

ENSC 2012 DSM Plan Filing (NSUARB-E-ENSC-R-10)
ENSC Responses to Multeese Information Requests

NON-CONFIDENTIAL

1 **Request IR-1:**

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3 **With respect to page 1, lines 25-26, please provide a copy of ENSC's "comprehensive policy**
4 **framework".**

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6 Response IR-1:

7

8 Please refer to Attachment 1.

Efficiency Nova Scotia Corporation

Policy Framework

Efficiency Nova Scotia Corporation

Policy Framework

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EFFICIENCY NOVA SCOTIA CORPORATION

CODE OF BUSINESS CONDUCT AND ETHICS

Board Approved: April 12, 2010

Revised: September 22, 2010

1. OBJECTIVE

- Efficiency Nova Scotia Corporation is committed to maintaining a high standard of legal and ethical business conduct.
- The purpose of the Code of Business Conduct and Ethics (the "Code") is to provide general guidance on the standards of conduct expected of Directors and employees of Efficiency Nova Scotia Corporation.
- The conduct of Directors and employees must be legal, fair and appropriate to the circumstances and defensible if challenged.
- The Code is meant to support, but not replace, a Director or employee's use of good judgment regarding his or her conduct.
- All Directors and employees shall sign the acknowledgement form attached as Schedule A to this Code to acknowledge that they have received, read and understood the Code and that they will adhere to it.

2. DEFINITIONS

- For the purpose of the Code, the following definitions will apply:
 - ▶ **Director**
A member of Efficiency Nova Scotia Corporation's Board of Directors.
 - ▶ **Employee**
A person who has an employment contract or letter of employment with Efficiency Nova Scotia Corporation. Upon Board decision, an individual who does not have an employment contract or letter of employment may be considered an employee for the purpose of this code (i.e. contracted professional).
 - ▶ **Corporate Property**
Assets including furniture, equipment and hardware, as well as intellectual property such as research or information.

3. APPLICATION

- The Code applies to all Directors and employees.

4. RESPONSIBILITY

- It is the responsibility of Directors and employees to be familiar with the provisions of the Code. Every Director and employee has a duty to avoid conflicts of interest and is accountable for his/her conduct.
- It is the responsibility of the Chair of the Governance Committee and of the CEO (or a designate) to ensure that Directors and employees receive a copy of the Code, as well as adequate and appropriate information in relation to its provisions and revisions. It is further the responsibility of the Chair of the Governance Committee, or designate, to review the Code at least once per year to ensure it reflects the changing needs, realities, and responsibilities of Directors and employees.

5. COMPLIANCE WITH LAW

- Directors and employees will comply with all applicable Federal and Provincial laws and regulations. They will not commit or condone an illegal act or instruct another person to do so.
- The Chief Executive Officer (or a designate) will be responsible for establishing a process to respond to any questions regarding applicable law.

6. CONFLICT OF INTEREST

- Directors and employees have an obligation to act in the best interests of Efficiency Nova Scotia Corporation. Accordingly, they should not be involved in any activity that creates or gives the appearance of a conflict of interest between their personal interests and the interests of Efficiency Nova Scotia Corporation.
- Any interest or influence that would preclude a Director or employee from making a decision free from bias and only considering the interests of Efficiency Nova Scotia Corporation is a conflict of interest.
- Directors and employees will perform their duties impartially, responsibly, diligently, efficiently, and with integrity, and avoid situations that could interfere with their judgment, or the judgment of others, in making decisions in Efficiency Nova Scotia Corporation's best interest.
- In the case of a Director, disclosure of any potential conflict of interest will be made to the Chairman of the Board; in the case of the CEO, disclosure of a potential conflict of interest will be made to the Chair who will take the matter to the Board of Directors; and in the case of an employee, disclosure of a potential conflict of interest will be made to the CEO (or a designate).
- The disclosure must be complete and must be sufficient for the Board (in the case of a Director or the CEO) or CEO (in the case of an employee) to reach a determination as to whether a conflict of interest exists and to determine the appropriate course of action.
- Where a conflict of interest exists and full disclosure has been made as required, the impacted Director or employee in a conflict of interest shall withdraw from the meeting during the discussion or voting of any motion relating thereto. If the individual does not voluntarily withdraw they will be asked to do so by the Chair. Such individual may be asked by the Chair to remain in the meeting during the discussion prior to departure in advance of the vote.
- Directors and employees are expected to not participate in matters involving their conflict and are expected to not influence the outcome of any decision to be taken in any way.

7. OUTSIDE INTERESTS

- Involvement in outside business, political or personal interests and activities by Directors and employees is permitted unless such interest or other activity:
 - ▶ causes or may result in a conflict of interest; or
 - ▶ is performed in such a way as to appear to be an official act, or to represent Efficiency Nova Scotia Corporation's opinion of policy; or
 - ▶ unduly interferes with regular duties, through telephone calls, Internet use or otherwise; or
 - ▶ involves the use of Efficiency Nova Scotia Corporation's premises or Corporate Property, unless such use is otherwise authorized.
- Directors and employees will declare their outside activities as part of their annual sign-off and arrange them in such a manner as to avoid any conflicts of interest or other breaches to the provisions of the Code.
- No Director or employee will hold a material private interest, directly or indirectly, or hold or accept a position as a Director or employee, in an entity where by virtue of his or her position at Efficiency Nova Scotia Corporation, the Director or employee could in any way benefit the entity by influencing the decisions of Efficiency Nova Scotia Corporation.

8. CONFIDENTIAL INFORMATION

- Directors and employees will maintain the confidentiality of all confidential information and records of Efficiency Nova Scotia Corporation at all times, and must not make use of

such information or records except in the course of performance of their duties or should the information or records become a matter of general public knowledge.

- Directors and employees will not use such confidential information to further any private interests.
- Directors and employees shall:
 - ▶ not discuss confidential information with or in the presence of any unauthorized persons, including family members and friends;
 - ▶ use confidential information only for our legitimate business purposes and not for personal gain; and
 - ▶ not disclose confidential information to third parties.
- Directors and employees using Efficiency Nova Scotia Corporation's computer systems, including e-mail, will be expected to comply with any internal policies and procedures that guide the storage, use and transmission of electronic information.
- An exception to these policies would be granted when the disclosure of such information is required to comply with legislation or legal authority.

9. OUTSIDE EMPLOYMENT

- Employees are expected to devote their time and efforts to Efficiency Nova Scotia Corporation during regular hours of work.
- If an employee holds a job(s) outside of Efficiency Nova Scotia Corporation using their own resources and in a manner not adversely affecting their performance or objectivity for Efficiency Nova Scotia Corporation, such employment must:
 - ▶ be outside regular work hours;
 - ▶ not cause or be likely to result in a conflict of interest;
 - ▶ not be performed in such a way as to appear to be an official act, or to represent Efficiency Nova Scotia Corporation's opinion or policy;
 - ▶ not unduly interfere through telephone calls, or otherwise, with regular duties; and
 - ▶ not involve the use of Efficiency Nova Scotia Corporation premises, equipment or supplies, unless such use is otherwise authorized by the CEO or designate.

10. FEES, ENTERTAINMENT, GIFTS AND BENEFITS

- Directors and employees shall not solicit or accept directly or indirectly a fee, entertainment, gift or benefit from a person or an organization who has dealings with Efficiency Nova Scotia Corporation, unless in the normal exchanges common to business relationships. The following criteria should be used:
 - ▶ the benefit is of a nominal value;
 - ▶ the exchange does not create, or lead to, an expectation of an obligation such as preferential treatment; and
 - ▶ the exchange occurs infrequently (i.e. once or twice per year).
- Inappropriate gifts should be returned to the giver, along with an explanation of the Code requirements.

11. ENVIRONMENT AND SAFETY

- Every Director and employee has a role in ensuring Efficiency Nova Scotia Corporation's operations comply with applicable legislation and standards relating to environment and safety, as well as a personal responsibility to take all prudent precautions in every activity he or she performs.

12. USE OF CORPORATE PROPERTY

- Directors and employees will not benefit from, use, or permit the use of Corporate Property for any purpose other than in the course of performance of official duties and

functions, although use of such assets for minimal personal use will be tolerated as long as it is immaterial, insignificant and does not interfere with duties and functions.

- Directors and employees will ensure that Corporate Property assigned to them is maintained in good condition and be able to account for such property at all times.

13. PERSONAL CONDUCT

- A high level of ethical conduct appropriate to the circumstances will be expected of all Directors and employees.
- Directors and employees will:
 - ▶ conduct themselves efficiently, impartially, and with integrity in the fulfillment of their roles;
 - ▶ exercise diligence, care, prudence and common sense and remain informed of the policies, business and affairs of Efficiency Nova Scotia Corporation and other regulatory requirements by which Efficiency Nova Scotia Corporation is governed;
 - ▶ deal with fellow Directors and employees openly, honestly and with respect and dignity and will make available to and share with them all information as may be relevant and properly disclosed to ensure the proper conduct and sound operation of Efficiency Nova Scotia Corporation; and
 - ▶ exercise diligence in ensuring that the actions and conduct of the business and affairs of Efficiency Nova Scotia Corporation are carried out in accordance with the policies and mandate of Efficiency Nova Scotia Corporation and this Code.
- In the course of performance of official duties and functions involving the public, Directors and employees will deal with all members of the public fairly and reasonably.
- Directors and employees will act in a manner that will bear the closest public scrutiny, an obligation that is not fully discharged by simply acting within the law.
- Directors and employees will promote a workplace that is free from discrimination or harassment based on race, color, religion, sex, age, national origin.
- The personal conduct of Directors and employees within and outside of the workplace will not affect:
 - ▶ their ability to perform official duties;
 - ▶ the ability of other Directors or employees to perform their duties; or
 - ▶ public confidence in Efficiency Nova Scotia Corporation.

14. POST-EMPLOYMENT CONDUCT

- Directors and employees who leave Efficiency Nova Scotia Corporation will be expected to refrain from using proprietary information or knowledge obtained during their term with Efficiency Nova Scotia Corporation.
- Confidentiality of information and records will continue in perpetuity beyond their appointment or employment.

15. ENFORCEMENT AND PENALTY

Reporting of Any Illegal or Unethical Behaviour

- Directors and employees are encouraged to submit, in person or in writing, any known or suspected violations of any laws, governmental regulations or this Code, to the Chair of the Governance Committee as soon as practicable upon becoming aware of the known or suspected violation.
- In addition, Directors and employees may contact the Chair of the Governance Committee with a question or concern about this Code or a business practice. Any questions or submissions shall be addressed immediately.

Handling of Reports and Investigations

- Each submission forwarded to the Governance Committee, whether openly, confidentially, or anonymously, shall be reviewed by the Governance Committee. The Governance Committee shall determine whether the Governance Committee and/or management should investigate the submission.
- If the Governance Committee determines that an investigation is appropriate, the Governance Committee shall notify the CEO in writing of that conclusion. The Governance Committee and/or management shall promptly investigate the submission and shall record the results of the investigation in writing. The Governance Committee and/or management shall be free in its discretion to engage outside auditors, counsel or other experts to assist in the investigation and in the analysis of the results.
- The Governance Committee shall retain for a period of seven years all records relating to any submission and to the investigation of any such submission. The types of records to be retained by the Governance Committee shall include records of all steps taken in connection with the investigation and the results of any such investigation.

Confidentiality and Non-Retaliation

- All submissions shall be treated confidentially to every extent possible. The Governance Committee shall not, unless compelled by judicial or other legal process, reveal the identity of any person who makes a submission and who asks that his or her identity as the person who made the submission remain confidential and shall not make any effort, or tolerate any effort made by any other person or group, to ascertain the identity of the person who makes the submission anonymously.
- Any submission may be made without fear of dismissal, disciplinary action or retaliation of any kind. Efficiency Nova Scotia Corporation shall not discharge, discipline, demote, suspend, threaten or in any manner discriminate against any person who submits in good faith submission or any person who provides assistance to the Governance Committee, management or any other person or group, including any governmental, regulatory or law enforcement body, investigating the submission.

Consequences of a Violation

- Directors and employees that violate any laws, governmental regulations or this Code shall face appropriate, case specific disciplinary action, which may include reprimand, suspension without pay, demotion or immediate discharge.

Schedule A

**EFFICIENCY NOVA SCOTIA CORPORATION
CODE OF BUSINESS CONDUCT AND ETHICS
ACKNOWLEDGEMENT FORM**

I, _____, acknowledge that I have received, read and understood the Code of Business Conduct and Ethics (the "**Code**"). I will adhere in all respects to the standards described in the Code. I further confirm my understanding that any violation of the Code will subject me to appropriate disciplinary action, which may include reprimand, suspension without pay, demotion or discharge. Execution of this acknowledgment form does not constitute a waiver of any other rights I may have by law or contract.

Name (please print): _____

Position: _____

Date: _____

Signature: _____

Please complete this form and return it to the Chair of the Governance Committee.

EFFICIENCY NOVA SCOTIA CORPORATION

EMPLOYMENT EQUITY POLICY

Board Approved: April 28, 2010

Revised: September 22, 2010

1. INTRODUCTION

- Efficiency Nova Scotia Corporation is committed to being a workforce that is free of discrimination, values diversity and is representative, at all job levels, of the designated groups: Aboriginal People, African Nova Scotians and Other Racially Visible Persons, persons with Disabilities and Women in occupations or positions where they are under-represented.
- Members of the designated groups have historically faced barriers to employment and advancement in all sectors. The Employment Equity Policy will continue to improve representation of designated groups within the workforce.

2. DEFINITIONS

- For the purpose of the Policy, the following definitions will apply:
 - ▶ **Director**
A member of Efficiency Nova Scotia Corporation's Board of Directors.
 - ▶ **Employee**
A person who has an employment contract or letter of employment with Efficiency Nova Scotia Corporation.
 - ▶ **Aboriginal People**
Persons who identify themselves as status Indian, non-status Indian, Inuit, or Métis.
 - ▶ **African Nova Scotians**
Persons who identify themselves as indigenous black Nova Scotians.
 - ▶ **Cultural Competence**
Attitudes, behaviours and policies which enable employees and organizations to work effectively in cross-cultural situations.
 - ▶ **Designated Groups**
Aboriginal People, African Nova Scotians and Other Racially Visible Persons, persons with Disabilities and Women in occupations or positions where they are under-represented.
 - ▶ **Designated Positions**
Positions which are limited to applicants from the designated groups under the Employment Equity Policy.
 - ▶ **Diversity**
Recognition of each of our characteristics and what makes us distinct from each other, including age, language, culture, race, ethnicity, sexual orientation, gender, abilities and religious or spiritual beliefs.
 - ▶ **Employment Equity**
Equitable representation is achieved in a workforce when, in all occupational categories and at all levels of employment, the representation of the designated groups is reflective of the working age population.
 - ▶ **Equity**
Fair treatment of people by acknowledging and making provision for their differences in a process that is free of systemic barriers.
 - ▶ **Fairness**

An accessible, consistent and transparent process that is impartial based on principles of merit and equity.

► ***Inclusive***

All employees feel valued and a sense of belonging in an organization that applies the principles of equity and fairness in all aspects of its policies, practices and procedures.

► ***Merit***

The factors to be considered when assessing merit include (in no particular order): education, experience, skills, knowledge, personal attributes, and where applicable, years of service. Relative merit among applicants is determined by screening to ensure applicants meet the requirements advertised for the position, and based on the factors of merit and equity, conducting selection assessments to identify a ranked order of candidates.

► ***Personal Attributes***

Job-related qualities required for the position; examples include flexibility, initiative, and reliability.

► ***Persons With Disabilities***

Persons who, for the purposes of employment, identify themselves or believe that an employer or potential employer is likely to consider that the workplace environment may create a barrier due to a long-term or recurring physical, mental, sensory, psychiatric, or learning impairment.

► ***Racially Visible Persons***

Persons, other than Aboriginal people, who are non-Caucasian in race or non-white in colour.

► ***Reasonable Accommodation***

Human Rights legislation requires that employers have a duty to accommodate by providing reasonable accommodation to support the special needs of all employees, for example, improving accessibility to the workplace, religious observance, and alternative work arrangements. "Reasonable" imparts a duty to accommodate unless it would impose undue hardship on the employer.

► ***Undue Hardship***

Is determined on a case-by-case basis taking into consideration many factors which include safety, financial cost, employee morale, operational requirements and the impact on collective agreement provisions, where applicable. It is recognized that the use of the term "undue" implies that some hardship is acceptable.

► ***Women***

Refers to women in occupations or positions where they are under-represented.

3. POLICY OBJECTIVES

- This policy is designed to
 - Promote an inclusive, culturally competent workforce that values diversity;
 - Assist with the identification and removal of systemic barriers to employment and advancement of members of the designated groups; and
 - Achieve a workforce where the designated groups are equitably represented.

4. APPLICATION

- The policy applies to all Directors and employees.

5. RESPONSIBILITY

- It is the responsibility of Directors and employees to be familiar with the provisions of the policy. Every Director and employee has a duty to comply with the policy and is accountable for his/her conduct.
- It is the responsibility of the Chair of the Management Resources and Compensation Committee to ensure that Directors and employees receive a copy of the policy, as well as adequate and appropriate information in relation to its provisions and revisions. It is further the responsibility of the Chair of the Management Resources and Compensation Committee or designate, to ensure that the Board deals with the subject on a yearly basis, and to review the policy at least once per year to ensure it reflects the changing needs, realities, and responsibilities of Directors and employees.

6. POLICY DIRECTIVES

► **Job Postings**

Each job posting shall contain a statement that promotes a culture that values diversity and a welcoming message to encourage applications from members of the designated groups.

► **Accommodation**

Efficiency Nova Scotia Corporation shall provide reasonable accommodation to applicants, candidates and employees.

► **Selection**

Selection shall be based on the principles of merit, fairness and equity.

► **Workforce Self-Identification Survey**

A Workforce Self-Identification Survey form shall be provided to new employees upon appointment. Efficiency Nova Scotia Corporation will maintain the individual survey results as confidential information to the extent possible by law.

► **Workforce Profile**

The information obtained through the confidential Workforce Self-Identification Survey shall be used to develop a workforce profile of the designated groups.

► **Identification And Removal Of Barriers (Employment System Reviews)**

Efficiency Nova Scotia Corporation shall continually monitor their employment systems to identify and remove barriers to employment, retention and advancement for members of the designated groups.

► **Communication**

Efficiency Nova Scotia Corporation should develop and implement a communication plan to support its employment equity goals.

► **Education**

Efficiency Nova Scotia Corporation shall ensure employees participate in mandatory Diversity and Employment Equity training.

7. ACCOUNTABILITY

► **Chief Executive Officer**

The Chief Executive Officer of Efficiency Nova Scotia Corporation is accountable to:

- Keep the Board of Directors advised of the Employment Equity Policy and programs;
- Establish an environment that is supportive of diversity and employment equity;
- Maintain and analyze employment equity data on the representation of the designated groups within Efficiency Nova Scotia Corporation;
- Establish quantitative and qualitative goals to achieve a representative organization;
- Analyze and monitor employment systems to identify and remove barriers to employment, retention and advancement for members of the designated groups;
- Develop and implement a communication plan to support organizational employment equity goals.

► **Manager of Human Resources**

The Manager of Human Resources for Efficiency Nova Scotia Corporation is accountable to:

- Ensure that all employees are provided with, and are encouraged to complete, a Workforce Self-Identification Survey questionnaire;
- Ensure hiring managers are aware of the organization's employment equity goals;
- Ensure hiring proceeds on the basis of merit, fairness and equity; and
- Ensure human resources and management staff are trained in the accommodation process.

► **Supervisors And Managers**

Supervisors and Managers are accountable to:

- Ensure a welcoming and respectful environment for all employees;
- Ensure that all employees attend mandatory Diversity and Employment Equity training and attend any training as required;
- Support organizational efforts to improve the representation of designated groups in the workplace.

► **Employees**

Employees are accountable to:

- Ensure a welcoming and respectful environment for all employees;
- Attend mandatory Diversity and Employment Equity training; and
- Participate in the accommodation process when accommodations are required.

8. MONITORING

- The CEO (or a designate) will be responsible for monitoring the effectiveness and consistent application of this policy.
- The Board where appropriate will provide authorization to allow representatives of Canada Employment and Immigration access to the company premises and the Employment Equity records upon request.

9. REFERENCES

- Canadian Charter of Rights and Freedoms
- Nova Scotia Human Rights Act

EFFICIENCY NOVA SCOTIA CORPORATION

HARASSMENT POLICY

Board Approved: April 28, 2010

Revised: September 22, 2010

1. INTRODUCTION

- Efficiency Nova Scotia Corporation is committed to a healthy, safe and supportive workplace and is committed to provide a work environment that values diversity and where all persons are treated with respect and dignity. It is the right of all employees to work in an environment free from harassment, sexual harassment, and discrimination.
- Harassment, sexual harassment, and discrimination (offensive behaviour) affect the workplace and the well-being of individuals and will not be tolerated. This policy promotes awareness, prevention, and prompt resolution of offensive behaviour.
- The Nova Scotia Human Rights Act prohibits sexual harassment and discrimination on the basis of the protected characteristics set out in the Act. Efficiency Nova Scotia Corporation's policy goes beyond the parameters of legislation by prohibiting other types of workplace harassment.
- Whether the source of the offensive behaviour comes from within the organization or outside, any allegation of offensive behaviour is serious and should be taken seriously. Managers have an obligation to take appropriate action to protect their employees and others in the workplace and to put a stop to any offensive behaviour they are aware of, whether or not a complaint has been filed. Employees have an obligation to treat all persons with respect and dignity and are encouraged to take appropriate action to ensure offensive behaviour is not tolerated or condoned.

2. DEFINITIONS

- For the purpose of the Policy, the following definitions will apply:
 - ▶ **Director**
A member of Efficiency Nova Scotia Corporation's Board of Directors.
 - ▶ **Employee**
A person who has an employment contract or letter of employment with Efficiency Nova Scotia Corporation.
 - ▶ **Complaint**
A written allegation of offensive behaviour submitted to Human Resources.
 - ▶ **Complainant**
An employee(s) who has brought forward or filed a complaint under this policy, alleging that offensive behaviour has occurred.
 - ▶ **Discrimination**
Means discrimination as legislated under the Nova Scotia Human Rights Act.
 - ▶ **Harassment**
Harassment refers to derogatory (e.g., condescending, insulting, belittling) or vexatious (e.g., aggressive, angry, antagonistic) conduct or comments that are known or ought reasonably to be known to be offensive or unwelcome. Harassment includes, but is not limited to, the following:
 - Actions or comments that are directed at no person in particular but that create an intimidating, demeaning or offensive work environment;
 - Any objectionable comment, act, or display that demeans, belittles, or causes personal humiliation or embarrassment, and any act of intimidation or threat;
 - Conduct or comments that would amount to harassment involving any of the protected characteristics set out in the Nova Scotia Human Rights Act; age; race; colour; religion; creed; sex (gender, including pregnancy); sexual orientation; physical disability or mental disability; an irrational fear of contracting an illness

or disease; ethnic, national or aboriginal origin; family status; marital status; source of income; political belief, affiliation or activity; association with another individual or class of individuals having characteristics named above.

► **Investigator**

An individual(s) appointed by the Harassment Advisor to investigate through fact finding complaints of offensive behaviour.

► **Mediation**

A voluntary process used to resolve conflict by having a neutral person help the parties to the dispute attempt to arrive at a mutually acceptable solution.

► **Offensive Behaviour**

Means harassment, sexual harassment, or discrimination.

► **Person in Authority**

A person other than the employee's direct supervisor who is a member of the employee's chain of command.

► **"Reasonably to be known"**

The "reasonably to be known" standard refers to an objective assessment of how a specific behaviour might generally be received.

► **Respondent**

An employee(s) against whom allegations of offensive behaviour are made.

► **Sexual Harassment**

Means sexual harassment as legislated under the Nova Scotia Human Rights Act. Sexual harassment also includes comments, gestures or physical conduct of a sexual nature, or actions or comments with a sexual connotation or component that are directed at no person in particular but that create an intimidating, demeaning or offensive work environment, where an individual knows or ought to reasonably know that the behaviour is unwelcome and offensive. Examples of conduct that fall within the definition of sexual harassment are:

- Inappropriate or derogatory comments, humour, insults or behaviour based on gender and/or sexual orientation
- Inappropriate, lewd, or sexually offensive written, graphic or behavioural displays
- Inappropriate conversation, physical touching, or leering that could be construed to be a sexual advance
- Any implied or expressed reward for complying with a sexually-oriented advance or request
- A reprisal or threat of reprisal against an individual for rejecting a sexual solicitation or advance

► **Third Parties**

Persons who are engaged in work activities at an Efficiency Nova Scotia Corporation workplace who are not direct employees of the organization. They include, but are not limited to, volunteers, temporary agency employees, student work-term, contractors, and custodial staff.

► **Workplace**

Any place occupied by an employee as part of their employment which includes, but is not limited to, lunchrooms, a client's home or work site, vehicle, training events,

conferences, business travel, work-related social gatherings, or other location where an employee is engaged in activity associated with employment.

► **Workplace Restoration**

Promoting and/or restoring positive work environment and respectful workplace relationships.

3. POLICY OBJECTIVES

- This policy seeks to:
 - Provide a work environment that is free from all forms of offensive behaviour
 - Educate employees and create understanding as to what is considered offensive behaviour
 - Provide a mechanism to have offensive behaviour addressed and eliminated from the workplace

4. APPLICATION

- The policy applies to all Directors and employees.

5. RESPONSIBILITY

- It is the responsibility of Directors and employees to be familiar with the provisions of the policy. Every Director and employee has a duty to comply with the policy and is accountable for his/her conduct.
- It is the responsibility of the Chair of the Management Resources and Compensation Committee to ensure that Directors and employees receive a copy of the policy, as well as adequate and appropriate information in relation to its provisions and revisions. It is further the responsibility of the Chair of the Management Resources and Compensation Committee or designate, to review the policy at least once per year to ensure it reflects the changing needs, realities, and responsibilities of Directors and employees.

6. POLICY DIRECTIVES

Creating an environment that is free from offensive behaviour is achieved through awareness and training. The CEO will ensure that employees are provided with an opportunity to attend the required training on harassment in the workplace.

Managers are to lead by example and take reasonable measures to ensure a work environment that is free from offensive behaviour. If a manager, person in authority, or a human resource professional is made aware of a violation of this policy, they are required to take action even in the absence of a complaint. This applies to situations that involve employees as well as third parties working in Efficiency Nova Scotia Corporation's workplace. It is the intent of this policy to promote employee involvement in resolving situations. The use of resolution options, including mediation, is encouraged at any stage of this policy.

Resolution to a situation should be sought within 12 months of the offensive behaviour. In extenuating circumstances complaints beyond 12 months may be considered.

Nothing in this policy shall be deemed to restrict the authority of managers in performance management, counselling, disciplinary action or other appropriate interactions between employees and supervisors.

All information regarding a complaint is to be treated as confidential and will be disclosed on a need to know basis only.

► **Harassment Advisor**

The Manager of Human Resources for Efficiency Nova Scotia Corporation shall be or shall designate a Harassment Advisor, reporting to the CEO. The responsibilities of the Harassment Advisor shall include:

- Promotion of awareness and understanding of and sensitivity to, the issues of harassment among employees
- Provision of information, advice and assistance to employees who have reported an incident and to managers in order to resolve the problem
- Investigation, in consultation with the CEO, of complaints of harassment
- Provision of advice to the appropriate person(s) to resolve a complaint as required
- Reporting on the education programs undertaken in this regard
- Recommendation of any changes in procedures that may facilitate the organization's ability to deal effectively with instances of harassment
- Preparation of an annual report on the number and disposition of complaints

► **Resolution Options**

The following resolutions options are available to all employees.

Communicating concerns directly to the person

- Employees who believe they are experiencing offensive behaviour may choose to speak directly with the person(s) and inform them that their behaviour is unwelcome and must stop.
- If done in person, the employee may want to be accompanied by another person.
- The employee should document any discussion between the employee and the person(s) concerned and keep a record of any written correspondence.
- A matter dealt with to the employee's satisfaction is considered resolved.

Communicating concerns to a manager, person in authority, or human resource professional

- If the matter is not resolved to the employee's satisfaction or if the employee chooses not to speak to the person(s) directly, the employee may approach their manager, person in authority, or human resource professional and ask for their assistance in resolving the situation.
- If the discussion is done in person, the employee may find it helpful to be accompanied by another person.
- The employee should document any discussion between them and the manager, person in authority, or human resource professional and keep a record of the discussion and, if the concerns are communicated in writing, to keep a copy of the correspondence.
- Within 10 working days of being informed of the situation the manager, person in authority or human resource professional will review and take steps to resolve the situation as appropriate.
- The manager, person in authority, or human resource professional may refer the matter to the CEO or ask for their assistance in resolving the situation which may include a request for mediation.

- Once a manager, person in authority, or human resource professional is made aware of a behaviour that could be a breach of this policy, they must ensure that the matter is properly dealt with by the employer.

► **Written Complaint Option**

An employee has the option to initiate a written complaint if the above resolution options are not effective in resolving the situation to the satisfaction of the employee or if the employee prefers to file a written complaint immediately.

Filing a Complaint

- Written complaints must be signed by the complainant.
- The completed form is sent to the Harassment Advisor.
- Upon receipt of the complaint, the Advisor will inform the CEO and the respondent that a complaint has been filed and that the Advisor will be conducting a preliminary investigation. The CEO and the respondent will be provided with a copy of the complaint.
- Within 10 working days of the complaint being acknowledged, the Advisor reviews the complaint and if necessary, seeks additional information to determine that the allegations, if proven, are offensive behaviour. The Advisor may extend this time limit if required.
- If the Advisor determines that the allegations, if proven, are not offensive behaviour, the Advisor informs the complainant, the respondent, and the CEO in writing. The Advisor may redirect the complainant to other appropriate avenues of recourse or may suggest other means of resolving the situation.
- If the Advisor determines that the allegations may be offensive behaviour, the Advisor may offer the option of mediation to the complainant and the respondent. Both parties have to agree to the mediation in order for the process to begin.
- Within 20 working days of initiating the mediation process, the complainant and the respondent will have resolved the situation or the mediation will be suspended. A report will be provided by the Mediator to the Advisor indicating the results of mediation.
- If mediation fails to resolve the situation or it is determined that formal investigation is the more appropriate action to be taken, the Advisor will inform the CEO, the complainant, and the respondent that an investigation will be conducted, and assign an investigator(s).

Formal Investigation

- The investigator(s) will interview the complainant, the respondent, and any witnesses, and will review relevant documentation.
- The investigator(s) must complete their investigation and file a report of their findings to the CEO and the Advisor within 30 working days of receiving the complaint. This timeline may be extended if necessary, upon recommendation by the CEO and approval by the Board.

► **Decision**

- Within 15 working days of receiving the investigator's report, the CEO determines on the basis of the investigator's report what action, if any, including appropriate disciplinary action, is to be taken.

- The CEO may seek the advice of the Advisor in determining appropriate workplace restoration options which may be actioned to create a workplace free from offensive behaviour.
- The CEO should, in addition to other appropriate persons, seek the advice of the Head of Human Resources in determining whether disciplinary action is warranted and the appropriate level of disciplinary action where applicable.
- The CEO will inform the parties in writing of the results of the investigation in determining a finding of offensive behaviour. The CEO will ensure that workplace restorative measures and/or disciplinary actions are taken, if warranted, and will report his/her findings to the Board.

► **Withdrawal of Complaint**

If at any time after filing a complaint the complainant wishes to abandon the complaint, he or she must communicate this in writing to the Advisor. The Advisor will determine whether the investigation is to be continued.

► **Retaliation**

Retaliation is prohibited against anyone who has reported an offensive behaviour or participated in an investigation. Retaliation may result in disciplinary action.

► **Bad Faith Complaints**

Complaints should be undertaken with great care because they may result in damage to the respondent's reputation and disruptions in the workplace. Complaints made which are frivolous, vexatious or in bad faith may result in disciplinary action.

7. ACCOUNTABILITY

► **Chief Executive Officer**

The Chief Executive Officer or a designate of Efficiency Nova Scotia Corporation is accountable to:

- Ensure all employees are provided with an opportunity to attend training regarding harassment in the workplace
- Take steps to create an environment free from offensive behaviour
- Determine appropriate disciplinary action

► **Manager of Human Resources**

The Manager of Human Resources for Efficiency Nova Scotia Corporation is accountable to:

- Be, or to designate, a Harassment Advisor
- Provide advice as required to the CEO
- Respond to allegations of offensive behaviour
- Respond to employees' and managers' inquiries

► **Supervisors and Managers**

Supervisors and Managers are accountable to:

- Set a positive example
- Take action to protect employees and others from offensive behaviour
- Respond to allegations of offensive behaviour

► **Employees**

Employees are accountable to:

- Attend training regarding harassment in the workplace
- Treat all persons with respect and dignity

► **Harassment Advisor**

The Harassment Advisor is accountable to:

- Provide policy advice
- Review and process all written complaints
- Assign mediators and/or investigators
- Provide advice as required to the CEO on workplace restoration actions
- Act in an advisory capacity to employees on issues of offensive behaviour and application of this policy
- Evaluate the effectiveness of this policy and recommend changes as necessary

8. MONITORING

- The Manager of Human Resources will be responsible for monitoring the effectiveness and consistent application of this policy.

9. REFERENCES

- Canadian Charter of Rights and Freedoms
- Criminal Code of Canada
- Nova Scotia Human Rights Act
- Nova Scotia Occupational Health and Safety Act. 1996
Violence in the Workplace Regulations made under Section 82 of the Occupational Health and Safety Act, S.N.S. 1996, c. 7 O.I.C. 2007-200 (April 4, 2007, effective April 1, 2008*), N.S. Reg. 209/2007

* Except Sections 1 to 6, which are effective October 1, 2007.

Schedule A**GUIDELINES****► Representation**

During the interview process employees have the option of being accompanied by a co-worker, or other support person, including legal counsel. The cost of such representation will be borne by the employee

► Timelines

At the request of any of the parties, the Advisor may agree to extend the time limits specified at any stage of the process. The Advisor will ensure that the appropriate parties are notified of any time limit extensions

► Dealing With Offensive Behaviour By Third Parties Or Clients/Customers

Efficiency Nova Scotia Corporation is committed to provide a workplace that is free from offensive behaviour. This extends to circumstances where an employee is subject to offensive behaviour by third parties and/or clients/customers. These procedures do not supersede the Violence in the Workplace Regulations, and where circumstances warrant these procedures should be considered in conjunction with those regulations.

Procedures for dealing with offensive behaviour by Third Parties

The following process and procedures apply to circumstances where employees are subject to offensive behaviour by third parties in the workplace. Third Parties are persons who are engaged in work activities at Efficiency Nova Scotia Corporation's workplace who are not direct employees of Efficiency Nova Scotia Corporation. They include, but are not limited to, volunteers, temporary agency employees, student work-term, contractors, and custodial staff

- Upon receipt of a complaint, the manager or person in authority will take immediate steps to ensure that the complainant is protected from the source of the alleged offensive behaviour
- The manager or person in authority, in consultation with the employee, shall take such action as is appropriate and reasonable in the circumstance to ensure that the offensive behaviour does not continue
- In the case of a written complaint, an investigation will be carried out in accordance with the process set out in the Harassment Policy
- The respondent and the respondent's employer, if applicable, will be informed of the complaint and the investigation
- Any findings determined by the investigation will be provided to the respondent's employer, if applicable

Procedures for dealing with offensive behaviour by Clients/Customers

The following process and procedures apply to circumstances where employees are subject to offensive behaviour by clients/customers.

- Employees who are subject to offensive behaviour by clients/customers are encouraged to report the incident(s) to their manager or person in authority, particularly if the offensive behaviour is of a serious nature or made in circumstances where the employee feels the offensive behaviour may continue or re-occur

- Upon receipt of such a complaint, the manager or person in authority, in consultation with the employee, shall take such action as is appropriate and reasonable in the circumstance to ensure that the offensive behaviour does not continue
- The manager or person in authority shall consider what, if any, procedures and safe work practices are appropriate at the workplace to minimize or control offensive behaviour by clients/customers.

Dealing with offensive behaviour by Employees

The process as defined in the Harassment Policy applies to employees of Efficiency Nova Scotia Corporation. Though third parties and client/customers cannot access the complaint process described in the policy, managers are to ensure that their employees do not act offensively toward these parties. In addressing these situations managers are expected to abide by the spirit of the policy and ensure that where internal procedures exist to deal with the complaint, that they are followed.

Other Options

Complainants may, instead of the complaint procedures under the Harassment Policy, file a complaint under any of the following options where applicable:

- Complaint to the Nova Scotia Human Rights Commission
- Complaint under the Criminal Code
- Complaint under the Nova Scotia Occupational Health and Safety Act

EFFICIENCY NOVA SCOTIA

OCCUPATIONAL HEALTH & SAFETY POLICY

Board Approved: 1 December 2010

Updated: 1 December 2010

I. INTRODUCTION

The Province of Nova Scotia Occupational Health and Safety Act, 1996, c7, s.1 defines the duties and precautions required of Efficiency Nova Scotia under the Act as an employer of more than twenty employees who are regularly employed. The Act requires Efficiency Nova Scotia to establish a policy on Occupational Health and Safety and will have to establish a Joint Occupational Health and Safety Committee. The Act further requires Efficiency Nova Scotia to establish and maintain a written Occupational Health and Safety program in consultation with the Joint Occupational Health and Safety Committee for the purpose of implementing Efficiency Nova Scotia's policy.

II. DEFINITIONS

- For the purpose of the Policy, the following definitions will apply:
 - ▶ **Director**
A member of Efficiency Nova Scotia's Board of Directors.
 - ▶ **Employee**
A person who has an employment contract or letter of employment with Efficiency Nova Scotia.

III. POLICY OBJECTIVES

The safety of Efficiency Nova Scotia employees is a primary concern of the Company. In fulfilling this commitment to Occupational Health & Safety, the Company shall provide a safe work environment and shall provide protective clothing, equipment and related training to ensure employee safety. All employees will comply with the regulations, as set out in The Act, in the performance of their duties.

IV. APPLICATION

- The policy applies to all Directors and Employees.

V. RESPONSIBILITY

- It is the responsibility of Directors and Employees to be familiar with the provisions of the policy. Every Director and Employee has a duty to comply with the policy and is accountable for his/her conduct. Directors and Employees must support the policy and cooperate at all times with the JOHSC.
- It is the responsibility ENSC to ensure that Directors and Employees receive a copy of the policy, as well as adequate and appropriate information in relation to its provisions and revisions. It is further the responsibility of the Chief Executive Officer or designate, to review the policy at least once per year to ensure it reflects the changing needs, realities, and responsibilities of Directors and Employees.

VI. POLICY DIRECTIVES

- ▶ **Efficiency Nova Scotia**
ENSC will make every effort to eliminate the possibility of injury, or illness in the workplace (as defined by The Act) by taking all precautions reasonable in the circumstances to prevent harm to workers. In order to create a healthy and safe work environment, Efficiency Nova Scotia will cooperate with the Joint Occupational Health and Safety Committee to inform and train managers and employees about their responsibilities under the Act and Policy. Employees will be held responsible for ensuring that they follow this policy and use safe work practices to protect their own health and safety and that of other employees at the workplace. All employees have general responsibility for ensuring the safety of equipment and facilities.
- ▶ **Contractors, Constructors, Suppliers, self-employee Persons, Providers of Occupational Health and Safety Services, Architects and Engineers (As Defined in the Act)**
All contractors, constructors, suppliers, self-employed persons, providers of occupational health and safety services, architects and engineers who work at Efficiency Nova Scotia are required to comply with this policy and to comply with the Act and the regulation. 1996, c.7, 2.14, s.15, s.16, s.18, s.20, s.21
- ▶ **Joint Occupational Health and Safety Committee**
Efficiency Nova Scotia's Joint Occupational Health and Safety Committee will comply with 1996, c.7, s.31 of The Act. The Occupational Health and Safety policy will be reviewed annually by the Joint Committee.

VII. ACCOUNTABILITY

- ▶ **Human Resource Manager**
The Human Resource Manager for Efficiency Nova Scotia is accountable to:

- Ensure that all employees are familiar with the Occupational Health and Safety policy and program; and
- Ensure all management and staff are trained in the Occupational Health and Safety procedures.

► **Supervisors And Managers**

Supervisors and Managers are accountable to:

- Ensure employees attend mandatory Occupational Health and Safety training;
- Comply with the Occupational Health and Safety policy and program;
- Report any incidents promptly to Human Resources; and
- Report to Human Resources any condition which may exist that is deemed to be hazardous which may include conditions that have potential to cause injury, accident, or illness, related to the workplace.

► **Employees**

Employees are accountable to:

- Comply with the Occupational Health and Safety policy and program;
- Report any incidents promptly to their Supervisor or Manager or Human Resources; and
- Report to their Supervisor or Manager or Human Resources any condition which may exist that is deemed to be hazardous which may include conditions that have potential to cause injury, accident, or illness, related to the workplace.

VIII. MONITORING AND AUDITING

- In order to audit the effectiveness of the communication of this policy, every employee will be provided with and required to initial the policy upon hire.
- The CEO and/or delegate will have to report at least annually to the Board of Directors on the compliance of the OHS policy and program.

IX. REFERENCES

- Nova Scotia Occupational Health and Safety Act. 1996

EFFICIENCY NOVA SCOTIA CORPORATION

ENVIRONMENTAL POLICY

Board Approved: April 28, 2010

Revised: September 22, 2010

1. OBJECTIVE

- It is the goal of Efficiency Nova Scotia Corporation to deliver quality programs and services in a manner that contributes to a healthy environment. The Corporation will follow and demonstrate leadership in energy efficiency in its day-to-day operations, and follow leading environmental policies to reduce the consumption of energy and water, reduce waste, and promote sustainable procurement
- It is the policy of Efficiency Nova Scotia Corporation to model ethical, responsible, effective and efficient environmental practices through operations and programs, and to commit to continuous improvement

2. APPLICATION

- The Policy applies to all directors and employees.

3. RESPONSIBILITY

- It is the responsibility of directors and employees to be familiar with the provisions of the Policy. Every director and employee has a duty to act in an environmentally conscious manner.
- It is the responsibility of the Chief Executive Officer (CEO), or a designate, to ensure that directors and employees have access to the Policy, as well as adequate and appropriate information in relation to its provisions and revisions. It is further the responsibility of the CEO, or a designate, to review the Policy at least once per year to ensure it reflects the changing needs, realities, and responsibilities of directors and employees.

4. GUIDELINES

Efficiency Nova Scotia Corporation:

- will recognize environmental protection, and the importance of integrating environmental considerations into our decision making and activities;
- will identify, implement and promote best practice environmental management systems and operations
- will provide an environmentally sound workplace, and implement environmentally sound work practices
- will work closely with its employees to develop and implement agreed environmental initiatives
- will monitor the implementation of the policy by carrying out periodic audits and, when appropriate, introduce remedial measures

5. ENERGY

- We will minimize our energy consumption and apply energy efficient practices in our operations as much as possible
- The energy consumption and efficiency of new products will be taken into account when purchasing new assets

6. WASTE

- We will identify, implement and promote best practices in waste minimization through reduction, re-use and re-cycling
- We will provide a workplace that supports waste minimization practices

7. WATER

- We will promote reduced consumption and efficient use water in our operations.

8. PROCUREMENT

- The Corporation will develop and implement a sustainable procurement policy which will consider the full life cycle costing of the goods and services it acquires.

EFFICIENCY NOVA SCOTIA CORPORATION

PROCUREMENT POLICY

Board Approved: June 9, 2010

Revised: September 22, 2010

I. OBJECTIVE

Efficiency Nova Scotia Corporation is committed to the following principles of procurement that serve as the foundation for all procurement:

- ▶ Open
- ▶ Fair
- ▶ Sustainable
- ▶ Transparent
- ▶ Consistent
- ▶ Effective
- ▶ Efficient
- ▶ Competitive

II. DEFINITIONS

- ▶ **Director**
A member of Efficiency Nova Scotia Corporation's Board of Directors.
- ▶ **Employee**
A person who has an employment contract or letter of employment with Efficiency Nova Scotia Corporation. Upon Board decision, an individual who does not have an employment contract or letter of employment may be considered an employee for the purpose of this policy (i.e. contracted professional).
- ▶ **Sustainable Procurement**
Taking a holistic approach to obtain best value. This will be done by integrating the following criteria in the procurement process where appropriate:
 - Environmental criteria: e.g. Green House Gas Reduction, Waste Reduction, Toxic Use Reduction
 - Economic criteria: e.g. Life Cycle Cost, Fiscal Responsibility, Support for the Local Economy
 - Social criteria: e.g. Employee Health and Safety, Inclusiveness and Fair Wage, Health Promotion
- ▶ **Life Cycle Costing**
A type of analysis that goes beyond the purchase price and also considers the costs of items such as shipping and packaging, disposal of packaging, energy use, maintenance, warranty, parts and repairs, consumable supplies, disposal, training, etc.

III. POLICY GUIDELINES

Sustainable Procurement

Efficiency Nova Scotia Corporation will consider sustainable criteria in all procurement decisions. To guide the adoption of sustainable procurement, specifications will be developed on a category by category basis.

