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1 Macro-environmental Comparison of Resource Options

Keyask 695 MW	Conawapa 1485 MW	Transmission	Gas SCGT:216 MW	Wind 100 MW	DSM
Air					
Greenhouse gases (2.5 tonnes / GW.h)	Greenhouse gases 1.4 tonnes / GW.h	Greenhouse gases (Not calculated; minor or negligible)	Greenhouse gases (SCGT: 764 tonnes / GW.h) (CCGT: 509 tonnes / MW.h)	Greenhouse gases (13 tonnes / MW.h)	Greenhouse gases (Reduction of 1 million tonnes by 2027/28)
Land					
125 km ² / 695 M (0.2.75 km ² / MW)	10 - 20 km ² / 1485 MW (0.005 - 0.01 km ² / MW)	M-M Project: - In Manitoba: Early estimate of 12 - 15 km ² - In Minnesota: Early estimate of 24 km ² N-S Upgrade Project: Under study	For generating station: 0.03 km ² / 320 MW (negligible on a per MW basis) Including upstream gas production: 650 – 1070 m ² / GW.h	Footprint: 0.15 – 0.30 km ² Total area: 15 – 46 km ² Footprint: 21 m ² / GW.h Total area: 6,600 m ² / GW.h	
Water					
Water quality	Water quality		Water quality and Consumption (Related to exploration and production of natural gas)		Consumption (Consumer savings of 10 billion litres by 2027/28)

Tab 2

100 MW wind farm. Calculations for land use intensity reflect this same broad range, from 21 m²/GWh for a small footprint to 6,600 m²/GWh for the broadly affected area.

Air

The Intergovernmental Panel on Climate Change has determined climate warming is unequivocal, human influence on the climate system is clear, and continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system. It further states that limiting climate change will require substantial and sustained reductions of greenhouse gas emissions.¹ Greenhouse emissions are measured in carbon dioxide equivalents (CO_{2e}). The following is based on data from the Pembina Institute's life-cycle greenhouse assessment (Appendix 7.3 of the NFAT submission).

- **Keeyask:** 2.5 tonnes of CO_{2e} per GWh
- **Conawapa:** 1.4 tonnes of CO_{2e} per GWh
- **Manitoba-Minnesota and Northern Upgrade Transmission Projects:** Minor based on preliminary order of magnitude estimate
- **Gas:** 509 tonnes of CO_{2e} per GWh for CCGT; 764 tonnes of CO_{2e} per GWh for SCGT
- **Wind:** 13 tonnes of CO_{2e} per GWh

As well, Manitoba Hydro has estimated its electric Power Smart programs will reduce greenhouse gas emissions by over 1 million tonnes between 2013/14 and 2027/28.

Water

Water quality is fundamental to the health of aquatic life. Federal and provincial guidelines and objectives and guidelines assist in defining water quality conditions. Water consumption can also be a concern, especially when natural gas is produced using a technique known as hydraulic fracturing ('fracking').

¹ IPCC WGI AR5 (2013). Summary for Policymakers: Twelfth Session of Working Group 1.

Tab 3

3616

1 MR. ED WOJCZYNSKI: Okay.

2 DR. HUGH GRANT: I'll be very brief.

3 Could you just explain -- I was quite surprised that
4 the greenhouse gas effects of it -- of hydro is
5 significantly less than wind. When you talk about life
6 cycle, does that mean from construction through to
7 destruction, and --

8 MR. ED WOJCZYNSKI: Yeah, life cycle is
9 over the whole life of each facility, and then we
10 essentially divide it or levelize it by the amount of
11 energy over its life, so that accounts for the
12 different periods of life for the different
13 technologies, and it includes, amongst other things,
14 let's talk about the hydro project to start with. The
15 amount of concrete and cement, it's quite -- cement --
16 creating cement creates greenhouse gases. That's
17 included.

18 The -- the diesel trucks used, for
19 example, and the heavy equipment that's used. Any land
20 that you've cleared for the project, whether it's the
21 road or along the reservoir, so the fact you've taken
22 trees out of the carbon cycle, that's included, and the
23 -- there's a relatively small component which I'm going
24 to mention, but is often being brought up in -- by
25 people, and that is the emissions from the reservoirs.

