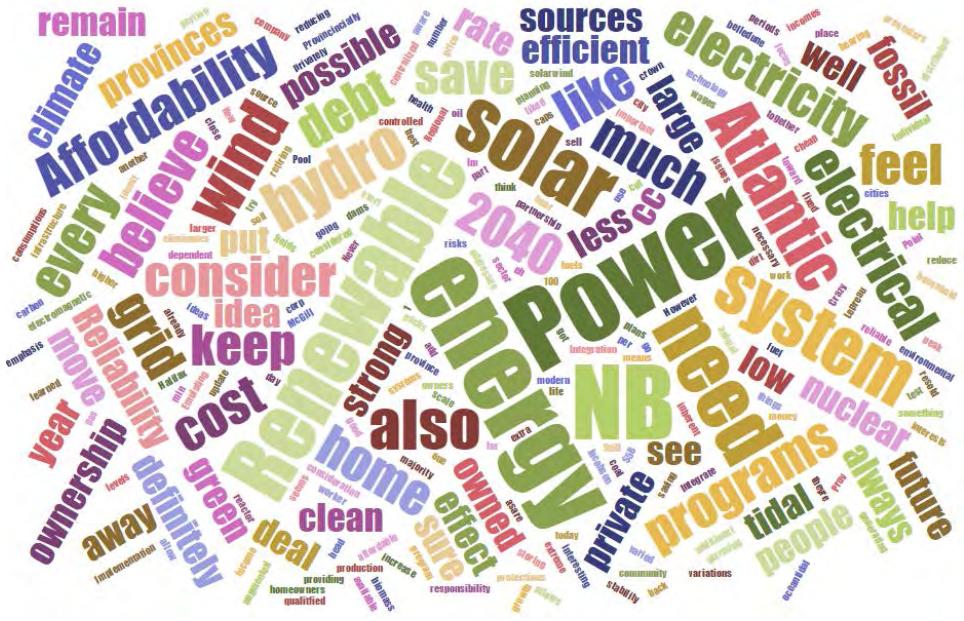
Sincerely,

The Deliberating Members of the New Brunswick Electrical Energy Futures Jury

cc: Gaeton Thomas, President and CEO, NB Power, gathomas@nbpower.com



Pie chart representing the consensus of the deliberating Members of the New Brunswick Electrical Energy Futures Jury on the 2040 fuel mix. The group began with a figure containing equal sized pie wedges for each of the seven categories of electrical energy generation and then negotiated this final graphic through a consensus process.



Word cloud representing a graphic summary of themes and topics of concern to participants. The data from the word cloud were drawn from paragraphs written by the Members of the New Brunswick Electrical Energy Futures Jury and the size of the font for each word represents the frequency that word was mentioned. The end result gives a graphic depiction of the attributes of the electrical energy system in 2040 that they felt will be most important to most New Brunswickers.



May 16, 2017

Mr. Gaëtan Thomas
CEO, NB Power
515 King Street
Fredericton, NB
E3B 4X1

Re: Comments on 2017 Integrated Resource Plan

Dear Mr. Thomas:

Thank you for the opportunity to provide input on NB Power's 2017 Integrated Resource Plan (IRP). The Conservation Council believes New Brunswick, and NB Power, have an important opportunity to create a clean electricity system in line with national and international climate change commitments, that improves the health and well-being of ratepayers, and that creates long-term sustainable jobs in our province. We believe we can achieve these objectives while maintaining reliability and managing rate impacts. Before summarizing the menu of options to consider, let's set the table by summarizing the context within which IRP planning is taking place.

Since the 2014 IRP, significant changes have occurred in the policy landscape with the 2016 national Pan-Canadian Framework resulting from the 2015 United Nations Paris Agreement being one of the most significant. NB Power must now explicitly plan for an electricity system operating under a nationally coordinated carbon price, as well as regulations aimed at significantly reducing greenhouse gas emissions intensity of coal-fired power plants. While questions remain with respect to how carbon pricing and coal-fired power plant regulations will be fully implemented, we know enough now to say that NB Power and the Province of New Brunswick should plan for a fossil-fuel free electricity system by 2030.

We also know from the response of New Brunswickers to the proposed sale of NB Power to Hydro Québec that ratepayers/citizens want their electricity produced in New Brunswick by New Brunswickers for New Brunswickers. Ratepayers/citizens also want reasonable power rates and electricity that is reliable. We know clearly from the 2017 ice storm on the Acadian Peninsula, as well as post-tropical storm Arthur, that reliability is not a certainty



with increasing exposure to extreme events and that power outages of a week or more is dangerous to public health.

NB Power argues that it is changing its culture to adapt to changing electricity market conditions, including the transition to significantly more electricity generated from smaller-scale, distributed renewable energy. Its commitment to Smart Grid technologies and to reduce and shift demand initiatives are positioned as evidence of cultural change within NB Power and an openness to developing a new business model. The Conservation Council is concerned that NB Power is not adapting quickly enough to changing conditions. We recommend an offensive, rather than defensive IRP, setting a clear direction toward a fossil-free electricity system by 2030.

Such a commitment would, for example, direct attention away from weakening proposed implementation of federal regulations affecting Belledune, and instead, would focus on transitioning the plant off coal by 2030 and the region toward a renewable, distributed and resilient electricity system in the Acadian Peninsula. Such an approach could ensure a just transition for Belledune workers, create jobs in Northern NB, and allow for federal-provincial partnerships that position our province, in the longer-term, to provide power in NB, for NB, produced by New Brunswickers.