For those categories where specifications have been developed, all purchases within those categories no matter the dollar amount, must meet or exceed all environmental, economic and social criteria as outlined in the specifications.

For those categories where specifications have not yet been developed, Efficiency Nova Scotia Corporation will to the best of its ability, consider sustainable criteria in all procurement decisions.

Support for the Local Economy

To help establish Nova Scotia as a leading jurisdiction in energy efficiency, Efficiency Nova Scotia will to the best of its ability consider local economic benefit and the potential to build local capabilities in all procurement decisions.

Procurement of Goods, Services and Construction

Regardless of whether the procurement is for a one-time purchase, a repetitive purchase from a single supplier, or a long term multi-year contract, the following rules will apply, based on the total value of the procurement:

Goods, services or construction valued below \$10,000 excluding taxes

For goods, services or construction valued below \$10,000 excluding taxes quotes are not required, and sole source selection may be used. When using sole source selection, Efficiency Nova Scotia Corporation shall ensure that it undertakes appropriate due diligence and selection processes to ensure value is received.

Goods, services or construction valued equal to and above \$10,000 excluding taxes

For goods, services and construction valued equal to and above \$10,000 excluding taxes, Efficiency Nova Scotia Corporation will seek competitive quotes. The exception to this would be when Directors and Employees are using the Alternative Procurement Process.

Alternative Procurement Process

In order for the Procurement Policy to balance the need to be open and competitive with the demands of urgent, specialized or exceptional circumstances, Efficiency Nova Scotia Directors and Employees may use sole source selection. Any such use must be authorized by the CEO and/or the Board. This alternative procurement process must be used only for the purposes intended and not to avoid competition or to discriminate against specific suppliers.

Supplier Debriefing

Efficiency Nova Scotia Corporation will offer a supplier debriefing session to provide constructive feedback from the evaluation. Suppliers can find out how their proposal scored against published criteria, obtain comments from the evaluation team on their bid, and gather information on how future submissions may be improved. Supplier's bids are not compared to other bids, nor will information on other bids be provided.

IV. APPROVALS AND RESPONSIBILITIES**► Approvals**

The acquisition of capital goods (purchased or leased) requires the prior approval of the Board or the CEO, regardless of the dollar value of the acquisition. The acquisition of non-capital goods up to \$5,000 requires prior approval by the Board, or the CEO or a designate (i.e. a director or manager). If over \$5,000, prior approval from the Board or the CEO is required.

The acquisition of any goods, services or construction in excess of \$20,000 will require approval of the Board.

► Responsibilities

All Directors and Employees have the responsibility for procuring goods and services in accordance with the requirements of this Policy. Specifically, they must:

- read and be familiar with the Policy; and
- be responsible for the safe-guarding of funds or credit cards provided.

The Director of Finance and Administration is required to conduct a compliance review of the Policy on an annual basis and report any deviations to the CEO, who in turn, is required to report any material deviations to the Finance Committee of the Board.

V. POLICY REVIEW

- The Director of Finance and Administration is responsible for ensuring the Procurement Policy is reviewed on an annual basis, including recommendations for changes so that the policy continues to be sufficient and appropriate. Findings of the annual review will be reported to the Finance Committee of the Board.

EFFICIENCY NOVA SCOTIA CORPORATION
REIMBURSEMENT OF EXPENSES POLICY

Board Approved: April 12, 2010

Revised: September 22, 2010

1. OBJECTIVE

- To provide direction regarding the process and procedures to be followed for claiming allowances reimbursement of out-of-pocket expenses incurred by Directors or employees while on Efficiency Nova Scotia Corporation business and/or in carrying out their respective responsibilities.

2. DEFINITIONS

- For the purpose of this policy, the following definitions apply:
 - ▶ **Allowance**
An authorized amount that may be claimed in lieu of actual expenditures for specific items such as kilometers (mileage).
 - ▶ **Accommodations**
Hotel or similar commercial establishment, which provides lodging at an established daily rate.
 - ▶ **Continuous Travel**
Continuous travel is considered to begin at the scheduled departure time of the first flight of a journey and end at the earlier of:
 - arrival at the destination;
 - the beginning of an overnight stop; and
 - the scheduled arrival time of the first inter-connecting flight(s) within the airlines minimum connecting time rules.
 - ▶ **Director**
A member of Efficiency Nova Scotia Corporation's Board of Directors.
 - ▶ **Employee**
A person who has an employment contract or letter of employment with Efficiency Nova Scotia Corporation. Upon Board decision, an individual who does not have an employment contract or letter of employment may be considered an employee for the purpose of this policy (i.e. contracted professional).
 - ▶ **Manager**
A person with oversight and supervisory responsibilities and authorities for Efficiency Nova Scotia Corporation staff.
 - ▶ **Employer**
Efficiency Nova Scotia Corporation.
 - ▶ **Entertainment/Hospitality**
Business meals, beverages, refreshments, receptions, shows or performances.
 - ▶ **Expense Claim Form**
The standard form used (Board Expense Claim or Employee Expense Claim) to submit for reimbursement.
 - ▶ **Expenses**
The actual costs incurred, supported by proof of payment, up to the amount judged by Efficiency Nova Scotia Corporation to be reasonable, based upon experience of what such costs should be in the circumstances.
 - ▶ **Incidental Expense**

Miscellaneous expenses including such items as gratuities (other than those related to meals and taxi use) and other supplies and services, the costs of which can be attributed to a period in travel status, but for which no other reimbursement or allowance is provided under this Policy.

► **International Travel**

Travel outside Canada.

► **Mileage**

A rate paid per kilometer of distance travelled by a personal vehicle while on Efficiency Nova Scotia Corporation's business.

► **Proof of Payment**

An original document or carbon copy showing the date, supplier and amount of expenditure paid.

► **Transportation Expenses**

Charges for commercial air, rail, and automobile (private or rental) travel; road, ferry and bridge tolls, and parking charges.

► **Travel Expense**

An expense actually and necessarily incurred by an employee in connection with travel on Efficiency Nova Scotia Corporation's business.

► **Workplace**

The location at or from which an employee ordinarily performs the duties of his/her position.

3. POLICY STATEMENT

- Employees and Directors are reimbursed for expenses incurred while on Efficiency Nova Scotia Corporation business and/or in carrying out their respective responsibilities.
- Efficiency Nova Scotia Corporation will determine whether: when, where, by whom, and by what means travel will be undertaken and to select the mode and class of transportation and the accommodations to be used, subject to the provisions of this policy.
- Efficiency Nova Scotia Corporation expects travel costs to be minimized whenever possible. Since the most important decision is the one to travel and thus incur the expense in the first place, travel should be planned carefully so as to maximize benefits and minimize costs.

4. TRAVEL EXPENSES AND PROCEDURES

A. Accommodation / Meals

- Employees and Directors are authorized to stay in establishments that are conveniently located and comfortably equipped. An employee/Director will be reimbursed for the actual and reasonable expenses incurred for commercial accommodation upon providing proof of payment.
- Employees may stay at a private residence when travelling. In such instances the employee may be reimbursed to a maximum of \$20.00 per night.
- When travel plans change and accommodation will not be required, employees/Directors are to ensure that reservations are cancelled directly with the commercial establishment(s). Proof of cancellation is to be obtained (i.e. cancellation number and agent's name).
- Employees will be reimbursed for their meals according to the following schedules:

Breakfast	\$ 8.00
Lunch	\$ 12.00
Dinner	\$ 25.00

OR

A Director or employee may choose to claim reasonable meal expenses accompanied by receipts in lieu of the above meal rates.

- The cost of breakfast may be claimed only when the employee has been travelling on the Efficiency Nova Scotia Corporation's business for more than one hour before the recognized time for the start of the day's work.
- The cost of an evening meal may be claimed when the employee is not expected to return to his or her residence before 6:30 p.m.
- An employee/Director who is travelling is reimbursed the costs incurred for local and long-distance telephone calls necessarily placed because of required travel, or related to Efficiency Nova Scotia Corporation's business.

B. Air Travel and Authorization

- All air travel is pre-authorized by the employee's manager, and in the case of a manager, by the CEO.
- The standard air travel is economy class. Business class tickets are only purchased in extenuating circumstances, and with the prior approval of the CEO, or in the case of the CEO or Director, the Chair. Discounts and reduced fares shall be selected rather than full-fare economy when these rates are available.
- The cost of transportation to and from an airport may be claimed at the defined mileage rate.
- A refund of airfare paid by an airline to an employee/Director, who is bumped or who voluntarily postponed the flight at the request of the airline, will be refunded to Efficiency Nova Scotia Corporation.
- The use of a private aircraft, privately owned or rented, may be authorized by the CEO/Chair when this mode of transportation is considered both economical and practical. Employees/Directors who carry private life insurance policies are advised to confirm with their insurance agent that they are adequately insured if they use non-commercial flights.

C. Combining Vacation or Personal Time

- If an employee/Director chooses to combine a business journey with one taken for vacation or other personal reasons, the allowable travel expense will be limited to those costs that would have arose if the journey had been made solely for business purposes. No expenses relating to a travel companion, if applicable, are allowable.

D. Dry Cleaning / Valet Service and Laundry

- Dry cleaning and/or valet service charges may be claimed only where essential due to extraordinary circumstances. Receipts must accompany the claim.

E. Privately Owned Vehicles

- When using a privately leased or owned automobile to travel to an out-of-town location on Efficiency Nova Scotia Corporation business, the actual mileage incurred will be reimbursed. The mileage allowance is 43 cents per km.
- If an employee/Director chooses to use a privately owned vehicle rather than travel by air, or vice versa, the lower cost of the two modes of transportation will be reimbursed.
- To ensure that employees/Directors are adequately protected, privately owned vehicles used on Efficiency Nova Scotia Corporation's business shall, as a minimum, have basic

insurance coverage. The employee/Director is responsible for payment of their respective insurance premiums. When the use of a privately owned vehicle occurs, Efficiency Nova Scotia Corporation assumes no financial responsibility beyond payment of the authorized mileage rate and that, in the event of an accident, Efficiency Nova Scotia Corporation assures no responsibility for the deductible amounts related to comprehensive or collision coverage.

F. Prohibited Expenses

- Expenses related to parking tickets, speeding or other violations are not allowable travel expenses.

G. Rental Vehicles

- Economical rental vehicles may be used where this method is practical. Full-size or specialty vehicles should be used only when warranted by:
 - ▶ the number of passengers to be carried;
 - ▶ the bulk or weight of the goods to be transported;
 - ▶ weather conditions; or
 - ▶ an extenuating circumstance.

H. International Travel

This section includes only those provisions that are unique to travel outside Canada. The balance of the general policies also apply to these travel situations.

- Expense claims are processed in Canadian funds. Receipts must be converted to Canadian dollars showing the conversion rate on the receipt and then reported on the Expense Claim Form.
- Prior to departure, employees travelling internationally are encouraged to obtain international telephone-card privileges, or international telephone network facilities, which are to be used in a reasonable manner.
- The costs incurred in converting funds to foreign currencies and reconvertng any unused balance to Canadian currency are reimbursed based on receipts. Where such receipts are not attached to the travel claim, the average of the Bank of Canada currency exchange rates apply, based on a random sample of days in travel status selected by Efficiency Nova Scotia Corporation.

5. OTHER EXPENSES

A. Incidentals and Other Expenses

- Reasonable incidental and other expenses incurred by an employee/Director on Efficiency Nova Scotia Corporation business travel are reimbursed upon provision of proof of payment.

B. Entertainment/Hospitality

- Actual entertainment/hospitality expenses that are deemed necessary for employees/Directors to carry out their respective responsibilities may be claimed.

C. Parking and Tolls

- When employees/Directors use a vehicle on Efficiency Nova Scotia Corporation's business travel, the employee/Director will be reimbursed the actual costs of parking the vehicle. Fines for overtime parking or other violations are not an allowable expense.
- Charges for bridge, ferry, causeway tolls and parking fees actually and necessarily incurred on Efficiency Nova Scotia Corporation's business may be claimed.

D. Travel/Meals Outside Regular Business Hours

- When an employee is required to report to work early or to remain/return at work after regular business hours (8:30 a.m. – 5:00 p.m.) Efficiency Nova Scotia Corporation may, as a direct consequence of the hour, authorize payment for the use of a taxi or for a meal.

E. Travel Card Usage

- The employees/Directors must pay their personal credit card accounts. Any fee or deposit required for maintaining a personal credit card must be borne by the employee/Director. Interest charges and surcharges on credit cards cannot be claimed.

6. APPROVALS AND RESPONSIBILITIES**A. Approval of Claims**

- Employee expenses are approved by the employee's manager, or in the case of a manager, by the CEO. The CEO's expenses are approved by the Chair of the Management Resource and Compensation Committee. Director expense claims are approved by the Board Chair. The Board Chair's expense claims are approved by the Chair of the Finance Committee or, if the two Chair positions are held by the same person, by another designated Director.

B. Responsibilities

- All employees and Directors have the responsibility for administering travel and expenses in accordance with the requirements of this Policy. Specifically, they must:
 - ▶ read and be familiar with the Policy;
 - ▶ submit fully completed and accurate expense claims on a monthly basis within five business days of month end, using the authorized form with necessary supporting documentation, including receipts and explanations as required; and
 - ▶ be responsible for the safe-guarding of funds or credit cards provided.
- Any fraudulent irregularity in the expense claim submitted by an employee or Director, or any other misuse or misappropriation of funds, will result in disciplinary action up to and including termination.
- The Finance Group is responsible for ensuring that the procedures related to the completion of expense claims are followed. This includes, but is not limited to, accuracy of totals, required signatures, attached authorizations (if applicable) and receipts. In addition, the Finance Group is required to conduct a compliance review of the Policy on an annual basis and report any deviations to the CEO, who in turn, is required to report any material deviations to the Finance Committee.

7. POLICY REVIEW

- The Director of Finance and Administration is responsible for ensuring the Reimbursement of Expenses Policy is reviewed on an annual basis, including recommendations for changes so that the policy continues to be sufficient and appropriate.

EFFICIENCY NOVA SCOTIA CORPORATION

BYLAWS

Board Approved: April 12, 2010

Board Revised: September 22, 2010

BYLAWS OF THE EFFICIENCY NOVA SCOTIA CORPORATION

1. ORGANIZATION

- 1.1.1 The name of the organization shall be Efficiency Nova Scotia Corporation.

2. BYLAWS

- 2.1.1 The following bylaws are hereby enacted by the Board of Directors of Efficiency Nova Scotia Corporation.

3. DEFINITIONS

- 3.1.1 In these bylaws:
- (a) “Act” means the “Efficiency Nova Scotia Corporation Act”, S.N.S. 2009, c. 3
 - (b) “Board” means the Board of Directors of the Corporation;
 - (c) “Corporation” means the Efficiency Nova Scotia Corporation; and,
 - (d) “Special Resolution” means a resolution passed by not less than 2/3 of those Board members present to vote.

4. MEMBERSHIP OF THE BOARD

4.1 Board Members

- 4.1.1 As stated in section 10 of the Act, the Board shall consist of:
- (a) not fewer than two nor more than ten members appointed under Article 4.1.2 and 4.1.3; and
 - (b) one non-voting member who is a deputy minister or other public servant appointed by the Governor in Council.
- 4.1.2 The initial members of the Board of Directors referred to in Article 4.1.1(a) shall be appointed by the Governor in Council, hold offices for the term set by the Governor in Council and remain in office, notwithstanding the expiry of their term, until re-appointed or replaced.
- 4.1.3 Subject to Article 4.1.2, the members of the Board of Directors referred to in Article 4.1.1(a) shall be appointed by resolution of the Board and hold office for the term approved by the Board.
- 4.1.4 A member of the House of Assembly or the Executive Council or a person who has been a member of the House of Assembly or the Executive Council within the last three years is not eligible to be a member of the Board of Directors.
- 4.1.5 An employee of a public utility or an affiliate of a public utility is not eligible to be a member of the Board.
- 4.1.6 No member of the Board, other than the member appointed under Article 4.1.1(b) by the Governor in Council, may be a public servant.

4.2 Term of Membership on the Board

- 4.2.1 A member of the Board appointed under Article 4.1.3 shall be appointed for a term of three years and may be appointed for a second consecutive term.

4.2.2 Each member of the Board appointed under Article 4.1.2 and Article 4.1.3 remains in office, notwithstanding the expiry of his or her term, until the member resigns, is reappointed or replaced.

4.2.3 Notwithstanding Article 4.2.1, a Board member appointed under Article 4.1.3 may be appointed for a term or consecutive terms exceeding six years where the Board, by resolution, so determines. A Board member appointed under Article 4.1.2 may also be re-appointed for a term or consecutive terms exceeding six years where the Board, by resolution, so determines.

4.3 Vacancies on the Board

4.3.1 Where a vacancy occurs on the Board, the Board may appoint a person to fill the vacancy for the balance of the term of the member replaced.

5. OFFICERS OF THE BOARD

5.1 Board Composition

5.1.1 The officers of the Board shall be:

- (a) the Chair;
- (b) the Vice-Chair;
- (c) the Chair of the Governance Committee;
- (d) the Chair of the Finance Committee; and
- (e) the Chair of the Management Resources and Compensation Committee.

5.2 Election of Officers

5.2.1 At the annual meeting, the Board shall elect a slate of officers.

5.2.2 The Governance Committee shall submit a slate of officers of the Board for consideration.

5.2.3 Officers shall normally serve two-year terms.

5.3 Chair

5.3.1 The Chair shall preside at all meetings of the Board and of the Executive Committee and shall perform such duties as may be required under the Act and the bylaws, or as are incidental to the office. The Chair shall be ex-officio, a member of all committees of the Board.

5.4 Vice-Chair

5.4.1 The Vice-Chair shall perform such duties as are assigned to him or her and shall exercise all powers and perform all duties of the Chair in the absence of the Chair.

5.5 Committee Chairs

5.5.1 The Committee Chairs assign work to the Committee members, set the agenda and chair the Committee meetings, and ensure distribution of meeting minutes. They are responsible for setting tone for the Committee work, and ensuring that Committee members have the information needed to do their jobs. The Chairs are responsible for reporting to the Board on Committee decisions and recommendations.

5.6 Resignations

- 5.6.1 Any Director or other officer may resign at anytime, such resignation to be in writing, and to take effect from the time of its receipt by the Corporation, unless some time be fixed in the resignation and then from that date. The acceptance of a resignation shall not be required to make it effective.

6. RECORDING SECRETARY

- 6.1.1 The Board shall appoint a Recording Secretary. The Recording Secretary shall be directly responsible to the Chair of the Board and shall have charge of the minutes and records thereof. The Recording Secretary shall perform such duties as may from time to time be assigned to him or her by the Board or the Chief Executive Officer and shall issue or cause to be issued notices of all meetings of the Board when directed to do so.

7. MEETINGS OF THE BOARD

7.1 Regular Meetings

- 7.1.1 Regular meetings of the Board shall be held at such places and times as shall be determined by resolution of the Board. Notice of such regular meetings of the Board shall not be required to be given, except that whenever the time or place of such regular meetings shall be changed, notice of such action shall be given.

7.2 Special Meetings of the Board

- 7.2.1 Special meetings of the Board may be called at any time by the Chairman of the Board, or by two-thirds of the Directors, to be held at such place and times as shall be specified in the notice or waiver of notice thereof. Notice of every special meeting of the Board, stating the place, day and hour thereof, shall be given at least twenty-four hours before the time at which the meeting is to be held.

7.3 Board and Committee Meetings by Telephone

- 7.3.1 One or more of the Directors or Committee members may participate in any regular or special meetings of the Board or Committee by telephone conference or similar communication equipment by means of which all persons participating in the meeting are able to hear each other, participation in this manner shall constitute presence in person at such meeting.

7.4 Annual Meeting

- 7.4.1 At the annual meeting, the Board shall:
- (a) receive and consider for approval the audited financial statements of the Corporation for the immediately preceding fiscal year;
 - (b) appoint the auditor;
 - (c) receive the report of the Governance Committee and elect the officers of the Board; and
 - (d) receive the annual reports of all standing committees of the Board.

7.5 Quorum

- 7.5.1 The attendance (in person or by teleconference) of more than 50% of the members of the Board shall constitute a quorum and shall be necessary to conduct the business of Efficiency Nova Scotia Corporation.

7.6 Voting

- 7.6.1 Unless otherwise provided herein, matters arising at any meeting of the Board shall be decided by a majority of votes. Only Board members present in person or by teleconference may vote and no Board member may vote or be represented by proxy. In the case of a tie vote, the Chair shall cast the deciding vote. Any vote shall be taken by ballot if so demanded by any Board member present, but if no demand is made, the vote shall be taken in the normal way by a voice vote or a show of hands. The declaration by the Chair that a resolution has been carried and an entry to that effect in the minutes shall be prima facie evidence of the fact without proof of the number or proportion of the votes recorded in favour or against such resolution.

7.7 Minutes

- 7.7.1 A record of the minutes of each meeting of the Board shall be kept by the Recording Secretary and submitted at the next meeting of the Board. A copy of the minutes of each meeting as drafted by the Recording Secretary shall be sent to each Board member prior to the next regular meeting of the Board.

8. COMMITTEES**8.1 Board Committees**

- 8.1.1 The Board shall generally discharge the duties and responsibilities vested in it through delegation of its functions, for recommendation or decision as it deems appropriate, to the committees of the Board.
- 8.1.2 The committees constituted by the Board shall be:
- (a) The Executive Committee;
 - (b) Standing committees, being those committees whose duties are normally continuous. Unless otherwise determined by the Board, the standing committees are:
 Governance;
 Finance; and
 Management Resources and Compensation.
 - (c) Ad hoc committees, being those committees appointed by the Board or the Executive Committee for specific duties of a non-recurring nature, and which may also include in their membership one or more persons who are not Board members subject to the proviso that the Chair of any ad hoc committee must be a Board member.

8.2 Executive Committee

- 8.2.1 The Executive Committee shall be comprised of the Chair and Vice-Chair of the Board of Directors and the chairs of each of the standing committees. The Executive Committee shall meet only when it is not practical for the entire Board to meet. The Committee is authorized to make decisions and transact business on behalf of the Board, but must reasonably satisfy itself that it is acting in a manner and direction that would be consistent with that of the entire Board. Any decisions made by the Executive Committee will be reported to the Board at its next scheduled meeting.

8.3 Governance Committee

- 8.3.1 The Governance Committee is responsible for assisting the Board of Directors with their

responsibilities with respect to occupational health & safety, the Board election process, the orientation of new and existing Board members and the training and education of the Board members as it relates to governance roles and responsibilities. The Committee evaluates and monitors governance structures and processes, including policy development and processes for Board monitoring/oversight of operations and develops recommendations on Board code of conduct and ethics policies and processes.

8.4 Finance Committee

- 8.4.1 The Finance Committee is responsible for assisting the Board of Directors with their responsibilities with respect to the oversight of the accounting and financial reporting processes, investing activities, internal financial controls, financial risk management systems and internal and external audit functions. The Finance Committee is also responsible for advising the Board on annual operating and capital budgets and overall fiscal policy, planning, and practice.

8.5 Management Resource and Compensation Committee

- 8.5.1 The Management Resource and Compensation Committee is responsible for assisting the Board of Directors with their responsibilities with respect to the selection, compensation, evaluation and succession of the Chief Executive Officer (CEO). The Committee also recommends approval to the Board on the selection and compensation of other Senior Executive staff who will report directly to the CEO, and has responsibility for employment equity and harassment policies.

9. COMPENSATION

- 9.1.1 Directors as such, shall not receive any stated salary for their services, but by resolution of the Board, a monthly fixed sum and a fixed sum and expenses for attendance at each regular or special meeting of the Board and any committee meetings shall be paid.

10. CONFLICT OF INTEREST

- 10.1.1 A Board member who:
- (a) is party to a material contract or proposed material contract with the Corporation; or
 - (b) is a Director or officer of or has a material interest in any person who is a party to a material contract with the Corporation,

shall disclose in writing to the Board or request to have entered into the minutes of the meetings of the Board the nature and extent of the member's interest.

- 10.1.2 The disclosure required by Article 10.1.1 shall be made:
- (a) at the meeting at which a proposed contract is first considered;
 - (b) if the member was not then interested in a proposed contract, at the first meeting after the member becomes so interested;
 - (c) if the member becomes interested after a contract is made, at the first meeting after the member becomes so interested; or
 - (d) if a person who is interested in a contract later becomes a member, at the first meeting after the person becomes a member.
- 10.1.3 A member referred to in Article 10.1.1 shall not vote thereon. The member shall withdraw from the meeting during the discussion or voting of any motion relating

thereto. If the member does not voluntarily withdraw they will be asked to do so by the Chair. Such Board member may be asked by the Chair to remain in the meeting during the discussion prior to departing in advance of the vote.

11. INDEMNITY

11.1.1 Pursuant to section 14 of the Act, a member of the Board of Directors or any employee of the Corporation is not personally liable for anything done or omitted to be done or for any neglect or default in the *bona fide* exercise or purported exercise of a power conferred upon that member or employee, as the case may be, pursuant to the Act and these Bylaws.

11.1.2 The Corporation shall purchase and maintain insurance for the benefit of a member of the Board of Directors or any employee referred to in Article 11.1.1 against any liability claimed by a third party against such member or employee for anything done or omitted to be done or for any neglect or default in the *bona fide* exercise or purported exercise of a power conferred upon that member or employee, as the case may be, pursuant to the Act and these Bylaws, and may indemnify any such member or employee in respect of all costs, charges and expenses reasonably incurred by the person (and not otherwise covered by insurance) in defence of any such claim.

12. FISCAL YEAR

12.1.1 The fiscal year of the Corporation ends on December 31st in each year.

13. NOTICE

13.1.1 Whenever written notice is required to be given to any person, it may be given to such person, either personally or by sending a copy thereof through the mail, by fax, or by email, charges prepaid, to his or her address appearing on the books of the Corporation, or supplied by him or her to the Corporation for the purpose of notice.

14. AMENDMENTS

14.1.1 These bylaws may be altered, amended or repealed by Special Resolution of the Board.

15. BORROWING POWERS

15.1.1 The borrowing powers of the Corporation authorized by section 34(b) of the Act may be exercised by Special Resolution of the Board.

BILL NO. 49

(as passed, with amendments)



*1st Session, 61st General Assembly
Nova Scotia
58 Elizabeth II, 2009*

Government Bill

Efficiency Nova Scotia Corporation Act

CHAPTER 3 OF THE ACTS OF 2009

The Honourable Bill Estabrooks, MB
Minister of Energy

[First Reading](#): October 23, 2009 (LINK TO BILL AS INTRODUCED)

Second Reading: October 27, 2009

[Third Reading](#): November 3, 2009 (WITH COMMITTEE AMENDMENTS)

Royal Assent: November 5, 2009



An Act to Establish the Efficiency Nova Scotia Corporation

Be it enacted by the Governor and Assembly as follows:

1 This Act may be cited as the Efficiency Nova Scotia Corporation Act.

2 The purpose of this Act is to

- (a) establish an administrator to manage electricity demand-side management programs in the Province;
- (b) establish a fund to be used to defray the costs of electricity demand-side management programs;
- (c) provide for regulatory oversight of the administrator, the Fund and electricity demand-side management programs; and
- (d) provide the administrator with the authority to engage in energy efficiency and conservation programs other than electricity demand-side management programs.

3 In this Act,

- (a) "Board of Directors" means the Board of Directors of the Corporation;
- (b) "Corporation" means the Efficiency Nova Scotia Corporation;
- (c) "electricity demand-side management program" means an electricity demand-side management program designed to
 - (i) promote efficiency of electricity use,
 - (ii) promote electricity conservation, and
 - (iii) manage electricity demand where it is not otherwise managed by a public utility;
- (d) "Fund" means the Electricity Demand-side Management Fund;
- (e) "Minister" means the Minister of Energy or another minister appointed by the Governor in Council as the minister responsible for this Act;

(f) "Nova Scotia Power" means Nova Scotia Power Incorporated, a company regulated under the Public Utilities Act as a public utility;

(g) "public servant" means a person employed in the public service of the Province;

(h) "public utility" means any person that may now or hereafter transmit, deliver or furnish electric power or energy for compensation to or for the public, and includes Nova Scotia Power;

(i) "Review Board" means the Nova Scotia Utility and Review Board established under the Utility and Review Board Act.

4 This Act binds Her Majesty in right of the Province.

5 The Minister has the general supervision and management of this Act.

CORPORATION

6 There is hereby established a body corporate to be known as the Efficiency Nova Scotia Corporation.

7 Notwithstanding Sections 70 and 71 of the Provincial Finance Act, the Corporation is not and may not be designated as a crown corporation under the Provincial Finance Act or otherwise.

8 The objects of the Corporation are to

(a) design and administer electricity demand-side management programs with a view to restraining future electricity demand and use in the Province; and

(b) engage in energy efficiency and conservation programs other than electricity demand-side management programs.

9 The management and control of the affairs of the Corporation is vested in a Board of Directors and the Board may, subject to this Act, exercise the powers of the Corporation.

10 (1) The Board of Directors consists of

(a) not fewer than two nor more than ten members appointed under subsection (2) or (3); and

(b) one non-voting member who is a deputy minister or other public servant appointed by the Governor in Council.

(2) The initial members of the Board of Directors referred to in clause (1)(a) shall be appointed by the Governor in Council, hold office for the term set by the Governor in Council and remain in office, notwithstanding the expiry of their term, until re-appointed or replaced.

(3) Subject to subsection (2), the members of the Board of Directors referred to in clause (1)(a) shall be appointed as provided by and hold office for the term provided by the by-laws of the Corporation.

(4) A member of the House of Assembly or the Executive Council or a person who has been a member of the House of Assembly or the Executive Council within the last three years is not eligible to be a member of the Board of Directors.

(5) An employee of a public utility or an affiliate of a public utility is not eligible to be a member of the Board of Directors.

(6) No member of the Board of Directors, other than the member appointed under clause (1)(b) by the Governor in Council, may be a public servant.

11 (1) The Governor in Council shall designate one of the members of the initial Board of Directors as its Chair, to hold such office for the term set by the Governor in Council.

(2) Subject to subsection (1), the Board of Directors may appoint or, by by-law, provide for the appointment of one of its members as its Chair, to hold such office for the term set by the Board of Directors or the by-laws.

12 A majority of the members of the Board of Directors appointed under clause 10(1)(b) and subsection 10(2) or (3) constitutes a quorum.

13 (1) A member of the Board of Directors, who is not a public servant, shall be paid such remuneration as the Board determines.

(2) The members of the Board of Directors shall be reimbursed for reasonable expenses necessarily incurred in the performance of their duties.

14 A member of the Board of Directors or an employee of the Corporation is not personally liable for anything done or omitted to be done or for any neglect or default in the bona fide exercise or purported exercise of a power conferred upon that member or employee, as the case may be, pursuant to this Act.

15 The Board of Directors may make by-laws

- (a) respecting the appointment of its members under subsection 10(3) and their term of office;
- (b) respecting the appointment of its Chair under subsection 11(2) and the Chair's term of office;
- (c) regulating its proceedings;
- (d) determining the power and duties of its officers, servants and agents;
- (e) generally, respecting the management of the Corporation.

16 (1) The Corporation shall operate on a not-for-profit basis.

(2) No officer, director or employee of the Corporation may share in any operating surpluses of the Corporation.

17 (1) The Board of Directors shall appoint a Chief Executive Officer of the Corporation.

(2) The Chief Executive Officer of the Corporation shall be paid such remuneration as the Board of Directors determines and shall be reimbursed for reasonable expenses necessarily incurred in the performance of the duties of the Chief Executive Officer.

(3) The Chief Executive Officer, subject to the control and direction of the Board of Directors, has charge of the conduct of the business of the Corporation.

18 (1) The Corporation may employ such other officers and employees as are necessary for the proper conduct and management of the affairs of the Corporation.

(2) The Corporation may engage the services of professional persons, technical persons and experts upon such terms and conditions as the Board of Directors determines.

19 The officers and employees of the Corporation shall be paid such salary and receive such benefits as are determined by the Board of Directors.

20 The Corporation

(a) shall administer electricity demand-side management programs with a view to restraining electricity demand and use; and

(b) may engage in energy efficiency and conservation programs other than electricity demand-side management.

21 (1) Upon written notice from the Corporation, a public utility shall, within such reasonable time as is specified in the notice, provide to the Corporation, for the purpose of permitting the Corporation to fulfil its duties under this Act, such information, including records, respecting customer electricity usage and load as is specified in the notice.

(2) The Corporation and any representatives of the Corporation shall keep confidential all information obtained under subsection (1) except information that

(a) is in the public domain at the time it is obtained;

(b) comes into the public domain after it has been obtained, other than by virtue of a breach of this subsection;

(c) is available to the Corporation on a non-confidential basis from a public utility if the source is entitled to disclose the information; or

(d) is required by law to be disclosed, but only to the extent so required.

22 Subject to this Act, the Corporation has all of the capacity, rights, powers and privileges of a natural person necessary to carry out its objects in accordance with this Act.

23 (1) The Companies Act does not apply to the Corporation, except to the extent that the Governor in Council determines.

(2) The Corporation may, in pursuit of its objects, enter into an agreement in accordance with the law with a government or a department, agency or body of a government or with an international organization or a body of such an organization or body.

24 The fiscal year of the Corporation shall be as determined by the Board of Directors.

25 The Corporation shall establish and maintain an accounting system in accordance with generally accepted accounting principles.

26 The Board of Directors shall appoint an auditor for the Corporation and the auditor shall annually audit and prepare a report on the accounts of the Corporation.

ELECTRICITY DEMAND-SIDE MANAGEMENT FUND

27 (1) There is hereby established the Electricity Demand-side Management Fund.

(2) The Fund consists of

(a) any electricity demand-side management transitional funds contributed from Nova Scotia Power referred to in Sections 41 and 43;

(b) assessments on public utilities referred to in Section 31;

(c) any other funds contributed by any person for the purpose of electricity demand-side management; and

(d) investment income of the Fund.

(3) The Fund vests in the Corporation and must be kept segregated from any other assets or funds of the Corporation.

28 Only expenditures permitted under this Act and approved by the Review Board may be made from the Fund.

29 (1) All costs of the Corporation's operations related to electricity demand-side management, including administration expenses and the cost of any electricity demand-side management programs, shall be paid out of the Fund.

(2) No other costs of the Corporation, including costs related to energy efficiency and conservation programs, must be paid from the Fund.

30 Any surplus in program funds in any year must be retained in the Fund and used for the following year's program.

31 (1) Subject to the approval of the Review Board, the Corporation shall determine a public utility's annual assessment for electricity demand-side management.

(2) A public utility's annual assessment for electricity demand-side management programs must be paid to the Corporation in such amounts and at such times as the Review Board determines.

(3) The Corporation shall provide notice of an assessment to a public utility in any manner it considers necessary or expedient.

(4) Any notice provided pursuant to subsection (3) must indicate the amount owing by the public utility and the time the assessment is payable.

32 The Fund is not available to meet any future, current or past general obligations of Her Majesty in right of the Province, but Her Majesty may participate in any electricity demand-side management programs and services on the same basis as any other electricity consumer or customer of a public utility.

33 Nothing in this Act makes the Fund, or is to be construed to cause the Fund to be considered, public moneys subject to appropriation by the Legislature or required to be deposited into the Consolidated Fund of the Province.

34 The Corporation may

(a) invest the Fund according to investment and lending policies, standards and procedures that are approved from time to time by the Review Board; and

(b) borrow from any financial institution, by way of overdraft or otherwise, any sums the Board of Directors considers necessary to properly carry out the Corporation's objects.

PROGRAM AND EXPENDITURES

35 The Corporation shall submit to the Review Board for approval an electricity demand-side management program for one or more calendar years, at the time and in the manner required by the Review Board, commencing with the program for the 2012 calendar year or such later year as the Review Board determines.

36 In approving the electricity demand-side management program, the Review Board must be satisfied that the allocation of costs of the Corporation between electricity demand-side management programs and energy efficiency and conservation programs, other than electricity demand side management programs, is just and reasonable.

37 The Review Board has the general supervision of the Corporation in relation to electricity demand-side management and may make all necessary examinations and inquiries and keep itself informed as to the compliance by the Corporation with the provisions of law and has the right to obtain from the Corporation all information necessary to enable the Board to fulfil its duties.

38 The Public Utilities Act applies mutatis mutandis to the supervision of the Corporation under Section 37, except that

- (a) the Corporation is not entitled to recover any rate of return through its assessments; and
- (b) notwithstanding Section 117 of the Public Utilities Act, where there is a conflict between this Act and the Public Utilities Act, this Act prevails.

39 Each public utility is entitled to recover through its rate base the electricity demand-side management charges assessed against it under this Act on the basis approved by the Review Board under the Public Utilities Act.

MISCELLANEOUS

40 The Corporation and Nova Scotia Power shall enter into a transition plan with respect to the manner in which the electricity demand-side management program will be undertaken by the Corporation and Nova Scotia Power.

41 The transition plan must address

- (a) issues of the transition of any electricity demand-side management program that has not concluded;
- (b) the transfer of funding for any electricity demand-side management programs to be transferred; and
- (c) the provision of information by Nova Scotia Power to the Corporation to permit the Corporation to execute the electricity demand-side management programs and transfer and assumption of any outstanding contractual arrangements related to the electricity demand-side management programs to be transferred.

42 The transition plan referred to in Section 40 must be approved by the Review Board.

43 (1) Nova Scotia Power shall pay to the Corporation an assessment, as determined by the Review Board, to cover the start-up costs of the Corporation related to electricity demand-side management.

(2) Nova Scotia Power may recover the assessment from its ratepayers as the Review Board determines.

44 This Act comes into force on such day as the Governor in Council orders and declares by proclamation.



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ENSC 2012 DSM Plan Filing (NSUARB-E-ENSC-R-10)
 ENSC Responses to Multeese Information Requests

NON-CONFIDENTIAL

Request IR-2:

With respect to page 8, lines 3-4, please provide the adjustments made to Appendix B of the Board's August 4, 2009 Decision to arrive at the 88.13 Gwh and the \$22.56 million.

Response IR-2:

Lines 3-4 on page 8 of ENSC's Evidence reference the approved 2010 DSM Plan energy savings target of 81.13 GWh at an expenditure of up to \$22.56 million. Appendix B of the August 4, 2009 Decision showed 82.67 GWh and \$22.89 million; but, was later adjusted to reflect the Board's Decision.

Two adjustments were made to Appendix B of the Board's August 4, 2009 Decision:

- In a letter to NSPI on August 21, 2009, the UARB communicated the following correction: "On Page 52, under the "C & I" section, in the "Rx Rebate" row, the entry in the first column "Budget" should be 0.15, not 1.05."
- In the August 4, 2009 Decision, page 49, bullet 3, the Board decided that "The C&I rate class expenditures for 2010 DSM are reduced to \$800,000." The resulting adjustment to Appendix B was communicated in the October 1, 2009 DSM Cost Recovery Rider filed with the Board. Appendix B of that filing is Attachment 1 of this IR. The adjustment had the effect of decreasing the C&I Custom program budget from \$6.26 million to \$6.18 million, with a corresponding decrease in its energy savings target from 38.19 GWh to 37.65 GWh. Additionally, the C&I New Construction budget decreased from \$1.76 million to \$1.52 million, with a corresponding decrease in its energy savings target from 7.06 GWh to 6.07 GWh. Accordingly, the overall 2010 DSM Plan

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1 target decreased from 82.67 GWh to 81.13 GWh and the overall budget decreased
2 from \$22.89 million to \$22.56 million.

DSM Cost Recovery Rider Appendix B Page 1 of 1

Appendix B: 2010 DSM Plan

2010 DSM Plan	Budget ¹ (\$ millions)	Number of Participants / Units	Incremental Annual Net Energy Savings at Generator (GWh)	Incremental Annual Net Demand Savings at Generator (MW)	Total Resource Benefit/Cost Ratio (TRC)
Residential					
Efficient Products ²	\$2.07	40,661	8.86	1.86	1.9
Existing Homes ²	\$2.12	2,700	4.93	1.41	1.6
Low Income Households ²	\$2.18	1,500	5.26	1.17	2.0
New Homes ²	\$2.07	1,000	4.37	1.40	1.4
Residential Subtotal	\$8.44	45,861	23.43	5.84	1.7
C&I					
Rx Rebate	\$0.15	-	-	-	-
Custom ²	\$6.18	120	37.65	6.31	3.1
Small Business DI Lighting ²	\$5.62	600	13.98	3.30	1.8
New Construction ²	\$1.52	30	6.07	1.18	2.7
C&I Subtotal	\$13.47	750	57.70	10.79	2.6
Multi Sector					
Education and Outreach	\$0.40	-	-	-	-
Development and Research ²	\$0.25	-	-	-	-
Multi Sector Subtotal	\$0.65	-	-	-	-
TOTAL	\$22.56	46,611	81.13	16.64	2.3

Notes:

- 1) Figures expressed in 2010 dollars.
- 2) Programs established in 2008/2009.

ENSC 2012 DSM Plan Filing (NSUARB-E-ENSC-R-10)
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Request IR-3:

With respect to Figure 2.4 on page 9, please add a column to show the amounts approved by the Board in its August 4, 2009 Decision and comment on any significant differences between the amounts approved and the amounts actually spent.

Response IR-3:

The following figure adds columns to Figure 2.4 to show the UARB approved budget and the budget as revised at the January 26, 2010 PDWG meeting. It also includes a column to show the variance between expenditures and the revised budget.

	A	B	C	A-C
Program	2010 Expenditures (Unaudited) (\$ million)*	2010 UARB Approved Budget (\$ million)*	PDWG Course Correction January 26, 2010 (\$ million)*	Variance (\$ million)*
Residential				
Efficient Products	3.85	2.07	1.00	2.85
Existing Homes	1.30	2.12	2.43	-1.13
Low-Income Households	1.85	2.18	2.66	-0.81
New Homes	0.49	2.07	0.95	-0.46
Commercial and Industrial				
Efficient Products	2.43		2.72	-0.29
Prescriptive Rebate	1.49	0.15	1.88	-0.39
Custom**	3.59	7.70	3.42	0.17
Small Business Direct Install	4.31	5.62	5.00	-0.69
Education and Outreach	0.40	0.40	0.75	-0.35
Development and Research	1.44	0.25	1.75	-0.31
ENSC Startup	1.55	0.00	0.00	1.55
Total	22.70	22.56	22.56	0.14

* Numbers are rounded

** Includes New Construction

ENSC 2012 DSM Plan Filing (NSUARB-E-ENSC-R-10)
ENSC Responses to Multeese Information Requests

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- 1 The two most significant variances relate to an increased investment in the Efficient Products
- 2 program that was undertaken mid-year to adjust for anticipated shortfalls in the other Residential
- 3 programs and the ENSC startup costs.

ENSC 2012 DSM Plan Filing (NSUARB-E-ENSC-R-10)
 ENSC Responses to Multeese Information Requests

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Request IR-4:

With respect to Figure 5.1 on page 14,

- a) Please confirm that if the overachievements from 2008-09, contributions from the Extra Large Industrials, and Codes and Standards are excluded, the incremental savings for 2012 are 124.1 Gwh, with an associated investment of \$43.7 million, for an average first year cost of \$352/Mwh.
- b) Please confirm that the 2011 DSM Plan as approved by the Board has savings of 158.5 Gwh with an associated investment of \$41.9 million, for an average first year cost of \$264/Mwh.
- c) If a) and b) are confirmed, please explain why ENSC feels it is appropriate to plan 2012 to have energy savings from ENSC investments that are lower than in 2011.
- d) If a) and b) are confirmed, please comment on why the cost of the 2012 DSM is expected to be so much higher on a \$/Mwh basis.
- e) Assuming energy savings from ENSC investment to be 124.1 Gwh, as proposed, please discuss options to lower the 2012 DSM \$/Mwh costs and the implications of each strategy.
- f) If a) and b) are confirmed, please provide Figure 5.1 where
 - energy savings from ENSC investments are equal to the 2011 energy savings
 - energy savings from ENSC investments are 10% greater than the 2011 energy savings

Response IR-4:

- a) Confirmed.
- b) Confirmed.
- c) The 2012 DSM Plan was developed to meet 2012 IRP targets. It provides funding that allows ENSC to develop and implement Enabling Strategies that are key to achieving

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-
- 1 long-term IRP electricity savings objectives, within a budget that minimizes increased
 2 charges to ratepayers. Increased levels of program investment would make it necessary
 3 to reduce funding for Enabling Strategies or to further increase ratepayer costs.
 4
- 5 d) Generally speaking, two important factors contribute to increased unit costs.
 6
- 7 • “Low-Hanging Fruit”: At their outset, DSM programs benefit from “low-hanging
 8 fruit” in two respects: low-cost measures, and easier-to-convince customers. As
 9 programs evolve, they are either required to pursue more costly measures or to
 10 more aggressively pursue potential participants. For example, the baseline
 11 penetration of compact fluorescent bulbs is higher today than it was a couple of
 12 years ago, and is expected to be higher still by the end of 2011. Going forward,
 13 achieving a similar level of savings from consumer products will require
 14 promotion of higher-cost measures (e.g. specialty bulbs) and/or a more aggressive
 15 approach to enroll customers who did not take up previous program incentives.
 16 The Small Business Direct Install program offers a similar example of this
 17 challenge: to pursue savings in this area, ENSC must add new, cost-effective
 18 measures to the program; however, such measures raise the average unit cost.
 19
 - 20 • Diminishing Returns: As programs achieve market-wide success and markets
 21 begin to transform, improvements to the baseline leave less savings on the table
 22 from the same or similar measures. For example, starting in 2012, a new general
 23 purpose lighting standard will increase the efficiency of standard incandescent
 24 light bulbs. While compact fluorescents still offer cost-effective electricity
 25 savings relative to these higher-efficiency incandescents, such savings are
 26 expected to be reduced by approximately one-third. Similarly, with the
 27 introduction in 2010 of a new construction code for residential houses, savings
 28 from more costly measures will be required to achieve net savings. Because of
 29 this, more aggressive incentives will also be required.
 30

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The reader will note the linkage between increasing program unit costs and savings from codes and standards (the latter resulting in higher baselines and lower energy saving deltas, all else being equal). ENSC notes the perverse incentive that would result if its performance were to be assessed exclusively on its program unit costs, without regard for the savings from codes and standards.

e) As noted in Section 6 of the Evidence, the 2012 DSM Plan seeks to balance a number of guiding principles, including, but not limited to, minimizing first-year program costs. There are several ways in which ENSC could reduce the cost and achieve the same level of anticipated savings, each with different implications. These are presented below by order of anticipated impact.