3617

1 Canadian reservoirs -- actually I'll say North American
2 reservoirs produce very, very, very few emissions.

3 What has reached some -- given some --
4 and that is included in here, but it's very small. The
5 reason that issue has been given some prominence is
6 some -- there are some dams and reservoirs in the
7 equatorial regions that have low output, vast amounts
8 of flooding, and they have a lot of material, and --
9 and those -- some of those have had relatively high
10 amounts, but these projects have very, very few
11 emissions, like, from the reservoirs themselves.

12 From the wind, for instance, it's --
13 again, it's the steel. There's a lot of steel. That -
14 - there's greenhouse gases for that. There's also some
15 greenery taken out of action, as well, and there's even
16 -- it's a bit surprising, and people aren't normally
17 aware, there's a good chunk of concrete underneath each
18 wind turbine to keep it stable, so all of those are
19 accounted for.

20 DR. HUGH GRANT: Because it comes a --
21 wind is five (5) times more in this calculation. Is
22 that in ri --

23 MR. ED WOJCZYNSKI: Yes, and these
24 numbers were not calculated by us, but by the Pembina
25 Institute, and -- and they -- they -- one (1) of their

3618

1 expertise is doing this, and I think there was -- some
2 people have -- may have -- some people may -- may view
3 us as having gone to the Pembina Institute and gone to
4 somebody who has a bias of some kind.

5 I can guarantee the Pembina Institute,
6 which is environmentally oriented, has no bias against
7 wind, and they double check their numbers.

8 THE CHAIRPERSON: Okay. The panel has
9 exhausted its questions for the time being. Given that
10 it's lunch now I propose that we take a half hour
11 lunch. I just want to put everybody on notice that the
12 panel is prepared to sit beyond 4:30. We want to make
13 sure that we address all of the -- all of the witnesses
14 -- all the Intervenors have an opportunity to question
15 the witnesses and we're prepared to sit beyond 4:30 to
16 make sure that happens today.

17 So for those of you who have childcare
18 issues, you better make other arrangements, because
19 we're going to sit until we complete the schedule.
20 Thank you.

21

22 --- Upon recessing at 12:42 p.m.

23 --- Upon resuming at 1:18 p.m.

24

25 THE CHAIRPERSON: Good afternoon. I

Tab 4

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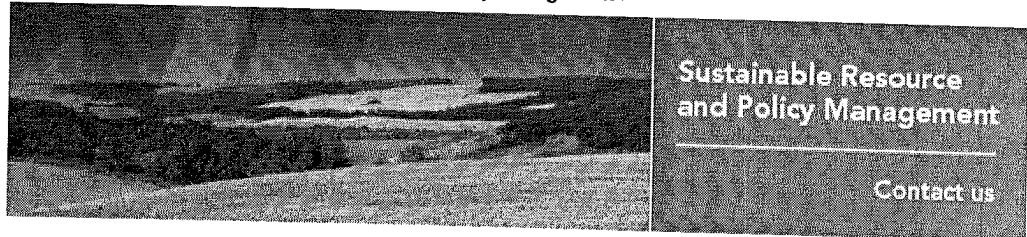
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REPORT OF THE CONSULTATION ON SUSTAINABLE DEVELOPMENT IMPLEMENTATION (COSDI)

June , 1999

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GLOSSARY OF TERMS

- **Aboriginal Peoples** - The definition of "Aboriginal peoples" being used in this document is the legal definition contained in the Constitution of Canada. This includes Indians (on and off reserve Status Indians, First Nations, non-Status Indians, Treaty and non-Treaty Indians), Metis and Inuit.
- **Assessment and Review of Effects** – an assessment and review of all sustainability factors such as environmental, economic, social, cultural and human health. The terms "assessment and review of effects", "assessment and review process", "assessment process", "assessment and review", and effects assessment will be used synonymously.
- **Effect** - is a neutral term including positive and negative effects of a plan or project.
- **Guidelines** - refer to instructions provided to the proponent for the information requirements and the conduct of an effects assessment.

