

R-3864-2013

TESTIMONY OF MR. MATTHEW MUKASH

I. USING RENEWABLE ENERGIES IN OFF-GRID NETWORKS

1. Question : As President of a business specializing in renewable resource energy project development, are you able to identify the reasons why it is difficult for off-grid networks to produce energy from renewable sources, and therefore hard for them to reduce their diesel consumption and GHG emissions?

1. Answer : To begin with, as the former Grand Chief of Eeyou Istchee, as the representative of Whapmagoostui, my community, as President of Nimschu Iskudow Inc. (which means *electricity* in Cree) that was created to develop renewable energy solutions, and on behalf of Quebec First Nations, I would like to thank the commissioners for hearing my testimony.

In my opinion, the main reason is the lack of Hydro Quebec policies and tangible regulations that would enable green energy integration in the off-grid regions. There are no clear scales and calculations to be used for comparison when replacing a diesel plant, or adding power and energy to an existing plant with a renewable energy plant, with regards to production costs, avoided costs or opportunity costs.

Furthermore, because of the lack of structure, it is very difficult to convince Hydro Quebec to enter into commercial discussions that would lead to green energy development because Hydro Quebec seems to use an unfavourable discount rate for renewable energies, for example when it uses an inflation cost of diesel at 2% annually.

As with all Quebecers, we have seen the price of gas increase a lot in the past years and we are worried because Hydro Quebec only offers the option to produce energy from diesel. This represents many hundreds of millions of dollars in annual expenses, money that could have been used in sustainability projects during the time spent on this procurement plan. With an unemployment rate of over 30% in Whapmagoostui, it is not socially acceptable to continue with un-renewable resource as the only option.

2. Question : As the President of a business specializing in renewable energy resource project development, do you have experience with government request for proposals relating to wind energy suppliers and/or biomass with HQD, or knowledge of energy production projects oriented towards diesel?

2. Answer : No, I have never participated in the request for proposal process for those energy sources. There has never been a request for proposal processes for those energies in the Whapmagoostui/Kuujuarapik areas, even though the energy plant is in the process of being upgraded.

In that regard, Hydro Quebec has entered into the process of upgrading the diesel stockyard in the Kuujjuarapik village. As far as I know, Hydro Quebec plans to increase the diesel stockyard by more than 100% (from 50 kL to 120 kL), even though it was not indicated in the last request for proposal number 14520468¹: “North of Quebec/Power plant of Kuujjuarapik – Retrofitting of the fuel stockyard, the fuel room, and construction of the pumps and barrel room.”²

ADDENDA No 1

APPEL DE PROPOSITIONS 14520468

Nord-du-Québec / Centrale de Kuujjuarapik - Mise aux normes du parc à carburant, de la salle à carburant et construction de la salle des pompes et à barils

Le 26 février 2014

That is surprising because in the description in the request for proposal, it is indicated « *Increase of the capacity and retrofitting of the fuel stockyard* »³:



DEVIS D'INSTALLATION RELATIF

AUX TRAVAUX DE MÉCANIQUE DE PRODUCTION REQUIS DE

L'ENTREPRENEUR POUR


L'AUGMENTATION DE LA CAPACITÉ ET

MISE AU NORME DU PARC À CARBURANT

My perception is that we also find lots of other construction works for the addition of a fourth group⁴ (2128-40091-001-01-0HQ-L, page 11) :

¹ Devis d'installation relatif aux travaux de mécanique de production requis de l'entrepreneur pour l'augmentation de la capacité et mise au norme du parc à carburant centrale Kuujjuarapik, no. OTP : QUKBT, no installation : 2128, document no. : 2128-40091-001-01-0-HQ-1

² APPEL DE PROPOSITIONS 14520468 Nord-du-Québec / Centrale de Kuujjuarapik - Mise aux normes du parc à carburant, de la salle à carburant et construction de la salle des pompes et à barils, le 26 février 2014, http://www.hydroquebec.com/soumissionnez/documents_consultation/doc_14520468.html

³ Site Web Hydroquebec.com, ouverture des plis en cours, http://www.hydroquebec.com/soumissionnez/documents_consultation/doc_14520468.html, Devis: [2128-40377-001-02-0-HQ-1-OUKBT-01-OC](http://www.hydroquebec.com/soumissionnez/documents_consultation/doc_14520468.html) 

⁴ ADDENDA No 02 APPEL DE PROPOSITIONS 14520468, Nord-du-Québec / Centrale de Kuujjuarapik - Mise aux normes du parc à carburant, de la salle à carburant et construction de la salle des pompes et à barils, Le 7 mars 2014, [01_14520468_Ad2](http://www.hydroquebec.com/soumissionnez/documents_consultation/doc_14520468.html), http://www.hydroquebec.com/soumissionnez/documents_consultation/doc_14520468.html