- **Enabling Strategies.** Enabling Strategies are investments aimed at generating or facilitating future cost-effective electricity savings. Since these strategies are future-oriented, ENSC has not attributed first-year savings to this line item. Since the question refers strictly to opportunities to reduce the first-year program unit cost of savings, any transfer of funds from Enabling Strategies to other program areas would necessarily improve the first-year plan cost. However, this could result in lost opportunities for cost-effective savings in the future, for example by impeding ENSC's ability to develop innovative financial solutions that may offer a cost-lowering complement to standard incentives. This would also contradict ENSC first and fourth guiding principles, i.e. achieving IRP-driven cumulative savings goals, and transforming markets in the long run.

- **Low-income efforts.** After Enabling Strategies, the low-income component of the Existing Houses program represents the highest cost when looking at first-year unit program costs. This stems from a combination of three factors:
 - the added financial barriers these customers face, requiring higher incentives as a share of total cost to enable participation

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- the higher incidence of split incentives and other factors that require higher transaction costs to attract participants into the program
- the longer-than-average lives of the measures (lifetime savings), a benefit that is not accounted for when considering first-year costs alone.

ENSC could reduce its overall first-year unit program costs by reducing or eliminating its efforts directed at this community, and transferring those funds to other programs. This, however, would come at the expense of ENSC's third guiding principle of accessibility.

- **All residential programs.** Finally, it is worth noting that residential sector programs as a whole are considerably more costly than commercial and industrial sector programs, when viewed on a first-year program cost basis.. Not unlike low-income efforts, this is partly a function of the types of measures available, including many with longer lives (lifetime savings) that are not accounted for by the first-cost metric. Conceivably, ENSC could transfer part or all of the residential sector budget to commercial and industrial sector programs to reduce the average first-year unit cost, although this would come at the expense of ENSC's third guiding principle of accessibility.

f) Two revised versions of Figure 5.1 are shown below. The first revised Figure 5.1 depicts 158.5 GWh in energy savings from ENSC programs (equal to the amount in the 2011 DSM Plan). It depicts 158.5 GWh by increasing energy savings in the 2012 DSM Plan by 25 percent for all residential programs (except for New Houses); and 30 percent for all non-residential programs.

The second revised Figure 5.1 depicts 174.66 GWh, which is just over 10 percent greater than the 2011 DSM Plan. This amount results in energy savings increases to the 2012

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1 DSM Plan of: 40 percent for all residential programs (except for New Houses); and 50
 2 percent for all non-residential programs.

3

4 **Revised Figure 5.1 with 158.5 GWh in Energy Savings from ENSC Programs**

	Budget (million)	Benefits (million)	Incremental Annual Net Energy Savings at Generator (GWh)	Incremental Annual Net Demand Savings at Generator (MW)	Benefit/ Cost Ratio Total Resource Cost Test (TRC) ¹	Benefit/ Cost Ratio Program Administrator Cost Test (PAC) ²
OVERACHIEVEMENTS FROM 2008-2009 DSM PLANS						
Overachievements from 2008-09 DSM programs	-	-	19.5	6.1	-	-
ENABLING STRATEGIES						
Education and Outreach	2.0	-	-	-	-	-
Development and Research	1.5	-	-	-	-	-
Other Enabling Strategies	1.5	-	-	-	-	-
RESIDENTIAL PROGRAMS						
Efficient Products ³	4.9	16.3	21.4	3.2	1.9	3.3
Existing Houses ³	12.2	30.4	17.6	5.2	1.9	2.5
New Houses	4.3	10.0	5.6	1.5	1.5	2.3
Home Energy Report ³	1.1	1.7	16.2	3.8	1.5	1.5
COMMERCIAL AND INDUSTRIAL DSM PROGRAMS						
Prescriptive	6.0	30.2	28.9	5.7	2.7	5.0
Custom	12.3	63.0	50.2	7.1	2.1	5.1
Small Business Direct Install	7.6	21.2	18.7	2.9	2.1	2.8
SAVINGS FROM OUTSIDE ENSC-FUNDED DSM						
Projects from Extra-Large Industrials			80.0	12.0		
Codes & Standards	-	-	10.0	2.7	-	-
Total	53.4	172.8	268.0	50.2	1.9	3.2

Currency is expressed in 2012 dollars. Numbers may not sum exactly due to rounding.

1. TRC compares the sum of ENSC's and participants' investments against the direct benefits to Nova Scotia (such as avoided costs).

2. PAC compares ENSC's (i.e. NSPI ratepayers') costs against the direct benefits to Nova Scotia (avoided costs of electrical capacity and energy).

3. Includes participation by low-income households

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1 **Revised Figure 5.1 with 174.66 GWh in Energy Savings from ENSC Programs**

	Budget (million)	Benefits (million)	Incremental Annual Net Energy Savings at Generator (GWh)	Incremental Annual Net Demand Savings at Generator (MW)	Benefit/ Cost Ratio Total Resource Cost Test (TRC)¹	Benefit/ Cost Ratio Program Administrator Cost Test (PAC)²
OVERACHIEVEMENTS FROM 2008-2009 DSM PLANS						
Overachievements from 2008-09 DSM programs	-	-	19.5	6.1	-	-
ENABLING STRATEGIES						
Education and Outreach	2.0	-	-	-	-	-
Development and Research	1.5	-	-	-	-	-
Other Enabling Strategies	1.5	-	-	-	-	-
RESIDENTIAL PROGRAMS						
Efficient Products ³	5.5	18.1	23.6	3.6	1.9	3.3
Existing Houses ³	13.6	34.0	19.7	5.9	1.9	2.5
New Houses	4.3	10.0	5.6	1.5	1.5	2.3
Home Energy Report ³	1.3	1.9	18.2	4.2	1.5	1.5
COMMERCIAL AND INDUSTRIAL DSM PROGRAMS						
Prescriptive	6.7	33.4	32.0	6.3	2.7	5.0
Custom	13.5	69.4	55.4	7.8	2.1	5.1
Small Business Direct Install	8.1	23.0	20.2	3.1	2.1	2.8
SAVINGS FROM OUTSIDE ENSC-FUNDED DSM						
Projects from Extra-Large Industrials			80.0	12.0		
Codes & Standards	-	-	10.0	2.7	-	-
Total	58.0	189.8	284.1	53.2	2.0	3.3

Currency is expressed in 2012 dollars. Numbers may not sum exactly due to rounding.

1. TRC compares the sum of ENSC's and participants' investments against the direct benefits to Nova Scotia (such as avoided costs).

2. PAC compares ENSC's (i.e. NSPI ratepayers') costs against the direct benefits to Nova Scotia (avoided costs of electrical capacity and energy).

3. Includes participation by low-income households

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Request IR-5:

With respect to Figure 5.1,

a) If the annual avoided energy and avoided capacity costs used in the development of the TRC's and PAC's are different from those used to assess the 2011 DSM Plan,

- Please provide them.**
- Please provide the date of the most recent update.**
- Please confirm that the avoided costs currently being used were derived using the same methodology as was used to develop the avoided costs for the 2011 DSM programs. If not, please provide the new derivation.**

b) Please confirm that avoided costs are being applied in the same manner as in 2011.

c) Please provide the derivation of the TRC and PAC results for two of the measures in the Efficient Products program that have different life expectancies.

Response IR-5:

a) The avoided costs used in the development of the 2012 DSM Plan are the same as those used for the 2011 DSM Plan.

b) Confirmed.

c) Please refer to Synapse IR-1, Confidential Attachment 1, filed electronically.

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Request IR-6:

With respect to Figure 5.1, Note e, please provide the derivation of the “historic savings” of 10 Gwh associated with the adoption of Codes and Standards.

Response IR-6:

Savings attributed to Codes and Standards for the 2012 DSM Plan are based on new requirements from the provincial building code that came into effect on January 1, 2010, as well as on the federal efficiency standard for general-service lamps that is set to come into effect in 2012.

The new energy efficiency requirements of the provincial building code are expected to save 7.9 GWh in 2011 and an additional 7.5 GWh in 2012, for a total of 15.4 GWh of new savings in 2012. The federal standard for general-service lamps, beginning in 2012, will further provide 6.4 GWh in 2012, for a total of 21.8 GWh.

Given that Codes and Standards are a new component in ENSC’s Plan, and given uncertainties around regulations that have not yet come into effect, ENSC chose to take a conservative approach to the savings it is counting on for 2012. For this reason, ENSC is planning for 10 GWh of energy savings, and 2.7 MW of demand savings, in its 2012 DSM Plan.

Please refer to Attachment 1, which is a memo from Dunskey Energy Consulting to ENSC, detailing the methodology and results of the savings analysis for Codes and Standards.



MEMORANDUM

To: Chuck Faulkner, ENSC
From: Philippe Dunsky
Date: 2011-01-12

Re.: Codes and standards – estimated energy savings

Energy savings from Codes & Standards improvements

Recent and upcoming regulations on the energy efficiency of buildings and equipments will have a significant impact on Nova Scotia's electrical demand. DEC has assessed potential savings stemming from the following modifications:

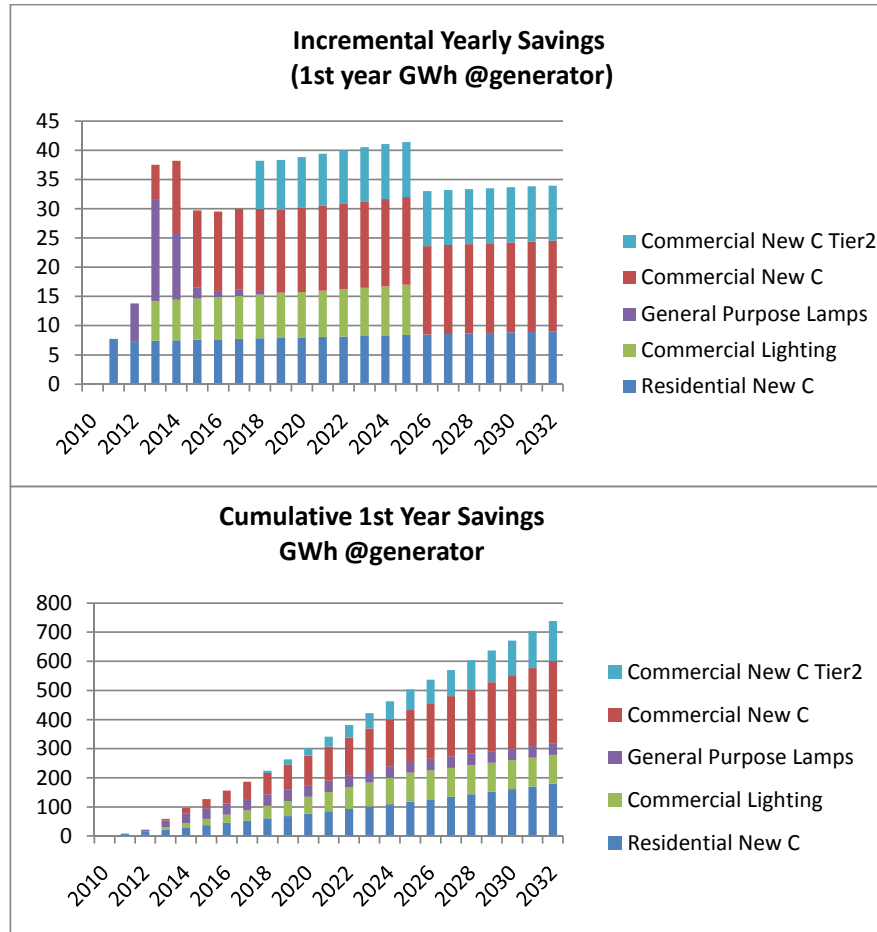
1. **Residential energy code:** Nova Scotia has recently updated its building code by including stricter requirements for energy efficiency. The new requirements have been in effect since January 1st, 2010.
2. **Non-residential building code:** Nova Scotia has committed to adopt the upcoming Model National Energy Code for Buildings 2011 (NECB), scheduled to be published in the Fall of 2011. Provincial adoption of the 2011 NECB should follow within six to nine months of its publication.
3. **General purpose lighting:** Natural Resources Canada has amended *Canada's Energy Efficiency Regulations* to phase out inefficient incandescent lamps starting in January 2012. The new requirements will first apply to higher wattage bulbs (output above 1050 lumens), with the remainder of general purpose lamps being phased out starting December 31st, 2012.
4. **Linear fluorescent lighting:** Conserve Nova Scotia and the provincial Department of Energy are working on a new standard to make high performance T8 lighting the minimum standard for linear fluorescent lighting. The current schedule is for the new standard to be in place at some point during 2012.

We have forecasted savings from the above-mentioned changes to codes and standards for the 2011 to 2032 period. Reported savings are at generator, using a ratio of 1.1188 between savings at meter and at generator.

SUMMARY OF RESULTS

The results of our analysis are presented in the following graphs. Note that future modifications to codes and standards beyond those specifically mentioned above have not been factored in, although we expect

continued improvements to codes and standards to generate substantial additional savings in the long-term.



INCREMENTAL NET standards energy savings (GWh)

(Gwh)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Residential New C	0.00	7.88	7.46	7.53	7.61	7.69	7.77	7.85	7.93	8.01	8.09
Commercial New C	0.00	0.00	0.00	6.00	12.48	13.12	13.60	13.82	14.02	14.21	14.38
Commercial Lighting	0.00	0.00	0.00	6.77	6.90	7.04	7.18	7.33	7.47	7.62	7.77
General Purpose Lamps	0.00	0.00	6.44	17.31	11.29	1.95	1.07	1.05	0.63	0.12	0.00
Commercial New C Tier2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.22	8.46	8.69
Total @generator	0.00	7.88	13.89	37.61	38.28	29.80	29.62	30.04	38.28	38.43	38.93

METHODOLOGY

The first step in calculating energy savings was to determine the “potential standard energy savings” if all relevant buildings/appliances/lighting units met the new code or standard. The potential savings were then adjusted by the estimated rate of compliance to get the “gross standard energy savings”. The “net standard energy savings” was then calculated based on the naturally occurring market adoption (NOMAD) of the practices encoded in the modelled codes or standards.

We discuss the approach for each code or standard analyzed below. Note that all savings identified are incremental to the 2009 IRP forecasted demand.

RESIDENTIAL ENERGY CODE

The new energy performance requirement of the residential building code requires a rating of 80 on the Energuide for Houses (EGH) scale.

Potential standard savings

Potential savings were calculated using the following equation:

$$\text{Savings}_{\text{potential}} = \text{New starts} * \text{SHMS}_{\text{elec}} * (\text{Consumption}_{\text{EGH80}} - \text{Consumption}_{\text{EGH77}})$$

Where:

New starts: Yearly new housing starts – provided by CMHC market outlook

SHMS_{elec} : Electrical space heating market share for residential new construction

Based on discussions with representatives from the Ministry of Labour and Workforce Development and energy auditors having worked extensively on modelling the impact of the new energy code, the average achieved performance of new construction prior to the code implementation was estimated at an average rating of EGH77.

We have assumed that the new requirement will apply to 50% of the multiple units starts, since high-rise apartment buildings are not subject to the residential building code.

Gross standard savings

According to the Ministry, compliance with the new energy code has been significant to date. Although no data is available, we have assumed a 90% compliance to calculate gross savings.

Net standard savings

Normally occurring market adoption was assumed to be 5%, based on data from a draft potential studies (DEC client unnamed).

NON-RESIDENTIAL ENERGY CODE

The 2011 NECB will provide a 15% reduction in energy consumption of buildings compared to Canada's 1997 MNECB.

Potential standard savings

The potential savings are based on energy intensity, which were estimated using the Office of Energy Efficiency's (OEE) data for non-residential building in the Atlantic Region. OEE's reported data are for the complete building stock, and thus had to be corrected for recent construction trends across Canada.

$$NS\ Intensity_{New\ C\ non-res} = Atlantic\ intensity_{avg} * \frac{Canada\ intensity_{2000-2004}}{Canada\ intensity_{avg}}$$

Annual square meters of new construction in the non-residential sector was inferred from data on the value of annual building permits, using average construction costs per square meter. (ref. Statistic Canada, table 026-0006 for building permits value, and rsmeans.com for construction costs)

To assess the potential savings coming from the NECB, the current new construction baseline needed to be assessed. A study conducted by the Natural Research Council of Canada has concluded that current building practices are in line with the 1997 MNECB for all building systems except lighting, which is in line with ASHRAE 90.1-2007 standards. This improvement in lighting practices has been taken into account in establishing a baseline.

Typical energy consumption of a 1997 MNECB-compliant building, with adjustment for lighting practices and estimated 2011 NECB savings:

MJ	MNECB	Adjusted Baseline	2011 NECB Savings Relative to Baseline
	1997	1997	
Lighting	2070	1351	23%
Equipment	1092	1092	0%
Heating	3329	3329	18%
Cooling	329	329	12%
Ancillary	1891	1891	25%
Total	8711	7992	18%

The lighting correction was calculated based on average lighting intensity data from the Atlantic region from the OEE

Finally, we took into account the fuel mix for each end-use to calculate the average electrical savings coming from the new NECB, with essentially 100% electricity for all end-uses aside from space heating, which was estimated at 5% based on OEE data for the Atlantic region. The final electrical savings are estimated at 11.7%.

Gross standard savings

Similarly to the residential sector, provincial code staff expect the compliance rate for non-residential new construction to be significant. DEC has assumed a compliance rate starting at 75% in the first year and rising to 85% after 5 years.

Net standard savings

Federal and provincial governments have committed to a LEED-silver rating for their new construction, and thus this sector of the market would have met or exceeded the expected energy performance improvements built into the 2011 NECB. Similarly, LEED ratings and other 'green' building certifications are becoming more popular in the non-residential market. Based on these factors, we have assumed a normally occurring market adoption of 10%.

GENERAL PURPOSE LIGHTING

The new federal requirements for general purpose lighting will provide a reduction of energy consumption in the range of 25 to 30% based on lamp wattage.

Potential standard savings

To assess the number of bulbs potentially affected by the new regulation, we relied on NS Power Inc.'s 2009 Panel Energy Usage Study, which reported the number of bulbs per household, either incandescent or CFL.

Since the new standard does not apply to specialty-type bulbs, the assumed bulb potential was reduced, assuming that the CFLs currently installed in houses replaced non-specialty bulbs, in essence greatly reducing the number of potential bulbs.

The non-residential potential was not estimated, based on a study conducted by the DOE which concluded that the amount of remaining inefficient bulbs in the C&I sector is marginal compared to the residential sector.

$$\text{Potential bulbs} = \text{Total bulbs} * \text{non_specialty ratio} - \text{CFLs}$$

Where the non-specialty ratio is assumed to be 30%.

To evaluate the electric savings, the bulb's location (indoor or outdoor) was taken into account, as well as the space heating fuel, to account for negative interactive effect on electric space heating.

Additionally, based on a recent potential study in another jurisdiction, we have assumed an average daily usage of 1.94 hours/day. This is conservative compared to other jurisdictions that often use 2.3 or 2.4 hours/day.

Gross and net standard savings

Since energy savings come from a product energy regulation, we have assumed full compliance.

Evidence from other jurisdictions indicates that the market is close to saturation for CFLs, so we assumed a normally occurring market adoption of 0%.

Yearly net savings

The yearly savings coming from the general purpose lighting regulation is heavily dependent on the replacement rate of the bulbs, and cannot be calculated based on the average bulb savings. We used a distribution curve of daily usage to evaluate the replacement rate of different bulbs, and accounted for those replacement rates in the yearly savings calculations. We also assumed a 3 month lag between the regulation coming into effect and existing stocks of incandescent bulbs being depleted from the market.

LINEAR FLUORESCENT LIGHTING

Nova Scotia Power Inc. has successfully delivered the Smart Lighting Choices program, which in essence target the same market as the desired new standards on high-performance T8 lighting. NSPI estimates that this program has achieved 80% market penetration, although overall data on the market is not available.

Potential savings

Since the Smart Lighting Choices program essentially has the same impact as the proposed regulation, potential savings are based on the program results for 2010, corrected to account for a market penetration of 100%.

Gross and net standard savings

Since the energy savings originate from a product standard, we have assumed full compliance to the new standard.

Additionally, NSPI has calculated the energy savings from a transition from regular T8 to high performance T8, which in their evaluation eliminates the need to consider free-ridership in the program savings calculation. In line with this methodology, we have assumed a naturally occurring market adoption of 0%.

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Request IR-7:

With respect to page 15, line 17, please provide the basis for concluding that the industrial projects “were not included in the 2009 IRP Update” and reconcile it to the statement in Note 13 that “All DSM is assumed to be included in the projection used in the 2009 IRP”.

Response IR-7:

In the 2009 IRP Update the DSM projection was understood to include all initiatives that would result in energy and/or demand savings and was not prescriptive. NSPI has confirmed to ENSC that the pre-DSM load forecast for the 2009 IRP Update did not include any specific demand or energy reductions associated with efficiency projects from the Extra-Large-Industrial class of customers.

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Request IR-8:

With respect to page 15, lines 19 – 23,

a) Please provide the “preliminary investigation” provided to ENSC by a third-party specialist.

b) Please provide the qualifications of the third-party specialist to complete this work.

Response IR-8:

a) Please refer to Attachment 1.

b) Please refer to Attachment 1.

Review of energy efficiency projects at New Page – Port Hawkesbury

for Efficiency Nova Scotia Corporation

Prepared by Tom Ryan .ing

21/03/2011

New Page Port Hawkesbury Preliminary Energy Demand and Consumption Review

Executive Summary:

In early February, 2011 Efficiency Nova Scotia Corporation (ENSC) requested that Energy Performance Services (EPS/Canada) Inc. (EPS) conduct a preliminary review of information submitted by 2 industrial facilities: New Page Port Hawkesbury Ltd. (NPPH) and Bowater Mersey Paper Company Ltd. (“the ELI Facilities”) regarding actual and planned energy efficiency projects which might contribute towards the energy efficiency and demand reduction objectives of ENSC. Based on preliminary information and time constraints, EPS decided to focus exclusively on assessing the projects submitted by NPPH.

EPS’s findings are based on information supplied by NPPH. The time allocated for analysis was brief and hence an in-depth evaluation was not undertaken. While the findings herein are not based on an exhaustive examination of mill operating data, in our opinion the preliminary information provided by the company is reasonable and our analysis found their claims to be credible. A summary of the original list of projects submitted by NPPH and revised estimates is found in **Table-2**. Additionally, evidence of improvement in energy efficiency is compelling as shown in **Table-1** (next page), where NPPH is producing higher production following implementation of the energy efficiency projects while using substantially less energy. The quantity of energy savings represented by NPPH as being the result of energy efficiency improvements is reasonable technologically and is in line with the substantial reductions in the *Customer Base Load (CBL)* achieved over the last several years (see **Table-1** on next page CNL History).

Improvements to the energy efficiency of the refining systems account for the majority of the efficiency gains. Tom Ryan was engaged to undertake the evaluation of the improvements and claimed energy savings. A bio of Mr. Ryan is found in **Appendix-1**. Mr. Ryan has specific experience with design, supply and installation of refining technology and with evaluation, implementation and measurement of savings from energy savings technologies. Each project is discussed in the body of the report in **Section-1**. In **Section-2**, we examine plant demand around the time of the winter monthly NSPI system peak and compare post-project versus pre-project conditions to determine if the implementation of these projects resulted in comparable efficiency gains (and resulting demand reductions) through these peak events.

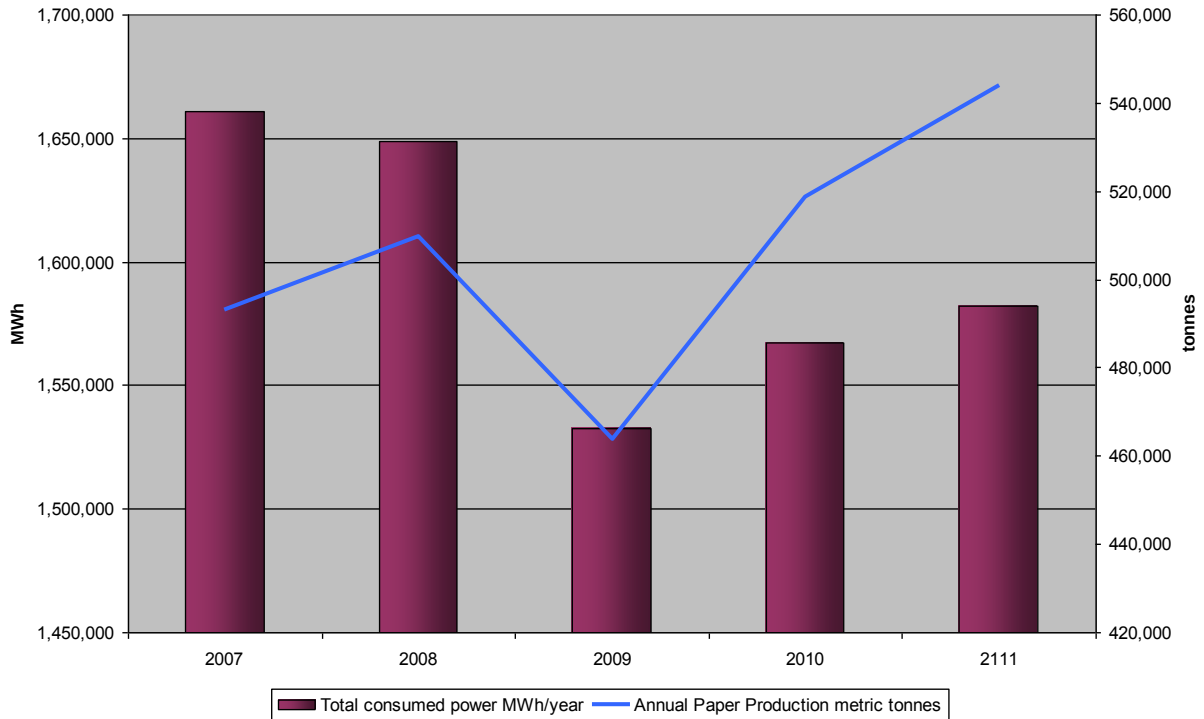
To complete a greater level of validation for these and future projects, ENSC and/or evaluation and verification consultants will need to obtain more comprehensive data from NPPH and apply a more formalized Measurement & Verification (M&V) process to be established with the ELI class.

Table-1 General production & energy consumption data & CBL History

In order to provide context, the annual paper production and power consumption as provided by NPPH are shown in the figure below. While production has been on an

upward trend, total consumption and Customer Base Load (CBL) have been decreasing quite significantly. Comparison of pre-project (2008) production and energy figures with post project (2010) shows an ability to produce substantially more production (blue line) with less power (purple bars);

NPPH Annual Production & Power Consumption



CBL History



Year	CBL
2007	203
2008	197
2009	193
2010	185
2011	174.5

The following summary table (**Table-2**) lists both demand and energy consumption savings for a number of key energy efficiency projects that have been implemented by NPPH since mid 2009. The table has the original estimates that were provided by NPPH to ENSC and revised estimates based on a review of project data by EPS.

Table-2

#	Project Title	Year started	Initial savings estimates provided to ENSC by NPPH		Revised estimate based on projects review		Comments
			GWh	MW	GWh	MW	
1	Upgrade Line 1 Refiner	2010	63.00	7	74.00	8.5	Startup June 30, 2010. Because of capacity increase and specific energy decrease, production mix from 3 lines is affected.
2	Optimize Line 3 Production	Mid 2009	15.60	2	9.80	1.1	Has been reduced since there is an overlap with savings reported in Line 1 refiner upgrade project. Savings shown are from mid 2009 to end of 2010.
1/2b	Increase pulp freeness	-	23.40	3	0.00	0.0	Any claimed savings for this project have been dropped. There was some overlap with the other refining projects listed above.
3	Optimize Rejects Screening	Sep 09-Jun 11	7.00	1	16.80	2.0	Savings come from reduced recirculation to reject refiners. Most of the work is completed.
4	Bypass Noss Cleaners	Feb-Sep 2011	15.12	1.8	11.30	1.35	Initial trials done with the support of Paprican are showing that the Noss cleaner system can be bypassed entirely while maintaining paper quality. Expected number is discounted by 25% due to some uncertainty.

#	Project Title	Year started	Initial savings estimates provided to ENSC by NPPH		Revised estimate based on projects review		Comments
5	PM2 Vacuum Blower Power Reduction+ other PM2 improvements	Late 2009	8.40	1.0	12.60	1.5	Conservative estimate. Blower alone produced at least 1.2 MW in savings. Overall PM2 load reduction at transformer from late 2009 to end of 2010 is 1.5-2.0 MW
6	Reduce PM 2 Chiller Operation	2010	4.20	0.5	0.00	0.0	Captured in other PM2 improvements (5) above. Chiller project alone generated 0.09 MW & 0.8 GWh of reductions.
7	Eliminate PM1 Disc Filter Pump	??	0.27	0.03	0.00	0.0	Represents 0.2% of savings, within the margin of error of aggregate estimate. Discounted.
8	Automate Stahl Controls	2011	4.25	0.5	0.00	0.0	Uncertainty on project timing & operability. Discounted.
	TOTAL		141.24	16.83	124.50	14.45	

Section-1:**1- Line 1 secondary refiner replacement**

The most significant energy project done by NPPH in 2010 involved making significant changes to one of its three refining lines. Prior to the changes, the mill had three refining lines with the following capacities:

Line 1 – Andritz Twin-66 Primary & Secondary refiners + SB170 Tertiary refiner, 400-450 ADMT/d capacity

Line 2 – Andritz Twin-66 Primary & Secondary refiners + SB170 Tertiary refiner, 400-450 ADMT/d capacity

Line 3 – Metsa CD refiners, 700-750 ADMT/d capacity

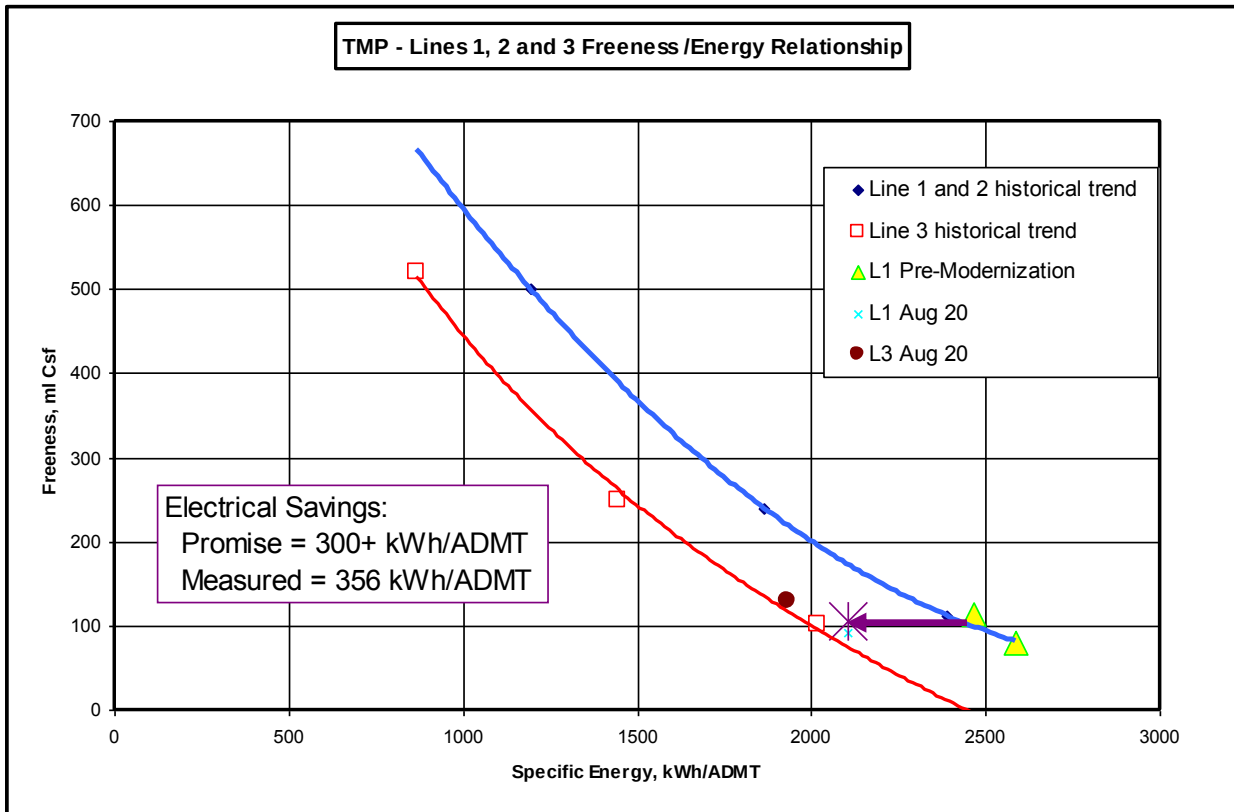
Line 3 was able to produce substantially more production than either line 1 or line 2, and at significantly (16-19%) lower energy consumption.

The energy efficiency project involved replacing the Twin-66 secondary refiner on line 1 with a CD-82 refiner. This has had two major consequences:

- *Line 1 capacity increased to approximately 600 ADMT/d*
- *Specific energy was reduced very significantly (14-15%)*

According to NPPH, the project did not create any significant changes in energy required by other unit operations.

The following graph illustrates specific energy versus Freeness. Freeness (which indicates how quickly free water drains through a mat of pulp fibre - with a low number indicating more highly refined pulp) is a measure of how “refined” pulp is and the plant aims to produce pulp at approximately 100-130 ml CSF at the exit of the tertiary refiners. While there is inherent variability in the specific energy versus freeness curve, lines 1 and 2 were requiring on average approximately 2450 kWh/ADMT before the project, while line 3 was producing pulp at approximately 2000 kWh/ADMT. The purpose of the project was to make line 1 emulate line 3 to the extent possible while only changing the secondary refiner in order to limit capital expenditures. The project was very successful in that it enabled reduced specific energy to approximately 2100 kWh/ADMT, based on a series of tests done since the new secondary refiner was commissioned on June 30, 2010.



	Before the project	After the project
Line 1	420 ADMT/d * 330 d = 138,600 t	600 ADMT/d * 340 d = 204,000 t
Line 2	420 ADMT/d * 330 d = 138,600 t	420 ADMT/d * 158 d = 66,400 t
Line 3	700 ADMT/d * 340 d = 238,000 t	720 ADMT/d * 340 d = 244,800 t
Total	515,200 ADMT/y of pulp	515,200 ADMT/y of pulp

While paper production has varied between 460,000 and 520,000 tonnes per year since 2007, we will use 500,000 tonnes per year as a basis of comparison. Since a tonne of TMP pulp yields approximately 97 tonnes of paper, we need :

$$500,000 \text{ tonnes /y} * 1/97 = 515,464 \text{ ADMT/d of pulp on average}$$

A constant paper production basis to compare the before and after situation. Based on preliminary discussions with NPPH, the following approximation for pulp production per TMP line was developed:

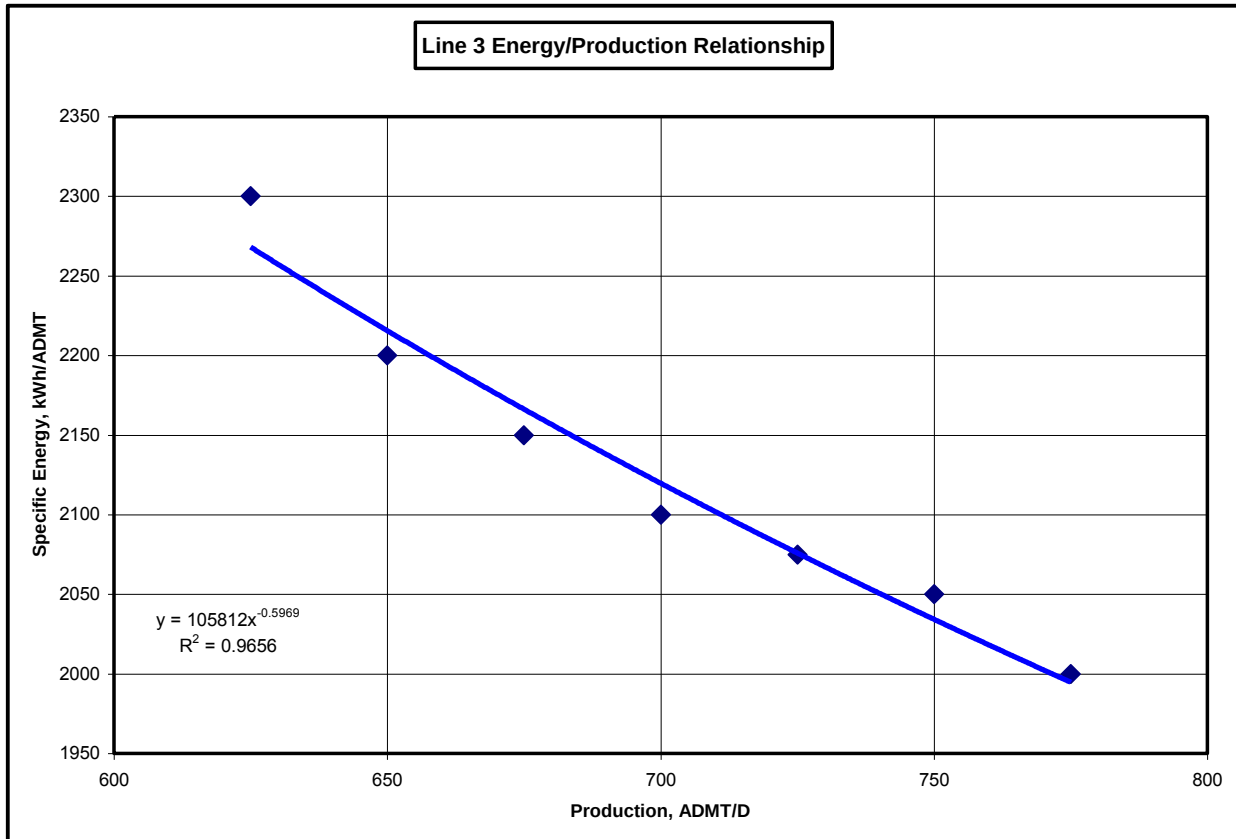
Mainline refiner demand and consumption:

	Before the project (3 lines running)	After the project (3 lines running)	After the project (Lines 1 & 3 running)	Reduction
Mainline Refiner Demand (MW)	144.1	155.4	112.5	
Average load (MW) (365 days)	131.9	123.4		8.5
Mainline Refiner consumption (GWh/yr)	1155	1081		74

2- Line 3 optimization (freeness increase/production increase/specific energy reduction)

According to the TMP Operations Manager, NPPH has been working to consistently reduce specific energy in line 3 by producing pulp at higher freeness. The expectation is to reduce specific energy by approximately 80 kWh/ADMT in 2011, in conjunction with increased line 3 production. In order to avoid double counting, we suggest using a more modest 40 kWh/ADMT. See Table-3 entitled Energy/Production Relationship below for an illustration of this.

Table-3



If we assume an unchanged total annual production on line 3 of 244,800 ADMT, 40 kWh/ADMT would translate into 9.8 GWh of annual savings. This would lead to an annual average load reduction of 1.1 MW.

1/2b- Increase Pulp freeness

As this process has been ongoing for several years, some of the benefit has likely been captured in the calculations provided above. In order to avoid double counting and since the "Increase pulp freeness" project that had been identified earlier overlaps the above two projects, any claimed savings for this project have been dropped.

3- **Optimize Rejects Screening**

The mill has been working on the refined rejects secondary screens, shown circled in red on the *Review of TMP Unit Processes* flowsheet on the following page to reduce the mass reject rate in order to reduce the amount of pulp that recirculates through the reject refiners. This reduces the absolute feed rate to the reject refiners. In order to do this project, they have proceeded in several steps.

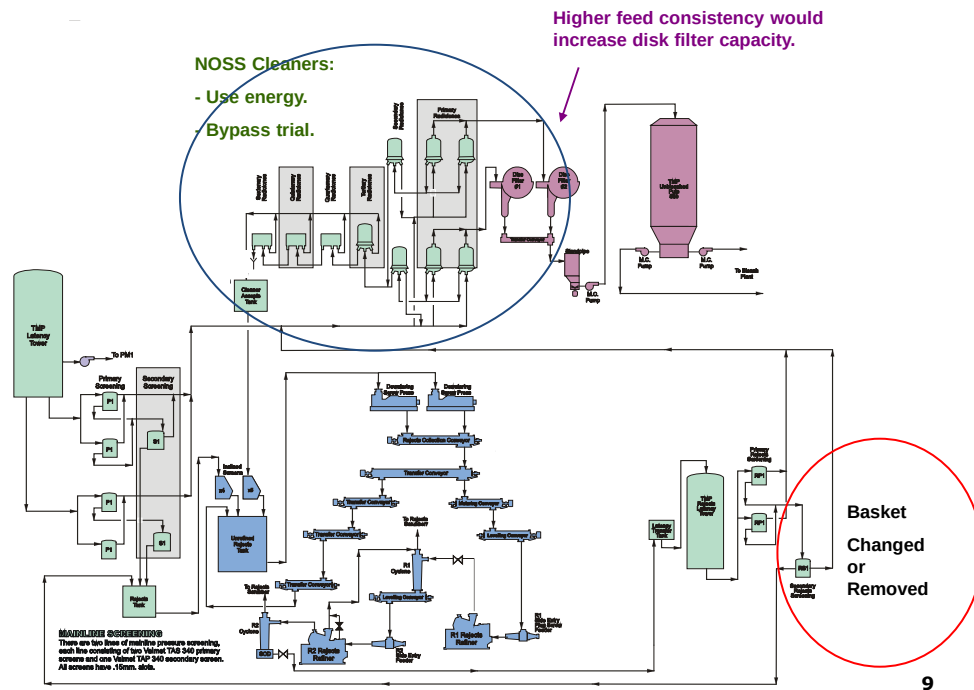
- 1- Fall 2009: Replace the existing 0.15 mm slotted secondary screen basket with a coarser 0.18 mm basket This effort has reduced the run-around from 120 ADMT/D to about 80 ADMT/D.
- 2- Spring 2010: Replace 0.18 mm slotted screen basket with an even coarser 0.25 mm basket
- 3- Spring 2011: Remove screen baskets altogether (may generate savings not yet quantified).

There are two methods of estimating the effect of this project:

- 1- Since the recirculation rate is reduced by 40 ADMT/d and rejects specific energy is 1200 kWh/ADMT, demand reduction would be $1200 \text{ kWh/ADMT} \times 40 \text{ ADMT/d} \times 1 \text{ d/24 h} = 2.0 \text{ MW}$
- 2- On a total rejects basis, demand reduction is estimated to be $100 \text{ kWh/ADMT} \times 500 \text{ ADMT/d} \times 1 \text{ d/24 h} = 2.08 \text{ MW}$

We have used the lower of these two estimates.