Ministerial Discretion to Designate a Development

Q) That steps be taken to address the current legal difficulties in interpretation and application of section 16 of *The Environment Act* so that the Minister has clear authority to determine whether any development is subject to effects assessment

End Grandfathering Provisions

R) Developments that pre-existed *The Environment Act* and remain unlicensed or are subject to a Clean Environment Commission Order, be phased into the licensing requirements described above.

5. Public Participation

There is inconsistent opportunity for public involvement in the planning and decision-making processes. Sometimes key decisions (e.g. significant resource allocation) are made with the public brought in later, in an environmental assessment process, that addresses primarily mitigation measures. Different decision-making processes bring differing levels of public involvement, and different levels and ease of access to information.

These recommendations do not imply that there is no effective consultation in Manitoba today, but, rather, call for consistent and timely effective public consultation in planning, significant resource allocation and development assessment and review processes. Some of the recommendations are current practice in some processes, but are not equally applied across government or across all the relevant decision-making processes.

Recommendations

It is recommended that:

Participation in Planning and Assessment and Review

A) There be opportunity for effective/meaningful public participation and consultation processes at all levels of planning, significant resource allocation and effects assessment and review to include:

- a. Opportunity for input into information requirements and the establishment of guidelines for the proponent;
- b. Opportunity for the public to meet with the proponent, proponent's experts and the Technical Advisory Committee (TAC – interdepartmental committee established under *The Environment Act* to provide expert advice to the director with regard to proposed developments);
- c. Opportunity for the public to meet with government and proponent experts;
- d. Early and effective notification, consistency in the manner of notice, and easy access to information;
- e. The development of protocols to define appropriate procedures that would reflect "effective", "meaningful" and "timely" consultation;
- f. Capacity-building mechanisms be developed to enable the meaningful public participation in sustainable development processes (including education and awareness, appropriate timelines for notification and responses, access to information, and possible funding approaches); and
- g. Local knowledge, special naturalized, and/or community-based knowledge be recognized and considered in sustainable development processes.

Early Participation

B) Manitoba additionally encourage the proponent to provide for meaningful public input before the formal development review process is initiated or the significant resource allocation decided upon, including outreach to those not historically reached or involved by traditional methods, including Aboriginal peoples.

Information/Notification

C) Government departments develop and provide to the public clear and "user friendly" guides to assist public participation in the planning and development review processes.

D) A review of current public notification procedures be undertaken to facilitate accessibility to information across Manitoba and to take advantage of emerging technologies.

E) In order to increase the ability of the public to participate in and influence decisions in the planning and development review processes, Manitoba:

- a. Include specific notification schedules for decision-making agencies that will provide consistent and early public notices respecting planning, significant resource

- allocation and development review activities;
- b. Require proponents to provide reasonable opportunities and times for the public and groups to be heard and to know they have been heard;
- c. Specify provision of adequate time for the public to review and respond to plans and proposals;
- d. Provide documentation of criteria and rationales used by decision-makers (including appeal bodies) to the public along with the decision;
- e. Ensure timely and convenient access by the public to copies of documents used in planning, significant resource allocations and development review processes, as well as to copies of licenses, appeal decisions or other approvals from a regulatory authority; and
- f. Make available to the public consistent and dependable follow-up reporting of monitoring, enforcement and subsequent actions.

Public Input in Land Use, Resource Decisions

F) To ensure public input is a part of decision-making during the planning process, Manitoba:

- a. Obtain public input in advance of irrevocable land use or significant resource allocation decisions by publicly establishing and consistently relying upon criteria for identifying the circumstances where such public input will be required; and
- b. Seek such public input in establishing all public policies, legislation and strategies affecting air, land and water, to assist in considerations of ecological, socio-economic, human health and cultural/heritage values.

Assessment Independent from Design

G) Require proponents, with respect to major developments, to demonstrate that the design of the project has been independent from the assessment of the impacts of the project.

Manitoba Environmental Council

H) The Government review the mandate for the Manitoba Environmental Council as provided for in *The Environment Act*.

Encourage Consultation

I) Manitoba actively encourage proponents, including government, and require evidence from them, that broad, meaningful consultation has occurred and serious effort to resolve concerns has been completed before developments proceed further through the decision-making process.