Les différentes interventions de l'entrepreneur visées par ce devis se situent au niveau :

- > Des réservoirs de stockage extérieur du parc à carburant incluant toute la plomberie;
- > De la salle des pompes;
- > De la salle à carburant;
- > Des baies de moteur incluant l'interface pour le raccordement ultérieur du 4^e groupe;
- > Des refroidisseurs de carburant;
- > De l'abri à barils;
- > Du groupe électrogène d'urgence;
- > De l'atelier dans lequel est localisé le chauffe-eau;
- > Du passage de la tuyauterie traversant les murs de la centrale;
- > Du local abritant le système d'huile rebut;
- > De la salle abritant le système incendie de la centrale;
- > Des zones visées par le système d'alimentation temporaire en carburant;

2014-03-05

2128-40091-001-01-A-HQ-L

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It does not seem clear to me, either, if the retrofitting of the diesel stockyard comes from only one project, which is the addition of a production group using diesel. If that is the case, the total of these costs should be taken into account during an opportunity cost analysis between a renewable resource project and the previously mentioned project of increasing the diesel power plant production, in order to make a clear choice with regards to investment and total cost.

In fact, it is difficult, maybe even impossible, to evaluate the Hydro Quebec objectives because the request for proposals seem to have been split into pieces, for example, some for supplying new reservoirs, other for their installation and work on the power plant, and others for the treatment of contaminated soils and the control systems (Réf. 02_14520468_Ad2_Devis_2128-40091-001-01-A-HQ-L, p.9, 07_Devis technique_PDB_Foreurs_2014).

Furthermore, other temporary options, like the rental of the diesel storage truck, do not seem to have been considered in the benefits of the lower cost. These solutions should have been discussed with CREE but it seems that Hydro-Quebec was only discussing this project with Inuit. It would only be fair for both communities to be consulted when these solutions affects the long-term energy needs of both communities.

3. Question : Are you able to identify the main distinction(s) between a request for proposal from government decrees and one including the project development of renewable energy supply in an off-grid network without a request for proposal procedure.

3. Answer: Yes, this procedure is geared more towards the integrated network. In our case, we are in an off-grid. We therefore asked the government to intervene in order to force a discussion process with Hydro Quebec. As a result, on July 14, 2011, our community chief wrote to Premier Jean Charest and asked him for a pilot project to be put in place to construct a green energy plant. Following this request, a confidentiality agreement was signed between Hydro Quebec, the Grand Council of the Crees (Eeyou Istchee), the community of Whapmagoostui and potential partners to study the possibility of a green energy project. We

cannot comment on the rest of the process in front of the Board because of this confidentiality agreement.. I would only add that some issues treated in one way for on-grid projects need to be addressed in another way in the off-grid contracts. For example, if the off-taker doesn't commit to a take or pay clause, it makes an off-grid project very difficult to be bankable, especially if this one must commit to contribute to the guaranteed power request.

4. Question : As President of a business specializing in the development of renewable resource energy projects, can you identify the main difficulties encountered during a renewable energy supply project development process in off-grid networks without a request for proposal process?

4. Answer : Yes, overall, it is very difficult, maybe even impossible, for the communities to prepare a technical file without having access to funding for the project development. Presently, the Board authorizes the funding of Hydro Quebec diesel projects through its tariffs and approbation of the “plan d’approvisionnement”. We think that a part of this funding should go directly to communities that want to take over green energy production. If we look at other experiences, for example in Alaska, an annual request for proposal asks all of the communities to present proposals to receive a part of the development budget. Alaska is in its 7th request for proposal and as a result many wind power, biomass and solar projects are now successfully working, resulting in more than 51 million dollars worth of diesel savings⁵.

It is important to note that the main success factor of renewable energy projects in off-grid networks is the appropriation of the project by the community. It would therefore be important that the Board recommends to Hydro Quebec to implement a request for proposals process to all of the communities from the investment budgets that the Board makes available through the approbation of the “plan d’approvisionnement”. This would satisfy the objective to have the best cost for all users and to have a process whereby the communities would have enough funds to appropriate the project. We understand that the audiences surrounding the “plan d’approvisionnement” aim to plan the supply needs for the next 10 years and that therefore it is desirable that the Board orients the investment process to meet its needs throughout the length of the Plan.

I read the evidence of Hydro Quebec with regards to this, and I learned that starting in Winter 2016-2017 there would be 6 networks that are power deficient⁶. The needs identified by the Supply Plan should be the subject of a request for proposal aimed at the concerned communities.