Review of TMP Unit Processes



9

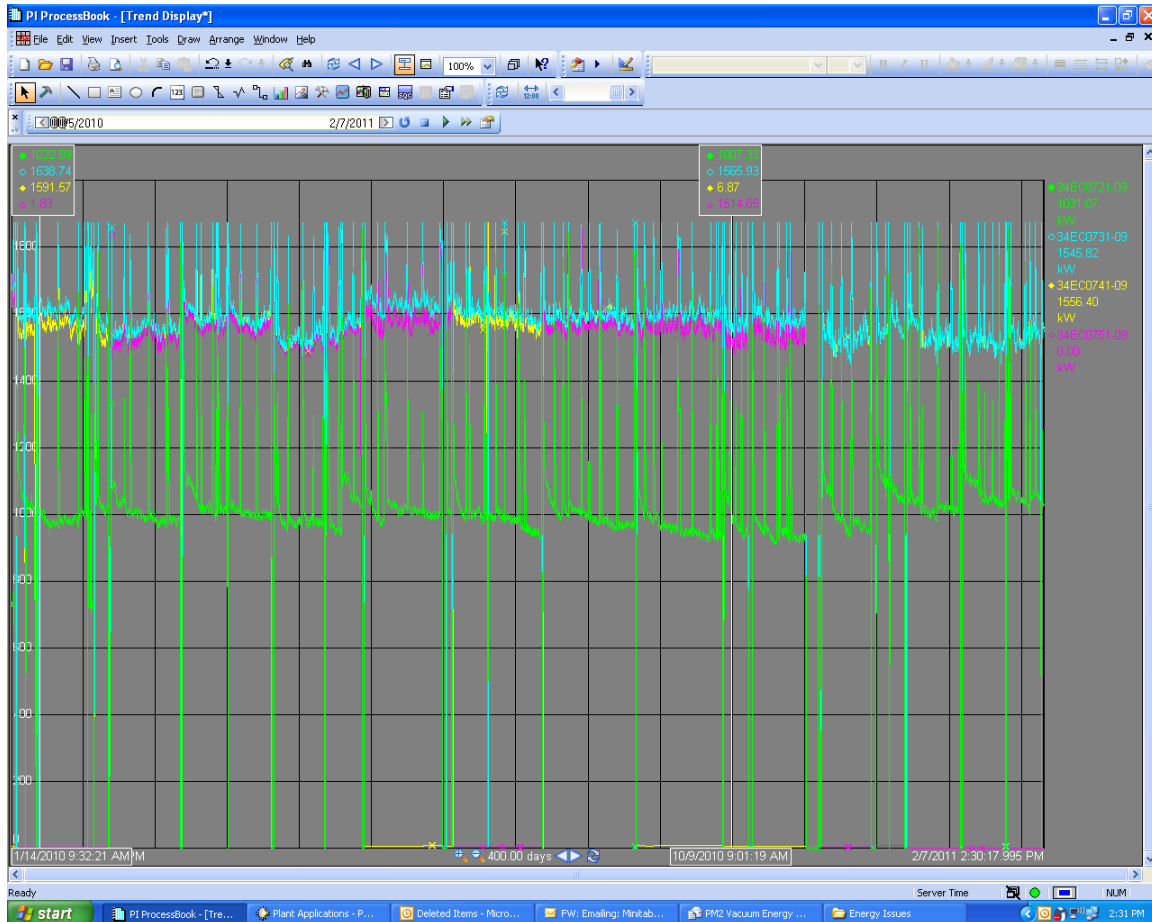
4- Bypass Noss Cleaners

Initial trials done with the support of Paprican are showing that the Noss cleaner system shown circled in blue on the *Review of TMP Unit Processes* flowsheet above, can be bypassed entirely while maintaining paper quality. Cleaners require pulp to be passed through hydrocyclones at low consistency (high water content). This requires a very large amount of pumping energy. Bypassing the cleaners will eliminate the need for approximately 1.8 MW of pumping energy. It will also reduce the load on the TMP plant disc filters because less water will need to be removed, though the disc filter load reduction is not factored into the savings calculation for the purposes of this evaluation. Paper machines also have cleaners, so in effect there is duplication built into the overall plant's operations.

Project completion is expected between May and September 2011. Removing the cleaners would reduce plant load by approximately 1.8 MW. The expected number is discounted by 25% due to some uncertainty.

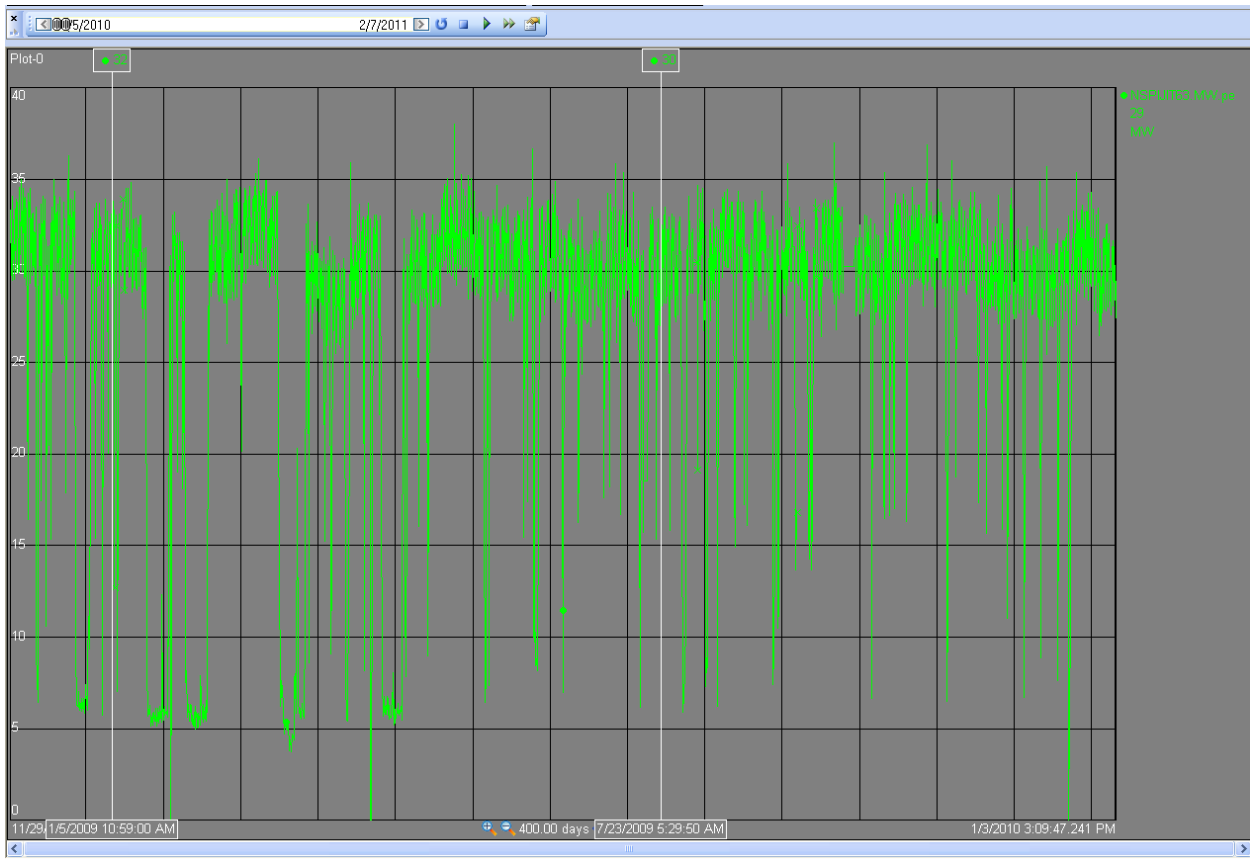
5- PM2 vacuum blower power reduction

One of 4 blowers was shut down on PM2 vacuum system in the fall of 2010 and significant changes were made to the suction system. The Vacuum Blower power reduction conservatively produced approximately 1.2 MW in savings on its own. The graph below show plots for the 4 blower loads. The blower that was shut down was running at about 1.55 MW. There was a modest increase in the combined load of the 3 remaining blowers.



Various other actions on PM2 have amounted to a total PM2 Line reduction of 1.5-2 MW (including the vacuum blower power reduction project) seen in from late 2009 through 2010. Trends for T63, the transformer feeding all of the PM2 Line, are included below. The savings items include:

1. Drive load reduction on motors which turn the forming and press sections rolls. This is a direct side effect of the vacuum reduction, but it is not captured under the vacuum blower motor load trends.
2. LED lighting installations.
3. VFD drive on Couch Pit Pump.
4. Auto shut-off switches in many hydraulics and ventilation rooms.



6- Reduce PM 2 Chiller Operation

The project was done to allow two of three chillers to run at any given time, rather than have all three running continuously. Based on NPPH's post project analysis, savings were lower than anticipated, since the two remaining units work more to compensate for stopping the third unit. Changes were done in January 2010. Savings are 92 kW and 0.80 GWh. This project is captured in the savings under project 5 shown above so is not counted again in the savings total reported here.

7- Eliminate PM1 Disc Filter Pump

This project was completed at least 24 months ago (which may disqualify it from counting towards the eligible savings calculation) and generated savings that represents about 0.2% of the reported total. Since this amount is within the margin of error of the aggregate estimate, it has not been included in the totals.

8- Automate Stahl Turbine Controls

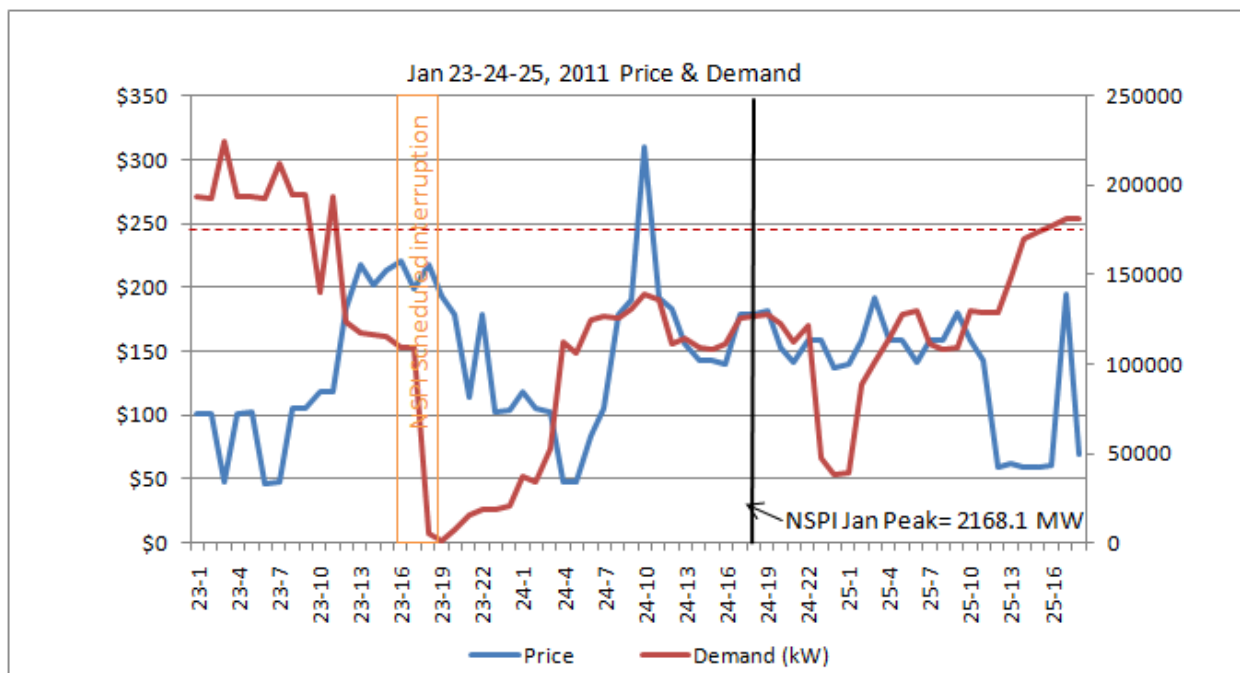
This project has not yet been implemented. Since there is significant uncertainty with respect to the project schedule and there are several concerns pertaining to system operability, the project's savings have been excluded from this report.

Section-2: Efficiency gains and resultant demand reductions during winter NSPI system peaks

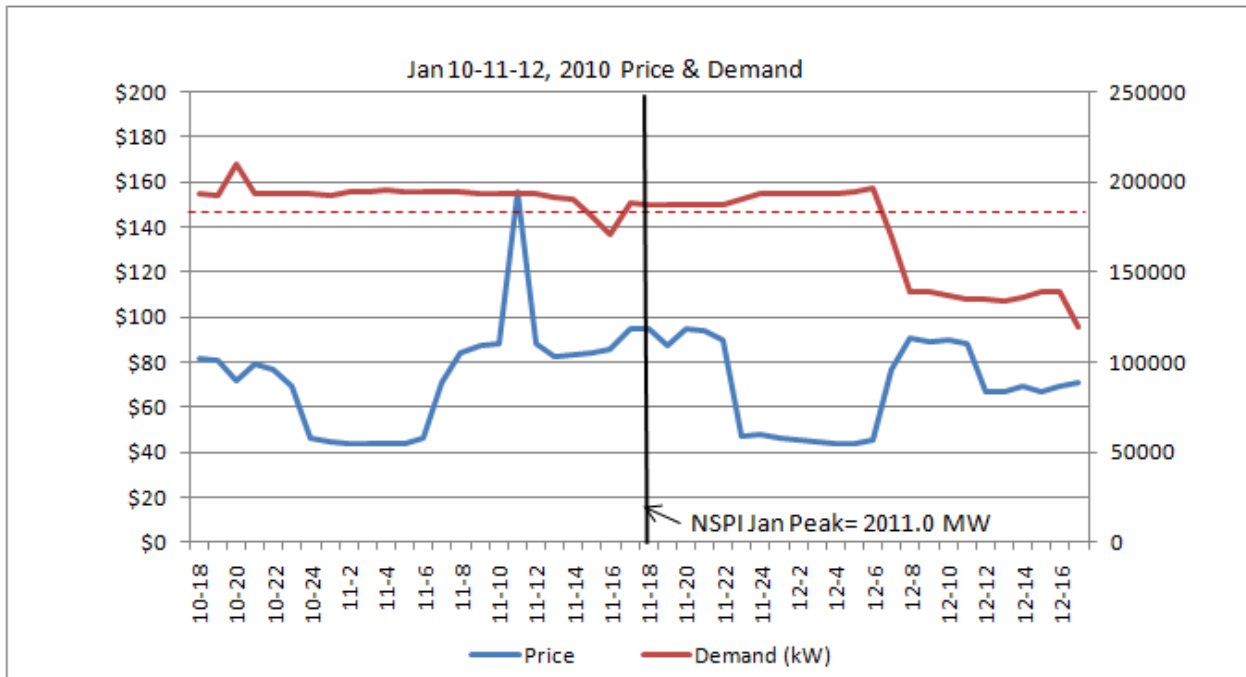
At ENSC's request, we have examined plant demand around the time of the winter monthly NSPI system peak and compared post-project vs. pre-project conditions to determine if the implementation of these projects resulted in comparable efficiency gains (and resulting demand reductions) through these peak events.

In the figures below, we examine plant demand and hourly price data near the time of the system peak. As Nova Scotia's annual system peaks almost always occur during the winter months and demand management capability tends to be far more critical during the winter months, we obtained detailed billing data for one winter month since the key project (Line 1 refiner upgrade) has been implemented and three winter months prior to implementation to see if we could detect any trends in comparing pre- and post-project conditions. We have graphed the both plant demand and the hourly price that was being quoted to the plant for the 24 hours on either side of the monthly NSPI system peak demand.

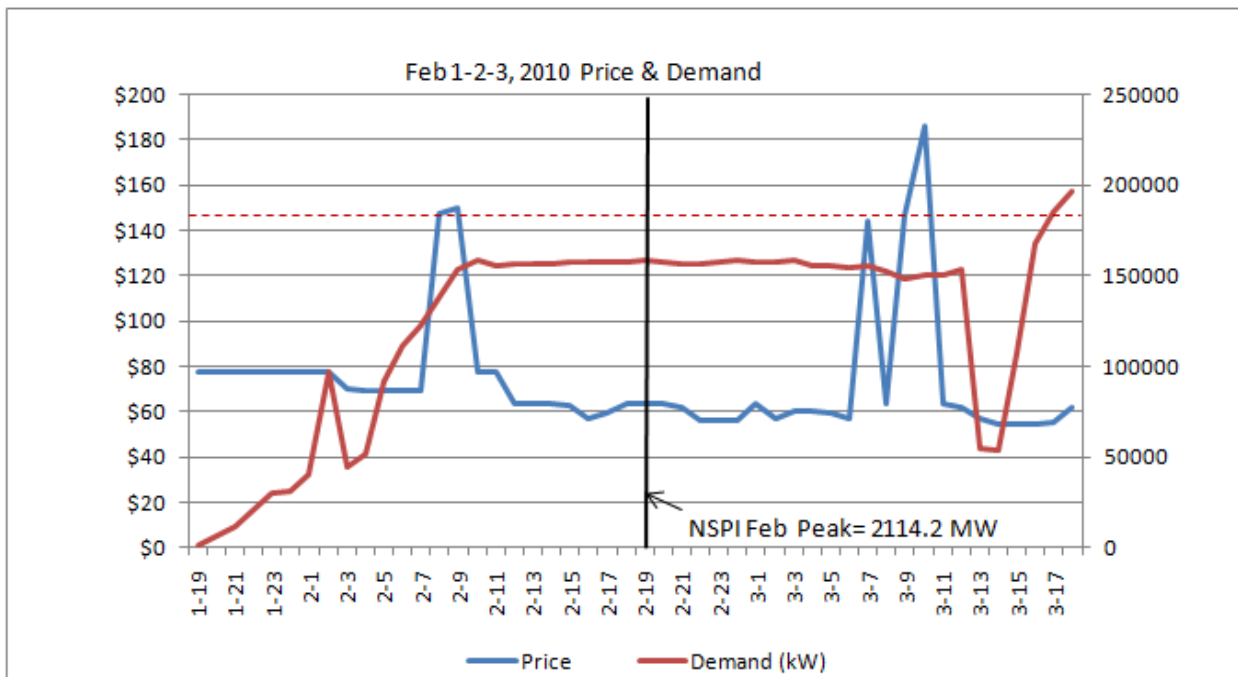
In the post-project case, we have data for the month of January 2011. We have chosen to add several hours at the start of the graph because the plant had a NSPI scheduled interruption approximately 24 hours prior to the peak. Note that after the initial ramp up from the shutdown condition, the plant kept its demand well below the CBL until well after the system peak had passed.



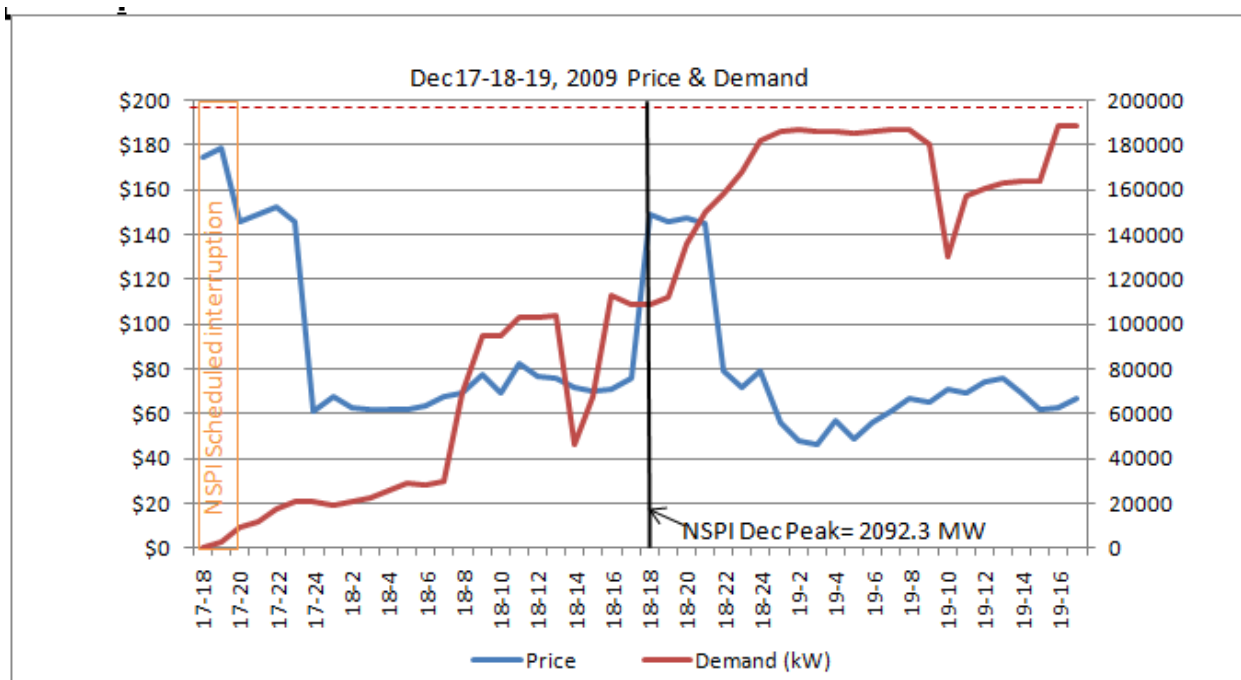
If we compare the post-project condition to the January 2010 peak as shown below, there is very little evidence that NPPH made any adjustment to its demand, which remained above the CBL despite a significant price spike prior to the system peak.



In February 2010, there was a plant shutdown about 24 hours prior to the system peak. Once consumption stabilized upon restarting the plant, it remained very stable below the CBL, despite significant price peaks about 10-12 hours before and 12-18 hours after the system peak.



In December 2009, the plant was also subject to an NSPI scheduled interruption about 24 hours prior to the system peak. Once the plant was restarted, demand rose fairly steadily through the system peak despite a significant price spike.



The following table compares average and peak NPPH consumption for the 24 hour periods (12 hours on either side) surrounding the NSPI system peak as graphed for the 4 periods above.

Sample	Date & Time of NSPI peak	NSPI peak (MW)	24 hr period, +/-12 hrs from peak		NPPH CBL (MW)
			NPPH avg. (MW)	NPPH peak (MW)	
Post-project	Jan 24, 2011, 18:00	2168.1	109.9	138.8	174.5
Pre-project 1	Feb 2, 2010, 19:00	2114.2	156.1	158.7	185.0
Pre-project 2	Jan 11, 2010, 18:00	2011.0	190.4	196.4	185.0
Pre-project 3	Dec 18, 2009, 18:00	2092.3	127.7	186.7	193.0

Both the average and peak consumption were much lower for the post-project data set, with even the peak consumption significantly below NPPH's customer base load. For all of the pre-project data sets, average and peak consumption were significantly higher. This is good evidence that the projects resulted in substantially better overall energy efficiency through monthly system peaks. It is recommended that a few more months of

post-project winter peak data be examined to improve the confidence level of these observations. At the time the data for his report were compiled, this information was not yet available.

Appendix 1: Qualifications of Mr. Tom Ryan

Mr. Tom Ryan is a mechanical engineer with over 22 years experience in industrial energy efficiency, the design of pulp & paper mill facilities and the commercialization of renewable energy technologies. He combines strong technical depth in pulp & paper technologies with specialization in thermo-mechanical pulping (TMP) with an extensive knowledge of energy efficiency technologies and demonstration of energy efficiency savings. He has held positions in proposal development, project management and regional operations management for the Norwegian conglomerate Kvaerner and its subsidiary Hymac (delivery of TMP and other system to pulp & paper clients) as well as serving as a Project Engineer for an Australian forest products company Wesfarmers. Having spent the first three years of his career as an applications engineer designing mechanical pulp mills and the following four years as a project manager for the construction of mechanical pulp mills, he has a very solid understanding of pulp & paper processes and the energy aspects related to their operation.

Mr. Ryan is the co-founder of SyENERGY Integrated Energy Solutions, where he has full responsibility for all technical aspects of the company's operations. Syenergy specializes in delivery of energy efficiency technologies to wood producers as well as development of a solar thermal air pre-heating technology.

Mr. Ryan is a leading expert in environmental, economic and social performance metrics and pollution prevention. He had a key role in the development and deployment of the Enviroclub initiative, working closely with three federal government agencies (Environment Canada, Canada Economic Development for Quebec Regions and National Research Council Canada - Industrial Research Assistance Program) to assist manufacturing companies in the implementation of eco-efficiency projects. Mr. Ryan has extensive experience leading feasibility studies and managing projects in partnership with industry, equipment suppliers, construction companies, engineering firms and government bodies from many countries.

Appendix 2: Statement of Qualifications for Energy Performance Services (EPS/Canada) Inc.

Energy Performances Services (EPS/Canada) Inc. (“EPS”) incorporated in 1992 is a Canadian company that specializes in industrial energy efficiency. EPS has been providing consulting to public and private sector organizations related to energy efficiency projects, market development and energy efficiency programming for over 19 years. Example clients include:

- | | |
|---|--------------------------|
| • Efficiency New Brunswick | • 3M Canada |
| • Office of Energy Efficiency
(Gov. of Canada) | • Dominion Textile |
| • Efficiency Nova Scotia | • Manitoba Rolling Mills |
| • Enbridge | • Yukon Electric Company |
| • The World Bank | • Lake Erie Steel |
| | • Peerless Carpets |

Representative projects of EPS Canada include:

3M Canada

EPS is currently leading the joint US/Canadian Global Superior Energy Performance (ISO 50001) Pilot at 3M Brockville which aims to assist 3M Canada over a 1-year period in establishing all of the elements required to comply with the new ISO 50001 Energy Management Standard and to demonstrate intensity reductions from energy efficiency projects. This pilot is part of the release of the new International energy management standard in 2011.

Efficiency New Brunswick

EPS has been directly involved with the Efficiency NB ***large industry program*** for the last 3.5 years since initial design in the fall of 2007, through delivery starting January 2008 and continuing to present. Under this program, Mr. Bassett of EPS has worked with the largest 30 plants in the province to develop, implement and measure energy savings from energy efficiency projects. To date, over \$100 million of energy efficiency projects have been evaluated and are in implementation involving technologies for electricity and fuel savings. In particular, Mr. Bassett has worked directly with the large forest sector facilities in the pulp & paper sector to identify, implement and evaluate energy efficiency projects.

Greenhouse Gas Emission Reduction in Brazilian Industry (GERBI)

EPS assisted Marbek a sub-consultant to the GERBI project in Brazil over a 3-year period to specifically develop energy efficiency projects in Brazilian heavy industry. EPS assisted with the engagement of industry and development of specific projects as well as training of the emerging service sector. A photo of an example project to recover waste

heat from a ceramic kiln for re-use in a process dryer that was constructed by one of the industries is shown below:



Canadian Initiative for International Technology Transfer (CIITT)

-Performance Contract Development for Dry-Rex Dryer

EPS led a team to develop & deliver an energy efficiency project using a renewable fuel waste heat dryer (Dry-Rex system) at a paper mill in Columbia. The project involved reducing the amount of coal being burned for steam generation by increasing the efficiency of bagasse-fired boilers using a waste heat dryer

Government of Canada- CDM and JI Office

-Project Design Documents for 11 Small-scale Energy Efficiency Projects in India

EPS produced 11 Project Design Documents (PDD's) (in accordance with UNFCCC Kyoto Protocol requirements under the Clean Development Mechanism), for carbon credit certification of small-scale energy efficiency projects developed and implemented by an Thermax EPS in Asia. The work involved completion of baselines, monitoring methodologies, calculations and all components of the PDD's required to submit the projects for validation and eventual certification.

World Bank-Energy Efficiency Market Development-Vietnam

EPS provided energy efficiency market development consulting to the World Bank for a 4-year Global Environment Fund (GEF) sponsored program to address climate change through development of sustainable business models and mechanisms to support energy efficiency (EE) service company development in Vietnam.

Development of Industrial ESCO market in India.

Over a 5-year period, EPS Canada was responsible for a joint venture company in India Thermax EPS. The company grew to a full-time staff of 25 and developed/financed and developed & constructed energy efficiency projects in textile, chemical, glass and paper industries. Examples provided below:



New steam & power generation system in a paper mill

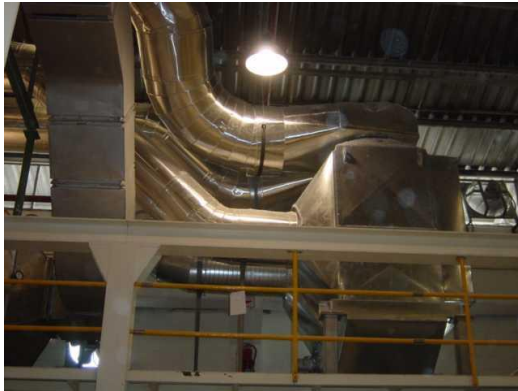


Installation of a triple effect evaporator system at a textile mill in Bombay, India to recover caustic soda chemicals from the wastewater effluent. This resulted in a reduction of 40% of the mills requirement for caustic soda purchases.

Development of Industrial ESCO Market in Thailand:

EPS formed a joint venture in Thailand and was selected as a winning bidder to participate in the *Pilot Industrial ESCO Demonstration Program* sponsored by the World Bank and the Electricity Generating Authority of Thailand (EGAT). EPS led a local team to sign an agreement with a tissue paper company (Kimberly Clarke-Thailand), conduct preliminary and detailed energy audits and construct heat recovery systems on the hoods of the 2 paper machines as well as a new control system on the waste-water treatment system. Photos of the projects are shown below:

EPS



Installation of economizers



Installation of “dissolved oxygen” measurement system control device leading to increased energy efficiency.

Development of Industrial Canadian Energy Efficiency Market:

EPS Canada has developed and installed industrial energy efficiency projects facilities in Canada. Example projects include:

EPS



Installation of a new fluid hydraulic coupling on a 3500 hp fume emission control fan.
This project involved retrofit of a 3500 hp fan system resulting in savings of 900 kW on a continuous basis.

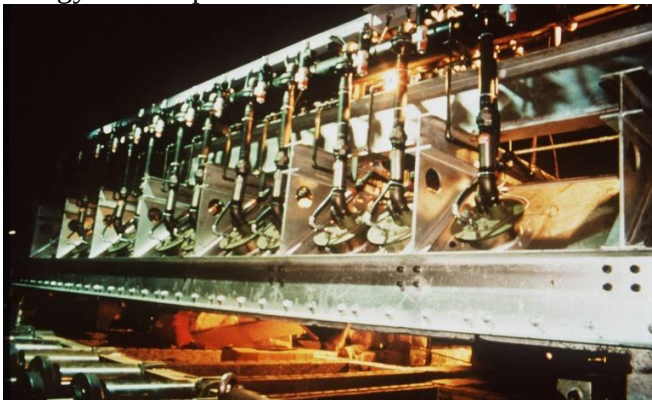


EPS installed this new high efficiency fan impeller on a 3000 hp fan on a blast furnace at an integrated steel plant. The new impeller resulted in a 700 kW reduction in electrical demand at the plant.

EPS



EPS designed and installed a hinged lid system for 200 tonne liquid steel ladles in a basic oxygen furnace melt-shop. The hinged system resulted in a 40% decrease in natural gas energy consumption.



EPS designed and installed a new furnace pre-heater at a steel rolling mill. The pre-heater increased the co-efficient of heat transfer into the steel by four times.

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Request IR-9:

With respect to page 16, line 25, please provide the basis on which ENSC concludes that “Both of these changes are incremental to the electrical load forecast in the 2009 IRP Update”.

Response IR-9:

Discussions with Nova Scotia Power Inc. have confirmed that the IRP model for the residential energy consumption forecast is an econometric model that does not generally account for individual measures or initiatives.

Discussions with the Office of Energy Efficiency have also confirmed that past federal standards were largely aimed at securing new baselines, i.e. requiring the remaining “laggards” to adopt more efficient technologies that large majorities had already adopted. In comparison, Nova Scotia’s new provincial building code and the new federal standard for general-service lamps are expected to drive substantial increases in energy efficiency above current adoption rates.

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Request IR-10:

With respect to page 17, lines 23 – 25,

- a) Please provide examples of measures which may fail the TRC test but potentially provides strategic or long term benefits.**
- b) Please discuss why the strategic or long term benefits can not be expressed as energy savings and included in the TRC calculation.**

Response IR-10:

a) Please refer to NPB IR-3b; see Tables 5 through 8 and 12 through 16.

b) Some of the measures listed in these tables fail the TRC test. In some instances, the strategic or long-term benefits, such as stimulating demand through market development for newer technologies to achieve economies of scale and take advantage of experience curve effects, are not easily expressed as energy savings and are not included in the TRC calculation.

As volume grows for a measure, it is expected that prices will decline. It is also expected that retailers, contractors and trade allies will become more familiar with the measures, and their installation and operation and will, therefore, be more willing to recommend the measures to customers. Without this market development, demand for these measures would likely not develop in Nova Scotia to the same extent. Another example of a strategic and long term benefit is building a conservation culture among customers through simple actions, such as purchasing LED holiday lights, which establish and reinforce commitment towards energy efficient decisions and behaviour.

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1 ENSC has not expressed the strategic or long-term benefits of these measures as
2 monetary savings in the 2012 DSM Plan TRC calculations since these benefits are not
3 easily quantified. This is similar to some Enabling Strategies, such as training,
4 development and research, and education, which are understood to provide benefits in the
5 short- and/or long-term, without quantified energy savings.

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Request IR-11:

With respect to page 18, line 1, please confirm that

a) The only mathematical difference between the TRC and the PAC is the exclusion of participant's costs in the denominators used to calculate them,

b) For 2012, the DSM plan was assessed economically using the TRC, with the PAC provided as information only.

Response IR-11:

a) Confirmed.

b) Confirmed.

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Request IR-12:

With respect to page 18, lines 23 – 25,

a) Please elaborate on the modified approach to free ridership and spill over used in the evaluation of 2010 DSM programs, with particular focus on how it is an improvement over the approach used in 2009.

b) Please provide the estimated free rider and spill over numbers for each 2010 program and discuss any implications of those results for program design (e.g. low free ridership would suggest the program is appropriately designed, whereas high free ridership may suggest a need for changes in program design. Alternatively, high free ridership could indicate that market transformation is being achieved and needs to be locked in.)

c) Please discuss areas of the free ridership and spill over approach that ENSC believes warrant further refinement.

Response IR-12:

a) For 2010, the evaluation contractor (NMR) revised the free ridership questions and mirrored the free ridership calculations developed for the Energy Trust of Oregon (ETO) by Research into Action.

Timing: In 2010 customers were contacted sooner after they participated in a given program. Recall is likely to diminish over time and events and may impact customers' responses regarding their actions in the absence of the program. A relatively short time lag is a strength when measuring free ridership.

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Free Ridership Calculations: The 2009 methodology used a combined multiplicative and an arithmetic mean to estimate free ridership, based on answers to multiple questions. Similarly, the 2010 methodology used responses to a variety of questions to estimate two scores:

- a score based on stated intentions (based on an arithmetic mean)
- the influence of the program (based on an arithmetic mean)

The results of these two calculations were then averaged to determine the final free ridership score. The 2010 additive approach may be considered an improvement over the 2009 methodology.

Questions: The content of the questions in 2009 and 2010 were very similar. Both sets of questions sought to estimate free ridership by asking respondents a multiple set of questions and both sets of questions are designed to provide cross-checks. The inclusion of a question regarding customers' budgets was a strength, added in 2010, and is part of standard ETO questions. This question was used for screening free riders from non-free riders as well as a cross-check for customers whose score for stated intentions was 50 percent. Additionally, in 2010 NMR included the use of a screening question to determine if the customer intended to install equipment without prior knowledge of the program.

Spillover: By contacting customers soon after participation, they may not have had sufficient time to pursue additional measures, which is a drawback for measuring spillover. While some of the surveys did include questions regarding future intentions, NMR did not quantify these intentions. In 2009 and 2010, NMR sought to estimate

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participant-like spillover¹ for measures that had been installed since participation in the program and for which the participant said their participation in the program was responsible.

b) Net-to-gross is the combined effect of free ridership and spillover.

$$\text{Net-to-Gross Ratio} = 1 + (\text{Spillover}) - (\text{Free ridership})$$

2010 Program	Evaluated 2010 Net-to-Gross Ratio*
Efficient Products - Retail Markdown	1.07
Efficient Products - Appliance Retirement/Replacement	0.74
Existing Houses	0.76
Low Income	1.00
New Houses	0.46
Efficient Products - Direct Install	0.77
Prescriptive Rebates - Smart Lighting Choices	0.84
Prescriptive Rebates - Business Energy Rebates	0.54
Commercial and Industrial Custom	0.90
Small Business Direct Install	0.87

* Evaluated 2010 Net-to Gross ratios are subject to the 2010 Verification Report.

Program implications will be based on the findings and recommendations of the 2010 evaluation and verification reports. As an example, the New Houses program runs until the end of June, 2011. The evaluated 2010 net-to-gross ratio will be considered when developing the next phase of the program.

¹ “Participant-like spillover is a conservative approach used to estimate spillover by asking participants about measures installed outside the program that are exactly the same type and efficiency as the ones installed through the program. Non-like spillover is based on asking participants about other energy efficient measures they had installed on their own and without assistance from another DSM program.” NMR, Evaluation Report, Prescriptive Rebates, (2010) page 19, section 3.4

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c) ENSC will seek to further adjust assessment of free ridership and spillover and suggests doing so through consultation with experts and input from stakeholders. Areas for refinement may include, but are not limited to, the following:

- adjusting timing to assess spillover, as the current timing of the participant survey may not fully capture energy savings due to spillover
- broadening methodology for assessing spillover to include non-like spillover

“It should be noted that some surveyed participants reported non-like spillover (29%). Based on this, it is possible that the SBLS program resulted in some additional spillover. However, without follow-up inspections at facilities where customers reported spillover, it was impossible to determine the efficiency level of the equipment and estimate the potential savings that could have been attributed to the spillover.”²

- adjusting free ridership scoring for participants that say that their budget could not have accommodated the project without the incentive received from the program
- developing an adjustment for self-reporting; e.g. for the Existing Houses program

² NMR Group Inc., *Impact and Process Evaluation: Small Business Direct Install Program*, (2010) page 10 section 2.5

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1 **Request IR-13:**

2

3 **With respect to page 21, line 24, please provide a copy of the Affordable Energy Coalition**
4 **study.**

5

6 Response IR-13:

7

8 Please refer to Attachment 1.

Low-Income-Renter Demand Side Management in Nova Scotia: Aligning Interests in Energy Conservation

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¹ Note that content has not been updated to reflect the inclusion of low-income-renter DSM programming in the 2012 DSM Plan, filed on February 28, 2011 (ENSC 2012 DSM FILING (E-ENSC-R-10)).

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Executive Summary

A convergence of recent trends including rising and unpredictable costs of energy, the increasing desire and need to mitigate environmental damage, and the focus on energy security has resulted in an expansion of Demand Side Management (DSM) programming to reduce energy consumption as a way of meeting these challenges. In response to these concerns, Efficiency Nova Scotia has been mandated to develop, fund, and operate DSM programming in Nova Scotia. Although DSM programming has been made available to many sectors of the economy in Nova Scotia, low-income renters have been left behind by the DSM revolution. The exclusion of low-income-renters from targeted DSM programming means a shortfall in the potential benefits of energy efficiency, and that the one group that could benefit most from energy efficiency continues to suffer from energy poverty.

A fundamental step in developing low-income-renter DSM programming is identifying low-income-renters in the province. Determining eligibility requirements, identification strategies and estimating the number of eligible low-income-renters in the province are priorities for low-income-renter DSM programming. There are a number of index measures available to make this determination. Eligibility for social programs, geographical considerations and energy consumption information may also be used as indicators. Low-income-renter DSM Program developers must assess information available in light of eligibility options, scope of program measures, and program funding for low-income renters in Nova Scotia as a pre-requisite for determining eligibility criteria for low-income-renter DSM programming and scope of program offerings.

In this paper, we introduce a number of successful programs that can offer guidance for low-income-renter DSM programming in Nova Scotia. The Warm Up Winnipeg Program (Manitoba) and the BC Hydro Energy Conservation Assistance Program (British Columbia) harness the power of community to extend DSM programming to low-income energy consumers. The Energy Efficiency Retrofit Program (New Brunswick) and the Social Housing Retrofit Renovation Program (Ontario) extend retrofit programming to low-income households. The Energy Management Assistance Program (California) uses its bulk purchasing power to lower program costs. The Warm Front Program (U.K.) embraces the concept of client-centered program development. The Assisted Multi-Family Loan Program (New York) recognizes the need to provide some business centered options to entice landlords to participate in DSM programming. The Peaksaver Program (Ontario) employs new technology to support efficiency gains, and the Weatherization Assistance Program (U.S.) provides a good example of how DSM programming can be effectively administered.

The term “efficiency gap” is used to describe the difference between actual energy consumption and the lower level of energy consumption that would make sense given the availability of more efficient energy choices in terms of use or technology. The goal of DSM programming is to reduce this gap by offering help to energy consumers to become more efficient. Barriers exist under a broad range of circumstances and have been particularly difficult to address in the case of low-income-renters.

Low-income-renters face a range of barriers that prevent them from participating in DSM. Market barriers, including market function, the principal-agent problem, investment in energy efficient technology, and property transfer barriers, are significant barriers to low-income-renter DSM. Informational, technological, behavioral and policy barriers also require targeted solutions.

These barriers will effect landlords and tenants differently, but the effects on both parties need to be addressed in DSM policy and programming to effectively overcome the efficiency gap in the low-income-renter context. This is because the low-income-renter will ultimately bear the burden of high energy costs, whether paid directly through energy billing, or indirectly through rent.

We considered the principal-agent problem, lack of capital, leasehold transfer issues, information asymmetry, inability to understand and use information and technology, low levels of trust, and vulnerability to existing policy constraints to be the most significant barriers to DSM participation facing low-income-renters.

We considered the principal-agent problem, financing, transaction costs and property transfer to be the most significant barriers to DSM participation facing landlords. The lack of low-income-renter DSM programming and the exclusion of renters from the Low Income Housing Program, despite collection of the cost recovery rider, are imminent concerns.

Developing low-income-renter DSM programming that is implemented at the building or neighborhood level has the greatest potential to address these barriers. The local context makes the required information collection and analysis more manageable. In addition, members of the community can be engaged to help one another in an environment where trust relationships have already been established, and where neighbors understand mutual concerns, needs and learning requirements.

A detailed analysis and an integrated policy planning approach, among government and non-governmental organizations, will provide opportunities for cooperation that includes sharing resources, expertise, information and funding to support shared objectives. Low-income-renter DSM policy must meet the needs of low-income-renters, align to the objectives of government, and be flexible enough to sustain itself as conditions change over time. Designing low-income-renter DSM policy within a system framework and evaluating policy plans prior to implementation are also important. By looking at low-income-renter DSM programming as a continuing policy response chances of long-term success increase.

Policy, programming, and practical solutions can be marshaled to overcome barriers to low-income-renter DSM. In this paper, we offer a range of recommendations to make provincial DSM policy more inclusive by extending targeted programming to low-income-renters. We suggest that the following Low-income-renter DSM Program opportunities be incorporated into the 2012 DSM Plan:

1. Make a commitment to low-income-renter DSM programming in the 2012 DSM Plan
2. Establish a simple process to qualify and inform low-income-renters about DSM programming
3. Ensure that the cost recovery rider charges paid by low-income-renters and their landlords are invested in low-income-renter DSM programming
4. Modify the Power Down Program to offer products at no cost
5. Modify the Pull the Plug II Program to cover full replacement cost
6. Modify the LED Holiday Lighting Exchange Program to provide low-income-renters with a direct exchange program
7. Modify the EnerGuide for Multi-Unit Residential Buildings (MURBs) Program by broadening eligibility criteria and increasing funding
8. Implement a DSM Captain Program to support education and promotion of low-income-renter DSM programming
9. Leverage income assistance and energy service information to identify and assist low-income-renters in accessing DSM programming
10. Implement an Energy Leader Program to celebrate low-income-renter DSM success

We suggest the following Low-income-renter DSM Program opportunities be incorporated into DSM programming under Efficiency Nova Scotia over an intermediate-term time frame, beyond the 2012 DSM Plan:

1. Identify low-income-renters and manage cost recovery rider contributions to support low-income-renter DSM programming
2. Provide no cost DSM programming to low-income-renters and attractive grants or financing terms to landlord property owners
3. Develop a building energy code for rental housing and appliance standards
4. Develop a rental housing efficiency labeling system
5. Continue to develop capacity to provide efficient assessment and program design services to minimize transaction costs
6. Continue to develop opportunities for education and promotion of DSM programming
7. Use innovative energy efficiency technology
8. Incorporate training requirements into low-income-renter DSM programming
9. Use a community-based model to deploy low-income-renter DSM programming
10. Protect low-income-renters by requiring that landlords contract to security of tenure and rent control in return for receiving DSM Program funding in the absence of protective legislation
11. Communicate and cooperate across levels of government, government departments, non-governmental organizations and other DSM programs

12. Plan for sustainability of low-income-renter DSM programming by taking a management system approach to programming and policy development

We suggest the following policy initiatives be considered outside of the DSM Plan to support a comprehensive low-income-renter DSM policy package:

1. Support cooperative networks across levels and departments of government for low-income-renter DSM policy development
2. Engage the powers of other levels and departments of governments to support low-income-renter DSM policy
3. Consider synergies between low-income-renter DSM programming and other DSM Plan offerings
4. Consider the use of other policy tools to enhance the low-income-renter DSM policy package
5. Undertake a full analysis of deferred cost models, including Pay As You Save (PAYS), as a funding source for low-income-renter DSM programming
6. Develop a long term funding strategy to finance low-income-renter DSM programming
7. Implement a building energy code for rental housing and appliance standards
8. Implement a rental housing efficiency labeling system
9. Protect low-income-renters by amending the Residential Tenancies Act to support security of tenure and rent control
10. Use the Employment and Income Assistance Act as a vehicle to support and implement low-income-renter DSM policy

Low-income-renter DSM programming and policy is an important part of addressing energy poverty in Nova Scotia, but it is not the whole solution. Low-income individuals may still experience energy poverty because energy bills extend beyond their means. The Universal Service Program model (USP) provides the comprehensive solution that low-income individuals require to balance the cost of energy with the cost of food and shelter relative to their income. In addition to DSM programming, the USP provides for rate affordability, arrearage management, and crisis intervention programming, in addition to basic consumer protections.