Public Hearings

J) Manitoba develop clear and well-understood criteria for the determination of the need for public hearings, and make subsequent hearing decisions based on those criteria. Public explanations with respect to the decisions would be based on the criteria.

K) Hearing bodies be provided the opportunities, staff and fiscal resources to undertake independent fact-finding helpful to imminent or expected decision-making processes.

L) To ensure that hearing panels can function effectively and efficiently:

- a. Government issue clear instructions to hearing bodies on the issues to be addressed and/or the products required of the hearing. Guidelines or a process akin to guidelines should be the primary basis for generating instructions to hearing bodies on issues to be addressed or products required of the hearing process. Generally, hearing bodies should focus on issues of significance, including issues which remain controversial with the public, areas of residual technical uncertainty, or matters which may not have been sufficiently addressed.
- b. Hearing bodies undertake to have an understanding of technical matters prior to and during hearings.
- c. Information, which a proponent is required to provide or otherwise intends to rely on at a hearing, be made available as soon as possible to the public and to the hearing body within a specified time prior to the hearing. Failure by a proponent to provide information as required in advance of the hearing will be cause for the panel to postpone the hearing. Interested parties wishing to make representations should also be required to file materials within a certain time.
- d. Manitoba review the composition of the pool of panelists to ensure that:
 - i. panelists are available to participate when required;
 - ii. the pool of panelists displays a broad array of technical and non-technical knowledge, to be capable of addressing all sustainable development components;

Tab 5

From: Connie Gamble

Sent: Thursday, July 19, 2012 3:20 PM

To: <mailto:ron@ccpaws.mb.org> ; <mailto:info@cpaws.mb.org> ; 'MB Eco Network' ; p.miller@mymts.net ; 'Susan McLarty Nature MB' ; 'Byron Williams CAC' ; 'Suzanne CAC (for Byron)' ; 'Gaile Whelan - MB Wildlands'

Subject: NFAT - July 31st meeting

The following meeting notice is sent to you based on a recent phone call and your interest in Manitoba Hydro's future development plan and

the Needs for and Alternative To (NFAT) process. We would be pleased to meet with you to discuss our current thinking and hear from you.

MEETING OBJECTIVES:

* to brainstorm information needs of greatest value to this group prior to the NFAT public review & obtain feedback on future development plans (Keeyask, Conawapa with export sales and US interconnections)

PREWORK: To provide a more efficient process, please provide a description of information needs and potential presentation focus to Connie no later than noon July 27th (*also note any special dietary requirements*)

suggested topics for your consideration, but not limited to:
load forecast, demand side management, resource planning process,
export markets/export sales and the value/risks of hydro in the export market

meeting location: 360 Portage

please report to the security desk and staff will escort you to our meeting room

meeting time: 4:45-6:15 pm on Tuesday July 31, 2012

coffee/soft drinks and sandwiches will be available

AGENDA 5pm

1. WELCOME & INTRODUCTIONS
2. MH PERSPECTIVE TO DATE re: NFAT
3. DISCUSSION OF POTENTIAL PRESENTATIONS
4. NEXT STEPS

contact: Connie Gamble

Manitoba Hydro NFAT lead

cgamble@hydro.mb.ca

ph (204) 360 3962

Please RSVP, note preliminary information needs regarding clarity of NFAT and provide any dietary restrictions to cgamble@hydro.mb.ca.

See you on the 31st!

Tab 6

Needs For and Alternatives To (NFAT):

Winnipeg ENGOS Meeting

Meeting Minutes

Date of Meeting: **Tuesday July 31, 2012; 5:00pm-7:00pm**

Location: **3-301 Meeting Room, Winnipeg 360 Portage Avenue**

In Attendance from Manitoba Hydro:	Connie Gamble	Manitoba Hydro
	Ed Wojczynski	Manitoba Hydro
	William Henderson	Manitoba Hydro
	Kimberley Cooper	Manitoba Hydro
	Tara Gingras	Manitoba Hydro