We recommend that the IRP, should be positioned as an electrification strategy for the province, and include commitments to:

1. An economy-wide investment in energy efficiency through building retrofits in social housing, the residential, commercial/institutional/government (including municipal), and industrial sectors; and equipment and appliances. The goal would be to **advance NB Power's Reduce and Shift Demand objective of 609 MW by 2038 to between 2020 and 2025**¹.
2. **Accelerate investments in the Smart Grid** (the Energy Internet) to give the electricity system the capacity it needs to significantly increase the supply of renewable energy (aiming for 100% renewable). The Smart Grid is central to managing a more distributed energy system, as well as providing load balancing services to Nova Scotia, PEI and New England. The electrification strategy, or roadmap, can build on work completed under the Atlantic Energy Gateway Initiative and take advantage of new federal support aimed at identifying opportunities for regional electricity cooperation². Our electrification roadmap needs to be regionally focused, particularly because Nova Scotia will also need to reduce and then phase out the use of coal, and include a regional and long-term system investment plan (i.e. modernizing and

¹ <https://www.nbpower.com/media/102794/irpjuly2014-english.pdf>, p.128

² <http://www.acoa-apec.gc.ca/eng/publications/ResearchStudies/Pages/Home.aspx#aeg>; Federal budget 2016 provided \$5 million over two years to engage provinces and utilities in assessing regional electricity cooperation opportunities

integrating regional transmission networks, as well as regional targets for renewable energy to replace the loss of coal-fired generation. Acceleration of Smart Grid investments could advance installation of additional renewable energy technologies along with installation of next generation meters, hot water heaters and storage devices using telecommunications systems to manage a distributed load (including micro-grids; beyond what is already currently funded).

3. Expand regional investment in renewable energy, including accelerated solar rooftop targets. **A stretch target for New Brunswick could be 200,000 kilowatts (kW) of cumulative installed commercial and residential solar power by 2025** (100,000 kW each for residential and commercial, grid connected and off-grid), with NB Power working with suppliers to develop home equity loan and/or leasing programs, and power purchase agreements aimed at lowering payback periods from the current 13 to 15 years to between 5 and 10 years.³
4. Accelerated scale-up of electricity transportation infrastructure and incentives to increase the sale of electric plug-in and low-emission hybrid vehicles. Québec has a legislated target of putting 100,000 electric vehicles on the road by 2020: that's about 1.2% of the total fleet of over 8 million vehicles registered or about 16% of new car sales in 2020.⁴ A similar scheme for New Brunswick would **set a goal of 10,000 electric vehicles on the road by 2020, with the number of electric car sales increasing each year so that by 2030 there would be 140,000 to 150,000 electric vehicles on the road.**⁵ A fossil-fuel vehicle driven 20,000 kilometres a year generates about 5 tons of greenhouse gases. A rough estimate of the emissions reduction potential is at least 500,000 tonnes.⁶
5. Community economic development and worker transition investments to maximize job creation from energy efficiency and renewable electricity investments.

Electricity-related investments would be complemented by a provincial investment plan. To see the Conservation Council's full climate action plan, go to: <http://www.conservationscouncil.ca/our-programs/climate-and-energy/>.

³ <https://www.nbpower.com/media/169863/dsm-plan-2016-18.pdf>; represents stretch target for achievable potential

⁴ <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/econ58a-eng.htm>; assuming at 50,000 new car sales a month = 600,000 a year so 100,000 electric vehicles in 2020 would be equivalent to at least 16% of all new sales

⁵ Assuming at 5,000 new car sales a month or 60,000 a year that 16% would be 9600 vehicles so rounding to 10,000

⁶ Assuming 2017: 1k, 2018: 2k, 2019: 3k, 2020: 4k (cumulative = 10k), 2021: 6k, 2022-2030: 8k rising to 20k/year for a total of 140,000 to 150,000 electric vehicles on the road and declining greenhouse gas reductions from fleet fuel economy standards.

We also strongly encourage NB Power to more actively consider risks from climate change impacts in its IRP. Our infrastructure and our capacity to respond to these events has not kept pace with the changes in our climate. Individual extreme events need to be understood in the context of a rapidly changing climate. Scientists working on climate change adaptation increasingly urge a move from short-term emergency response to extreme events. Instead, we are being encouraged to move toward long-term risk reduction and preparedness. This change in focus opens the door to considering and planning for the long-term resiliency of New Brunswick communities and families. Solutions with the longer-term lens in focus encourage us to integrate climate change mitigation and climate change adaptation approaches.

The recent ice storm provides an opportunity think about how we can integrate mitigation and adaptation to climate change into electricity planning. We can develop a regional energy plan for the Acadian Peninsula that brings low to non-emitting sources (from wind, solar, hydro, biomass, if sustainably produced) of electricity and Smart Grid/micro-grid infrastructure into the system that also improves resiliency to extreme events. Priority for installation of new energy resilient technologies could be First Responder buildings like fire halls, city halls, and community centres used as warming centres. The shift to energy resiliency would also involve job-creating retrofits of homes in the region (and throughout the province) to improve energy efficiency and to install renewable energy and other modern technologies. A system-based assessment of options would ensure a sustainable energy system for, in the case of this example, the North that situates solutions within our climate change mitigation, as well as adaptation objectives.

The Conservation Council urges NB Power to advance an electrification strategy in its 2017 IRP that would form the basis of federal-provincial negotiations on how carbon pricing revenue and infrastructure dollars could be allocated within the electricity sector. A progressive and forward-looking IRP has the potential to satisfy the requirements for a reliable, cost-effective and sustainable electricity system based on a new model of delivery and financial operations.

We look forward to collaborating with you to make this vision a reality.

Sincerely,



Lois Corbett
Executive Director