There is considerable work to be done, but addressing low-income-renter DSM programming will have benefits that extend beyond Demand Side Management to combating energy poverty, improving the living conditions of low-income members of our community, conserving energy resources, and respecting the environment. Low-income-renter DSM programming is a viable and productive way to align interests in energy conservation.

Introduction

A convergence of recent trends including rising and unpredictable costs of energy, the increasing desire and need to mitigate environmental damage, and the focus on energy security has resulted in an expansion of Demand Side Management (DSM) programming to reduce energy consumption as a way of meeting these challenges. In response to these concerns, Efficiency Nova Scotia has been mandated to develop, fund, and operate DSM programming in Nova Scotia. Although DSM programming has been made available to many sectors of the economy in Nova Scotia, low-income-renters have been left behind by the DSM revolution. The exclusion of low-income-renters from targeted DSM programming means a shortfall in the potential benefits of energy efficiency, and that the one group that could most benefit from energy efficiency continues to suffer from energy poverty.

Energy poverty refers to a lack of electricity, fuel or heat, caused by a variety of circumstances, particularly economic poverty. In real terms, energy poverty means insufficiently heated and ventilated homes and a greater incidence of health problems resulting from mould and mildew growth. Low-income earners are obliged to spend a disproportionate share of their income to achieve the same level of healthy and comfortable conditions in their homes as is commonly expected. It is an issue that engages the principles of equality and opportunity, so often denied to those on the margins of society. By addressing energy poverty, those who experience it are less burdened by financial and health concerns and more able to participate in society.

Combating energy poverty also serves the ends of environmental conservation and protection by reducing the demand on the environment to provide energy.

The Affordable Energy Coalition (AEC) has worked to bring attention to the problem of energy poverty and cooperate with others to identify realistic solutions. This is reflected in its involvement with the Low-Income Sub-committee of the Program Development Working Group (PDWG) supporting Nova Scotia's DSM programming. While DSM programs exist in Nova Scotia, low-income-renters are not included in critical programming due to a variety of factors, particularly property ownership barriers. The aim of this paper is to identify opportunities to extend DSM programming to low-income-renters in Nova Scotia.

Part I of this paper will address the issue of identifying eligible low-income-renters for DSM programming in Nova Scotia. In Part II, we will consider existing DSM programs that benefit low-income-renters in various jurisdictions of North America and Europe. Part III will identify and describe barriers to developing and implementing DSM programming for low-income-renters. Part IV discusses recommendations for increasing DSM effectiveness and availability for low-income-renters in Nova Scotia and includes short-, intermediate- and long-term strategies. The discussion in Part IV considers existing programs and possibilities for adaptation, potential future programming, as well as public policy and regulations.

This report is intended to assist the ongoing development of low-income-renter DSM programming in Nova Scotia and other jurisdictions. Specific concerns or discussion of related

issues, such as low-income-renter landlord-centered education and programming, may be addressed by future studies and dialogue. It may also be desirable from the perspective of the DSM provider to employ dedicated researchers on a permanent or contract basis to continue the work begun here. Low-income-renter DSM programming requires a sensitivity to—and familiarity with—the unique conditions of energy poverty which may not be considered in a generalist approach to DSM.

Part I:**Defining the Low-Income-Renter in Nova Scotia for Demand Side Management**

Identifying eligible candidates for low-income-renter DSM programming is an initial consideration in DSM Program design. This part of the paper begins with a discussion of poverty, then focuses on energy poverty and the role that DSM programming can play in addressing concerns that go to the root of poverty itself. A number of methods have been developed to describe poverty. These methods will be presented as possibilities for determining DSM Program eligibility.

Low-income-renter DSM programming focuses on the low-income-renter who is also an energy consumer; however, the specific circumstances of the low-income-renter include a broad range of scenarios, and differ across rural and urban Nova Scotia. An overview of the next steps required for identifying low-income-renters concludes this part of the paper.

Methods to Define Low-Income in Nova Scotia

Although a general description of low-income status is linked to measuring poverty, a functional definition of low-income will depend on context. Poverty is the inability to provide for basic needs: food, clothing, housing and energy. Other needs that vary depending on individual circumstances also contribute to poverty: medical, health care, child care and transportation expenses. When income is insufficient to provide for these needs, low-income individuals require social and community support.

Many methods have been developed for identifying low-income individuals and households; however, it is important to consider the objective factors that describe the realities of life for low-income individuals, and that differentiate their experiences from their higher-income counterparts. The extent that individuals and households experience poverty depends on the cost of their needs compared to their income and other supports. The total cost of each need reflects market dynamics, consumer choice and consumption behavior. In Nova Scotia, individuals aided by the Income Assistance Program receive calculated support, up to a maximum limit, based on eligibility requirements.

The 2007 Food Costing Study provides a telling analysis of the cash flow realities of low-income individuals in Nova Scotia who receive support from the Income Assistance Program. Although the study was done from the perspective of food security, the study looked at the complete picture of household needs, expenses and inputs. The study assumed a total income of \$600.82 per month that included income assistance, GST rebate and a transportation allowance, and found a net deficit in monthly income of \$217.39, for a single 30 year old male living alone.² Living expenses included an assumption that \$50 per month would be spent on energy. Today, a single adult living alone is eligible for a maximum shelter allowance of \$300 per month and a

² Dr. Patty Williams, “Cost and Affordability of a Nutritious Diet in Nova Scotia”, online: Mount Saint Vincent University <http://www.gov.ns.ca/hpp/publications/food_costing_study.pdf>.

maximum personal allowance (for food, clothing, personal care items and other expenses) of \$214 per month.³

DSM programming has significant potential to address energy poverty,⁴ toward an outcome that the resources of low-income people are not depleted by energy costs to the extent that they cannot pay for housing, food and clothing. While DSM programming is an important part of addressing energy poverty concerns in our northern climate, it will not be the only measure required. To the extent that DSM programming does not relieve energy poverty, further programming should be integrated under a Universal Service Program (USP).⁵

A USP is a comprehensive policy solution that helps low-income individuals to balance the cost of energy with the cost of food and shelter relative to their income. In addition to DSM programming, the USP provides for rate affordability, arrearage management, and crisis intervention programming, in addition to basic consumer protections.⁶

Developing a definition of low-income for low-income-renter DSM programming in Nova Scotia will require careful analysis and is beyond the scope of this paper. The completion of this work will provide an important foundation for making strategic decisions about eligibility requirements, program measures, and program resource allocation. However, determining eligibility of clients on an individual basis may be administratively unworkable. Using an effective surrogate to identify program eligibility can be an attractive way to control administrative program costs. An effective surrogate will provide support to most of the individuals that would have been identified by specialized eligibility assessments.

A number of approaches can be used to determine eligibility for low-income programming by using surrogate measures that have already been developed or implemented. Options include using the low-income measures that have been developed by Statistics Canada, relying on program eligibility assessments under federal and provincial programs that provide assistance to low-income clients, and shifting from an individual approach to a geographic approach, using census data to determine eligible neighborhoods.⁷

Statistics Canada uses three measures to report on low-income in Canada: the Canadian Low Income Cut-off (LICO), the Low Income Measure (LIM), and the Market Based Measure (MBM).

³ Dalhousie Legal Aid Service, *Welfare Rights Guide: A Guide to Income Assistance in Nova Scotia* (Halifax: Dalhousie Legal Aid Service, 2010).

⁴ Maine McEachern & Jill Vivian, *Conserving the Planet Without Hurting Low Income Families: Options for Fair Energy Efficiency Programs for Low-Income Households* (Victoria: University of Victoria Environmental Law Centre, 2010) at 10 [Victoria].

⁵ Roger Colton, *A Ratepayer Funded Home Energy Affordability Program for Low Income Households: A Universal Service Program for Ontario's Energy Utilities*, (Toronto: Low Income Energy Network, 2006) [USP].

⁶ *Ibid.*

⁷ Comments of Blair Hamilton (19 November 2010) at PDWG Low Income Subcommittee Meeting.

The Canadian Low Income Cut-off (LICO) index⁸ is a threshold-based measure adjusted by geography and considers income only, not spending requirements.⁹ While LICO does consider differences between rural and urban economies, it does not consider transportation expenses as an added expense in rural communities. However, these expenses may have a considerable impact on low-income individuals living in rural communities, becoming a barrier to accessing education, employment, and services. In Nova Scotia, LICO is now being used to indicate eligibility for Residential Energy Affordability Program (REAP).¹⁰

The Low Income Measure (LIM) is another method available to measure poverty. “The Low Income Measure (LIM) is a fixed percentage (50%) of median adjusted family income, where “adjusted” indicates that family needs are taken into account.”¹¹ The LIM is also based entirely on income, however unlike the LICO, it is based on after-tax income, as opposed to before-tax income.

The Market Based Measure (MBM) accounts for a broader range of expenses, and considers regional differences. The MBM goes beyond measuring subsistence living and addresses household requirements to achieve a level of social inclusion.¹² The MBM would include the transportation expenses that are not considered by LICO. Child care costs are also considered by the MBM.¹³

Another effective means of identifying individuals for low-income-renter DSM programming is sharing program eligibility information with other programs that benefit the same group of clients. For example, the Warm Front program in the UK controls administrative costs by extending low-income DSM benefits to clients based on participation in a range of social programs.¹⁴ Warm Front’s report to the U.K. Parliament suggested that such criteria were not perfect because they sometimes permitted those who had already received other DSM programming to benefit. However, such concerns could be built into the screening process while retaining the administrative efficiencies of pre-qualification.¹⁵

In Nova Scotia, eligibility under the provincial Income Assistance Program would be one such option. In Nova Scotia, Income Assistance is extended to Nova Scotians primarily through the *Employment Support and Income Assistance Act*, administered by the NS Department of Community Services. Eligibility for Income Assistance is means-based and provided to

⁸ Statistics Canada, *Low Income Before Tax Cut-Offs*, Online: Statistics Canada <<http://www12.statcan.ca/census-recensement/2006/ref/dict/fam020-eng.cfm>>.

⁹ Philip Giles, *Low Income Measurement in Canada*, (Ottawa: Statistics Canada, 2004) at 10-11 [Giles], online: <<http://www.statcan.gc.ca/pub/75f0002m/75f0002m2004011-eng.pdf>>.

¹⁰ Comments of Darlah Purdy (19 November, 2010) at PDWG Low Income Subcommittee Meeting [Purdy].

¹¹ Giles, *supra* note 9 at 13.

¹² *Ibid* at 15.

¹³ Angella MacEwen with Christine Saulnier, *The Cost of Poverty in Nova Scotia*, (Halifax: Canadian Centre for Policy Alternatives, 2010).

¹⁴ *Welcome to Warm Front*, online: Warm Front Team <<http://www.warmfront.co.uk/do-i-qualify.htm>> [Warm Front].

¹⁵ UK, HC, “The Warm Front Scheme: Report to the House of Commons” (2 February 2009) (National Audit Office).

supplement an individual's budget deficit if income does not adequately cover expenses. While Income Assistance eligibility should be considered an effective indicator, using it as the only indicator would be inadequate because low-income individuals may only qualify for assistance on an intermittent basis, and eligibility requirements are prone to leave out the working poor.¹⁶

A geographical approach to eligibility is also an idea that could be used effectively to identify eligibility for low-income-renter DSM programming. Detailed census data from Statistics Canada could be used to do a strategic assessment of the location of low-income rental housing infrastructure. This kind of indicator would be especially pertinent for the development of community-based programming models, such as the Warm Up Winnipeg model that has been very successful in Manitoba.

The most effective way to determine eligibility for low-income DSM may well be a combination of all of these ideas. Program eligibility and the provision of program services will have to balance program resources. The different contexts of urban and rural Nova Scotia, as well as provincial and federal lands within the province, may require different approaches. However, the resulting program should be able to provide DSM programming to low-income-renters across the province in an equitable way and prioritize individuals who are most in need. Therefore, it is important to develop and build on a strong definition of low-income for DSM programming, and to measure results in terms of the impact that measures have on the actual energy costs of low-income-renters.

Identifying Low-Income-Renters in Nova Scotia for Demand Side Management Programming

In Nova Scotia, rental housing is a common form of housing, and includes a range of housing situations: single family homes and mobile homes, duplexes, flats, buildings with a small number of units (less than four units), larger apartment buildings (more than four units), and boarding houses. There is diversity across rural and urban areas, and also between the provincial and federal land base within the province. The situation on Indian Reserves is particularly unique within the province, where many households are financed on a rent-to-own basis. In Nova Scotia residential tenancies are governed by the *Residential Tenancies Act*, administered by the Residential Tenancies Board under the Minister of Service Nova Scotia and Municipal Relations. This administrative scheme governs the rights and obligations within the landlord and tenant relationship.

There is the same diversity in contracts between landlords and tenants regarding energy use as there is in forms of rental housing. Tenants require energy for heat, hot water, appliances, lights and other plug loads. Efficiency factors that influence electricity consumption include weatherization, selection of materials, and management of consumption. However, the arrangements regarding who is responsible for selecting, using, and paying for energy consumption will vary from case to case. Common scenarios include:¹⁷

¹⁶ Purdy, *supra* note 10.

¹⁷ Comments of John Aguinaga (20 July, 2010) [Aguinaga].

1. Tenant pays for electric heat, electric hot water and other electric devices
2. Tenant pays for electric hot water and other electric devices
3. Tenant pays for other electric devices
4. Tenant does not directly pay for electricity

Low-income-renter DSM programming is challenging due to the diversity of rental housing and energy contract situations. There may be rental housing situations that align to specific energy contract situations, but this will not necessarily be the case. The different objectives and levels of information available to the landlord and tenant lead to a principle-agent problem. While not the only barrier to energy conservation in the context of rental housing, the principle-agent problem is seen as a significant obstruction. The principle-agent problem will be discussed in more detail later in this paper.

This year Efficiency Nova Scotia, a new corporation established to design and manage DSM programming in Nova Scotia, will continue the work of the interim administrator of DSM programming in the province, Nova Scotia Power Incorporated (NSPI). An important extension of the current program will be the development of low-income-renter DSM programming. The Efficient Products Program and the Education and Outreach Program under the current DSM programming benefit all customers;¹⁸ however, the impact of these programs on the low-income-renter consumer is limited due to the inability of the low-income-renter to participate in the market place. The Residential Energy Affordability Program (REAP) does not reach low-income-renters due to the requirement of property ownership to participate in the program.

NSPI can still play an important role in low-income-renter DSM programming as the new administration structure is implemented. NSPI has a direct connection to energy consumers and is in a position to identify and communicate with customers, and to collect consumer behavior information as part of a wider DSM strategy. Privacy and access to information issues would have to be considered and dealt with, but there is room for innovation in terms of how customer information can be used to benefit energy consumers.

Next Steps to Identify Low-Income-Renters

The purpose of this discussion has been to indicate the scope of considerations that should inform the eligibility of low-income-renters in Nova Scotia for specialized DSM programming. Determining eligibility requirements, developing low-income-renter identification strategies and estimating the number of eligible low-income-renters in the province are priorities for low-income-renter DSM programming. There are a number of index measures available to make this determination. Eligibility for social programming and energy consumption information may also be used as an indicator.

¹⁸ Canada, *Application to approve Nova Scotia's Electricity Demand Side management Plan for 2011 (NSUARB P-884(3)) NSPI Responses to CA Information Requests* (Halifax: Nova Scotia Utility and Review Board, 2010), online: Nova Scotia Utility and Review Board < [http://www.nspower.ca/site-nsp/media/nspower/NSPI%20DSM%202011%20IR%20Responses\(1\).pdf](http://www.nspower.ca/site-nsp/media/nspower/NSPI%20DSM%202011%20IR%20Responses(1).pdf)>.

Eligibility criteria should be framed to avoid complex approval processes in favor of using available information to make decisions to conserve program resources for implementation of efficiency measures. The eligibility criteria selected should therefore reflect the information that will be used to determine eligibility. A number of possible information sources have been identified in this part of the paper. Low-income-renter DSM Program developers should assess the information available in light of eligibility criteria options, scope of program measures, and program funding for low-income-renters in Nova Scotia.

In the next part of the paper, some of the highlights of low-income-renter programs that have been implemented in jurisdictions outside of Nova Scotia are described. The intention of this discussion is to provide the reader with a solution-oriented frame of reference to prepare for a more detailed analysis of individual barriers in Part III of the paper.

Part II:

Low-Income-Renter Demand Side Management Models

In this paper, we have profiled several DSM programs that provide some benefit to low-income-renters. Fact sheets that profile the nineteen programs examined in our research are included in the appendix of this paper. While most of these programs provide viable DSM programming to their respective clientele, there are notable standouts that have used innovative tools or achieved unique success. In this part of the paper, we consider some of these more closely.

Neighborhood and Building Program Models

Manitoba: Warm Up Winnipeg

One of the more innovative Canadian DSM programs is Warm Up Winnipeg, which serves 16 of the poorest neighborhoods in Winnipeg, Manitoba. Established in 2006 the program receives funding from the major provincial electrical utility (Manitoba Hydro), the United Way, the Winnipeg Foundation, the Winnipeg Partnership Agreement, the Government of Manitoba and other community organizations. The program is run by BUILD (Building Urban Industries for Local Development), a community development organization. Program measures include attic and basement insulation, water aerators, pipe wrapping among others. To date, Warm Up Winnipeg has produced over \$500 in average annual energy savings for low-income participants for total savings of over \$400,000. Over 315 low-income households have been insulated and over 1500 water retrofits have been installed.¹⁹

Another innovative feature of Warm Up Winnipeg is that it trains and employs laborers from the communities it serves to deliver its energy efficiency services. Through the program, laborers gain employment experience and valuable skill sets.²⁰

The most noteworthy feature of Warm Up Winnipeg—and likely the key to its success—is its focus on specific communities that are particularly impoverished.²¹ Where housing stock is likely to be of lower quality and inefficient, the immediate need of the residents of low-income neighborhoods generates a demand for energy efficiency. It may also be that targeting specific communities can help to ensure communication of information regarding the program through established social networks and focused advertising resources. A general or province-wide program may not generate the same level of awareness.

Warm Up Winnipeg targets energy poverty while achieving gains against poverty in general. Low-income communities benefit from energy efficiency gains and permanently retain a more skilled and experienced workforce.

¹⁹ *Warm Up Winnipeg*, online: <<http://www.warmupwinnipeg.ca/index.html>>.

²⁰ Government of Manitoba, Media Release, “Lower Bills, Clean Energy, Reduced Poverty Focus of Inspiring Community Project: Rondeau” (November 29, 2006), online: <<http://www.gov.mb.ca/chc/press/top/2006/11/2006-11-29-115500-523.html>> [*Manitoba*].

²¹ *Ibid.*

British Columbia: BC Hydro Energy Conservation Assistance Program

British Columbia Hydro's Energy Conservation Assistance Program delivers its DSM programming both to individuals and in bulk format. Benefits include pipe-wrapping, insulation, energy efficient bulbs, water aerators and other energy efficiency measures. Where a project requires the participation of several tenants, BC Hydro cooperates with housing providers by organizing meetings, notifying tenants and scheduling appointments with individual tenants.²² Participation in DSM programming is reliant on adequate dissemination of accurate information to potential participants; BC Hydro's pro-active and personalized approach to meeting with groups and individuals poses perhaps the ideal form of such education.

Retrofit Program Models

DSM programming often brings with it an increase in property value that can lead a landlord to increase rent or target a different segment of the rental market with the improved property. A landlord's motivation to profit from investments in energy efficiency is in tension with the need of low-income-renters to maintain access to housing that they can afford. Two of the programs we reviewed have attempted to address this problem directly.

Landlords may be inclined to justify increased rental rates wherever any improvement has been made to a property, regardless of the source of the capital or expertise employed in that improvement. One of the challenges faced in administering low-income DSM is to ensure that energy savings aren't used as a justification for rental or fee increases thereby negating the benefit to low-income participants.

New Brunswick: Energy Efficiency Retrofit Program

New Brunswick's Energy Efficiency Retrofit Program, established in 2007, requires participating landlords to sign an approval letter committing to maintain rental rates despite energy retrofits. In exchange for their agreement landlords can access energy efficiency grants that will upgrade windows, insulation, ventilation, air sealing and furnaces in their property.²³

Ontario: Social Housing Retrofit Renovation Program

Ontario's Social Housing Retrofit Renovation Program (SHRRP) offers significant funds for energy efficiency upgrades to a maximum funding of \$32,000 per housing unit, provided landlords commit to maintaining their property as low-income social housing for a period of ten years.²⁴ SHRRP also offers landlords the benefit of a program administrator to help ensure that

²² *Energy Conservation Assistance Program*, online: BC Hydro
<http://www.bchydro.com/powersmart/residential/ps_low_income/energy_conservation.html?WT.mc_id=rd_ecap> [ECAP].

²³ *Energy Efficiency Retrofit Program for Low Income Households*, online: Government of New Brunswick
<<http://app.infoaa.7700.gnb.ca/gnb/Pub/EServices/ListServiceDetails.asp?ServiceID1=19556&ReportType1=All>>.

²⁴ *Social Housing Renovation and Retrofit Program (SHRRP)*, online: Canada-Ontario Affordable Housing Initiative
<http://www.mah.gov.on.ca/AssetFactory.aspx?did=6867> [SHRRP].

energy efficiency measures are properly planned and executed. Where renovations and retrofits may involve significant work, and perhaps involve new technologies or materials, having an experienced administrator can help to relieve the burden of supervising such work and ensure that potential problems are avoided. SHRRP addresses accountability and reporting by requiring property owners to keep and maintain all records related to the project for a period of 5 years, and to comply with Generally Accepted Accounting Principles (GAAP).²⁵ Also, regular reports on project progress are required throughout the process of renovation and retrofit. This rigorous accounting of funding and expenditures helps to ensure the program's viability and maximum economic efficiency.

High Volume Program Model

California: Energy Management Assistance Program

California's Energy Management Assistance Program cooperates with the Low-Income Home Energy Assistance Program to purchase energy efficiency devices and materials at bulk rates. Weather-dependent efficiency measures include high-efficiency windows and air conditioners, weather-stripping and insulation.²⁶ Non-weather-dependent measures include energy efficient appliances, light bulbs, faucets and pipe-wrapping.²⁷ The cost savings of bulk purchasing are passed onto clients. This approach also ensures higher standards and reduces the storage and administrative burdens on the program's various delivery agents. This approach highlights the potential benefits of collaboration among DSM programs. Naturally in a market as large as California's, a single jurisdiction with a population greater than Canada, implementing such arrangements may be easier and the benefits greater, but it does pose a useful example.

Low-Income Client-Centered Program Model

U.K.: Warm Front

Identification of an appropriate class of potential beneficiaries for low-income-renter DSM programming may be problematic. A number of variables including income, living costs, type of housing, family size and other factors complicate the determination of eligibility. Various programs employ crude or arbitrary cut-offs related to family size and income which may work to exclude otherwise worthy applicants. On the other hand, eligibility requirements that are tailored for specific programs may result in prohibitive administrative burden.

The U.K. Warm Front Program avoids the extra administrative burdens of devising and managing its own eligibility requirements by recognizing that fairly sophisticated needs-based assessments are already employed by other government programs. Warm Front qualifies applicants by their receipt of income assistance, single mothers allowance, disability allowance,

²⁵ SHRRP, *supra* note 24.

²⁶ *Energy Management Assistance Program*, online: Southern California Edison <<http://www.sce.com/residential/income-qualified/ema/how-does-ema-work.htm>> [EMAP].

²⁷ *Ibid.*

worker's compensation allowance, veteran's pensions and other benefit schemes.²⁸ The program operates on the premise that qualification for such programs makes any new assessment redundant. Benefits include extensive energy efficiency consultation and significant grants depending on the type of housing stock and heating system.²⁹ Warm Front is also noted for its proactive approach to contacting clients that have already consulted with the program to ensure that they have applied for additional energy efficiency benefits.

Business-Centered Program Model

New York: Assisted Multi-Family Loan Program

Although many DSM programs offer funding to carry out energy efficiency work, many rely on some investment of capital by property owners. Particularly where renters pay heating bills directly, landlords may be disinclined to make energy efficiency investments as they perceive no benefit to themselves. This problem of split incentive may be partially overcome if attractive credit terms are offered to participating landlords. New York's Assisted Multi-Family Loan Program (AMFP), which operates in conjunction with the New York Energy Smart Loan Program, demonstrates a unique approach. Working in collaboration with lenders, the program is able to offer landlords the incentive of low-interest loans, as well grants, which may be applied to the program's measures including replacement of windows, boilers, insulation and appliances.³⁰ Ultimately, landlords will benefit from the renewal and enhancement of their assets; cheaper credit ensures that the immediate costs are more affordable.

The AMFP approach focuses on business principles, providing the return that landlords and program sponsors are looking for. Investments are applied only in proportion to their projected energy efficiency savings. In other words, there is an expected, and indeed calculated, return on investment that ensures benefits are passed on to low-income consumers while providing predictability to utilities and program sponsors.

Smart Grid Program Model

Ontario: Peaksaver

Smart grid technology has also been employed in various ways to bring the benefits of DSM programming to individual consumers. Ontario's Peaksaver Program is marketed to energy consumers who are motivated by the environmental benefits of reducing load at peak consumption times. The program does not target low-income householders nor does it purport to offer significant energy savings to participants. The program operates by giving customers the option of having remote switching technology attached to their water heater or furnace

²⁸ Warm Front, *supra* note 14.

²⁹ *Ibid.*

³⁰ New York State Energy Research and Development Authority, *Multi Family Buildings Program Information*, online: <<http://www.nyserda.org/Funding/appmultifamilyInfo.pdf>> [AMFP].

which allows the utility to adjust settings during periods of peak grid load to reduce demand.³¹ Customers do not lose control over their comfort settings as adjustments are relative to the customer's setting. The program is attractive in that it is available to homeowners and renters alike. If structured differently, a similar program could be employed to offer renters energy savings, and assist in addressing energy poverty.

Program Administration Model

U.S.: Weatherization Assistance Program

Although many of the factors important in the design and delivery of DSM programming have been dealt with by the programs studied in our research, some consistent gaps remain: particularly reporting and accountability measures. Overall, little information was available on how various programs consider these factors. Peaksaver considers only the system-wide benefit of its smart-grid technology measures and reports that 60MW of capacity is available to be dialed-down when necessary.³² Warm Up Winnipeg relies solely on data and estimates provided by outside agencies or utilities to estimate savings to clients.³³

The Weatherization Assistance Program (WAP) offered in the U.S. does provide regular accountability reports to Congress. These reports are also available to the public. Regular reporting on program effectiveness is provided through "In Progress Peer Reviews" and "Process Assessments."

The innovations that have been described in this part of the paper address a range of barriers that can prevent the low-income-renter from benefiting from the energy savings that come with energy conservation. Part III examines these barriers in more detail, describes their impact on the low-income-renter, and suggests program and policy solutions to overcome them. Many of the concepts at the heart of these solutions have been introduced in this part of the paper.

³¹ Peaksaver FAQ, online: Ontario Power Authority <<http://everykilowattcounts.ca/residential/peaksaver/faq.php>> [Peaksaver].

³² Telephone conversation with Colleen, OPA, November 8, 2010.

³³ Email from Tyler Pearce, BUILD, November 8, 2010.

Part III:**Low-Income-Renter Demand Side Management Barriers**

The term “efficiency gap” is used to describe the difference between actual energy consumption and a lower level of energy consumption that would make sense due to the savings that follow from energy efficient behavior. The goal of DSM programming is to reduce this gap by offering help to energy consumers to become more efficient. Barriers exist under a broad range of circumstances, but have been particularly difficult to address in the case of low-income-renters.

This part of the paper introduces a range of barriers to energy efficient behavior, and identifies those barriers that most acutely affect low-income-renters. Further to Part I of this paper, the relationship of the landlord and low-income-renter can cover a range of scenarios. Although the focus of the paper is addressing energy poverty through the reduction of energy bills paid directly by low-income-renters, comments will also be directed toward landlord barriers as low-income-renters stand to pay indirectly for the inefficient choices of the landlord, even if they do not directly pay 100% of unit energy costs.

This part concludes by addressing the combined effect of multiple barriers working together to increase the complexity and difficulty of designing effective low-income-renter DSM programming. This calls for a coordinated policy approach that includes flexible use of resources, fostering cooperation among interested organizations, collecting and analyzing pertinent information to develop community-level implementation programs, and implementing effective policy measures over time.

The Efficiency Gap

The goal of DSM programming is to narrow the efficiency gap. Through the use of education, information and technology, a DSM program communicates and assists energy consumers in making good choices and implementing measures that will conserve energy resources. The idea that energy efficiency supports economic efficiency is an important underpinning of DSM programming. DSM programs are put forward and promoted on the basis that energy conservation will decrease living expenses connected to energy use. Therefore, it should make good economic sense to participate in DSM programming.

The idea of “barriers to energy efficiency” is used to explain why the efficiency gap exists. Effective DSM programming starts with an understanding of these barriers. Program analysts must identify the issues that interfere with energy consumers making choices that would otherwise make good economic sense over the long term. Effective programming and policy solutions build on a solid understanding of these issues.

An understanding of barriers requires familiarity with the broad range of circumstances that influence energy choices and consumer behavior. This range of circumstances is particularly

complex in the rental context due to the influence of both the landlord and the tenant in energy consumption decision-making, and the challenges of the principal-agent problem.

In this paper, individual barriers are dealt with in the abstract. An understanding of barriers only becomes an effective tool for the development of DSM programming and policy when applied to specific circumstances. There is no “silver bullet” solution to the challenge of low-income-renter DSM programming. Effective low-income-renter DSM programming must be based on site specific conditions and contracts, and be informed by targeted data analysis. The set of barriers, the impact of individual barriers, and the impact of the collection of barriers taken as a whole, will vary from site to site. DSM programming and policy must acknowledge this diversity and adopt a strategic and flexible approach to designing and implementing efficiency measures to address energy conservation concerns in low-income-renter households.

An informed and targeted approach to low-income-renter DSM programming and policy will provide the system transparency and results to support the legitimacy of DSM policy. Program funding must be collected and administered, channels of communication and cooperation between stakeholders must be strengthened, and legislative intervention will be required to address particular issues. Quantitative and qualitative analysis, in addition to effective management of information resources, is essential to support this work. This work supports an informed and balanced approach to energy conservation that balances the extreme positions of reliance on market forces, with complete government control of energy consumption.³⁴

Barriers

In this section of the paper, barriers are addressed under five main headings: market barriers, information barriers, technology barriers, behavioral barriers and policy barriers. While all barriers inform the issues behind the energy gap, market barriers have been a particular focus of research.³⁵ The principal-agent problem and informational barriers related to the marketplace have been identified as being particularly important.

Each set of barriers will be discussed in the subsections that follow, and the impact of these barriers on both the landlord and the tenant will be discussed. The impact of energy poverty on the low-income-renter will not only be influenced by their direct cost of energy, but also the cost of energy paid for indirectly as part of monthly rent. The landlord and tenant will experience barriers differently in many cases due to the difference in their contractual position that forms the basis of their relationship. Energy consumption within the total housing unit will depend on the reaction of the landlord and tenant to individual barriers, the set of barriers facing each party, and the interactions between the barriers affecting both parties.

³⁴ William H. Golove and Joseph H. Eto, *Market Barriers to Energy Efficiency: A Critical Reappraisal of the Rationale for Public Policies to Promote Energy Efficiency* (Berkeley, Lawrence Berkeley National Laboratory, 2009) at 27 [Golove].

³⁵ *Ibid* at 5.

Market Barriers

Market barriers cover a broad range of general and individual issues, and have been the subject of considerable commentary in terms of explaining the efficiency gap. This section of the paper covers market barriers under four headings: market function, principal-agent problem, investment in energy saving devices, and property transfer. While information and technology barriers are addressed under a separate heading, they also play an important role in the marketplace. Behavioral and policy barriers can also be connected. The extent of the interconnectedness among barriers will depend on case-specific circumstances.

Market Function

The concept of market function captures the elements of the marketplace in which energy consumption decisions are made. In a perfect market, a number of elements would be in place to support energy efficient choices because those choices would also be economically efficient. Some of these elements include energy cost,³⁶ energy price,³⁷ energy services,³⁸ energy efficiency products,³⁹ and alternative energy sources.⁴⁰ In addition, the funding and implementation of DSM measures should also find justification within the marketplace.

Assertion of a true energy cost drives the market, but without accurately capturing the externalized costs of greenhouse gas emissions that support utility electricity generation,⁴¹ energy cost is uncertain. In a perfect market, the price set for energy would be a true reflection of the energy cost. Where energy efficiency products and alternative energy sources exist in the marketplace, and are available at a price that represents their true cost, a market for energy services can develop if the *cost of measures* plus the *transaction cost of energy services* are justified by the *savings related to energy conservation*. Renewable energy sources can be part of this solution: investors can consider these sources if they are available and the economics are attractive relative to conventional energy sources.⁴²

Capturing external costs of greenhouse gas emissions will usually depend on government intervention. The northeastern United States have started to develop this kind of a marketplace. A number of New England programs provide Energy Efficiency Resource

³⁶ PEW Center on Global Climate Change, "Residential Building End-Use Efficiency" (Washington: PEW, 2009) at 5 [PEW].

³⁷ *Golove, supra* note 34; *Ibid.*

³⁸ Morgan Delaney and Boris Safner, *Split-Incentives – A Case for the Third Party: Resolving the Landlord-tenant Dilemma Through Energy Services* (Berlin: TSB Technologystiftung, 2010) at 49 Online: <http://www.tsb-berlin.de/uploads/media/20100330_TSB_Contracting_Dissemination_Document_Final_01.pdf> [TSB].

³⁹ PEW, *supra* note 36 at 7.

⁴⁰ Thomas James Hammons *et al*, "Renewable Energy Alternatives for Developed Countries" (2000) 15 IEEE Transactions on Energy Conversion 4 at 481 [Hammons], online: <<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=900511>>.

⁴¹ PEW, *supra* note 36 at 5.

⁴² *Hammons, supra* note 40.

Standards (EERS) that link efficiency programming to greenhouse gas reduction programming. In 2009, ten of the states participating in the Regional Greenhouse Gas Initiative (RGGI), had moved toward a cap and invest system, “dedicating more than 80% of allowance value to clean energy, with an allocation of approximately 65% to energy efficiency.”⁴³

In this policy environment, Energy Service Companies (ESCO) are third party market players that can specialize in delivering energy services and control transaction costs, making the process of closing the efficiency gap more effective. In the end, DSM programming should make financial sense. For example, New York’s Assisted Multi-Family Loan Program (AMFP) is delivered on the basis that energy efficiency upgrades are required to generate 80% of the investment cost in energy efficiency savings.⁴⁴ Meeting such requirements depends on the provision of experienced and qualified assessors and managers. Similarly, the Enbridge Home Weatherization Retrofit Program has a requirement that energy efficiency upgrades merit the investment required to achieve them.⁴⁵

In Nova Scotia, government has intervened with the *Greenhouse Gas Emissions Regulations* under the *Nova Scotia Environment Act* to delineate compliance periods and emissions caps. Emissions in excess of these caps will be subject to new transmission incentive payments. These regulations have been put in place to align with the province’s goals under the *Environmental Goals and Sustainable Prosperity Act*. The price for electricity is set by the Nova Scotia Utility and Review Board based on evidence presented by NSPI and other stakeholders under the *Public Utilities Act*. There is no energy service market in place in Nova Scotia at the present time. While energy efficiency products and alternative energy sources are available, consumers in Nova Scotia are responsible for acquiring them and bear the transaction costs in most cases. However, the current rate-payer funded DSM programming in Nova Scotia does relieve this situation for individuals that become involved with the program and benefit from the extension of program measures.

In Nova Scotia, the policy infrastructure has not developed to the point that market function barriers can be addressed by DSM programming innovation. If an economic approach is to be taken to overcoming market barriers, energy costs must include the external costs of energy production. In the low-income-renter context, work on this barrier will have limited impact due to the low-income-renter’s limited economic power and marketplace participation constraints.

Under the present regime, the most significant market function barrier for both the landlord and the tenant is the return on rate-payer DSM Program investment, collected through the cost recovery rider on electricity billing. There is particular concern about the inequity of charging low-income-renters to fund DSM programming, in the absence of targeted low-income-renter DSM programming to meet their needs. Low-income-renters are particularly vulnerable to high

⁴³ Richard Cowart, “Delivering Energy Efficiency on a Large Scale: Challenges and Lessons Learned” (Presentation delivered at the International Energy Efficiency Forum, Warsaw, Poland, October 2009), online: <http://www.raponline.org/docs/RAP_Cowart_EEonLargeScale_Poland_2009_11.pdf>.

⁴⁴ AMFP, *supra* note 30.

⁴⁵ Ontario Power Authority, *Multi Family Efficiency Rebates*, online: <<http://www.meerontario.ca/eligibility.html>>.

electricity bills because they live in conditions of poverty. Their rental housing infrastructure is also likely to be inefficient due to the principal-agent problem inherent in the landlord-tenant relationship. Unable to effectively control energy consumption, they are in a position where they are likely to end up paying a disproportionate share of program costs relative to other rate-payers that have more effective access to DSM programming. Investing DSM funds back into rental housing infrastructure to benefit low-income-renter communities should be a priority in the 2012 DSM Plan.

Principal-Agent Problem

The principal-agent problem is widely recognized to be a key barrier to DSM in the rental context, and is particularly pertinent in the case of low-income-renter programming due to the bargaining power differential between landlord and tenant.

The principle-agent problem “refers to potential difficulties that arise when two parties engaged in a contract have different goals (split incentive) and different information (information asymmetry).”⁴⁶ The problem arises when the agent has an opportunity to act in his own interest, possibly aided by information that is not available to the principal. For example, the landlord (as agent) purchases an old and inefficient refrigerator to be used by the tenant (principal). The landlord’s goal would be to minimize the capital cost of the refrigerator, but the goal of the tenant who pays the energy bill (that includes energy consumed by the refrigerator) would be to minimize energy consumption. In addition the landlord may also have access to energy efficiency information about the refrigerator that is not disclosed to the tenant in this situation.

Even though there has been significant writing on this topic, coverage remains largely theoretical.⁴⁷ The challenge for DSM program and policy developers is to put principles into practice and complete careful analysis on a case-by-case basis to design programs and policy that effectively overcome barriers. This analysis must take place at the technology transaction level (i.e. the decision to purchase or use a particular piece of technology, for example, a refrigerator).⁴⁸

⁴⁶ International Energy Agency, *Mind the Gap: Quantifying Principle Agent problems in Energy Efficiency* (Paris: International Energy Agency, 2007) at 27 [*Mind the Gap*].

⁴⁷ PEW, *supra* note 36; *Mind the Gap*, *supra* note 46; Lucie Maruejols and Denise Young, *Energy Use in Canadian Multifamily Dwellings* (Edmonton: Canadian Building Energy End-Use Data and Analysis Centre, 2010) online: <http://www.cbeedac.com/whatsnew/documents/multifamilydwellingsreport_FINAL.pdf>; Kenneth Gillingham, Matthew Harding and David Rapson, *Split Incentives in Residential Energy Consumption*, online: <http://www.stanford.edu/~mch/GillinghamHardingRapson_SplitIncentives.pdf>; Jean-Jacques Laffont and David Martimort, *The Theory of Incentives: The Principal Agent Model* (Princeton: Princeton University Press, 2002).

⁴⁸ Golove, *supra* note 34 at 34; *Mind the Gap*, *supra* note 46 at 12; International Energy Agency, *Promoting Energy Efficiency Investments: Case Studies in the Residential Sector* (Paris: International Energy Agency, 2008) at 17 [*Residential*]; PEW, *supra* note 36 at 6.

Overcoming the principal-agent problem requires technology specific problem-solving. A method has been developed by the International Energy Agency (IEA) to deconstruct landlord-tenant contracts, revealing their technology specific components in order to identify opportunities to address the portion of the efficiency gap stemming from the principle-agent problem.⁴⁹ The full extent of the principal-agent problem in the context of a particular landlord-tenant relationship will therefore be a composite of these technology specific components. The list of individual technology transactions could include: space heating, space cooling, water heating, lighting, refrigeration and freezers, dryers, clothes washers, dishwashers, cooking, electric plug loads and other.⁵⁰

The nature of the landlord-tenant principal-agent problem can be classed into one of four cases. Analysis would include assigning each technology transaction to the most appropriate case, and collecting data that could be used to quantify the size of the efficiency gap.⁵¹

	End user can choose technology	End user cannot choose technology
End user pays the energy bill	Case 1: No PA problem	Case 2: Efficiency problem
End user does not pay the energy bill	Case 3: Usage and efficiency problem	Case 4: Usage problem

In the residential tenancy context, there are three main scenarios that can lead to overconsumption of the energy resource: first, where the landlord (as agent) chooses technology and the tenant (principal) makes energy consumption choices and pays the energy bill [case 2]; second, where the tenant (as agent) chooses technology and makes energy consumption choices and the landlord (principal) pays the energy bill [case 3]; and third, where the landlord has chosen the technology, the tenant (as agent) makes energy consumption choices and the landlord (principal) pays the energy bill [case 4].

The refrigerator example discussed above would fit into case 2. Information required to assess the efficiency gap related to refrigerator technology would include landlord and tenant obligations under contract, and refrigerator efficiency information. This information would have to be collected by census or sample in the building or community of the target DSM Program. Depending on the scope of the analysis, existing information may also be available.

In Nova Scotia, we would expect the space heating, water heating, and refrigeration and freezers to be the most significant contributors to the efficiency gap, caused by the principal-agent problem, for low-income-renters who pay for energy (case 2). In cases where the landlord pays energy costs and the tenant controls energy usage, we would expect space heating and water heating (case 4) and electric plug loads (case 3) to be the most significant

⁴⁹ *Mind the Gap*, *supra* note 46 at 39-51.

⁵⁰ *PEW*, *supra* note 36 at 1-3.

⁵¹ *Mind the Gap*, *supra* note 46 at 39-46.

contributors to the efficiency gap. We suggest that focusing on these technology transactions would address the greatest potential for energy conservation.

The IEA recommends a three-pronged approach to addressing the principal-agent problem in the energy efficiency context: contract redesign, standard implementation and information dissemination.⁵²

The strongest policy solutions are those that are contract-oriented because they address the fundamental source of the problem. In theory, if both the goals and the level of information available to both principal and agent are made uniform, the principal-agent problem will no longer exist. While this approach has been used effectively in Japan to control the energy efficiency of vending machines,⁵³ the same contract design principals are not easily translated to the rental housing context; however, the use of Energy Service Companies (ESCOs) could be part of this solution.⁵⁴

Implementing energy building codes and appliance standards can address the principal-agent problem in cases where the landlord selects technology. Energy building codes and appliance standards also support energy conservation outside of the principle-agent context. In Nova Scotia, there is no energy building code in place, however some work has been done at the national level to develop these as part of a global effort to address energy efficiency.⁵⁵ In other jurisdictions, considerable progress has been made toward implementation of energy building codes.⁵⁶

In terms of appliance standards, the *Energy Efficient Appliances Act* and the *Energy Efficient Appliances Regulations* are in place in Nova Scotia, but landlords are likely to be exempt from the standards outlined in the regulations under s. 4(2) of the Act. In addition, the federal *Energy Efficiency Act* and *Energy Efficiency Regulations* establish energy efficiency standards and labeling requirements for a wide range of energy-using products, with the objective of eliminating the least energy-efficient products from the Canadian market. The province should consider extending useful standards to the rental housing context. Low-income-renters, the members of our community who are most vulnerable to the financial consequences of

⁵² *Mind the Gap*, *supra* note 46 at 192-197.

⁵³ *Ibid* at 194.

⁵⁴ *TSB*, *supra* note 38.

⁵⁵ Building Codes Assistance Project of the Alliance to Save Energy, *Building Energy Codes: Best Practices Report for APEC Economies*, online: APEC < http://www.apec-esis.org/www/UploadFile/Building_Energy_Codes_Best_Practice%20_SummaryReportAPECfinal.pdf>; *Performance Compliance for Houses: Specifications for Calculation Procedures for Demonstrating Compliance to the Model National Energy Code of Canada for Houses 1997 Using Whole House Performance*, online: National Research Council Canadian Commission on Building and Fire Codes < <http://www.nrc-cnrc.gc.ca/obj/irc/doc/pubs/nrcc46029.pdf>>.

⁵⁶ Michael Bobker, "Decoding the Code' Understanding the Workings of Building Code for Energy Conservation and PlaNYC2030 Goals," (Presentation delivered to the Building Performance Lab CUNY Institute for Urban Systems, Sallan Foundation Panel, New York City, September 22, 2008).

inefficient energy choices, should be able to share in the benefit of our society's standards for a sustainable future.