In Attendance from ENGOS:	Gaile Whelan- Enns	Manitoba Wildlands
	Peter Miller	Green Action Center
	Byron Williams	Public Interest Law Center
	Curt Hull	Climate Change Connection
	Josh Brandon	Green Action Center
	Daniel Friesen	DNF Consulting
	Megan Menzies	Student-Public Interest Law Center
	Gloria Desorcy	Public Interest Law Center
	Bruce Duggan	Providence University College

Not able to Attend:	CPAWS
	Nature Manitoba

PURPOSE OF MEETING

As part of the planning for the Needs For and Alternatives To (NFAT) for the future development plans, the meeting was scheduled to:

- Provide interested environmental parties with the Manitoba Hydro's perspective on future development plans
- Allow interested parties to participate in a discussion and provide feedback on Manitoba Hydro perspectives and current thinking for future NFAT development
- Assist Manitoba Hydro in defining topics for presentations of greatest value to ENGOS for background information prior to the public NFAT hearings.

The meeting was the first in series of meetings to be held with the Environmental Non-Government Organizations (ENGOS) as part of the Needs for and Alternatives to process.

Ed Wojczynski, Division Manager Portfolio Projects Management Division; provided an introduction of Manitoba Hydro's perspective and a tentative schedule outlining the different key dates for the NFAT. The schedule is subject to the governments ruling on the Terms of Reference including Scope.

Next Steps

The group requested a monthly informational meeting focused on topics related to the Needs for and Alternatives to. The first meeting is to be scheduled sometime after the second week in September. (5p.m-9p.m)

1st Meeting Topics- MH Mandate and Resource Planning Purpose

2nd Meeting Topics- Non Hydro and Non Fossil Alternatives

A brief description of Conawapa and Keeyask plants will be presented at the first ENGO meeting.

Manitoba Hydro requests that if any participant would like to invite their colleagues, contact information is to be forwarded to Connie Gamble for formal approval and invitation.

Tab 7

ELECTRIC RATES AND PROVISIONS

SCHEDULE RSC

RESIDENTIAL: CITY

Schedule RSC is for residential City customers, except those subject to Schedules REC and RLC.

Summer Billing Cycles (April - September)	Winter Billing Cycles (October - March)
ENERGY CHARGES:	
First 10 kWh per day at 5.06¢ per kWh	First 16 kWh per day at 5.06¢ per kWh
All additional kWh per day at 11.49¢ per kWh	All additional kWh per day at 11.49¢ per kWh
Base Service Charge: 16.07¢ per meter per day	

Section 21.49.030

- A. Schedule RSC is for residential city customers, except those subject to Schedules REC and RLC.
- B. Normal residential service shall be limited to single-phase.
- C. If Schedules RSC, RST and RSS are applied to transient occupancy in separately metered living units, billing shall be in the name of the owner on a continuous basis.
- D. Duplexes using a single meter prior to October 13, 1978 shall be considered as a single residence for the purpose of applying Schedules RSC, RST and RSS. For a new duplex or a larger service to an existing duplex, each residence shall be separately metered.
- E. All electrical service provided for domestic uses to a single residential account, including electrically heated swimming pools, shall have all consumption of electricity added together for billing on Schedules RSC, RST, RSS, RSH, and RSB.

ELECTRIC RATES AND PROVISIONS

SCHEDULE RES and RLS

RESIDENTIAL ELDERLY/DISABLED: SUBURBAN RESIDENTIAL LOW-INCOME: SUBURBAN

SCHEDULES RES/RLS are for qualified Residential Utility Discount Program suburban customers.