⁵ http://www.akenergyauthority.org/re-fund-7/4_Program_update/REFPerformance_2014_0426_Final.pdf

⁶ R-3864-2014, B-009, Tableau 4, Marges (Déficits) de puissance pas réseau, page 15

5. Question : Can you give examples of the difficulties encountered and the timeframes for the start of construction for the projects that you have participated in?

5. Answer : The negotiation process is divided in two, with one technical part that aims to demonstrate different aspects like the impact of the network stability, and one more commercial part. We cannot give more details due to the confidentiality agreement with Hydro Quebec. But this process is complex because it involves also the COMEV for environmental studies, and other authorities like for example NAVCAN for authorisations on wind tower a part of the consultations process within our communities.

The main obstacle is the difficulty in obtaining funds to develop a project, and this without any guarantee that at the end of the process there will be an electricity buying agreement (or PPA) from Hydro Quebec. In our case we have succeeded, thanks to collaboration with Hydro Quebec and private partners, to secure a grant for the realization of preliminary studies. Unfortunately, for the time being, the absence of a PPA has prohibited us from securing more grants. However, we would like to emphasize the support and collaboration of the working group of Hydro Quebec / Réseaux Autonomes in this process and we hope that in the short-term a PPA could be submitted to the Energy Board for approval.

6. Question : In your opinion, would there be advantages or inconveniences with putting in place a mechanism or an administrative process supervised by the Board's tribunal administration in order to identify the supply needs for each off-grid network separately, as well as the opportunities and means to produce electricity other than with diesel?

6. Answer : Yes, there would be a clear advantage for all of the concerned actors, the financing organisations and the potential partners. In clarifying the process and the needs, we would remove unnecessary spending and would orient the process towards a final result that it optimal and more efficient. The financing would then be easier to obtain. Furthermore, the process would be shorter which would therefore increase the credibility of project developers in the eyes of business partners.

7. Question : As a representative of a business specializing in the development of renewable resource energy projects, could you explain what are the elements for discussion that should be integrated into a more structured administrative process and explain why based on the following subjects:

7.1 Parameters related to costs (opportunity costs) :

7.1 Answer : In order to be able to develop a project in renewable resource energy production, you need to be able to clearly determine the methodology of production costs and avoided costs, etc. For the moment, the calculations can be done in many ways with or without discounting, with or without inflation index and with rates that are different. The calculation method does not always seem the same, and that is from where it is difficult to find a level playing field in order

to compare the costs. I will reiterate the fact that we feel that the inflation rate that Hydro Quebec uses for the diesel seems very low based on the historic rates.

7.2 Issues related to the reliability of the type of resource chosen :

7.2 Answer : This point is very important to us, because diesel is the chosen resource for the time being and it represents a significant risk to increase costs (due to the volatility of the price of diesel), as well as a net opportunity loss of development. We think that wind power, as well as other resources like biomass and solar, should be considered. In Alaska, many biomass projects are now in operation and it seems like this energy source should be considered. Biomass assures a fixed power supply and seems to us like a complimentary source of energy for off-grid networks. We hope that projects like Opticivan will quickly be able to demonstrate their economic viability. The Crees, via their PetroNor subsidiary, that currently distributes diesel in the Great North, have created BiomassNor in order to distribute densified biomass.

7.3 The capacity of networks to provide energy to communities

7.3 Answer : Supplying energy is an important issue for the communities in the North of Quebec, because it will permit the development of these communities. Without energy available, no new projects can be created. In Whapmagoostui, for example, the arena couldn't be connected to Hydro Quebec's network because it didn't have the necessary capacity. Therefore, in order to relieve the case-by-case analysis problems, the Board should require that Hydro Quebec files (1) during the deposit of this Supply Plan and (2) during each request for approval to new production investments, a letter from each off-grid network community that outlines the potential projects for the next 10 years. In Whapmagoostui/Kuujjuarapik's case, the network upgrade to a 25 kV distribution seems essential, because we do not see in all the numbers presented by Hydro Quebec all the future needs, nor those announced by the Quebec government in the Plan Nord.

8. Question : Could you please explain what are the issues relating to the upgrading process of a renewable resource in an off-grid network, as well as for the local community of these networks?

8. Answer : The issues for us are :

- Protection of the traditional land and wildlife
- Using sustainable resources for energy production
- The economical feasibility
- The reliability technique
- The optimisation of green renewable energies
- Local development (jobs and resources)
- The associated projects and other associated opportunities

9. Question : Do you have other elements or recommendations that you would like to bring forth with regards to the use of renewable energies in off-grid networks?

9. Answer : Green and renewable technologies are now available and need to be used in order to minimize the risk of air pollution and ecological catastrophes related to the refueling process such as the fuel pipes connecting the boat to the shore that float on the sea surface. Furthermore, the money spent on fuel could be used for the development of green and renewable technologies at the same, or sometimes smaller, cost. Not even taking into account that these same green energies open the door to other opportunities like collective heating and heating of agricultural greenhouses, where the residual heat from energy production from biomass could be used to make high quality local products for the local communities.