Information dissemination can address the information asymmetry between landlord and tenant and reduces the opportunity for the agent (often the landlord) to misuse informational advantage. Informational regulation that requires mandatory efficiency labeling of appliances and housing provides an example of how information asymmetry can be dealt with.⁵⁷

The policy solutions that are most likely to address the principal-agent problem would require legislative intervention for provincial implementation. However, it is possible to do developmental work on these initiatives and test them at a local scale through voluntary pilot project programming in receptive communities. This work could include developing innovative landlord-tenant contracts, developing and implementing an energy building code, and making efficiency information more accessible to landlords and tenants. In addition, this work would allow DSM Program developers to become proficient in collecting and analyzing technology transaction data, identifying the extent of efficiency gaps, and developing responsive DSM programming.

A localized approach would intuitively be the most efficient means of addressing principal-agent problems due to the increased uniformity of contracts and technology. The Brahms Energy Saving Team (BEST) in Toronto, Ontario is an example of a successful building-based program.⁵⁸

Investment in Energy Efficient Technology

Inability or disincentive to invest in energy efficient technology is another market barrier to energy conservation. Even when the consumer has an interest in increasing efficiency, it must be practical to do so. The financial constraints examined in this section include capital constraints,⁵⁹ and transaction costs.⁶⁰ For the purposes of this discussion, we assume that the technology is available to meet consumer requirements.

Capital constraint issues cluster around barriers accessing the capital required to make an investment. These barriers can include lack of capital (consumer has no access to capital in any form), lack of liquidity (consumer has capital, but capital is invested in assets that cannot be readily liquidated) and high cost of capital (consumer's cost of financing an investment is too

⁵⁷ Abbott, *The Green Landlords Model: Solving the Rubik's Cube of Energy Efficiency in Rental Housing*, online: BC Sustainable Energy Association <http://www.bcsea.org/sites/default/files/webinars/BCSEA_TW_Green_Landlords_090323.pdf> [Abbott]; *Energy Performance Certificates*, online: DirectGov <<http://epc.direct.gov.uk/index.html>>.

⁵⁸ *The Brahms Energy Saving Team: Engaging Tenants in the Culture of Conservation*, online: Toronto Environmental Alliance <<http://www.torontoenvironment.org/campaigns/climate/brahmsenergy>>.

⁵⁹ PEW, *supra* note 36.

⁶⁰ Golove, *supra* note 34 at 22-24.

high; this includes consideration of interest rate and discount rate reflecting payback period and investment risk).⁶¹

The lack of capital barrier is the most significant investment barrier to the low-income-renter, and is most relevant in situations where the tenant is responsible for selecting technology and paying the energy bill for using that technology. For example, it may make sense for a tenant to purchase Compact Fluorescent Light bulbs (CFL) and materials to reduce the draft coming in through windows. These measures may well lead to reducing energy bills. However, the low-income-renter will have very limited capital to invest, even for relatively inexpensive measures.

In Nova Scotia, low-income-renters living in poverty do not have sufficient income to cover their basic needs. Frequently in a deficit position, they have no capital to finance up-front energy investment costs. In the rare circumstance that an individual has acquired capital, total assets are capped for determining income assistance eligibility. A single person living on income assistance in Nova Scotia in 2011 is prohibited by regulation from having more than \$1000 in assets.⁶²

Subsidy, incentive and rebate programs short of 100% coverage (effectively removing the need for capital) cannot be effective for low-income-renter DSM programming. Therefore, the capital cost reduction problem quickly becomes a funding problem. There are approaches to making this funding available: providing full funding and providing the opportunity for deferred payment. Evaluating these options requires consideration of which option, or combination of options, will be the most effective in terms of maximizing the benefits to low-income-renters and having the greatest impact on the efficiency gap.

Fully funded programming has the advantage of having immediate results. Aside from monitoring requirements, there is no need to carry these projects “on the books.” The NB Energy Efficiency Retrofit Program is an example of a Canadian program that provides upgrade funding for multi-unit residential buildings.⁶³

The counterpoint to these advantages is that funding sources must be identified, and that funding availability may vary from year to year, making program planning difficult. However, there is wide federal, provincial, municipal and non-profit interest in housing and energy conservation. DSM programming could leverage this interest by engaging the support of these stakeholders. Beyond obtaining funding, a further concern is that the benefits of seed funding are not necessarily widespread across the population of low-income-renters, and may therefore only benefit a small proportion of individuals.⁶⁴

⁶¹ PEW, *supra* note 36.

⁶² *Employment Support and Income Assistance Act*, S.N.S. 2000, c. 27.

⁶³ *Existing Multi Unit Residential Building Upgrades*, Efficiency NB online: <<http://www.efficiencynb.ca/enb/1609/Existing-Multi-Unit-Residential-Building-Upgrades-Program>>.

⁶⁴ Comments of Nancy Brockway (19 November 2010) at PDWG Low Income Subcommittee Meeting.

Deferring payment through a Pay as You Save (PAYS) Program is an alternative option. A PAYS Program uses seed funding to float the program over the long term subject to repayments. The energy consumer pays back the capital cost of the technology investment, usually through the customer's energy bill, as energy savings are realized. The payback terms can be arranged so that the tenant's average energy bill is reduced overall: the customer can realize some of the savings, while the balance is directed toward repayment of the initial capital cost. The U.K. proposed PAYS Program seeks to achieve this happy medium by ensuring that "repayments are calculated to be less than the savings that will be made on the fuel bills."⁶⁵ This kind of programming could allow for spreading the benefits of seed funding more widely among low-income-renter energy customers, and has been recommended for implementation in British Columbia by the BC Sustainable Energy Association as part of their proposed Green Landlords Program.⁶⁶

There are, however, some disadvantages to deferred payment programming. Although it is considered a viable alternative, the implementation structure is complex, and has not been popular with either landlord or tenant groups. Consequently, implementation would require legislative intervention.⁶⁷ Program administration would have to ensure that seed funding balanced repayments, that payback periods balanced the program's cost of capital and technology lifespan, and that measures implemented would return the expected benefits. In addition, program design would have to consider the issues that arise through property or lease transfer.

Lack of liquidity and cost of capital are the most significant capital barriers facing the landlord. There are a number of possible policy solutions to overcome these constraints, including funding, deferring payment, tax incentives, and innovative financing. Funding and deferred payment solutions have already been discussed. Tax incentives provide another approach to addressing lack of capital. Tax incentives have not been widely used in Canada;⁶⁸ however, they have been used in other jurisdictions.⁶⁹

Innovative financing options include considering conservation and future energy savings in loan eligibility criteria and interest rates, and funded loan insurance coverage for energy upgrades.⁷⁰ The "Flat 35" Program in Japan⁷¹ and New York's Assisted Multi-Family Loan Program (AMFP) are examples of innovative loan programs. The AMFP works with lenders to offer low-interest loans and needs-based grants.⁷² The AMFP follows traditional commercial lending customs,

⁶⁵ UK Green Building Council, *Pay As You Save: Financing low energy refurbishment in housing, Executive Summary* (London: UK Green Building Council, 2009) at 2.

⁶⁶ *Abbott*, *supra* note 57.

⁶⁷ *TSB*, *supra* note 38.

⁶⁸ Blair Hamilton, project manager, Frances Huessy, ed., *A Comparison of Energy Efficiency Programmes for Existing Homes in Eleven Countries* (The Regulatory Assistance Project: 2010) (Prepared for the Department of Energy and Climate Change United Kingdom) at 39 [RAP].

⁶⁹ For example, tax incentive programs available in Australia, see: *RAP*, *supra* note 68 at 29.

⁷⁰ *PEW*, *supra* note 36 at 7.

⁷¹ *RAP*, *supra* note 68 at 82.

⁷² *AMFP*, *supra* note 30.

rather than the model of a public granting agency. Therefore, this model offers flexibility and accountability for energy efficiency upgrades by for-profit property owners. Insurance coverage incentives are not available in the rental housing context in Canada, but there is programming available that offers a refund on mortgage insurance for energy efficient homes.⁷³

Transaction costs are a further barrier to investment in energy efficient technology. The concept of transaction cost captures the idea that the process of a transaction will require some effort and use of resources, in terms of gathering information, making decisions, negotiating terms, and finalizing the transaction. Transaction costs are therefore an added expense to any capital expenditure. Transaction costs are potentially a very significant barrier to landlord investment in energy efficiency technology.⁷⁴ In particular, assessment expenses have been cited as a significant transaction cost, and a barrier to participation in programs where assessments are required.⁷⁵

Where the landlord can quantify the transaction cost, the landlord would be likely to add it to the cost of the technology acquired, and pass it on through rent. A low-income-renter's housing security can be put in jeopardy by increases in rent. Therefore, tenant protection from rent increases following landlord investment in energy efficiency technology has been incorporated into legislation in New Brunswick.

Where the landlord is unable to quantify the transaction cost, he or she will still realize that there is some effort involved in implementing energy efficiency technology. Absent a strong motivating force, the landlord may conclude that investing requires "too much work." The Social Housing Renovation and Retrofit Program in Ontario has delegated work to outside delivery partners to help control consumer transaction costs.

Making it easier for landlords to understand the advantage of investing to increase energy efficiency, and to implement efficiency measures, can address these concerns. Specialized services could be offered through the DSM Administrator, Efficiency Nova Scotia. The use of third party energy service providers would be another way to decrease transaction costs. The high transaction costs associated with a landlord's steep learning curve could be replaced by the moderated transaction costs of an experienced energy services facilitator or contractor.

Property Transfer

Property transfer issues can become market barriers when ownership and leasehold property interests are transferred. In the rental context both of these must be considered: ownership transfer when the landlord sells the rental property,⁷⁶ and leasehold transfer when the lease of one tenant ends and the lease of another begins. Property transfer becomes a barrier when the primary rationale for energy efficiency investment is to close the efficiency gap (i.e. to realize

⁷³ *RAP*, *supra* note 68 at 40.

⁷⁴ *Golove*, *supra* note 34 at 22-24.

⁷⁵ *Abbott*, *supra* note 57.

⁷⁶ *PEW*, *supra* note 36 at 5.

energy cost savings), and not to increase the value of the property. As investment increases and payback periods are extended, uncertainty regarding future property transfer will create risk for the investor. This becomes a disincentive for technology investment.⁷⁷ This would be a consideration for a landlord who might want to keep his or her options open for selling his building, and also for the renter who knows that their stay will not be permanent. The influence of this barrier on a specific landlord or tenant will vary depending on the goals and needs of each party.

Property transfer barriers intersect with information and technology barriers following property transfer. The new landlord and the new tenant may not be as informed about the energy consuming infrastructure, or as proficient in the use of energy saving technology, as the landlord or tenant that came before them. For example, energy consumers often have difficulty using digital thermostats.⁷⁸ DSM programming should therefore contemplate the training needs of future landlords and tenants following property transfer to enhance program sustainability.

Property transfer also provides DSM opportunities. Property transfer can be used as a trigger for DSM Program intervention.⁷⁹ Possibilities include energy audits,⁸⁰ energy assessments, energy labeling⁸¹ and educational programming.⁸²

A point of transfer energy labeling program would be an effective way to implement mandatory building energy labeling. Nova Scotia's new land registration system has been implemented in this way, with property transfer triggering registration. NSPI could expand its auto-landlord program⁸³ to landlords not currently engaged in the program. This information could be used to trigger energy audits of rental housing. Amending the *Residential Tenancy Act* to give prospective tenants the right to energy labeling information, and a procedure to implement this right, would be another way of achieving compliance. Creating a landlord registration or approval scheme would be another.

Market barriers capture a wide range of concerns, including market function, the principal-agent problem, investment capacity and property transfer issues. However, informational, technological, behavioral and policy barriers also influence consumer behavior in the market place. These barriers are dealt with separately in the sections below due to the unique aspects of each issue. Informational barriers will be addressed next.

⁷⁷ PEW, *supra* note 36 at 6

⁷⁸ Comments of Kate McDonald (2 November 2010) at PDWG Low Income Subcommittee Meeting [McDonald].

⁷⁹ PEW, *supra* note 36 at 7.

⁸⁰ *Ibid* at 7.

⁸¹ Abbott, *supra* note 57.

⁸² PEW, *supra* note 36 at 7.

⁸³ Aguinaga, *supra* note 17: a program that transfers energy bills to the landlord during periods of tenant vacancy.

Informational Barriers

Informational barriers include lack of information, cost of information, accuracy of information and the ability to use or act on information. Issues related to these barriers include whether information is available, the expense required to access information (in terms of time or money or both), resistance to sharing information between parties in the context of a transaction, and the ability of individuals to understand and use the information that is otherwise available to them. These barriers constrain the ability of an individual, whether a landlord or a tenant, to make a sensible decision—a decision to save money by closing the efficiency gap, in terms of DSM. This constrained position is referred to as “bounded rationality.”⁸⁴

The market barriers section of the paper dealt with cost of information as a “transaction cost,” discussed as an investment constraint and a significant barrier to landlord investment. Low accuracy of information, or “information asymmetry,” was discussed in the context of the principal-agent problem and is a significant factor in cases where the landlord has made technology choices that will influence tenant energy consumption.

In Nova Scotia, lack of awareness of information has been cited as one of the main barriers in the Low Income Houses Program uptake.⁸⁵ The current DSM Program outreach strategy takes a localized approach to information delivery. Exposure could be increased through the use of mass media (for example, television), and communicating program information through electricity billing mail-outs and customer service contact. When a Low-income-renter DSM Program is developed, putting information in the hands of low-income-renters so that they can take advantage of DSM programming should be a priority.

Sometimes, even though information is provided, it may still be unclear or confusing.⁸⁶ Factors that may limit a customer’s ability to understand information—including literacy, age and mental health—should be considered when designing information delivery and education programming. In addition, newcomers to DSM programming may find it difficult to understand novel concepts or to use new technology. Community-based response can be an effective way to overcome the challenges that some energy consumers face in understanding or acting on information. Community-based models can increase the reception of available information by building on relationships of mutual understanding and trust.

Solutions to informational barriers come in a number of forms including voluntary and mandatory building and appliance⁸⁷ labeling programs; community educational and engagement programs; using third party energy service companies to reduce transaction costs; and using smart grid technologies⁸⁸ and framing⁸⁹ to provide consumer feedback.

⁸⁴ Golove, *supra* note 34 at 20-21.

⁸⁵ Aguinaga, *supra* note 17.

⁸⁶ Abbott, *supra* note 57.

⁸⁷ PEW, *supra* note 36 at 8.

⁸⁸ *Ibid* at 7.

Effective communication is central to overcoming informational barriers. A number of programs in Canada have been able to overcome issues relating to lack of information and low ability to use information. The BC Hydro Energy Conservation Assistance Program has pro-actively engaged with tenants, either one-on-one or in a group setting, to inform them of the potential benefits of DSM programming and to encourage their participation and cooperation.⁹⁰ The BC Hydro Energy Savings Kit Offer provides online, DVD and printed tutorials to help customers with the installation and use of energy efficiency measures. Warm Up Winnipeg enhances communication and participation by targeting specific communities to take advantage of pre-existing social networks and trust bonds.⁹¹

Technological barriers are discussed in the next section. Implementation of technology is the most significant technological barrier for both landlord and tenant, and reinforces the importance of the energy consumer being able to understand and use available information.

⁸⁹ *PEW*, *supra* note 36 at 8: Sacramento Municipal Utility District (SMUD) smiley face program resulted in an estimated 2% energy savings by placing a happy face (☺) on bills of customers whose usage was low relative to nearby customers.

⁹⁰ *ECAP*, *supra* note 22.

⁹¹ Low Income Energy Efficiency Program, online: Manitoba Hydro
<http://www.hydro.mb.ca/your_home/lower_income.shtml>.

Technological Barriers

Technological barriers include a range of technological issues associated with energy efficiency decision-making. These include the availability of technology,⁹² the effectiveness of technology, and the implementation of technology.

A wide range of technologies are available to increase energy efficiency and decrease energy usage. Technology is integrated into DSM programming in the form of measures. Measures are actions to implement specific technologies due to their estimated impact on the efficiency gap, and range from comprehensive whole-home or whole-building frameworks, to specific technology implementation.⁹³ Current DSM programming in Nova Scotia includes Scope I⁹⁴ and Scope II⁹⁵ measures under the Low Income Homeowners Program.

While technology is available in the marketplace, it may not be accessible to low-income-renters due to their lack of capital. A number of Canadian programs provide effective, low-cost technology to tenants to conserve energy. The BC Hydro Energy Savings Kit Offer is provided to qualifying low-income households and includes a variety of energy saving technologies including: CFL light bulbs, weather-stripping, fridge and freezer thermometers and low-flow showerheads.⁹⁶ Other easy-install energy upgrades could potentially be offered to low-income-renters including pipe-wrapping and insulating film for windows. These solutions are an ideal way to begin low-income-renter DSM programming due to their low-cost and easy installation features while offering tenants some control over energy efficiency and energy usage in their homes. The Peaksaver Program provides a more sophisticated example, using smart-grid technology to dial-down water boiler and furnace settings during peak consumption periods.⁹⁷

⁹² *Hammons, supra* note 40.

⁹³ *RAP, supra* note 68 at 41; specific measures include insulation, air sealing, heating/cooling equipment, appliances, lighting, solar water heating, other efficient water heating equipment, efficient windows, biomass heating, solar electric, smart meters and in-home displays, and behavioural measures.

⁹⁴ Email from Helen Langille, NSPI (22 July 2010): Scope I measures consist of building envelope upgrades for the purposes of saving energy and increasing the comfort of the home. The savings under scope I are considered permanent because they are upgrades to the building itself, rather than changing plug load or behaviours. Include: Basement/crawlspace insulation, Exposed floors insulation, Main Walls insulation, Ceilings/Attics insulation, Air Sealing, Ventilation.

⁹⁵ *Ibid*: Scope II measures are electricity reduction measures based on consumption and behaviour and are installed in every home, regardless of heating fuel. Include: 13W CFLs, 23W Specialty CFLs, 13W Specialty CFLs, Flush-mount CFL fixtures, Replacement of halogen torchiere with CFL torchiere, Provide electric kettle, Fridge replacement, freezer replacement, secondary fridge or freezer removal, power bar install, hot water tank wrap (insulate), exposed copper hot water pipe wrap (insulate), low flow shower head, faucet aerators, programmable thermostats, dehumidifier

⁹⁶ *Energy Savings Kit Offer*, online: BC Hydro
<http://www.bchydro.com/powersmart/residential/ps_low_income/energy_saving_kits.html>.

⁹⁷ *Peaksaver, supra* note 31.

DSM programming assumes that estimations of technology efficiency and energy conservation results are accurate.⁹⁸ Monitoring changes in energy consumption should be integrated into DSM programming to verify these estimations.

The implementation of technology requires that service providers, investors and users of technology understand how to use it. This extends beyond the ability to use information discussed in the previous section, to the ability to use technology. Implementation of technology translates into a training issue.

Service providers must understand existing infrastructure, conservation measures and implementation constraints in order to complete an effective assessment and design a conservation plan.⁹⁹ Assessors must understand the impacts of their recommendations on the home environment. Inattention to these factors can degrade indoor air quality.¹⁰⁰ In Canada, the Canadian Mortgage and Housing Corporation (CMHC) has developed a comprehensive template to provide assessment guidance. This template can be used to standardize site-level DSM decision-making.¹⁰¹

Where DSM programming educates and trains customers, the individuals that provide this training must be well trained themselves. Once trained, these trainers can then help energy consumers to become effective users of technology by providing them with the skills they need to problem-solve and enable their independence. The community model of DSM programming is an effective way to address these trainer and customer requirements to support technology implementation.

With an understanding of market, informational and technology barriers in place, the next section addresses behavioral barriers. We suggest that behavioral barriers will have limited influence on the actions of landlords because their behavior is dominated by the conditions of the marketplace, including related barriers that influence their business operation. Therefore, the next section of the paper focuses on the behavior barriers that influence tenant decision-making outside of market forces.

Behavioral Barriers

Behavioral barriers¹⁰² help to explain the decisions of energy consumers that reach beyond market forces and difficulties understanding information and technology. Distrust of

⁹⁸ Quantum Consulting Inc, *National Energy Efficiency Best Practices Study Volume R5 – Residential Multi-Family Comprehensive Best Practices Report*, December 2004, online: Quantum Consulting Inc. <http://www.eebestpractices.com/pdf/BP_R5.PDF> at 17 [R5].

⁹⁹ *Ibid* at 2.

¹⁰⁰ *Ibid* at 16.

¹⁰¹ CMHC, *Energy and Water Efficiency in Multi-Unit Residential Buildings: A User Guide and Technical Manual for Property Managers and Owners* (Ottawa: CMHC, 2004).

¹⁰² Golove, *supra* note 34 at 17; PEW, *supra* note 36 at 5; Andrew J. Hoffman and Rebecca Henn, *Overcoming the Social and Psychological Barriers to Green Building*, 21 *Organization Environment* 4 (2008) 390-419.

information, privacy issues and the influence of custom are discussed in this section, and their impact on low-income-renter participation in DSM programming is addressed.

In Nova Scotia, distrust of information¹⁰³ and privacy concerns are barriers to participation in low-income DSM programming.¹⁰⁴ Trust issues arise from suspicion that DSM Program benefits are “too good to be true”—that assistance given with one hand will be taken by another. An example of this emerged within the REAP Program, where there was a concern that upgrade work requiring a building permit could lead to increased property taxes.¹⁰⁵ In addition, among participants in the regular residential program, program agents have encountered skepticism that upgrades are installed free of charge.¹⁰⁶

Privacy barriers include concerns about privacy in relation to personal information, and concerns about the physical privacy in home space. Some residents are not comfortable with outsiders coming into their homes to install efficiency measures.¹⁰⁷ The present response to this issue is an assurance of privacy from the outreach agent or service contractor. It is hoped that as awareness of the program increases, recognition and trust will increase, and privacy issues will become less of a barrier. The Warm Up Winnipeg neighborhood DSM Program model is an alternative approach to addressing this barrier where people from the community are trained to communicate with energy consumers.

The pull of custom can also be a strong behavioral barrier. Custom will vary among individuals, families and communities, as well as on a regional basis. A pillar of efficiency gap theory is that energy is being used that could otherwise be conserved—that there is an element of waste.¹⁰⁸ The goals of DSM programming parallel the goals of the Nova Scotia Solid Waste-Resource Management Strategy.¹⁰⁹ Engaging education and programming are required to bring about a waste culture change. Community level programming is an effective way to bring about this culture change because energy efficient decision-making becomes a shared community value.

The 1970s energy crisis provides a useful example of how simple reminders can be used in DSM programming to help energy consumers focus on changing their energy consumption habits. The energy conservation stickers that were designed to post on light switches are an artifact of this era. School visits and children’s educational programming are also useful to encourage younger generations to learn about energy usage and conservation. The DSM Program could also look to the Solid Waste-Resource Management Strategy for some innovative outreach

¹⁰³ Application to approve Nova Scotia’s Electricity Demand Side management Plan for 2011 (NSUARB P-884(3)) NSPI Responses to CA Information Requests, 30-March-2010 online: < [http://www.nspower.ca/site-nsp/media/nspower/NSPI%20DSM%202011%20IR%20Responses\(1\).pdf](http://www.nspower.ca/site-nsp/media/nspower/NSPI%20DSM%202011%20IR%20Responses(1).pdf)> [Response].

¹⁰⁴ Aguinaga, *supra* note 17.

¹⁰⁵ McDonald, *supra* note 78.

¹⁰⁶ Aguinaga, *supra* note 17.

¹⁰⁷ *Ibid.*

¹⁰⁸ *Energy Saving Tips to Help You Save*, online: Conserve NS <<http://www.conservens.ca/in-the-home/energy-savings-tips.asp>>.

¹⁰⁹ *Recycling and Waste*, Online: Nova Scotia Environment <<http://www.gov.ns.ca/nse/waste/>>.

ideas. Going one step farther, cooperating on programming to deliver both conservation messages together may also be effective. We suggest that where consumers have developed good habits regarding solid waste-resource management, they will be receptive to DSM programming because the same conservation ethic underscores both conservation activities.

Policy Barriers

Low-income-renter DSM programming in Nova Scotia takes place in a rich policy context. In many ways, government policy aligns with the objectives of DSM programming. For example, a range of federal,¹¹⁰ provincial,¹¹¹ and municipal¹¹² enactments deal with housing. In addition, comprehensive housing programs are available through government agencies and departments, including CHMC¹¹³ and the NS Department of Community Services.¹¹⁴

However, there are also policy barriers. While a number of DSM programming best practices and suggestions can be implemented in the current policy environment—either within the powers of Efficiency Nova Scotia or by cooperating with other government agencies and departments with common goals—a wider DSM policy model will be required to fully address the efficiency gap.

Current DSM Program constraints and the *Residential Tenancy Act* are the foremost policy barriers. The current DSM Plan does not provide special programming for either the landlord or the low-income-renter in the rental housing context. The DSM Plan Information Request responses released in March of 2010 indicate that the current requirement of homeownership to participate in the Existing Houses, New Houses and Low Income Programs is the most significant barrier to the low-income-renter.¹¹⁵ The DSM cost recovery rider¹¹⁶ is also a concern, as discussed in the market barriers section of this paper.

¹¹⁰ *National Housing Act*, R.S.C. 1985, c. N-11; *Canada Mortgage and Housing Corporation Act*, R.S.C. 1985, c. C-7.

¹¹¹ *Building Code Act*, R.S.N.S. 1989, c. 46; *Nova Scotia Building Code Regulations*, N.S. Reg. 322/2009; *Halifax Regional Municipality Charter*, S.N.S. 2008, c. 39; *Homeowners' Incentive Act*, R.S.N.S. 1989, c. 202; *Homeowners' Incentive Regulations*, N.S. Reg. 52/72; *Grant Entitlement Regulations*, N.S. Reg. 143/83; *Housing Act*, R.S.N.S. 1989, c. 211; *Provincial Housing Emergency Repair Program Regulations*, N.S. Reg. 214/2005; *Senior Citizens Assistance Program Regulations*, N.S. Reg. 215/2005; *Access-A-Home Program - R-11C*, N.S. Reg. 154/93; *Housing and Rentals Act*, R.S.N.S. 1989, c. 212; *Municipal Government Act*, S.N.S. 1998, c. 18; *Statements of Provincial Interest*, N.S. Reg. 101/2001; *Municipal Housing Corporations Act*, R.S.N.S. 1989, c. 304; *Preston Area Housing Act*, R.S.N.S. 1989, c. 353.

¹¹² Halifax Regional Municipality, By-law No. M-100, *Respecting Standards For Residential Occupancies*.

¹¹³ Canada Mortgage and Housing Corporation, online: CMHC <<http://www.cmhc-schl.gc.ca/en/index.cfm>>.

¹¹⁴ Nova Scotia Community Services, *Affordable Housing and Repairs*, online: NSCS <<http://www.gov.ns.ca/coms/housing/>>.

¹¹⁵ *Response*, *supra* note 103.

¹¹⁶ Nova Scotia Power, *DSM Cost Recovery Rider*, online: NSPI <<http://www.nspower.ca/en/home/aboutnspi/ratesandregulations/electricityrates/dsm.aspx>>.

The *Residential Tenancies Act*, despite providing some substantive protections for tenants¹¹⁷ and procedural safeguards, does not provide either the housing security or the standards that low-income-renters require to support energy technology improvements in their living spaces.

There is no rent control.¹¹⁸ With appropriate notice, the landlord can increase rent as much as he or she chooses. Although there is a *Rent Review Act*,¹¹⁹ all classes of residential premises are exempt under the *Residential Premises Exemption Regulations*.¹²⁰

Security of tenure requires residence for a period of at least five years, subject to certain conditions.¹²¹ Many low-income-renters do not reside in rental housing long enough to achieve security of tenure; however, if they do attain security of tenure, their housing security is still vulnerable due to rent increases.¹²²

Standards relating to the condition of rental premises are general and deferential to other legislation that addresses health, safety and housing.¹²³ Where the circumstances and needs of the low-income-renter are excluded from standards, not considered in standards or not enforced, this deference is not adequate.

Under current legislation, tenants have no protection from the cost of poor energy efficiency choices made by the landlord. The *Residential Tenancies Act* must be amended to provide housing security and standards if low-income-renters are going to be engaged in the sustainable implementation DSM solutions over the long term.

A detailed policy analysis was beyond the scope of this paper, but this work should be done as one of the first steps in developing long-term low-income-renter DSM policy. Within the current policy environment, a range of provincial government departments and municipalities have been assigned many of the powers necessary to address the challenges of low-income-renter DSM. For example, under the *Municipal Government Act*¹²⁴ and *Statements of Provincial Interest*,¹²⁵ municipal governments are provided with the authority to cooperate with other agencies, prescribe minimum standards and enact bylaws with respect to housing. Engaging these powers in the interest of low-income-renter DSM will require development and implementation work to put in place functional programming. This work would include drafting regulations and bylaws, extending standards currently in place to rental housing, implementing and/or enforcing enactments that have already been developed, innovating policy and

¹¹⁷ *Residential Tenancies Act*, R.S.N.S. 1989, c. 401, s. 9 [RTA].

¹¹⁸ *Ibid*, s.11; *Residential Premises Exemption Regulations*, N.S. Reg. 122/93.

¹¹⁹ *Rent Review Act*, R.S.N.S. 1989, c. 398.

¹²⁰ *Residential Premises Exemption Regulations*, N.S. Reg. 122/93.

¹²¹ At time of writing, Bill 119 was before the legislature to amend the *Residential Tenancies Act*. One of the provisions was immediate security of tenure. At time of final edit, the Bill had achieved Royal Assent but had not been proclaimed.

¹²² RTA, *supra* note 117, s.10.

¹²³ *Ibid*, s.9.

¹²⁴ *Municipal Government Act*, S.N.S. 1998, c. 18, ss. 59(b), 172, 174, 181(1).

¹²⁵ *Statements of Provincial Interest*, N.S. Reg. 101/2001.

guideline approaches that reflect the vulnerable position of low-income-renters, and strengthening relationships between agencies with complementary purposes.

Targeted legislative development may also have to take place. The provincial government could consider an approach similar to the Solid Waste-Resource Management Strategy. The concept of deferred payment for energy efficient upgrades also holds some promise to enable development of the infrastructure that is required to support low-income-renter DSM. The policy analysis should consider the full range of policy tool options and should be developed through the procedure outlined in the province's *Regulatory Management Policy Guide*¹²⁶ and related guidebooks. Options include command and control, economic and voluntary regulatory tools¹²⁷ that structure compliance around performance-based, technology-based and management-based standards.¹²⁸ Once an initial analysis is done to identify potential policy options, the options identified to address specific objectives should be considered together to ensure that the parts of the policy program will function effectively as a whole.

Low-income-renters face a range of barriers that prevent them from participating in DSM. In this section of the paper, market barriers, including market function, the principal-agent problem, investment in energy efficient technology, and property transfer barriers have been discussed. Informational, technological, behavioral and policy barriers have also been explored.

These barriers will effect landlords and tenants differently, but the effects on both of these parties need to be addressed in DSM policy and programming to effectively overcome the efficiency gap in the low-income-renter context. This is because the low-income-renter will ultimately bear the burden of high energy costs, whether paid directly through energy billing or indirectly through rent.

We considered the principal-agent problem, lack of capital, leasehold transfer issues, information asymmetry, inability to understand and use information and technology, low levels of trust, and vulnerability to existing policy constraints to be the most significant barriers to DSM participation facing low-income-renters.

We considered the principal-agent problem, financing, transaction costs and property transfer to be the most significant barriers to DSM participation facing landlords. The lack of low-income-renter DSM programming and the exclusion of renters from the Low Income Housing Program, despite collection of the cost recovery rider, are imminent concerns.

¹²⁶ Nova Scotia Treasury and Policy Board, *Regulatory Management Policy Guide Draft* (Halifax: Government of Nova Scotia, 2008); This approach is now being used to craft responsive policy within NS department of environment: see also Nova Scotia Environment, "Procedure for Policy Analysis" (29 May 2009); Nova Scotia Environment, "Procedure for Regulatory Tool Development" (29 May 2009).

¹²⁷ Nova Scotia Treasury and Policy Board, *Policy Instrument Options: Reference Manual* (Halifax: Government of Nova Scotia, 2008).

¹²⁸ Chris Tollefson, Fred Gale & David Haley, *Setting the Standard: Certification, Governance, and the Forest Stewardship Council* (Vancouver: UBC Press, 2008).

Implementing building- or neighborhood-based low-income-renter DSM programming has the greatest potential to address these barriers. Community-based DSM programming makes information analysis more manageable and can engage neighbors to help one another in an environment where trust relationships have already been established.

In the next section, the value of collective barrier analysis and an integrated approach to low-income-renter DSM is explored in more detail.

A Coordinated Approach

There is not a single barrier that is responsible for the efficiency gap in the context of low-income-renter DSM. A spectrum of barriers, including market, informational, technology, behavioral and policy barriers interact to prevent low-income-renters from engaging effectively in DSM programming. While certain barriers are likely to be more pertinent to low-income-renter DSM policy analysis, there will not be a standard set of barriers that can be applied to every low-income-renter DSM case.

Likewise, there will not be a single solution. Solutions must be made available to address the barriers that manifest themselves in any particular case. We suggest that the success of community DSM programming is a reflection of the need for a case specific approach. A “silver bullet”¹²⁹ response is not available. The challenge of addressing the set of barriers to low-income-renter DSM can be likened to untying a knot made of many strands of rope. The key is to unravel the knot—untying strands one by one until the knot is gone.¹³⁰ Developing a DSM program theory¹³¹ and policy is no different. An inclusive approach to policy analysis creates an environment where DSM program developers can refine the information collection and analytical skills required to effectively allocate resources and problem-solve as they move from case to case.

The multi-dimensional nature of poverty adds complexity to the dynamics of low-income-renter DSM programming. The person living in poverty is defined by the state in many ways. The scope of their income, the opportunities available, and their access to services come with strings attached: they have very limited independent economic power to compensate for weaknesses in the regulatory system, in comparison to their higher-income neighbors. For example, low-income-renters who find themselves facing a rent increase after the landlord has invested capital in energy efficient technology may be in a situation where money budgeted for other requirements is already being assigned to rent. In this case, viable options to accepting increased poverty are limited, and the possibility of homelessness can become a real threat.

¹²⁹ *Residential*, *supra* note 48 at 16.

¹³⁰ Malcolm Sparrow, *The Character of Harms* (Cambridge: Cambridge University Press, 2008) at 8-9.

¹³¹ *R5*, *supra* note 98 at 22-23.

Poverty cannot be addressed within a single agency by narrowly focused policy solutions.¹³² As part of a broader energy poverty solution, low-income-renter DSM policy must embrace the spectrum of regulation that impacts on the low-income-renter. Cooperation is essential – among levels of government, government departments, and non-governmental organizations (NGOs).

Federal, provincial and municipal governments have an interest in the issues that become barriers to low-income-renter DSM. Within the provincial government, the departments of Community Services, Energy, Environment, Health, and Service Nova Scotia and Municipal Relations have expressed legislative objectives that can support comprehensive and cooperative DSM policy and program solutions.¹³³

Likewise, NGOs cannot be overlooked in developing responsive low-income-renter DSM programming. A number of community-based organizations address the challenges of poverty in the province, many in relation to housing and health concerns. Other NGOs address the environmental concerns of our society, and share interests in conservation and long-term migration to affordable, sustainable, renewable sources of energy. These community organizations can support building networks that include the low-income-renters that stand to benefit from DSM. In particular, these organizations may be very helpful in identifying communities and buildings to engage in pilot program development work. The DSM Plan that is currently in place has already established community linkages through food banks and churches.¹³⁴ This cooperation has been beneficial to the community and supported DSM implementation.

Cooperation with DSM service providers in neighboring jurisdictions has been used to reduce material costs, set standards and improve practices.¹³⁵ California's Energy Management Assistance Program has been cited for cooperating with utilities and DSM providers to purchase energy efficiency technology in bulk form, resulting in savings and supporting high standards in energy technology. The New England Appliance Management Program provides another example, using a best practices group of delivery agents to generate constant improvements in all aspects of its programming.

An integrated policy planning approach¹³⁶ provides opportunities for cooperation that include sharing resources, expertise, information and funding to support shared objectives. Low-

¹³² Department of Community Services, Presentation at YWCA Women's Space (Halifax: Department of Community Services, 2010).

¹³³ *Supra* note 111.

¹³⁴ Comments of Helen Langille, at PDWG Low Income Subcommittee Meeting [*Langille*].

¹³⁵ *Victoria*, *supra* note 4 at 92-94.

¹³⁶ *Abbott*, *supra* note 57; Toronto Environmental Alliance, *A Low-income Energy Efficiency Program: Mapping the Sector and Program Design Principles*, online: Ontario Power Authority Conservation Bureau <http://www.powerauthority.on.ca/Storage/67/6264_TEA_report.pdf>; Beth Williams, *Overcoming Barriers to Energy Efficiency for Rental Housing*, online: Massachusetts Institute of Technology <<http://dspace.mit.edu/bitstream/handle/1721.1/44348/276307447.pdf?sequence=1>>.

income-renter DSM policy must meet the needs of low-income-renters, align to the objectives of government, and be flexible enough to sustain itself as conditions change over time. Designing low-income-renter DSM policy within a system framework, and evaluating policy plans prior to implementation, are important aspects of policy development. If low-income-renter DSM programming is viewed as a proactive and continuing policy response, chances of long-term success increase.

De T'Serclaes has suggested an evaluation procedure for DSM programming that tests policy prior to implementation with the goal of achieving better results.¹³⁷ This framework has been used to evaluate a range of programs.¹³⁸ The evaluation model was developed to address DSM programming focused on market barriers, and includes five key components: relevance, clarity, flexibility, impact and sustainability. However, we suggest that this evaluation approach can be used in the context of a broader set of barriers because the focus is on the effectiveness of the policy options chosen and not on the nature of the barriers addressed.

Next Steps to Identify Low-Income-Renter Barriers

The purpose of the discussion in this part of the paper has been to outline the scope of barriers and policy options that should be considered in the development of responsive and effective low-income-renter DSM programming and policy.

DSM policy analysts and program developers will share the important work of assembling information resources; strengthening cooperative relationships among levels of government, departments of government and community NGOs; and designing an implementation approach that enables resources to be used effectively. Implementation will require dedicated human resources to apply these DSM programming principals in practice.

Some of this work can be achieved within the existing powers of Efficiency Nova Scotia, over both short- and intermediate-term time horizons. However, the powers of other departments and levels of government can also be engaged to address low-income-renter DSM in a coordinated way. A solution could include forming a working group of policy analysts across this range of policy centers. The Program Development Working Group, including the Low-Income Subcommittee, is already using this kind of a cooperative model to address low-income-renter DSM challenges.

There may also be opportunity to engage new approaches to low-income-renter DSM that extend beyond the current policy framework. Energy market policy, including the creation of a carbon market and an energy services market that enables third party investment in energy efficient infrastructure and/or deferred payment frameworks (PAYS), could be part of a longer-term policy approach.

¹³⁷ Philippine de T'Serclaes, *Financing Energy Efficient Homes: Existing Policy Responses to Financial Barriers*, (Paris: International Energy Agency, 2007).

¹³⁸ *Residential*, *supra* note 48 at 15.

Throughout this process, the reality of energy poverty on low-income-renters must be central to the analysis. To align interests in energy conservation, policy must be responsive to the real needs of low-income-renters by relieving the poverty that they experience. Energy conservation through low-income-renter DSM programming is an important component of lowering total energy costs; however, it will not relieve energy poverty entirely. Low-income-renter DSM programming must be part of a wider low-income policy package to fully address energy poverty.

In the final part of the paper, short-term, intermediate-term, and long-term recommendations are presented. Our recommendations are tabled to provide direction for low-income-renter DSM programming and policy development, toward a future that envisions full relief from the impacts of energy poverty.

Part IV:

Recommendations for Increasing the Effectiveness of Demand Side Management among Low-income-renters in Nova Scotia

The challenge of low-income-renter DSM programming is complicated by the challenges of identifying and providing resources to low-income-renters in an equitable way, and undertaking the comprehensive analysis that is required to understand the barriers facing the low-income-renter. However, there are policy, programming and practical solutions that can be marshaled to overcome these barriers. To conclude the paper, we have framed the ideas presented and developed through our research as a series of graduated recommendations. This set of solutions can be investigated and implemented over time to provide a comprehensive policy response to the important problem of energy poverty.

These recommendations begin by addressing short-term adjustments to the DSM Plan that will extend DSM Program benefits to low-income-renter customers in the 2012 plan year. The recommendations also address ideas that require more significant analysis over a longer timeline, but can still be implemented in the context of the DSM Plan within the intermediate-term. The recommendations also summarize a set of options that will require work beyond the powers of Efficiency Nova Scotia, addressing requirements for high level policy analysis and legislative change. The recommendations conclude by returning to the framing issue of energy poverty and emphasizing the importance of measures beyond DSM.

Efficiency Nova Scotia DSM Plan

Short Term Low-income-renter DSM Program Strategies

The 2012 DSM Plan is currently in its development stage. There are opportunities to begin building the foundation of long-term low-income-renter DSM programming by working to identify low-income-renters as a discrete demographic and expanding outreach programming by leveraging existing relationships and celebrating early successes. The extension and promotion of programs that are already in place is also an important first step in providing DSM programming to low-income-renters.

We suggest that the following Low-income-renter DSM Program opportunities be incorporated into the 2012 DSM Plan:

1. Make a commitment to low-income-renter DSM programming in the 2012 DSM Plan

It is critical that Efficiency Nova Scotia commits to providing low-income-renter DSM programming in the 2012 DSM Plan, and begins working toward that goal. The recommendations in this section support that work.

2. Establish a simple process to qualify and inform low-income-renters about DSM programming

A number of methods were identified in Part I of the paper to identify low-income individuals. Determining eligibility requirements, identification strategies and estimating the number of eligible low-income-renters in the province are priorities for low-income-renter DSM programming. Although a comprehensive analysis is in order to balance resources available with program delivery, simple approaches to qualification can be tested during the initial stages of Low-income-renter DSM Program deployment. A number of existing programs, including Warm Front (U.K.), Low-Income Single Family Service (Vermont), and the Enbridge Home Weatherization Retrofit Program (Ontario) all employ eligibility criteria that include pre-qualification for those on certain government benefits or pension schemes.

3. Ensure that the cost recovery rider charges paid by low-income-renters and their landlords are invested in low-income-renter DSM programming

Initial approaches to qualification can also be used to estimate the Low-income-renter DSM Program funding stream from landlord and tenant cost recovery rider contributions. This amount should then be allocated to low-income-renter DSM programming. Over time, as more information is gathered in the context of the developing program, the estimated budget can be refined.

4. Modify the Power Down Program to offer products at no cost

The Power Down Program is available to low-income-renters but still requires an investment on their part. The Power Down products could be offered at no cost to qualifying low-income-renters, using diverse outlets for their delivery, including food banks, community centers, churches, municipal halls and mail delivery. Community networks and the knowledge of program outreach agents can be engaged to identify resource requirements and plan distribution.

5. Modify the Pull the Plug II Program to cover full replacement cost

The Pull the Plug II Program is nominally available to low-income-renters who own appliances. This program offers a cash rebate that can be applied to the cost of a new, more efficient, appliance. Due to a low-income-renter's lack of capital, the difference between the rebate and the purchase price becomes a market barrier. A Low-income-renter version of the Pull the Plug II Program should either replace inefficient appliances on a *gratis* basis, or use deferred payment arrangements coupled with up-front incentives.

Bulk purchasing of efficient appliances to meet program requirements could reduce program cost. This idea can include coordinating purchases with other jurisdictions and DSM providers. The most obvious opportunities for purchasing coordination would be among the Maritime Provinces. Economic and cultural integration support these natural partnerships. With

indications of increasing regional energy cooperation, Newfoundland and Labrador could also be included.

Soliciting charitable contributions from manufacturers, distributors and retailers with appropriate recognition can also allow for reduced costs and greater access to the program for low-income-renters. Community networks and the knowledge of program outreach agents can be engaged to identify resource requirements and plan distribution.

6. Modify the LED Holiday Lighting Exchange Program to provide low-income-renters with a direct exchange program.

The LED Holiday Lighting Exchange Program requires a two-for-one investment on the part of participants. Participants are presumed to be able to afford the replacement cost of at least one set of lights. Low-income-renters should not be included in this presumption. The DSM Program can spread Christmas cheer and give low-income-renters one set of LED lights per set of inefficient lights exchanged. The current delivery model can be expanded by increasing the diversity of outlets for exchange, similar to the recommendations for the Power Down Program.

7. Modify the EnerGuide for Multi-Unit Residential Buildings (MURBs) Program by broadening eligibility criteria and increasing funding

The EnerGuide for Multi-Unit Residential Buildings (MURBs) Program has great potential to benefit low-income-renters. However, at present it does not offer direct input for tenants and is limited in scope to buildings and apartments of certain dimensions, including buildings less than 3 storeys high and inclusive of 20 apartments. In addition, only low levels of assistance are available: \$4500 per building. A starting point would be the removal of these barriers.