Summer Billing Cycles (April - September)	Winter Billing Cycles (October - March)
ENERGY CHARGES:	
First 10 kWh per day at 2.23¢ per kWh	First 16 kWh per day at 2.23¢ per kWh
All additional kWh per day at 4.31¢ per kWh	All additional kWh per day at 4.31¢ per kWh
Base Service Charge: 6.43¢ per meter per day	

Section 21.49.040

- A. Schedules RES and RLS are available for separately metered residential service provided to Suburban customers who show satisfactory proof that they have a City Light residential account and reside in the dwelling unit where the account is billed and that they:
 1. For Schedule RLS, receive Supplemental Security Income pursuant to 42 USC § 1381-1383; or
 2. For Schedules RLS and RES, reside in a household in which the annual income of all household members together does not exceed seventy (70) percent of the Washington State median income for the number of individuals in the household as computed annually by the State or the City.
- B. Applicants for Schedules REC, RLC, RET, RLT, RES, RLS, REH, RLH, REB and RLB shall verify the information required to certify their eligibility for residential rate assistance and shall provide such other data as is deemed appropriate upon forms and in the manner determined by the City's Human Services Department.
- C. Schedules REC, RLC, RET, RLT, RES, RLS, REH, RLH, REB and RLB and any other form of residential rate assistance established by the Department are not available to those otherwise eligible persons who own their dwelling unit and who use electric heat as defined in Seattle Municipal Code Section 21.52.210 (Ordinance 109675, Section 2) but who have not completed or who are not in the process of completing the energy conservation measures required for participation in the Comprehensive Residential Weatherization Program described in Seattle Municipal Code Section 21.52.260 (Ordinance 109675, Section 8). Customers who own their own dwelling unit and who use electric heat have one (1) year from the date of application for Schedules REC, RLC, RET, RLT, RES, RLS, REH, RLH, REB and RLB to complete the energy conservation measures. Eligibility for residential rate assistance may be continued by the Department, however, if the Department determines that the customer's failure to complete the required energy conservation measures is

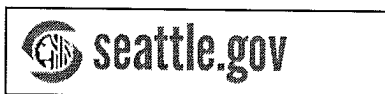
ELECTRIC RATES AND PROVISIONS

SCHEDULE RES and RLS

the fault of the City in failing to furnish or properly administer the Low-income Electric Program set forth in Seattle Municipal Code Section 21.52.250 (Ordinance 109675, Section 7).

- D. Schedules REC, RLC, RET, RLT, RES, RLS, REH, RLH, REB and RLB shall not apply to any subsidized unit operated by the Seattle Housing Authority, the Housing Authority of the County of King, or the Federal Government where utility allowances are provided.
- E. Normal residential service under Schedules REC, RLC, RET, RLT, RES, RLS, REH, RLH, REB and RLB shall be limited to single-phase.
- F. If Schedules REC, RLC, RET, RLT, RES, RLS, REH, RLH, REB and RLB are applied to transient occupancy in separately metered living units, billing shall be in the name of the owner on a continuous basis.
- G. Duplexes using a single meter prior to October 13, 1978 shall be considered as a single residence for the purpose of applying Schedules REC, RLC, RET, RLT, RES, RLS, REH, RLH, REB and RLB. For a new duplex or a larger service to an existing duplex, each residence shall be separately metered.
- H. All electric service provided for domestic uses to a single residential account, including electrically heated swimming pools, shall have all consumption of electricity added together for billing on Schedules REC, RLC, RET, RLT, RES, RLS, REH, RLH, REB and RLB.

Tab 8



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The **Seattle City Light Review Panel** was created March 22, 2010 through City Council Ordinance Number 123256 (<http://clerk.seattle.gov/~scripts/nph-brs.exe?s1=&s3=&s4=123256&s2=&s5=&Sect4=AND&I=20&Sect2=THESON&Sect3=PLURON&Sect5=CBORY&Sect6=HITOFF&d=ORDE&p=1&u=%2F%7Epublic%2Fcbory.htm&r=1&f=G>).

The Review Panel is the successor to the City Light Advisory Board/Committee (2003 - 2010) and the Rate Advisory Committee (2009), and combines the duties of both groups.

The nine panel members come from City Light's customer groups. Five members are nominated by the mayor and four members are nominated by the city council, serving staggered three-year terms. In 2010, the focus of the panel will be helping to develop a six year strategic plan for City Light.