As well, the use of smart meters could be put to use in demand-management applications, for example to heat living spaces when there is extra wind energy and therefore reduce the petrol needed to heat houses, etc.

II. THE USE OF DIESEL IN OFF-GRID NETWORKS

10. Question : As the former Grand Chief of the Cree Nation, and therefore having knowledge of the needs of the Cree populations living on an off-grid network, could you explain the elements for discussion that should be integrated into a more structured administrative process and explain why with regards to the following points:

10.1 Choosing resources:

10.1 Answer : In my opinion, the development and planning of the resource choice should be made in cooperation with the communities. The needs planning should also be improved, since for the moment Whapmagoostui cannot power its whole arena via the Hydro Quebec network and has had to spend a substantial amount of money for a 500 kW generator (20% of the capacity of the Hydro Quebec power plant) without being compensated for this capital investment. We are worried that other development projects, such as those related to Plan Nord and to new infrastructures, like the pumping station, do not correspond to the forecasts announced in this file by Hydro Quebec.

10.2 The social acceptability of the choice:

10.2 Answer : In my opinion it is important to explain the green and renewable alternatives available to the communities and to have the communities themselves approve the choices made with regard to the supply. It is important to realize that it is possible to create employment by choosing green energies, in comparison to diesel exploitation, and that the native appropriation of a project of this nature favours the economic development and acquiring knowledge for the targeted native community. In my opinion,

those are the two elements that will determine the social acceptability of the project.

10.3 A fair project base evaluation:

10.3 Answer : Hydro-Quebec should consider a fair base of comparison between the actual diesel solution and the renewables solutions. In our case, Hydro-Quebec has been castigating the Whapmagoostui renewable project solution by using only 2% as the annual projected increase rate in diesel as the comparison criterion when the actual historical annual increase rate is over 7% (since the 2004 “plan d’approvisionnement”). Whapmagoostui asked in 2011 the Premier Charest to adopt renewable energy solution for the development of the North. Since that time, we have been discussing with Hydro-Quebec to find out they must respect some criterion established by the Energy board. We would like the Energy board to instruct to Hydro-Quebec to use at least the historical diesel inflation rate in the evaluation and not the 2% inflation rate.

11. Question On the impact of using diesel on the environment and contamination? (Based on your knowledge, please give examples of the impact on the environment).

11. Answer : The soil contamination following petrol spills risks to contaminate drinking water sources. That has already happened in Whapmagoostui and Kuujjuarapik where Hydro Quebec needed to integrate in the request for proposals substantial sums related to this problem (réf. : [07_Devis technique PDB Foreurs 2014](#) [PDF - 1354 Ko]⁷). Also, the risk of a spill and ecological catastrophes is always present due to the refueling process as the fuel pipes connecting the boat to the shore float on the sea surface. The pipes, as well as where they are attached, have a high risk of spill. These risks do not apply when wind or water is the energy source. The less we use petroleum product, the minimum is the environment risk; even if it is not completely stopped, the less we use the less risk can occur.

12. Question Finally, concerning the reliability of electricity supply, are you able to confirm that the supply produced from diesel is very reliable?

12. Answer : Yes, it is generally reliable but there are often interruptions. We think that adding renewable energy would increase the reliability, especially if batteries were installed on the network.

⁷ Site Web Hydro-Québec,
http://www.hydroquebec.com/soumissionnez/documents_consultation/doc_14520468.html?prix1=NaN&prix2=NaN&prix3=50&no_soumission=14520468.07_Devis technique PDB Foreurs 2014

III. USING A COMBINED WIND-DIESEL SYSTEM IN OFF-GRID NETWORKS

13. Question : Are you able to explain the reasons why the Distributor seems to have difficulty moving ahead with a combined wind-diesel system?

13. Answer : Lack of resources at Hydro Quebec and probably the easy option to continue with the current technology. It is easier to modify existing power plant drawings than to study new concepts and if necessary develop new approaches. Furthermore, the process originating from the communities is not structured and difficult to fund.

14. Question : What are your recommendations to accelerate the implementation process of combined wind-diesel systems in off-grid networks?

14. Answer :

- Open the participation of communities to evaluate the future needs and to evaluate the type of energy wanted and provide the required information to the communities or designated contractors / partners.
- One of the possible options could be to have a request for proposal system like in Alaska.
- Another one would be to facilitate the signature of a conditional commitment letters from Hydro-Quebec for a PPA. This would be easier to finance the economic and technical feasibility studies and securing the financing for the construction and operation financing of these new energies projects.