Interest and demand for this program can be stimulated by accommodating group and individual information sessions. Interested renters can be trained to speak to their neighbors about program benefits. Property owners can be contacted directly and educated on the merits of the program, including increasing building value, integrity and quality. Contracting with the landlord as a condition of participating in the program is essential to control increases in rent and reserve low-income rental housing.

8. Implement a DSM Captain Program to support education and promotion of low-income-renter DSM programming

DSM programming should continue to build on its pro-active outreach approach, on both a group and individual basis. Community organizations should be identified and enlisted to cooperate in delivering DSM programming to their constituents. These organizations would include groups dedicated to improving living conditions in low-income and marginalized communities. The MicMac Native Friendship Centre and Halifax Housing Help are examples.

On an individual basis, natural leaders can be enabled as DSM captains in the building or neighborhood context. DSM captains could be identified through an application or nomination

process. If resources were available to train and employ DSM captains as part of the DSM Program implementation team, this would help to ensure consistency and reliability of service. Employees of organizations with a vested interest in DSM programming, such as Efficiency Nova Scotia and NSPI could organize an employee volunteer program as a form of corporate outreach to provide DSM captain services in the community. Cooperation with other government departments and agencies such as the NS Department of Community Services and Service Canada could leverage resources for training and delivery. Attention would have to be given to liability concerns as with any other in-home service.

9. Leverage income assistance and energy service information to identify and assist low-income-renters in accessing DSM programming

Existing information centers and communication networks should be used to identify and assist low-income-renters in accessing DSM programming. In Nova Scotia, this would include the NS Department of Community Services, the department responsible for distributing Income Assistance entitlements, and NSPI, the provincial energy provider.

The NS Department of Community Services can communicate with low-income-renters by including program information with Income Assistance cheques or through case worker contact. NSPI customer service staff should be trained to volunteer DSM Program information, direct clients to further sources of information, and identify potential beneficiaries. Potential beneficiaries would include customers who are in arrears or have had their power supply terminated. Customer service training should also focus on developing sensitivity to the needs low-income customers.

These mechanisms would not be the only means of communicating with low-income-renters, but they do provide an opportunity to obtain important program information and enhance program outreach.

10. Implement an Energy Leader Program to celebrate low-income-renter DSM success

An Energy Leader Program could be designed to celebrate success stories in DSM implementation. This kind of a program brings recognition to the value of DSM by providing real-life examples of success. In addition, it fosters culture change within the community by helping proactive individuals and organizations to lead by example.

Intermediate Term Low-income-renter DSM Program Strategies

Many of the opportunities identified in our research must be implemented over a longer timeframe, yet are still within the powers of Efficiency Nova Scotia for inclusion in the DSM Plan. Efficient use of limited resources and low administration costs are important features of sustainable DSM programming. Recognizing and harnessing existing relationships and infrastructure to meet program objectives is a critical component of this approach.

1. Identify low-income-renters and manage cost recovery rider contributions to support low-income-renter DSM programming

The work required to identify low-income-renters, and ensure that the DSM Program funding contributions of low-income-renters and their landlords are invested in targeted programming, should continue from the short-term work proposed for the 2012 DSM Plan. Information collected through eligibility assessments and program deployment should be fed back into program development to improve the information base that supports low-income-renter DSM programming. DSM Program developers and policy analysts should also consider the possibility of exempting low-income Nova Scotians from being required to pay this surcharge, as has been done in California, another jurisdiction that operates a rate-payer funded program. An alternative to total exemption is a surcharge rebate, where surcharge payments could be refunded relative to the energy efficiency gains as an incentive for DSM Program participation.

2. Provide no cost DSM programming to low-income-renters and attractive grants or financing terms to landlord property owners

Low-income-renters are not in a position to invest in energy efficient technology. Energy poverty can only be relieved by outside investment. Low-income-renter DSM programming should be offered at no cost to low-income consumers.

A number of jurisdictions provide attractive grants and financing terms to landlords as an incentive to equip their buildings with energy efficient technology. New York's Assisted Multi Family Loan Program leverages low-interest credit to fund energy efficiency improvements for building projects that would not otherwise qualify for conventional loans. The credit extended under this program has been as much as five million dollars for certain projects.¹³⁹ Manitoba's Lower Income Energy Efficiency Program offers a combination of long-term financing and rebates to cover costs of qualifying insulation and furnace upgrades.¹⁴⁰ New Brunswick's Energy Efficiency Retrofit Program offers successful applicants a combination of a non-repayable grant contribution and a repayable loan.¹⁴¹

3. Develop a building energy code for rental housing and appliance standards

In the absence of contract intervention, developing and implementing energy efficiency standards is a critical factor in addressing the principal-agent problem that exists in the landlord-tenant relationship. A number of model codes and standards are already available, and could be tailored to the rental housing context. Developing these standards, and testing them in a pilot project environment, could support widespread legislative intervention over a long-term time horizon.

¹³⁹ AMFP, *supra* note 30.

¹⁴⁰ Low Income Energy Efficiency Program, online: Manitoba Hydro <http://www.hydro.mb.ca/your_home/lower_income.shtml>.

¹⁴¹ Energy Efficiency Retrofit Program for Low Income Households, online: Government of New Brunswick <<http://app.infoaa.7700.gnb.ca/gnb/Pub/EServices/ListServiceDetails.asp?ServiceID1=19556&ReportType1=All>>.

4. *Develop a rental housing efficiency labeling system*

Rental housing efficiency labeling is an effective way to address the information asymmetry aspect of the principal-agent problem, by ensuring prospective tenants have the efficiency information they require to make wise contract choices. Providing tenants with information to predict energy costs would avoid the hardship of high energy bills after entering a lease contract. A rental housing energy efficiency labeling system moves the idea of standards forward by making the efficiency status of rental housing more transparent.

Mandatory efficiency labeling has been identified as a critical component in many DSM programs.¹⁴² While mandatory labeling would require legislative or regulatory intervention, a labeling program could be tested on a pilot project basis to support widespread long-term implementation. EnerGuide is an example of a housing efficiency labeling system. EnerGuide ratings¹⁴³ are used in the Saskatchewan Home Energy Improvement Program, the Energy Efficiency Retrofit Program (New Brunswick) and a number of programs under the current DSM Plan in Nova Scotia.¹⁴⁴ Providing year-round energy cost pattern information during periods of occupation would also enable prospective tenants to appreciate likely energy expenditures.

5. *Continue to develop capacity to provide efficient assessment and program design services to minimize transaction costs*

Competent service providers, using systematic assessment methods, play a critical role in controlling transaction costs of efficiency upgrades. EnerGuide ratings can be used in conjunction with Canadian Mortgage and Housing Corporation's *Energy and Water Efficiency in Multi-Residential Buildings* manual to support detailed cost-benefit analysis for renovations based on building and energy type. Analysis supports achieving maximum gains for every DSM investment.

EnerGuide ratings are already incorporated into programming that supports housing renovation projects in Nova Scotia. The service providers that have been trained under the existing DSM Plan are an important program asset. Building capacity to design tailored programming across the range of housing scenarios in the low-income-renter context should be a program priority.

6. *Continue to develop opportunities for education and promotion of DSM programming*

The education and promotion activities of program outreach providers should continue to develop throughout DSM Program implementation. Using government, consumer and community networks should also continue to be emphasized.

¹⁴² *Abbott, supra* note 57.

¹⁴³ set by Office of Energy Efficiency of Natural Resources Canada

¹⁴⁴ *Energuide Programs*, online: Conserve Nova Scotia <<http://www.conservens.ca/energuide/>>.

7. Use innovative energy efficiency technology

Innovative technology shows promise for intermediate-term implementation. For example, the smart-grid technology of the Peaksaver Program offers interesting possibilities for DSM programming.

8. Incorporate training requirements into low-income-renter DSM programming

Low-income-renter DSM programming must plan for delivery of training to service providers, investors and users of technology. Service providers must understand existing infrastructure, conservation measures and implementation constraints in order effectively assess and design conservation plans.¹⁴⁵ Where DSM programming extends education and training to customers, the individuals that will be providing this training must be well trained themselves. Once trained, these trainers can then help energy consumers to become effective users of technology by providing them with the skills they need to problem-solve and enabling independence.

9. Use a community-based model to deploy low-income-renter DSM programming

Strong relationships that already exist within a community can provide important support for low-income-renter DSM programming. Community-based DSM program models have been successful across a range of jurisdictions. Warm Up Winnipeg is a successful program that targets specific neighborhoods based on income levels. This program enjoys wide recognition and high participation rates.¹⁴⁶ In Nova Scotia, program outreach agents have noted that working through church communities has increased participation in DSM programming.¹⁴⁷ Meeting with individuals and groups can also support program education goals and attract program applications.

The community-based model also supports targeted deployment of DSM programming across a range of scales. DSM program design must be flexible enough to adapt to the specific needs of each community of low-income-renters. DSM programming may range from the provision of single energy efficiency technology (for example, CFL light-bulbs) to more elaborate measures such as the complete renovation and retrofitting of an entire apartment building.

The small-scale program option could resemble the BC Hydro Energy Savings Kit Offer, which provides several energy-saving devices for self-installation to low-income people with postal delivery.¹⁴⁸ The Social Housing Renovation and Retrofit Program (Ontario) is a more ambitious program, offering extensive renovation funding through grants of up to \$32,000 per housing

¹⁴⁵ R5, *supra* note 98 at 2.

¹⁴⁶ Manitoba, *supra* note 20.

¹⁴⁷ Langille, *supra* note 134.

¹⁴⁸ BC Hydro Powersmart, *Your Energy Saving Kit: Everything You Need to Know to Start Taking Your Energy Back Today*, online: Powersmart <http://www.bchydro.com/etc/medialib/internet/documents/power_smart/Energy_Saving_Kit_Manual.Par.0001.File.energy_saving_kit_manual.pdf>.

unit in large public housing projects. The BC Hydro Energy Conservation Assistance Program is a scalable model and provides the same service to single households as well as large groups of tenants. Model flexibility is important because it helps to ensure that all potential beneficiaries have access to programming.

10. Protect low-income-renters by requiring that landlords contract to security of tenure and rent control in return for receiving DSM Program funding in the absence of protective legislation

Low-income-renters should be protected from rental increase and eviction when the landlord has participated in low-income housing DSM programming. This can be done by requiring property owners to enter contracts in which they commit to maintaining rental rates and to renting upgraded units to low-income tenants. The Energy Efficiency Retrofit Program (New Brunswick) and the Social Housing Renovation and Retrofit Program (Ontario) use written contracts between a property owners and DSM program providers that require these commitments.

11. Communicate and cooperate across levels of government, government departments, non-governmental organizations and other DSM programs

Low-income-renter DSM programming should engage common interests across levels of government, government departments, and non-governmental organizations. Providers of DSM programming in other jurisdictions can also be important partners in program development. Cooperation and communication is essential in the intermediate term to prepare for implementing long-term solutions.

12. Plan for sustainability of low-income-renter DSM programming by taking a management system approach to programming and policy development

Low-income-renter DSM programming should remain relevant and responsive to changing realities over time. A management system approach that includes planning, implementation, monitoring and feedback components can support continuous improvement of DSM programming¹⁴⁹ and long-term program stability, especially when the nature of the energy resource is so dynamic. A management system approach was used in the *National Energy Efficiency Best Practices Study*, and provides a good example of how system principles should be incorporated into the DSM policy planning framework. Another significant feature of this approach is its use of project management theory to organize the work of policy development. Low-income-renter DSM Program management should also incorporate a preliminary evaluation stage to increase chances of program success.

¹⁴⁹ Victoria, *supra* note 4 at 84-86.

Nova Scotia DSM Policy

Long Term Low-Income-Renter DSM Policy Strategies

Low-income-renter DSM must be supported outside of the Efficiency Nova Scotia framework. Although the DSM Plan is an important policy vehicle, successful implementation of low-income-renter DSM requires a comprehensive policy package. Developing this policy package will depend on cooperation across levels and departments of government and include consideration of legislative and regulatory change.

We suggest the following policy initiatives be considered outside of the DSM Plan to support a comprehensive low-income-renter DSM policy package:

1. Support cooperative networks across levels and departments of government for low-income-renter DSM policy development

Establishing cooperative working relationships across levels and departments of government is required to lay the foundation for cross-cutting policy development. Federal, provincial and municipal governments all have an interest in the issues that manifest in the DSM barriers facing low-income-renters. Within the provincial government, the departments of Community Services, Energy, Environment, Health, and Service Nova Scotia and Municipal Relations have all expressed legislative objectives that can support comprehensive and cooperative DSM policy and program solutions. While these objectives are not specific in application, we suggest that low-income-renter DSM programming falls within these expressions of public interest.

2. Engage the powers of other levels and departments of governments to support low-income-renter DSM policy

Once cooperative working relationships across levels and departments of government have been established, the next step is coordinated work on an integrated low-income-renter DSM policy package. Government organizations must be engaged to develop and implement responses to support low-income-renter programming and address existing barriers that lie within their powers. Solutions must take a whole-person approach. Individuals living in poverty are profoundly affected by government policy, and compartmentalization along departmental lines is not a productive approach to problem-solving.

3. Consider synergies between low-income-renter DSM programming and other DSM Plan offerings

Low-income-renter DSM policy should reflect the goals and approaches of wider DSM policy and programming. DSM policy and program developers should capture synergies among DSM programs. Likewise, innovative measures developed in the context of low-income-renter DSM should be utilized in the continuous improvement of other DSM programming.

4. Consider the use of other policy tools to enhance the low-income-renter DSM policy package

The current DSM Plan takes a cooperative approach to DSM policy, using mainly economic incentive and voluntary educational and program policy tools to engage energy consumers in DSM programming. A broader approach that considers using a wider range of policy tools should be considered, following the type of policy analysis outlined in the province's *Regulatory Management Policy Guide*. The DSM Plan has an important role to play in the DSM policy package, but DSM policy should not be limited to the DSM Plan. The *Solid Waste-Resource Management Regulations* provide a good example of how a range of policy tools can be applied in a new governance context to generate additional momentum.

5. Undertake a full analysis of deferred cost models, including Pay As You Save (PAYS), as a funding source for low-income-renter DSM programming

More work needs to be done to understand deferred cost DSM program models, including the Pay As You Save (PAYS) Program. This work can be combined with an analysis of the value of incorporating third party energy service providers into low-income-rental DSM programming.

6. Develop a long term funding strategy to finance low-income-renter DSM programming

Fully funded and deferred cost model alternatives should be analyzed as funding strategies to finance low-income-renter DSM programming. The deferred cost model would include consideration of the PAYS programming. Program requirements, capital requirements, legislative requirements and feasibility would be considered in this analysis. New and innovative funding models can also be developed.

7. Implement a building energy code for rental housing and appliance standards

After energy building codes have been developed and tested on a pilot project basis under the DSM Plan, these standards should be implemented province-wide through legislation and/or regulation.

8. Implement a rental housing efficiency labeling system

After a rental housing efficiency labeling system has been developed and tested on a pilot project basis under the DSM Plan, these standards should be implemented province-wide through legislation and/or regulation.

9. Protect low-income-renters by amending the Residential Tenancies Act to support security of tenure and rent control

Low-income-renters should be protected by amending the *Residential Tenancies Act* to support security of tenure and rent control following DSM programming upgrades and improve housing

standards. Extending the ability to renters to authorize minor DSM measures, such as installation of programmable thermostats or smart-grid technology, should also be facilitated.

10. Use the Employment and Income Assistance Act as a vehicle to support and implement low-income-renter DSM policy

The *Employment and Income Assistance Act* should be used as a vehicle to support and implement low-income-renter DSM policy. For example, Income Assistance recipients could be required to participate in DSM programming, supported by personalized DSM delivery depending on the particular needs of the recipient. In addition, it would be helpful to engage caseworkers to facilitate access to DSM programming, for example where a client has an ability issue that prohibits him or her from accessing resources independently. This aspect of programming could be implemented by developing a mechanism for the Income Assistance recipient to extend this permission.

Energy Poverty in Nova Scotia

Short and Long Term Energy Poverty Reduction Strategies

Low-income-renter DSM programming and policy is an important part of addressing energy poverty in Nova Scotia, but it is not the whole solution. Low-income individuals may still experience energy poverty because energy bills extend beyond their means.

The Universal Service Program model (USP) has been put forward to provide the comprehensive solution that low-income individuals require to balance the cost of energy with the cost of food and shelter relative to their income. In addition to DSM programming, the USP provides for rate affordability, arrearage management, and crisis intervention programming, in addition to basic consumer protections.¹⁵⁰

Conclusion

Energy Poverty is a reality in Nova Scotia, but it can be understood and addressed. Low-income-renter DSM programming and policy is an important part of the solution, but there are a complex set of barriers that must be overcome in order to see results. Commitment of resources to targeted policy analysis and program design is critical. Developing a meaningful solution will require research, information management, inter-organizational cooperation, detailed analysis, community support, technical knowledge, program management and a sound understanding of low-income-renters and their landlords.

There is considerable work to be done, but addressing low-income-renter DSM programming will have benefits that extend beyond Demand Side Management to combating energy poverty,

¹⁵⁰ USP, *supra* note 5.

improving the living conditions of the low-income members of our community, conserving energy resources, and respecting the environment. Low-income-renter DSM programming is a viable and productive way to align interests in energy conservation.

Appendix:

DSM Program Profiles

British Columbia: Energy Conservation Assistance Program

Program Name	Energy Conservation Assistance Program
Jurisdiction	British Columbia
Date of Inception	N/A
Level of Government, Sponsor or Delivery Agent	BC Hydro
Inter-Program, Inter-Governmental Links	N/A
Barriers to Access	Available only to BC Hydro residential customers. Electricity bills must exceed \$500 or more than 8,000 kWh/yr per year. Applications require copies of tax assessments from Revenue Canada for each member of the household. Every household member must fall within table values found in Statistic Canada's Low Income Cut-Off table.
Program Highlights	The Energy Conservation Assistance Program (ECAP) provides qualified low-income BC Hydro residential account holders with a home energy evaluation, the installation of energy saving products, and personalized energy efficiency advice. All of this is free of charge to the participant. Energy saving products that may be installed include: • Energy saving light bulbs (compact fluorescent lamps) indoor and outdoor • Faucet aerators for the kitchen and bathroom • Low-flow showerhead • Water heater pipe wrap and blanket • Draft proofing, such as weatherstripping, caulking and outlet gaskets • Insulation for attics, walls and crawlspaces • Low-wattage night light • ENERGY STAR refrigerator The home evaluator determines which energy efficiency upgrades an applicant's home is eligible for. The installation of some products may require multiple visits.

	BC Hydro Power Smart offers bulk delivery of the Energy Conservation Assistance Program for housing organizations with multiple units. Eligibility for bulk projects is calculated using the average electric consumption for the entire housing complex as well as evaluating the organizations low income criteria. Housing providers will work with BC Hydro's Program Delivery Agents to coordinate the project with their tenants. This might include notifying tenants, holding a community meeting, and helping set-up appointment schedules.
Successes	N/A
Failures	N/A
Accountability	N/A
Reporting	N/A
Future Plans	N/A
Suitability for Nova Scotia (parallels or differences)	BC Hydro operates this program for the benefit of its low-income home-owner and renter customers. BC Hydro is a BC crown-corporation and like NSPI is a regulated company. There are no obvious impediments to implementation of a similar program, or one that has adapted any of its features, by NSPI in Nova Scotia.
Contact	BC Hydro Residential Operations PO Box 8910 STN Terminal Vancouver, BC V6B 9Z9 Phone: 604 431 9463 or toll free at 1 877 431 9463
Sources	http://www.bchydro.com/powersmart/residential/ps_low_income/energy_conservation.html?WT.mc_id=rd_ecap http://www.bchydro.com/etc/medialib/internet/documents/ps_home/pdf/low_income_program.Par.0001.File.A09-128-Low-Income-Application-Form-July-2010.pdf http://www.affordablewarmth.ca/about-affordable-warmth-bc

British Columbia: BC Hydro Energy Savings Kit Offer

Program Name	BC Hydro Energy Savings Kit Offer
Jurisdiction	British Columbia
Date of Inception	N/A
Level of Government, Sponsor or Delivery Agent	BC Hydro and Terasen Gas
Inter-Program, Inter-Governmental Links	N/A
Barriers to Access	Applications require copies of tax assessments from Revenue Canada for each member of the household. Every household member must fall within table values found in Statistic Canada's Low Income Cut-Off table. Individuals that are on Social Assistance, Disability, or Employment Insurance are more likely to qualify. Must be a BC Hydro or Terasen Gas customer.
Program Highlights	BC Hydro and Terasen Gas partnered to provide free energy saving kit for low income households. The free kit offers a variety of simple ways to help you save energy. The kit contains a number of free, simple, easy-to-install energy saving products including: • Compact fluorescent light bulbs (CFLs). CFLs use up to 75% less energy than regular light bulbs. They can also last up to 10 years. • Weatherstripping for windows and doors. • Fridge and freezer thermometers to help set refrigerators and freezers at an ideal temperature • A low-flow showerhead that uses significantly less water than a standard showerhead Includes a bulk delivery program for the energy saving kit (ESK). Allows qualified subsidized housing providers to easily distribute ESKs to their clients. BC Hydro provides simple application forms for the organization to distribute and subsequently collect from each Account Holder participating in the program. BC Hydro also offers the option for the organization to receive Direct Installation Funding (approximately \$30 per kit to cover the labour and

	administrative costs associated with installing the kits for clients). This option is dependent on funding availability. Online videos and tutorials help with installation of energy saving devices.
Successes	Available to tenants directly and requires no landlord consent or cooperation.
Failures	N/A
Accountability	N/A
Reporting	N/A
Future Plans	N/A
Suitability for Nova Scotia (parallels or differences)	BC Hydro and Terasen Gas operate this program for the benefit of its low-income home-owner and renter customers. BC Hydro is a BC crown-corporation and like NSPI is a regulated company. There are no obvious impediments to implementation of a similar program, or one that has adapted any of its features, by NSPI in Nova Scotia.
Contact	BC Hydro Residential Operations PO Box 8910 STN Terminal Vancouver, BC V6B 9Z9 Phone: 604 431 9463 or toll free at 1 877 431 9463 Email: powersmart@bchydro.com
Sources	http://www.bchydro.com/powersmart/residential/ps_low_income/energy_saving_kits.html http://www.bchydro.com/etc/medialib/internet/documents/power_smart/Energy_Saving_Kit_Manual.Par.0001.File.energy_saving_kit_manual.pdf http://www.affordablewarmth.ca/energy-efficiency-programs-low-income

British Columbia: LiveSmart-Ucluelet

Program Name	LiveSmart-Ucluelet
Jurisdiction	British Columbia
Date of Inception	N/A
Level of Government, Sponsor or Delivery Agent	Ministry of Energy, Mines and Petroleum Resources and City Green Solutions
Inter-Program, Inter-Governmental Links	N/A
Barriers to Access	Ucluelet, BC residents only. Absolute cap on the number of households benefitting.
Program Highlights	The project covers the costs associated with conducting two energy assessments (pre-audit & post-audit) as well as providing capital money (up to \$1700) for retrofits to eligible dwelling units. The program is designed to provide immediate assistance to 70 households in Ucluelet that are interested in having energy retrofits completed to their dwelling unit, ultimately reducing energy costs and CO2 emissions associated with the operation of the residence. Available to tenants and landlords alike. Eligibility criteria include qualification to receive assistance from one of any number of provincial or federal government financial-need based programs; OR An applicant may be qualified based on meeting four criteria: 1. Employment – this includes retired and current employees. The Ucluelet Affordable Housing Cooperative may grant an exemption where doing so meets the purposes of the Ucluelet Affordable Housing Program. 2. The housing unit applied for must be the full-time residence of the qualified applicant.

	3. Household income must not exceed \$52,000.
Successes	N/A
Failures	N/A
Accountability	N/A
Reporting	N/A
Future Plans	N/A
Suitability for Nova Scotia (parallels or differences)	LiveSmart – Ucluelet could serve as a model for Nova Scotia. A similar regulatory regime is in place. LiveSmart – Ucluelet is sponsored by a provincial government department and delivered by a private agency. Efficiency Nova Scotia could potentially consider such an arrangement suitable for delivery of any of its programs or any specialized program it would develop. For example, Live-Smart Ucluelet caters to a particular community and is tailored to the specific needs and concerns of that community; such a model may prove useful and provide enhanced results for communities in Nova Scotia.
Contact	Jason Niles, Assistant Planner, District of Ucluelet, 250-726-4781, jniles@ucluelet.ca Gerry Schreiber, CEA, Energy Advisor, City Green Solutions jniles@ucluelet.ca 250-726-2536
Sources	http://www.ucluelet.ca/UserFiles/File/Planning/participationform2.pdf http://www.citygreen.ca/energy-efficiency-programs-low-income-households

Saskatchewan: Saskatchewan Home Energy Improvement Program (SHEIP) for Rental Property Owners Housing Low-Income Tenants

Program Name	Saskatchewan Home Energy Improvement Program (SHEIP) for Rental Property Owners Housing Low-Income Tenants
Jurisdiction	Saskatchewan
Date of Inception	N/A
Level of Government, Sponsor or Delivery Agent	The program is funded by the Saskatchewan Housing Corporation (SHC), and provides a top-up grant that is combined with the grants offered through SaskEnergy's Saskatchewan EnerGuide for Houses Program and the federal ecoENERGY Retrofit Initiative.
Inter-Program, Inter-Governmental Links	Combined with the grants offered through SaskEnergy's Saskatchewan EnerGuide for Houses Program and the federal ecoENERGY Retrofit Initiative.
Barriers to Access	Requires participation of landlord. It does not provide services or benefits directly to low-income renters. Only the registered owner of the rental/rooming house property may apply. Applicants have to be in one of the following categories: Public / private / non-profit rental property owners who house low-income tenants. Tenant income cut-offs are established by SHC, potentially disqualifying a number of needy tenants and potential landlord applicants. Rental property has to fit within a dimensional cap: Smaller than 3.5 stories and 600 square metres.
Program Highlights	Provides financial assistance to rental property owners who house low-income tenants in order to help with the costs of energy retrofits to rental units such as heating system upgrades, tankless hot water heaters, insulation, and draft proofing, among others. A top-up grant to rental property owners of single, semi-detached, and row house dwellings of up to \$3,500 per unit in southern Saskatchewan and up to \$4,200 per unit in northern Saskatchewan.

	A top-up grant to rental property owners of multi-unit dwellings and rooming houses of up to \$1,000 per unit in the south and up to \$1,200 per unit in the north. Assistance is in the form of a top-up grant, which does not have to be repaid. Properties are eligible for maximum funding assistance once within a ten-year period. All grants are payable subject to the availability of funds. Assistance is not considered as income for tax purposes.
Successes	Specifically targets homeowners who rent to low-to-moderate income tenants.
Failures	Relies on cooperation and initiative of landlord. The program subsidizes energy efficiency assessments and home upgrades. The former may be initiated by tenants but actual improvements required landlord participation.
Accountability	N/A
Reporting	N/A
Future Plans	N/A
Suitability for Nova Scotia (parallels or differences)	Nova Scotia has a variety of low-income housing providers. SHC is a crown corporation of the government of Saskatchewan. An equivalent in Nova Scotia would be the Metro Regional Housing Authority in Halifax. A variety of other low-income housing providers would potentially qualify for this program were it to be established in Nova Scotia, including Harbour City Homes and Metro Community Housing Association. This program poses a suitable model for Nova Scotia.
Contact	Saskatchewan Housing Corporation Regina: 306-787-4177. Toll free at: 1-800-667-7567.
Sources	http://www.gov.sk.ca/adx.aspx/adxGetMedia.aspx?mediaId=167&PN=Shared

Manitoba: Lower Income Energy Efficiency Program

Program Name	Lower Income Energy Efficiency Program
Jurisdiction	Manitoba
Date of Inception	2007
Level of Government, Sponsor or Delivery Agent	Provincial ministries, Manitoba Hydro, and the Green Manitoba Efficiency Fund together provide materials, training, administrative support, audits, and other services to community programs, which deliver the initiative.
Inter-Program, Inter-Governmental Links	N/A
Barriers to Access	Requires cooperation of property owners. Applicant must fall within table amounts depending on population of community, household income and household size.
Program Highlights	Two stages of delivery: 1. Free home evaluation and provision of items such as CFL light-bulbs and low-flow showerheads. 2. Second, depending on the evaluation, insulation as well as low-flow or dual-flush toilets may be installed at no or minimal cost. Support is also given for upgrades from standard natural gas furnace or boiler to qualifying high efficiency ENERGY STAR natural gas furnaces or boilers. A combination of long-term financing and rebates to cover costs of qualifying insulation and furnace upgrades.
Successes	Energy and water savings are estimated to save between \$400-\$500 per year per household.
Failures	Only tenants who pay their own power bills may participate. Dependent on cooperation of landlords.
Accountability	As the program is run by Manitoba Hydro accountability is internal. Manitoba Hydro's annual reports do not provide detailed information or cost-benefit analyses of the program.
Reporting	N/A
Future Plans	N/A

Suitability for Nova Scotia (parallels or differences)	Both Manitoba and Nova Scotia are parallel in the Canadian context and share the same level of jurisdiction. NSPI is regulated but not a crown corporation as MB Hydro is. There are no obvious barriers to the employment of this model, or its features, in NS.
Contact	Telephone: 204-480-5900 in Winnipeg, 1-888-624-9376 (toll-free) Email: lowerincome@hydro.mb.ca
Sources	http://www.hydro.mb.ca/your_home/lower_income.shtml http://www.elc.uvic.ca/press/documents/Conserving-planet-without-hurting-low-income-families-April2010-FINAL.pdf

Manitoba: Warm Up Winnipeg

Program Name	Warm Up Winnipeg
Jurisdiction	Winnipeg, Manitoba
Date of Inception	November, 2006
Level of Government, Sponsor or Delivery Agent	BUILD (Building Urban Industries for Local Development)
Inter-Program, Inter-Governmental Links	Canada ecoTrust for Clean Air and Climate Change, Government of Manitoba, and several community organizations.
Barriers to Access	Geographic: Only available in 16 of Winnipeg's poorest neighbourhoods.
Program Highlights	Depends on labour provided by low-income community members who are provided skills training in order to carry out retrofitting work under the program. Warm Up Winnipeg retrofits homes with additional attic and basement insulation. It also installs low flush toilets, efficient showerheads, faucet aerators, compact fluorescent lighting, and pipe-wrapping. Focus on specific neighbourhoods or communities, beginning with Aboriginal neighbourhoods in Winnipeg
Successes	Focus on specific communities has resulted in a high rate of participation. Over \$500 in average annual energy savings for participant. Over 315 low-income households have been insulated and over 1500 water retrofits have been installed creating savings of over \$400,000 for low-income residents.
Failures	Geographical limitation. Essentially it is a Winnipeg-only program.
Accountability	Warm Up Winnipeg receives funding and materials from the Manitoba provincial government, Manitoba Hydro, the United Way, the Winnipeg Foundation and the Winnipeg Partnership Agreement. Previously, Canada ecoTrust for Clean Air and Climate Change. Accountability may be provided directly between these bodies. As BUILD is a non-profit corporation with a Board of Governors accountability is through the Board of Governors and generally

	accepted accounting principles.
Reporting	Data is provided by outside agencies. Work done on housing stock owned by the Manitoba Housing Authority has resulted in energy audits to measure energy efficiency savings once work has been completed by Warm Up Winnipeg. Information on economic savings has been provided by Manitoba Hydro, offering a comparison of energy bills pre and post retrofit.
Future Plans	BUILD hopes to double the program's size by the end of 2011.
Suitability for Nova Scotia (parallels or differences)	Perhaps the most distinctive feature of Warm Up Winnipeg is the focus on the low-income minority communities and neighbourhoods. The Warm Up Winnipeg model may be particularly suitable in helping to help alleviate energy poverty in low-income minority communities in Nova Scotia.
Contact	BUILD 434 Dufferin Ave. Winnipeg MB R2W 2Y5 204-943-5981
Sources	http://www.warmupwinnipeg.ca/index.html http://www.gov.mb.ca/chc/press/top/2006/11/2006-11-29-115500-523.html Email from Tyler Pearce, November 8, 2010.

Manitoba: Brandon Energy Efficiency Program (BEEP)

Program Name	Brandon Energy Efficiency Program (BEEP)
Jurisdiction	Brandon, Manitoba
Date of Inception	November, 2006
Level of Government, Sponsor or Delivery Agent	Brandon Neighbourhood Renewal Corporation
Inter-Program, Inter-Governmental Links	Canada ecoTrust for Clean Air and Climate Change, Government of Manitoba, and several community organizations.
Barriers to Access	Geographic: Only available in the city of Brandon. Requires cooperation of property owners. Only available to Manitoba Housing units as of June 1, 2010.
Program Highlights	Relies on labour provided by low-income community members who are provided skills training in order to carry out retrofitting work under the program. Brandon Energy Efficiency Program (BEEP) retrofits Manitoba Housing homes with additional attic and basement insulation. It also installs low flush toilets, efficient showerheads, faucet aerators, compact fluorescent lighting, and pipe-wrapping.
Successes	In one year the project retrofitted 55 homes, employed 15 trainees, and developed building inspection practices, eligibility list, and a tool inventory. Projected greenhouse gas emissions savings of 120 tons per 65 households retrofitted.
Failures	Geographical limitation. Essentially it is a Brandon-only program. Relies on cooperation of landlords. As of June 2010, the only properties eligible are Manitoba Housing units.
Accountability	N/A
Reporting	N/A
Future Plans	N/A

Suitability for Nova Scotia (parallels or differences)	Perhaps the most distinctive feature of the Brandon Energy Efficiency Program (BEEP) is its focus on a specific community. Depending on the specifics of any community's housing stock, labour force participation, etc. a generalized energy efficiency plan may not achieve the same high rate of success as this program.
Contact	Kristin 729-2491 (k.nickel@brandon.ca) George 729-2490 (g.mcleod@brandon.ca)
Sources	August 30, 2010 email from: Kristin Nickel, PHEC, Project Manager, Brandon Energy Efficiency Program (BEEP) http://www.bnrc.ca/page.aspx?page_id=27 http://www.elc.uvic.ca/press/documents/Conserving-planet-without-hurting-low-income-families-April2010-FINAL.pdf

Ontario: Enbridge Home Weatherization Retrofit Program

Program Name	Enbridge Home Weatherization Retrofit Program
Jurisdiction	Ontario
Date of Inception	N/A
Level of Government, Sponsor or Delivery Agent	Enbridge Gas Distribution, private natural gas supplier. Delivered by GreenSaver, Green Venture, and EnviroCentre.
Inter-Program, Inter-Governmental Links	N/A
Barriers to Access	Geographic limitations: for eligible low-income Enbridge Gas Distribution customers in Toronto, Peel, Durham and York Regions, in the City of Ottawa or in the counties of Renfrew, Prescott and Russell, Lanark, Leeds and Grenville, Stormont, Dundas and Glengarry and now the Niagara Region. In order to qualify for this program, one must be an Enbridge Gas Distribution customer and meet the following: Households must qualify for and benefit from one or more of the following programs: • Ontario Works • Ontario Disability Support Program (adult household income must not exceed amounts outlined below) • Guaranteed Income Supplement • Allowance for Seniors • Allowance for Survivors • National Child Benefit Supplement <u>OR</u> A household must have a total income below table values depending on the number of household members. In addition to the above limitations the premises must be older than 30 years; the beneficiary must pay their own Enbridge Gas utility bill; the home must be heated by natural gas; and the application must be made by November 30, 2010. Ultimately, this program is not currently set to continue on a permanent long-term basis.

Program Highlights	Free to participate. Accessible to low-income renters. Work Provided First Visit An energy adviser schedules a visit to the home. The first visit takes about 3 hours and usually includes inspection of: ○ Attic ○ Wall and foundation insulation ○ Heating system ○ Water heater ○ Ventilation system The adviser suggests general tips for saving energy and lowering your bills. If the energy adviser recommends upgrades trained contractors will return at a later date to complete these—if the home can achieve a minimum level of energy savings economically to justify making them. There is no charge for these upgrades. Possible improvements could include: ○ Draft-proofing: Including caulking and weatherstripping around doors and door frames, window casings, headers and baseboards, as well as attic hatches. ○ Insulation work: Including insulation in wood-framed wall cavities and crawl spaces, attics and basement walls. Follow up visits are scheduled in every case to ensure that energy savings have been realized.
Successes	Potential energy savings up to 30% as estimated by GreenSaver.

Failures	While the program itself has excellent, and innovative, features it has certain strict limitations on accessibility including geographic location (primarily in the Greater Toronto Area), age of housing and income caps.
Accountability	As this program is offered by Enbridge Gas Distribution, a private company, through its various delivery agents accountability is an internal one.
Reporting	N/A
Future Plans	Presently this program is expected to close on November 30, 2010.
Suitability for Nova Scotia (parallels or differences)	The scope of this program is likely determined to some degree by the economics of Enbridge's business model. Natural Gas is a well-established and widely used domestic energy source in Ontario. In Nova Scotia a small proportion of households use natural gas for home-heating purposes. Nevertheless the program employs some efficient administrative practices, and aside from certain limitations, is available to low-income renters. These aspects of this model could be adapted and applied in Nova Scotia.
Contact	GreenSaver Attn: Joe Bonello 74 Six Point Road Toronto, ON M8Z 2X2 Tel: 1-888-855-3106 Fax: 416-203-3121 Email: joseph@greensaver.org EnviroCentre Attn: Melanie Johnston 110 Laurier Ave. W. Ottawa, ON K1P 1J1 Tel: 613-580-2424 ext 15490 Fax: 613-580-2494 Email: melanie.johnston@ottawa.ca Green Venture 22 Veevers Drive Hamilton, ON L8K 5P8 Tel: 1-866-540-8866 Fax: 905-540-8882 Email: contact@greenventure.ca

Sources	https://portal-plumprod.cgc.enbridge.com/portal/server.pt?space=CommunityPage&control=SetCommunity&CommunityID=832#2 http://www.meerontario.ca/eligibility.html
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Ontario: Social Housing Renovation and Retrofit Program (SHRRP)

Program Name	Social Housing Renovation and Retrofit Program (SHRRP)
Jurisdiction	Ontario
Date of Inception	2009
Level of Government, Sponsor or Delivery Agent	Ontario and Federal combined. Delivered by Ministry of Municipal Affairs and Housing
Inter-Program, Inter-Governmental Links	Provincial-Federal
Barriers to Access	Geographical limitation: Ontario Only social housing administered by Service Managers (SMs), the Ministry of Health and Long Term Care, the Ministry of Community and Social Services and Rural and Native Housing may be eligible for SHRRP funding. Eligible projects fall within Schedule C of the <i>Canada-Ontario Social Housing Agreement, 1999</i>, subject to certain exceptions. They must either be subject to the <i>Social Housing Reform Act, 2000</i> (SHRA) or have an ongoing Project Operating Agreement in place with social housing providers.
Program Highlights	In order to get SHRRP funding the provider has to agree to maintain the social housing as affordable for a minimum of 10 years. Retrofits and renovations are not limited to energy efficiency initiatives, but may include repairs or replacements of windows, doors, roofs, heating/cooling/ventilation systems, and appliances. Maximum funding for renovation and retrofit projects is \$28,000-32,000 per unit although most projects are expected to average about \$14,000 per unit.
Successes	Service providers must sign an accountability framework and agree to provide the units as affordable housing for at least 10 years. Also, providers will be supplied with a full-time administrator to help implement the project, at no cost.

Failures	Some social housing units are specifically excluded including federal cooperative housing projects that were not transferred to the province under the Social Housing Agreement, and were retained by the federal government (CMHC has a separate repair program for unilaterally funded federal co-ops). Also excluded are projects funded under federal homelessness initiatives, including the Supporting Communities Partnership Initiative (SCPI), and the Homelessness Partnership Initiative (HPI). Other excluded housing categories/projects are: • Private projects with households in receipt of assistance under the Rent Supplement Program • Social housing in First Nations communities (on-reserve housing) • Rural and Native Homeownership Program units • Properties owned by landlords who are in the process of earning loan forgiveness under CMHC renovation programs other than the Residential Renovation Assistance Program – Disability (RRAP-D) • Project sponsors in the process of earning forgiveness under the Shelter Enhancement Program.
Accountability	The Service Manager (SM) and delivery partners shall require each social housing provider who completes repairs to keep and maintain, at its usual place of business, all records, invoices and other documents relating to the repair funds. This should be done in a manner consistent with Generally Accepted Accounting Principles (GAAP) and clerical practices. The records must be maintained and kept available for review for a period of five years from the date of completion. The SM shall also ensure that the delivery partners undertaking repairs can provide any additional information reasonably required by the ministry.
Reporting	Other programs may not be combined with the SHRRP without ministry approval. A key condition of the federal funding is that program reporting take place monthly on each project. SMs are required to report to the ministry on the status of each project during its development and renovation, retrofit, or regeneration. The ministry prepares a monthly roll-up in each SM's area.

	Project details will eventually be reported through the Affordable Housing Information System (AIMS). Each housing provider's Annual Information Return (AIR) must contain an audited statement of SHRRP project expenditures as well as a statement from a reputable independent auditor confirming that the funding provided was spent on approved, eligible capital expenditures, and in the case of regeneration projects, the budget was submitted with the business case for the project as approved by the Ministry.
Future Plans	N/A
Suitability for Nova Scotia (parallels or differences)	This is a combined program supported by the Ontario and Federal governments. The program partly originates in the transfer or downloading of federal housing projects and responsibility to the provincial government. Although the Nova Scotia government would have to come to an agreement with the federal government of its own there is nothing in theory that would prevent such an arrangement. Needless to say, this program does not provide a model which could be readily adopted by private or semi-private companies as it is funded by and administered by government housing authorities. The program has a variety of useful features especially with regards to reporting and accountability. Also, its requirement that housing that benefits from funding remain low-income housing is an important one.
Contact	Canada-Ontario Affordable Housing Program Housing Programs Branch 777 Bay Street, 2nd Floor Toronto ON M5G 2E5 General Inquiry: (416) 585-5013 Fax: (416) 585-7003 www.mah.gov.on.ca
Sources	http://www.mah.gov.on.ca/AssetFactory.aspx?did=6867

Ontario: Peaksaver

Program Name	Peaksaver
Jurisdiction	Ontario
Date of Inception	N/A
Level of Government, Sponsor or Delivery Agent	Participating electricity distributors in Ontario.
Inter-Program, Inter-Governmental Links	N/A
Barriers to Access	Only customers of participating distributors are eligible. One must have an account with a participating utility. Tenants who pay rent inclusive of electricity cannot participate. Requires approval of landlord. Requires the use of an electric hot water heater. Requires use of central air conditioning.
Program Highlights	Electricity distributor installs a thermostat or switch which allows them to remotely reduce electricity consumption during peak demand periods. Doesn't eliminate participant's control or comfort settings but only reduces the demand downwards from their setting on the thermostat. Participants can always opt out. Can only be activated by the utility a maximum of 10 ten times between May 1 and September 30 and never on weekends. \$25 incentive payment for participating and having the device installed.
Successes	No data was available on total energy savings attributed to Peaksaver. The incentive to low-income households is negligible. Despite this, the program offers an interesting model and may be adapted to provide long-term and real savings to those willing to moderate or tailor their electricity consumption. 60000 participants in Ontario. Capacity to reduce demand by

	60MW at peak consumption times.
Failures	Very small one-time incentive to participants. Requires landlords participation. Requires a particular arrangement of home cooling and heating systems.
Accountability	As provider or sponsor of the program direct accountability is to the Ontario Power Authority. Licensed by the Ontario Energy Board, it reports to the legislature through the Ministry of Energy (Ontario).
Reporting	N/A
Future Plans	N/A
Suitability for Nova Scotia (parallels or differences)	This program poses a model that would not be particularly difficult to implement in Nova Scotia. Nova Scotia and Ontario enjoy parallel jurisdiction. Efficiency Nova Scotia will share a similar mandate as Peaksaver operates under, allowing it to implement a similar program in Nova Scotia. One difference may lie in usage pattern differences between the two provinces. Ontario sees peak energy usage in the hottest days of summer when widespread air conditioning is activated. Nova Scotia's climate may not inspire such peaks. Despite this it should be possible to identify suitable opportunities to dial down usage remotely.
Contact	Ontario Power Authority Suite 1600 120 Adelaide Street West Toronto, Ontario M5H 1T1 Toll Free: 1-877-797-9473 webmaster@powerauthority.on.ca
Sources	http://everykilowattcounts.ca/residential/peaksaver/faq.php Conversation with Colleen at OPA, November 8, 2010.

Ontario: Helping Homes Conserve

Program Name	Helping Homes Conserve
Jurisdiction	Ontario
Date of Inception	N/A
Level of Government, Sponsor or Delivery Agent	Union Gas
Inter-Program, Inter-Governmental Links	N/A
Barriers to Access	Geographical limitation: Windsor, Hamilton, Sudbury, London, North Bay, Cornwall, Brantford, Waterloo, Cambridge, Dundas, Stoney Creek and Georgetown Areas. Only tenants who pay their own bills are eligible. Customers must have natural gas home heating through Union Gas to qualify for a programmable thermostat. Customers must have natural gas hot water heating to qualify for all other benefits. Requires landlord cooperation.
Program Highlights	Supplies and materials provided to beneficiaries include : - Up to two energy efficient massage showerhead(s). - One water-saving kitchen aerator and one water-saving bathroom aerator. - Up to two metres of foam pipe insulation . - Programmable thermostat.
Successes	Estimated savings of \$100 with additional \$100 in savings if a programmable thermostat is installed.
Failures	Limited range of energy saving measures. Requires landlord cooperation. Tenant cannot participate independently. Aerators are not installed by technicians.