[Click here to visit the Strategic Plan website \(http://seattle.gov/light/strategic-plan/\).](http://seattle.gov/light/strategic-plan/)

[Click here to visit the Rate Design website \(https://www.seattle.gov/light/rates/ratedesign.asp\).](https://www.seattle.gov/light/rates/ratedesign.asp)

Members include:

Tom Lienesch (Economist)
 Julia M. Ryan (Financial Analyst)
 Stan Price (Non-profit Energy Efficiency Advocate)
 Eric Thomas (Residential Representative)
 David Allen (Commercial Customer)
 Chris Roe (Industrial Customer)
 Sue Selman (Low-income Customer Representative)
 Eugene Wasserman (At-large Customer)
[Read the Member Biographies \(/citylightreviewpanel/memberbios\).](http://citylightreviewpanel/memberbios)

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If you have any comments, please email us at clrpquestions@seattle.gov (<mailto:clrpquestions@seattle.gov>).

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Member Bios

Tom Lienesch (Economist), *Senior Economist for the King County Wastewater Treatment Division*

During his 12 years as the senior economist for King County Wastewater Treatment Division, Tom has focused on rate setting, analyzing and creating alternative rate structures, financial policies and capital financing. Previously, he was the chief of the regional analysis branch at the Bureau of Economic Analysis in Washington, D.C. He holds a master's degree in economics from the Johns Hopkins University and a bachelor of arts in economics from the University of Washington.



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Julie Ryan (Financial Analyst), *Managing Partner, Aether Advisors LLC*, is an energy industry executive with expertise in risk management and strategic planning. Ms. Ryan provides advisory services to energy industry executives in the areas of risk management and hedging, strategic planning, energy supply, wholesale trading and marketing, M&A due diligence, and business integration planning. Ms. Ryan has over 27 years of direct experience in the energy industry. Prior to her providing energy consulting, she was Vice-President, Risk Management and Strategic Planning at Puget Sound Energy. Ms. Ryan also held officer positions at Merchant Energy Group of the Americas and Louis Dreyfus Energy Corp. Ms. Ryan is a volunteer member of the Seattle City Light Review Panel, which oversees its strategic planning process, financial activities and rate reviews. She has spoken at numerous industry conferences on the topics of hedging and risk management, and has been a guest instructor at Willamette University's Atkinson School of Management since 2006. Ms. Ryan graduated Cum Laude, and was elected to Phi Beta Kappa, from Smith College in Massachusetts.



If you have any comments, please email us at
clrpquestions@seattle.gov
(<mailto:clrpquestions@seattle.gov>).

Stan Price (Non-profit Energy Efficiency Advocate), *Executive Director for the Northwest Energy Efficiency Council*

Stan is a Partner at the Putnam Price Group, a Seattle-based consulting firm specializing in project management, communications, and education and training related to energy efficiency in buildings and industry. His firm provides executive management of the Northwest Energy Efficiency Council, a trade association of energy efficiency businesses in the Northwest. Stan has previously served as an Assistant Director of the Washington State Energy Office and held appointments at both Seattle University and Washington State University. He is a former Board member of the Northwest Energy Efficiency Alliance, past Chair of the Washington State Building Code Council, and was a member of the Convening Committee for the Energy Trust of Oregon. He currently is serving on the Northwest Energy Efficiency Taskforce.



Eric Thomas (Residential Customer Representative)

Eric became interested in public utility matters while constructing Seattle's first net-zero-energy home, which he shares with his wife. Seeking to improve metering and billing issues for solar panel owners in Seattle, he took part in a citizens' group that met with Seattle City Light representatives. He went on to found the Ballard Green Building Talks in conjunction with Sustainable Ballard and is a communications and messaging consultant for the Ballard RainWise outreach program, a partnership between Seattle Public Utilities and Sustainable Ballard. He is a communications advisor for the Northwest Eco Building Guild, Seattle Chapter, and helped organize the group's popular Green Home Tour. Eric is a senior copywriter for the New York City-based marketing agency IOOC, where he has contributed to award-winning campaigns for clients such as Walgreens. He has a master's degree in political science with a specialization in political writing from the City University of New York's Graduate School.



David Allen (Commercial Customer), Executive Vice President of Corporate Communications for McKinstry

David is responsible for brand development at McKinstry, a Seattle based construction, engineering and facility services firm. McKinstry, with sales in the \$200 million range, is the market leader in the Pacific Northwest for design/build mechanical construction and facility operation and management. Allen manages the company's marketing, business development and client service activities. David is widely respected for his contributions to creating McKinstry's positioning strategy that has resulted in the firm's national reputation as a leader in integrated, facility services delivery.



Chris Roe (Industrial Customer), Electricity Resource Manager for Boeing

Chris Roe's responsibilities include managing Boeing's electricity supply strategy across the country, leading Boeing's legislative and regulatory team for energy policy issues, and acting as the Boeing liaison to the Industrial Customers of Northwest Utilities (ICNU), a trade association representing large consumers of electricity in the NW. Chris also works on Boeing's conservation strategy to achieve corporate environmental goals, and prior to this role, managed the utilities and environmental conservation efforts for the Boeing manufacturing campus in Everett. Chris has a master's degree in engineering for sustainable development from the University of Cambridge, a bachelor's degree in mechanical engineering from the University of Washington, and lives in the Greenwood neighborhood in North Seattle.



Sue Selman (Low-income Customer Representative), Director of Property Management Bellwether Housing

Sue serves as Director of Property Management for Bellwether Housing, a nonprofit housing development and management organization serving low-income families, individuals and seniors in 1,800 units of affordable housing in 27 properties located throughout Seattle. Prior to joining Bellwether, Sue was Executive Director of Lutheran Alliance To Create Housing (LATCH), where she worked for more than 13 years. Sue holds a master's degree in social work and a bachelor of arts degree from the University of Washington. She is a Seattle native and has lived with her family in the Phinney Ridge neighborhood for 24 years.



Eugene Wasserman (At-large Customer)

Eugene is President of the North Seattle Industrial Association, which represents maritime and industrial businesses in Northwest Seattle. He previously chaired the Greater Seattle Chamber of Commerce's Utility Committee and has served on several City Light Rate Advisory and Strategic Plan Committees. He also served on a City Light Task Force that brought greater focus to commercial and industrial sector energy conservation. Wasserman also spent 22 years as Executive Director of the Neighborhood Business Council, an association of neighborhood chambers of commerce, merchant association, business and industrial associations.



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Tab 9

Integrated Resource Plan

Chapter 7

Consultation

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1 remains an uncertainty.

2 DR. PETER MILLER: Thank you for that.

3 One (1) other question. You are, no doubt, familiar
4 with Nicholas Stern, a British economist?

5 DR. DEAN MURPHY: Yes, the Stern
6 Report.

7 DR. PETER MILLER: Yes. And just this
8 brief quote:

9 "Climate change is a result of the
10 greatest market failure the world has
11 seen. The evidence on the
12 seriousness of the risks from
13 inaction or delayed action is now
14 overwhelming. The problem of climate
15 change involves a fundamental failure
16 of markets. Those who damage others
17 by emitting greenhouse gases
18 generally do not pay."

19 You're familiar with that?

20 DR. DEAN MURPHY: I am familiar with
21 that, yes.

22 DR. PETER MILLER: When you talk about
23 the economic dispatch of -- of generation or capital
24 investments in new generation, that economics that
25 plays in the -- in the marketplace does not include

2509

1 these externalities?

2 DR. DEAN MURPHY: Unless you've got a -
3 - and the appropriate carbon price, which is the way of
4 internalizing those externalities. In the -- in the
5 situation we are in now, where there is no carbon
6 price, it's true, there are externalities. There are
7 harm to others that are done by the burning of fossil
8 fuels that is not paid by the parties that are burning
9 those fossil fuels.

10 DR. PETER MILLER: And have you done
11 any research, or your firm, on what would be an
12 appropriate carbon price or -- or other way of
13 internalizing that cost?

14 DR. DEAN MURPHY: I have not directly
15 try -- myself tried to put a social value on carbon. I
16 am aware of a number of studies that -- that attempt to
17 do that, and they come up with widely varying numbers.

18 The -- the US administration recently --
19 as an example of one of those studies, the US
20 administration recently updated its social cost of
21 carbon, which the federal government uses in its own
22 planning -- the US federal government uses in its own
23 planning to determine the -- the costs of various
24 alternatives. So they impute a cost to carbon
25 emissions.