Accountability	As this program is offered by Union Gas, a private company, accountability is an internal.
Reporting	N/A
Future Plans	The above list of cities where the program is available was recently expanded to include the above. Future plans will extend eligibility to more cities.
Suitability for Nova Scotia (parallels or differences)	The scope of this program is likely determined to some degree by the economics of Union Gas' business model. Natural Gas is a well-established and widely used domestic energy source in Ontario. In Nova Scotia a small proportion of households use natural gas for home-heating purposes.
Contact	By telephone: 1 877 326-3488 Email contact form: https://www.uniongas.com/helpinghomes/contactus.asp
Sources	https://www.uniongas.com/helpinghomes/index.asp http://www.lowincomeenergy.ca/energy-assistance/

Quebec: Econologis

Program Name	Econologis
Jurisdiction	Quebec
Date of Inception	2007
Level of Government, Sponsor or Delivery Agent	Agence de l'efficacité énergétique, a Quebec government agency.
Inter-Program, Inter-Governmental Links	N/A
Barriers to Access	Participants must pay their own energy bills and use a fuel source other than wood for the main heating system. Income thresholds must also be met in order to participate ranging from \$22,171 for a single person household to \$58, 673 for a household of seven or more people.
Program Highlights	Program is available directly to low-income renters who pay their own utility bills and does not require participation of landlords. Two-step program. First, an energy efficiency advisor visits the home and assesses its energy efficiency levels as well as areas for improvement. Second, various measures are taken including caulking, weather-stripping, temperature adjustments, installation of CFL bulbs and insulation of electrical outlets, where appropriate. No cost to tenants.
Successes	Between 2004-2008 approximately 2979 low-income households were visited. Directly available to tenants.
Failures	The number of households visited was relatively small to the number of eligible households. Energy savings have not been significant. Sufficient building knowledge and auditing capacity have not been sufficiently developed to maximize the program's effectiveness.

Accountability	Has to be approved and re-approved by the provincial energy regulator, the Regie de L'Energie. Three-year plans designed to meet government targets for energy efficiency and new technologies must be submitted and approved by the Regie.
Reporting	N/A
Future Plans	Econologis itself is not expected to change or expand but a pilot project on energy-efficiency improvements for low-income households began this year in select communities. It guarantees results to participants and allows landlords of multi-unit buildings with 50% or more low income tenants to participate. It would have limits on the size and dimension of residences, could require landlords to contribute up to 20% of costs for improvements made, and requires landlord participation.
Suitability for Nova Scotia (parallels or differences)	Both Quebec and Nova Scotia are parallel in the Canadian context and share the same level of jurisdiction. There are no obvious barriers to the employment of this model, or its features, in NS.
Contact	Agence de l'efficacité énergétique 5700, 4 ^e Avenue Ouest, RC Québec (Québec) Canada G1H 6R1 Telephone: 418 627-6379 Toll free: 1 877 727-6655 Fax: 418 643-5828 E-mail: aee@aee.gouv.qc.ca
Sources	http://www.aee.gouv.qc.ca/en/my-home/econologis/ http://www.elc.uvic.ca/press/documents/Conserving-planet-without-hurting-low-income-families-April2010-FINAL.pdf

New Brunswick: Energy Efficiency Retrofit Program

Program Name	Energy Efficiency Retrofit Program
Jurisdiction	New Brunswick
Date of Inception	January, 2007
Level of Government, Sponsor or Delivery Agent	Efficiency New Brunswick, a New Brunswick crown corporation created under the <i>Energy Efficiency and Conservation Agency of New Brunswick Act</i> .
Inter-Program, Inter-Governmental Links	Existing Multi Unit Residential Building Upgrades Program
Barriers to Access	Requires participation of landlord. It does not provide services or benefits directly to low-income renters. The program targets low-income homeowners and "Private non-profit corporations and co-operatives where self-contained units or bed units are <i>occupied by tenants with low and moderate incomes</i>" Ineligible properties include: - Residential care facilities - Student housing - Hotels, motels, bed and breakfasts - Nursing Homes
Program Highlights	Eligible benefits under the scheme include the energy efficiency measures which will generate the highest potential energy cost savings for the occupants as identified by energy advisors. Eligible improvements include but are not limited to such things as: - Heating systems - Air Sealing - Ventilation Systems - Insulation - Windows Assistance for homeowners is in the form of a non-repayable grant contribution and a repayable loan. The maximum grant contribution for homeowners is \$4,500. Additional assistance for homeowners may be available where the property does not meet minimum standards of health and safety. Private non-profit groups and housing co-operatives are eligible for the non-repayable grant contribution only. Eligible groups may receive

	funding up to a maximum of \$5,000 per self-contained unit and \$3,000 per bed unit. This department conducts an initial inspection of property and provides a listing of energy efficiency improvements in priority order that could be completed within maximum assistance level starting with the improvements that will yield the most energy cost savings for the occupants.
Successes	Specifically targets homeowners who rent to low-to-moderate income tenants. Owners of residential rental properties must sign an approval letter stating that the rents will not be increased as a result of the energy retrofits. In situations where energy costs are included in the rent, energy cost savings will be passed through to the tenants.
Failures	Relies on cooperation and initiative of landlord. The program subsidizes energy efficiency assessments and home upgrades. The former may be initiated by tenants but actual improvements required landlord participation.
Accountability	Efficiency NB is required to submit a report to the Minister of Energy within six months of the end of the fiscal year. These reports are presented to the Legislature. The Agency is also required to provide the Minister with information as requested.
Reporting	N/A
Future Plans	No specific new initiatives or expansion have been announced for Energy Efficiency Retrofit Program. As of the 2007-2008 Annual Report (the most recent to be made public) the following initiatives are being considered for future implementation by Efficiency New Brunswick: - off-electric baseboard pilot project to better evaluate the cost of converting homes heated by electric baseboard to high efficiency, low GHG emitting natural gas furnaces and water heaters. - A pilot project with the Dept. of Social Development to ensure that developers participating in its Affordable Rental Housing program (funded jointly with the federal government) build their projects to a minimum

	EnerGuide 80 standard or better. This also allows developers to be eligible for a \$2,000 per unit grant from Efficiency NB if they incorporate low greenhouse gas producing central heating systems instead of electric baseboards.
Suitability for Nova Scotia (parallels or differences)	Very suitable. Nova Scotia shares a number of similar characteristics as New Brunswick including climate, housing stock, sources of energy including the recent residential availability of natural gas, and legislative and agency jurisdiction.
Contact	Efficiency NB 35 Charlotte St., Suite 101 Saint John, NB E2L 2H3 506-643-7826 (Telephone) 1-866-643-8833 (Toll-Free) 506-643-7835 (Fax) www.energycnb.ca
Sources	http://app.infoaa.7700.gnb.ca/gnb/Pub/EServices/ListServiceDetails.asp?ServiceID1=19556&ReportType1=All Efficiency NB 2007-2008 Annual Report <http://www.energycnb.ca/cms/uploaded_files/9WITQ45EOB/73/docs/2007-2008%20enb%20annual%20report%20-%20rapport%20annuel.pdf>

U.S. Federal: Weatherization Assistance Program (WAP); Vermont: Low-Income Single Family Service (LISF)

Program Name	Weatherization Assistance Program (WAP) and Low-Income Single Family Service (LISF)
Jurisdiction	WAP - U.S. Federal LISF - Vermont
Date of Inception	WAP – 1976 LISF – N/A
Level of Government, Sponsor or Delivery Agent	WAP is sponsored by the U.S. Department of Energy LISF is sponsored by Efficiency Vermont, a government agency. Delivered by different community organizations in Vermont.
Inter-Program, Inter-Governmental Links	LISF piggybacks on WAP by offering additional services to those who qualify and have taken advantage of WAP. <i>Low-Income Single Family Service (LISF)</i> - Services include analyzing energy bills, installing high efficiency lighting, switchingfuels, refrigerator and freezer replacement, education, and custom measures and arrangements with contractors. Measures are screened using a state cost-effectiveness measurement and must have a benefit-to-cost ratio of at least 1.0. Between 2000 and 2005, 4515 households were served, 9353 MWh of energy were saved, and heating bills were reduced by an average of US\$234 per year per household. LISF also cooperates with food banks, other poverty advocacy groups, and social housing to distribute high-efficiency light bulbs and water-saving devices. LISF has taken steps to address other market barriers: • Services are provided at no cost to households, negating the disincentive of upfront costs. • Lack of knowledge and lack of customer investment and acceptance are dealt with by having energy auditors provide households with cost savings estimates, implementation protocols that include the latest technology, free light fixtures, contract management for major renovations, and increased education campaigns. • The lack of incentives for owners of rental buildings is addressed by leveraging and facilitating financing for major

	renovations. • A referral network is in place for referring LIHs to other available services. LISF is funded through a state energy charge levied on energy bills.
Barriers to Access	To be eligible applicants have to fall within pre-set income guidelines according to household size, with a general limit of 60% of the median income in Vermont. Requires permission of landlord.
Program Highlights	If a household includes a member who receives Supplemental Security Income (SSI), Reach Up, Food Stamps, or Home Energy Assistance, the household is considered automatically eligible for weatherization services. Professional home energy evaluation followed by a collaborative home energy efficiency plan to reduce energy consumption and increase comfort. Energy efficiency measures include sealing drafts and air leaks, improving the heating system efficiency by cleaning, tuning and performing minor repairs or replacing the heating system if necessary. Installing insulation where there isn't any or where inadequate amounts exist (added ventilation and minor structural repairs are part of this activity); and improving, where possible, indoor air quality to reduce moisture problems.
Successes	Between 2000 and 2005, 4515 households were served, 9353 MWh of energy were saved, and heating bills were reduced by an average of US\$234 per year per household. Close collaboration between different programs and sponsors. LISF avoids resource waste and administrative overlap by piggybacking on WAP and allowing participants to pre-qualify based on participation in other programs.
Failures	Income cut-offs and requirement of landlord's consent may exclude worthy candidates for WAP and LISF services.
Accountability	N/A
Reporting	N/A

Future Plans	N/A
Suitability for Nova Scotia (parallels or differences)	Efficiency Nova Scotia, once operating, could potentially adopt the model set by WAP and LISF. It is an innovation that LISF operates as an add-on program that low-income earners can take extra advantage of, in addition to WAP itself. Funding comes through an extra charge levied on energy consumers in Vermont but such a charge may bring controversy to Nova Scotia if it were charged in addition to the fee which will already be levied to sustain Efficiency Nova Scotia. From a regulatory perspective there appears no reason why this model program couldn't be adapted for Nova Scotia.
Contact	PHONE Toll-free: 1-888-921-5990 MAIL Efficiency Vermont 255 S. Champlain Street, Suite 7 Burlington VT 05401
Sources	http://www.efficiencyvermont.com/pages/Common/ContactUs/ http://www.efficiencyvermont.com/pages/Residential/Building Efficiently/YourApartmentBuilding/FreeServices/ http://www.elc.uvic.ca/press/documents/Conserving-planet-without-hurting-low-income-families-April2010-FINAL.pdf http://www1.eere.energy.gov/wip/wap.html

New York: Assisted Multi-Family Loan Program

Program Name	Assisted Multi-Family Loan Program
Jurisdiction	New York
Date of Inception	N/A
Level of Government, Sponsor or Delivery Agent	NYSERDA, a public benefit corporation in New York state that funds energy supply and efficiency research and energy-related environmental issues. The program is delivered by numerous community groups, contractors and community organizations in New York state.
Inter-Program, Inter-Governmental Links	New York Energy Smart Loan Program - a collaboration with conventional lenders across New York State that lowers the interest rate on loans for energy efficiency improvements.
Barriers to Access	Average income of building must be no greater than 80% of state median income.
Program Highlights	AMFP offers both technical and financial services to help buildings identify, finance, implement, and monitor energy-saving measures. Eligible measures include windows, boilers, insulation, and replacement appliances. Financial assistance is in the form of low-interest loans and needs-based grants. AMFP also provides free training to building owners, maintenance staff, and operators in the proper use and maintenance of energy-efficient technologies. AMFP is a New York Energy Smart program that receives funding in accordance with generated savings; the energy savings themselves are calculated to finance the capital needed. The Multifamily Loan Program offers low-interest financing for buildings that would not qualify for a conventional loan. The financing is secured by 80% of the project savings from energy efficiency upgrades. The loan fund requires a 20% improvement over existing conditions to receive incentives. Exemptions might be made by NYSERDA, allowing an application for a loan to be made. Existing multiple housing units may get up to \$5000 per housing unit to a maximum of \$2.5 million per project. New construction can access a potential \$1 million per project.

	Additional incentives, or loan amounts, exist for smart meter programs and green building designations. Public housing providers can get up to a maximum \$5 million in loans and two interest rate reductions. NYSERDA reserves the right to inspect projects to ensure compliance with the loan application and terms, engineering practices, and energy evaluations.
Successes	Between 2000 and 2002, AMFP serviced 480 low-income properties and aimed to service 100,000 units by 2005. Anecdotally, the program has helped to ensure the solvency of low-income tenants and property owners by reducing their regular energy costs. Also, health and safety requirements helped to ensure better lighting and ventilation in many improved buildings.
Failures	The eligibility requirement of a building-wide income limit, measured relative to the state median income, means that tenants whose incomes fall within requirements may not benefit from the program due to income disparities between neighbours.
Accountability	N/A
Reporting	N/A
Future Plans	N/A
Suitability for Nova Scotia (parallels or differences)	Efficiency Nova Scotia will, ostensibly, fill the role that NYSERDA plays in New York, a sponsor, facilitator and designer of energy efficiency programs. Efficiency Nova Scotia may be in a position to help leverage low-cost credit that will help to encourage and enable landlords to participate in and invest in energy efficiency programs. This is perhaps the most unique and innovative feature of AMFP, besides its requirement that energy savings and capital be tied so that the greatest energy returns are gained for each investment. AMFP provides a model that may be adapted for implementation in Nova Scotia.
Contact	Email: residential@nyserda.org Phone: 1-877-NYSMART
Sources	http://www.elc.uvic.ca/press/documents/Conserving-planet-without-hurting-low-income-families-April2010-FINAL.pdf http://www.nyserda.org/Funding/appmultifamilyInfo.pdf

Massachusetts, Rhode Island, New Hampshire: Appliance Management Program

Program Name	Appliance Management Program
Jurisdiction	Massachusetts, Rhode Island, New Hampshire
Date of Inception	N/A
Level of Government, Sponsor or Delivery Agent	Energy distributor National Grid partnered with Community Action Program agencies.
Inter-Program, Inter-Governmental Links	Community Action Program (CAP) agencies are local private and non-profit agencies that carry out the mandate of the federal <i>Economic Opportunity Act</i> to fight poverty by enabling and empowering low-income people. The program is funded by a state energy charge levied in all three participating states.
Barriers to Access	To be eligible applicants have to fall within pre-set income guidelines according to household size and customized to the particular state they reside in.
Program Highlights	Available to renters and homeowners alike. Begins with an in-home energy efficiency assessment and referrals to other energy-efficiency and employment-training programs.
Successes	Since 1996, the program has delivered more than 30,000 MWh in cumulative annual savings and 425,000 MWh in lifetime savings to over 30,000 customers. An average of 1200 kWh/household—that have reduced LIH electricity expenditures by about US\$100/year. Regulatory support has allowed the program sponsor, National Grid, to be credited for non-electric savings where participants use other forms of energy. Joint-marketing with other LIEEPs wisely employs marketing resources. Best practices group allows the numerous CAP delivery agents to share experiences and successful methods.
Failures	Income and household size cut-offs may be too arbitrary. Potential exists to exclude people who should otherwise benefit.
Accountability	N/A

Reporting	N/A
Future Plans	N/A
Suitability for Nova Scotia (parallels or differences)	AMP does not present a model easily established in Nova Scotia. It is characterized by the diversity of jurisdictions and legislation involved, the singularity of one energy distributor and many delivery partners. Features that might be adopted in Nova Scotia included the comprehensive offering to qualified applicants and the focus on inclusion of participants in program delivery through the development of employment skills.
Contact	The contacts below are only a selection of CAP program delivery agents. Massachusetts: SMOC Energy Services at (866) 397-8478 South Middlesex Opportunity Council, 300 Howard Street, Framingham, MA 01702 Rhode Island: Comprehensive Community Action Programs (CCAP) 311 Doric Avenue Cranston, RI 02910 Phone: (401) 467-9610 New Hampshire: Rockingham County — Rockingham Community Action 1-800-639-3896
Sources	http://www.elc.uvic.ca/press/documents/Conserving-planet-without-hurting-low-income-families-April2010-FINAL.pdf http://www.smoc.org/index.asp?pgid=41 http://www.energy.ri.gov/lowincome/incomeguidelines.php

California: Energy Management Assistance (EMA) Program

Program Name	Energy Management Assistance (EMA) Program
Jurisdiction	California
Date of Inception	1984
Level of Government, Sponsor or Delivery Agent	Southern California Edison is the sponsoring utility. The program is delivered by community-based organizations, private contractors, other investor-owned utilities, and the California Public Utilities Commission (CPUC).
Inter-Program, Inter-Governmental Links	EMA cooperates with the Low-Income Home Energy Assistance Program to increase bulk-purchase capacity to increase savings on energy efficiency devices.
Barriers to Access	Applicants must meet annual income and household size thresholds. Homeowners written permission must be obtained before renters can participate. To qualify for EMA services, an SCE customer must: • Receive electricity service through a residential electric meter in SCE's service territory • Have an active SCE service account, or be sub-metered under a master-meter SCE account. • Meet program eligibility requirements, including the installation requirements for each service. • Meet income qualifications.
Program Highlights	Available to homeowners or renters. EMA offers comprehensive, household-tailored services to qualifying LICs. The program employs a Home Assessment Tool that determines which measures are appropriate for any particular home. The program considers two categories of energy efficiency measures, including weather-sensitive and non-weather-sensitive. Non-weather-sensitive measures might include: high-efficiency refrigerators; CFLs; low-flow showerheads; water-heater blankets; faucet aerators; water-heater pipe wrap; hard-wired porch light-fixtures; and in-home energy education. Weather-sensitive energy efficiency measures may include:

	high-efficiency window/wall air conditioners; evaporative coolers; outlet gaskets; ceiling insulation; weather-stripping; caulking; and minor home repairs. The program is coordinated so that purchase of energy saving devices is centralized to generate bulk-purchase cost savings through a bidding process. This helps to save money, ensure a standardized quality of service and high product standards and also reduces the capital and storage burden on small-scale delivery agents. Follow-up assessments ensure work was carried out properly and effectively.
Successes	In 2004, EMA budgeted US\$16 million, engaged 37,400 participants, saved 15.3 million kWh of energy, and had a cost-effectiveness of 0.63 under the Total Resource Cost Test. Over 2001-2004, EMA's participation rate was 16.3%, drawing 187,685 participants from 1.149 million eligible customers. EPA is funded through a public goods charge (i.e., an SBC) levied on customers.
Failures	Caps on income and household size may prevent some from participating in the program who otherwise are deserving. Landlords consent is required.
Accountability	N/A
Reporting	N/A
Future Plans	N/A
Suitability for Nova Scotia (parallels or differences)	The Public Utilities Code (PUC) of California sets EMA in a much different regulatory environment than that that exists in Nova Scotia. The PUC authorizes different class structures and rates and requires that low-income earners not be "jeopardized or overburdened by monthly energy expenditures." No such mandate or authority exists in Nova Scotia. It also establishes a Low-Income Oversight Board which reviews programs according to need, facilitates collaboration between different utilities, organizations and programs, and generally encourages grassroots implementation by community service providers.

Contact	Southern California Edison P.O. Box 800 Rosemead, CA 91770 Tel: 1-800-736-4777
Sources	http://www.sce.com/residential/income-qualified/ema/ http://www.elc.uvic.ca/press/documents/Conserving-planet-without-hurting-low-income-families-April2010-FINAL.pdf

U.K.: Warm Front

Program Name	Warm Front
Jurisdiction	U.K.
Date of Inception	2000
Level of Government or Provider	National government
Barriers to Access	Currently, regulations prevent homeowners from seeking their own quotes on work to be done under the scheme. A consequence of this is that households that are required to pay some part of repairs or improvements may actually be priced out of taking part in the program. The United Kingdom's National Audit Office recommends that this rule be abolished.
Program Highlights	The Scheme provides a grant of up to £2,700, or £4,000 if an oil central heating system is required, to pay the installation cost of heating and insulation measures in vulnerable private sector households.
Successes	Warm Front is widely considered to be a world leader in reducing energy poverty and is ranked by the U.K. Department of Energy as its third-most successful program for reduction of CO2 emissions. The Department considers the success of Warm Front based on how many households it has assisted and the resulting increase in energy efficiency. Cumulative figures since the inception of the scheme not available but Warm Front assisted 635000 households between June 2005 and March 2008. 86 per cent of customers were satisfied with the work carried out including 75 per cent who were highly satisfied, with five per cent of customers being dissatisfied. Eighty-nine per cent of customers were satisfied or highly satisfied with the overall quality of workmanship and 84 per cent would recommend the service to a close friend or relative. Efficient identification of those eligible for the scheme. Warm Front uses qualification in other needs-based programs, or entitlements, to identify those who may take advantage in the program. Examples include those on U.K. equivalents of income assistance, single mothers, disability allowance, worker's compensation recipients, veteran's pensions and others. The program also pro-actively identifies eligible persons through collaboration with other government service agencies.

	Staff received extra training to ensure that complaints are handled more efficiently with more direct recourse to senior staff.
Failures	Insufficient customer education resulting in confusion about which aspects of the program are funded and which are not.
Accountability	N/A
Reporting	N/A
Failures	Warm Front has failed to adequately assist those in certain types of constructions, particularly those in solid-wall housing (particularly a concern in the U.K. where a lot of housing stock is older and is solid-walled). Overlap with other energy poverty reduction programs has resulted in resources being unevenly focused on some recipients.
Future Plans	Warm Front is operated by EAGA, a private company contracted by the U.K. Department of Energy. Its current contract will expire sometime in 2010 and an option exists to renew it for a further two years. It is unclear if the U.K. government intends on exercising this option.
Suitability for Nova Scotia (parallels or differences)	Warm Front appears in all ways to offer a suitable model to be considered in Nova Scotia. Where differences do lie they suggest that Nova Scotia would perhaps achieve greater results than in the U.K. Nova Scotia is a single jurisdiction with housing stock that would more readily lend itself to energy efficiency improvements, unlike much of the housing stock in the U.K. Furthermore, Warm Front has variations depending on country (Northern Ireland, Wales, Scotland, or England). Nova Scotia would avoid administrative overlap or excess that the U.K. experiences. Furthermore, Nova Scotia does have the numerous home energy efficiency, and energy poverty reduction schemes, that the U.K. does so there is less risk of resource overlap and wastage.
Contact	Email: customer.management@eaga.com Tel: 44-0800 316 2805 Address: Eaga plc, Customer Management Team, FREEPOST NEA12054, Newcastle upon Tyne, U.K.

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Request IR-14:

With respect to page 29, lines 20 – 21,

a) Please clarify what ENSC means by the phrase “further assess the options for implementing such a model”. Is the focus on implementation strategies, or is it intended that the model itself will be part of the assessment? If the model is not part of the assessment, please provide the model that ENSC has in mind.

b) Please elaborate on the nature of the UARB engagement that ENSC may be seeking in 2011.

Response IR-14:

a) ENSC recommends that both the model itself and the strategy for its implementation be part of the assessment. ENSC is proposing a stakeholder forum or workshop, including representatives of the UARB in the summer or fall of 2011, that would consider options for a performance-based approach and multi-year framework. A consultant’s report that reviews the various models currently being used elsewhere would most likely be the starting point for dialogue on what would be the most effective model for use in Nova Scotia and how it should be implemented.

b) ENSC proposes that UARB staff and/or consultants participate in the forum/workshop. When consensus is reached on a model for use in Nova Scotia and how it should be implemented, ENSC will submit such a proposal to the UARB for review.

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Request IR-15:

With respect to page 31, lines 9-10,

a) Please provide any preliminary plans, strategies or methodologies that ENSC is currently considering or has implemented with respect to ensuring that in the event of a multi-fuels mandate, costs associated with each fuel will be segregated and common costs will be appropriately allocated among the fuels.

b) Does ENSC anticipate submitting any of its plans, strategies or methods to the UARB for approval? If so, what is ENSC's expectation as to when this is this likely to occur? If not, please explain.

Response IR-15:

a) The non-electricity energy efficiency and conservation program delivery model (other fuels segment) is in the process of being developed between ENSC and the Province of Nova Scotia's Department of Energy. While the details of the other fuels programs are not available, ENSC has taken steps so that it is able to deliver segmented cost information as the other-fuels programs evolve.

ENSC's plans, strategies and methodologies to ensure reasonable and defensible allocation of all costs, including the common costs, include:

- Implementing a fund-accounting system that will enable the separation of costs at source. The majority of costs will be directly attributable to programs. Common costs will be based on cost drivers or allocation factors supported by principles of causality.

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- 1 • Engaging the services of an outside consultant with regulatory experience in
2 determining a cost allocation framework. The framework will include regulatory
3 principles and establish an open and transparent methodology for allocating
4 common costs between the two segments of electricity and other fuels.
5
6 • Producing annual audited financial statements that will rely on strong internal
7 controls, including compliance with the established cost allocation framework and
8 methodology. The basis of financial statement presentation will include the
9 separation of costs between the two segments (electricity DSM and other fuels).
10
11 b) ENSC anticipates submitting the cost allocation framework and methodology to the
12 UARB in the fall of 2011.

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Request IR-16:

With respect to page 34, line 15, there appears to be a difference between ENSC’s proposal to apply the TRC at the program level and Dunsky’s recommendation (Appendix C, page 3) that the TRC be applied “at the plan – not the measure level” in the short term. (Emphasis added). Please comment.

Response IR-16:

Please refer to Multeese IR-23.

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Request IR-17:

With respect to Appendix A, page 6, line 6, please explain the rationale for collapsing the Low Income program into the Existing Houses program.

Response IR-17:

The Low-Income program for upgrading the energy efficiency of single-family homes has had a great deal in common with the Existing Houses program during 2008-2010. Both programs have the same overall process of an initial home audit, efficiency upgrades to the home, followed by a second audit. With the Low-Income program, all costs are covered by the DSM Administrator, which contracts with a delivery agent to provide the upgrade work, including the home audits. With the Existing Houses program, the homeowner arranges and pays for the audits and upgrades separately, and receives financial incentives for the completed work, based on a menu of prescribed incentives.

Beginning in 2011, and increasingly in 2012, programs for low-income households will expand to include multi-unit residential building upgrades under the C&I programs, appliance and lighting upgrades under Efficient Products and information on energy use and efficiency under the Home Energy Report. As a result, the overall programming effort targeting low-income households becomes spread across multiple programs. To include Low-Income as a separate program would portray this as the only DSM effort and expenditure targeting low-income clients.

Ultimately, ENSC will be considering measures that also target modest-income households. ENSC's emphasis is on combining programs, where practical, to simplify program delivery and understanding for prospective participants in both the residential and C&I sectors. With a program label such as "Existing Houses", it is straightforward for a prospective participant to identify their field of interest on ENSC's website or in a program pamphlet. To determine the

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1 specific measures in which a client may be interested, ENSC will encourage them to contact
2 program staff.

3

4 As a result, low-income components are embedded in the Existing Houses and other 2012
5 programs. However, ENSC will continue to identify and promote special measures for low-
6 income households; there is no reduction in scope for the program measures that will be
7 accessible by low-income participants. ENSC will also track and report program costs for low-
8 income clients.

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Request IR-18:

With respect to Appendix A, page 6, line 20

- a) Please comment on the appropriateness of including “small commercial, industrial and institutional customers” in a Residential program.**
- b) Please describe how, for this program, ENSC tracks expenditures and savings by rate class for the purposes of cost allocation and recovery.**
- c) Please comment on why no costs related to this program are assigned to any of the industrial classes in Table 2 of Appendix B.**

Response IR-18:

- a) Although the program is classified as residential, commercial and institutional customers will be eligible to participate through the Retail Price Markdown and Appliance Retirement components. The reference to industrial customers is an error.
- b) ENSC uses a DSM Data System to track customer data and participation by program and rate class, where possible. ENSC’s financial code of accounts allows for tracking of costs by program within the financial system. In programs such as Efficient Products Retail component, ENSC does not have participant data; and therefore, participation by rate class must be estimated.
- c) Please refer to part a.

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Request IR-19:

With respect to Appendix A, page 8, line 1, please elaborate on the “unique opportunity” offered to low income customers by the Efficient Products program.

Response IR-19:

This refers to a new component addition to the Efficient Products program. The Efficient Products program will pilot a component in 2011, and further expand in 2012, to directly install energy-efficient measures in single family, semi-detached and multi-unit residential buildings for low-income tenants. As such, it is a unique opportunity compared to the prior scope of the program.

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Request IR-20:

With respect to Appendix A, page 14, line 23

- a) Please explain why the Home Energy Report is proposed as a stand-alone program, as opposed to being included as a measure in other programs such as the Existing Houses program.**
- b) Please elaborate on how savings from Home Energy Report are evaluated and verified, with particular reference to how such savings are distinguished from savings related to other measures that may be installed under other DSM programs.**
- c) Please comment on the sustainability of energy savings that depend on customer behaviour as opposed to the installation of more efficient devices or processes.**

Response IR-20:

- a) The Home Energy Report program is proposed as a stand-alone program since it provides a very discrete offering and has an entirely different and independent delivery mechanism than other programs, such as the Existing Houses program.**
- b) In light of the experimental design of the Home Energy Report (HER) program (participant and control households randomly assigned), the best analytical approach to evaluating the program savings impact is a fixed effects regression analysis to generate a difference-in-difference estimate of program savings.**

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This approach has been used in evaluating several similar programs, and has been used in evaluations of Home Energy Report programs in several widely-cited papers by academic economists.¹

The figure below provides an illustration of the difference-in-difference concept and its relationship to the estimation of program savings. In the figure, average daily consumption (ADC) is initially the same for program and control households, because assignment to program versus control is random. Average daily consumption for program households declines after the start of the program by the amount $\alpha_1 + \alpha_2$, but it is inappropriate to conclude that this is entirely due to the program, because other factors affecting all households, such as broad economic changes, are also in play. These other factors also affect the control households – as shown in the figure below – and so the difference between the change in ADC over time for program households ($\alpha_1 + \alpha_2$) and for control households (α_1) is the portion of the reduction in ADC attributable to the program (that is, α_2). The approach to be used, fixed effects regression analysis, is ideal for separately identifying the reduction amounts α_1 and α_2 .

¹ See, for instance:

Alcott, Hunt. “Social Norms and Energy Conservation” Working paper, Hunt Alcott’s Papers, Published and Working Papers, June 2010, Massachusetts Institute of Technology (MIT), Cambridge, MA, 2009; <<http://web.mit.edu/allcott/www/papers.html>>

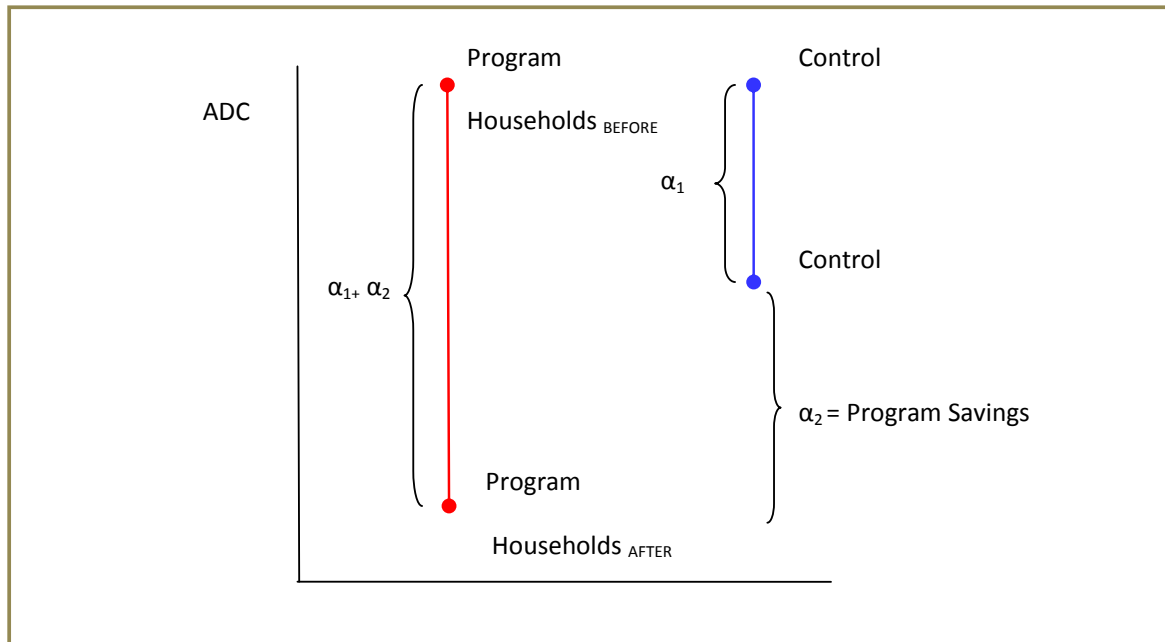
Ayres, I., S. Raseman and A. Shih. “Evidence from Two Large Field Experiments that Peer Comparison Feedback Can Reduce Residential Energy Usage”, NBER working paper no. 15386, the National Bureau of Economic Research, Working Papers and Chapters, September 2009, <www.nber.org/authors/ian_ayres>

Costa, D.L. and M.E. Kahn, Energy Conservation "Nudges" and Environmentalist Ideology: Evidence from a Randomized Residential Electricity Field Experiment, NBER working paper no. 15939, April 2010.

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Fixed Effects Regression Analysis Provides a Difference-in-Difference Estimator of Program Savings



The experimental design of the HER program allows an examination of the effect of the program on participation in other DSM programs. The logic of such an examination is straightforward: because customers are randomly assigned to the program, the effect of the program on participation in other DSM programs is the difference during the program period between enrollment in the other programs among control customers and HER program customers. So, for instance, if equal numbers of households are randomly assigned to the program and control groups, and 1000 program households participate in DSM program X and 800 control households participate in program X, then the HER program effectively increases the enrollment in program X by 25 percent.

Note: that for this additional 25 percent of households participating jointly in the HER program and program X, the attribution across the HER program and program X of any

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increase in average household savings is completely arbitrary.² This is an issue of what economists call “joint production”. On the one hand, the additional 25 percent of households in program X would not have been enrolled in program X without the HER program. On the other hand, the increase in average savings by these households presumably would not have occurred in the absence of program X. Both programs were necessary to generate the additional savings. An analysis of the HER program would include the following:

- identifying the change in participation in other DSM programs due to the HER program
- identifying any increases/decrease in average household savings by households jointly enrolled in the HER program and other DSM programs. When conducting such an analysis, ENSC would decide how to allocate these savings across the multiple programs.

c) ENSC has assumed a one year estimated useful life for the energy savings from the Home Energy Report program. Please also refer to CA IR-21, which shows the estimated life of the savings associated with each of the programs proposed for 2012. The longest-running OPOWER Home Report program is the program for Sacramento Metropolitan Utility District (SMUD), now in its third year. An evaluation of that program (included as an attachment to EAC IR-12) after two years found that program savings for high consumption households “ramped up” for the first 9-13 months of the program before settling at a constant annualized rate in Year 2 of the program, while low consumption households exhibited increasing annualized savings throughout the first two years of the program. These findings indicate that estimated savings for the first year of the SMUD program are conservative.

² “Increase in average household savings” means the increase in savings compared to the savings of HER program households not enrolled in program X. This increase is readily estimated in a fixed effects regression analysis.

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Request IR-21:

With respect to Appendix A, page 17, lines 5 – 7,

a) Please provide examples of “new program titles” that are currently being considered.

b) If transition to the new titles begins in 2011, why are they not being adopted completely until 2013, and why does none of them appear in the proposed 2012 plan?

Response IR-21:

a) Examples of new program titles have not yet been developed.

b) Descriptive program titles were retained for the 2012 DSM Plan to be consistent with the terminology used in prior DSM filings, although alternate titles will continue to be employed for marketing purposes. For example, the program currently marketed as “Small Business Lighting Solutions” has been described in DSM Plan filings as “Small Business Direct Install”. ENSC will continue to adopt new marketing titles as they are created in 2011 and beyond. ENSC is proposing to use these marketing titles in the 2013 DSM Plan.

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Request IR-22:

With respect to Appendix C. page 2 and Note 4 on page 12, please elaborate on Dunsky's statement that the current regulatory model "may hinder critical flexibility" and provide an example.

Response IR-22:

The report recognizes that within the current regulatory framework, the UARB and stakeholders have afforded the DSM Administrator significant in-year flexibility, primarily through the Program Development Working Group (PDWG) process.

ENSC's current annual plan review process presents limitations to its flexibility in delivering DSM programs; and, these limitations may, in turn, create cost pressures and/or unduly limit performance. For example:

- **Responsiveness:** Because of both the annual process and the time requirement for regulatory review, plans must currently be developed fully one to two years prior to the implementation period. While the PDWG process has, thus far, enabled flexibility within a given year, the DSM Administrator is expected to remain within the broad confines of the approved plan and its component programs. This diminishes its ability to be responsive to evolving facts on the ground (changing market conditions, regulatory initiatives, etc.), new opportunities that may arise or new concepts or innovations that may result from efforts at continuous improvement.
- **Contracting:** Since plans are only approved one year at a time, ENSC cannot sign multi-year agreements with implementation contractors. This limits ENSC's ability to enter into more favourable contract terms, especially ones in which set-up costs (e.g. establishing local operations, developing custom software

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1 applications, etc.) could be amortized over multiple years.

2

- 3 • **Staffing:** For the same reason noted above, single-year plans limit the
 4 Administrator's ability to make commitments and/or send clear signals to staff or
 5 potential staff regarding the organization's direction. Similarly, a one-year
 6 planning horizon may limit the Administrator's ability to implement effective
 7 compensation strategies, and/or aggravate unintended ambiguity between short-
 8 and long-term goals.

9

10 These are only examples and each one in and of itself may not prove an insurmountable
 11 obstacle to success. However, there is value – in terms of responsiveness, innovation and
 12 internal incentives – of both a planning horizon and an operating period that more closely
 13 match the Corporation's goals and objectives.

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Request IR-23:

With respect to Appendix C, page 3, Paragraph 2, please elaborate on why it is recommended that the TRC be applied at the plan level rather than the program level.

Response IR-23:

Philosophically, the Dunskey team supports the view that equal treatment of demand- and supply-side options – one of the foundations of integrated resource planning (IRP) – favours viewing the resource as a whole, as opposed to by each of its many components. Practically, the Dunskey team's experience with DSM plans and programs underscores the value of flexibility in designing and managing this resource.

Applying the TRC at the plan level gives room for programs or initiatives that might not pass the TRC but are beneficial. For example:

- new technologies (in particular, where economies of scale can drive down costs and can reasonably be thought to contribute to a positive TRC in the long run)
- programs aimed at hard-to-reach customers (low-income families, renters and small businesses) that may fall below a 1 on the TRC, but which are worth pursuing, either out of fairness (for customers who contribute to the DSM effort through their rates but may not be able to access standard programs) or because the TRC neglects significant non-energy benefits
- programs aimed primarily at long-term market transformation, where benefits may be difficult to quantify at the outset

All of these considerations point toward the importance of flexibility in designing and operating a comprehensive energy efficiency plan.

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1 Most plans throughout North America allow this flexibility, either by limiting the positive
2 benefit/cost ratio requirement to the plan level, as suggested in Dunsky's report, or by seeking it
3 at the program level but allowing exceptions where warranted. While semantically different,
4 these two options are very similar. It is in this respect that ENSC's proposal is substantially in
5 line with Dunsky's recommendation.

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Request IR-24:

With respect to Figure 1 on page 4 of Appendix C

a) Please provide the derivation of the “current goals” line.

b) Please explain “eligible demand”.

c) How does eligible demand change if DSM savings from sources other than ENSC programs are included as contributing to current goals?

Response IR-24:

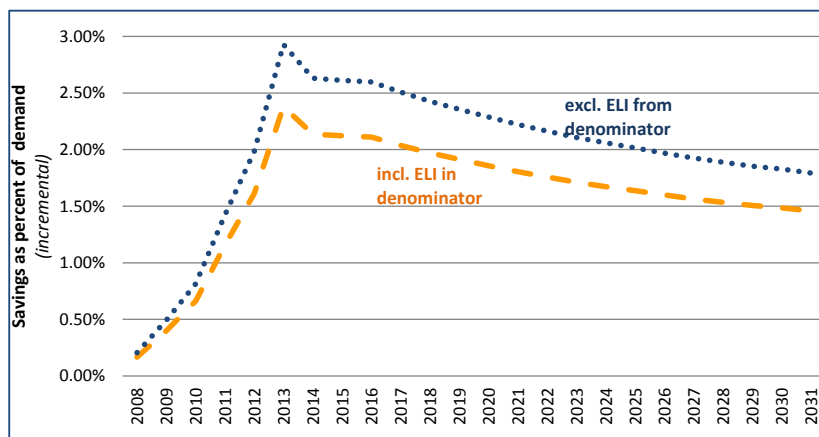
a) The current goal line is derived from the 2009 IRP Update. The achievable potential energy savings is compared to the total projected electricity consumption in Nova Scotia (2009 IRP Update Base Scenario Forecast Demand Without DSM), excluding the extra-large industrial consumption; since, at the time of preparing the report, they were not participating in electricity DSM programs.

b) “Eligible demand” is the total energy consumption in Nova Scotia, based on the 2009 IRP Update Base scenario forecast without DSM, excluding the extra-large industrial consumption. The extra-large industrial consumption was excluded from the analysis since they were not, at the time of preparing the report, participating in electricity DSM programs. Please refer to CA IR-44.

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c) For comparison purposes, were the ELI rate class to contribute to program savings (i.e. ELI customers partake in DSM programs and generate savings as a result of these programs), then the appropriate denominator would include all system demand (i.e. include ELI). For information purposes, below we present the curve from Figure 1, excluding and including ELI demand in the denominator.



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Request IR-25:

With respect to Appendix C, page 14, paragraph 5 and the Energy Star example provided,

a) Is it possible to estimate the degree to which the brand may be promoted by the appliance that does not of itself appear to pass the TRC, and the energy savings that may be attributed to that additional promotion?

b) If the response to a) is affirmative, should those additional savings be included as part of the TRC associated with that appliance?

c) If the response to b) is affirmative and the appliance still does not pass a TRC, should it be included in the program?

Response IR-25:

a) ENSC is not aware of any assessments in which the ENERGY STARTM brand may be promoted by promoting a given appliance that subsequently led to an estimate of the energy savings attributable to that additional promotion.

b) Not applicable.

c) Not applicable.

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Request IR-26:

With respect to Appendix C, page 15, paragraph 2,

- a) If tests other than the TRC were included in the California Standard Practice Manual of 1987, please indicate what they were.
- b) If the Manual included more than one test, was one test recommended above the others? If so, why?
- c) Please comment on why the TRC, as opposed to other possible tests that may have been in the Manual, “quickly became one of the most commonly-used DSM screening tests”.
- d) Please provide any available data on the number of US jurisdictions that have DSM programs and still use the TRC to screen them.
- e) Please provide any available data on the number of Canadian jurisdictions that have DSM programs and still use the TRC to screen them.
- f) For US and Canadian jurisdictions that have DSM but do not use a TRC, please provide any available data on whether any test is used to assess DSM, and if so, what tests are used.

Response IR-26:

- a) In addition to the TRC test, the California Standard Practice Manual (CSPM) of 1987 includes the Participant test, the Ratepayer Impact Measure (RIM) and the Utility Cost Test (UCT), since renamed the Program Administrator Cost Test (PAC). The societal

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perspective, commonly known as the Societal Cost Test (SCT) is treated as a variation of the TRC.

b) No. The CSPM recommends a multi-perspective approach (using more than one test to reflect different perspectives) and acknowledges that each test has strengths and weaknesses.

c) Regulators throughout North America have commonly evolved their application of tests based on the scope of savings that were deemed beneficial at the time. For example, many regions new to DSM have had a tendency to begin by applying the RIM, the most restrictive of all tests. As regions become more familiar with DSM and interested in securing more of its potential, they often evolve toward the broader TRC perspective. Today, a number of regions find the TRC to be too restrictive, and are moving toward variations on the TRC or different tests entirely.

d) According to the National Action Plan for Energy Efficiency (NAPEE, 2008, p. 5-4),¹ 21 states are using the TRC as a primary or secondary cost-effectiveness test. Use of the TRC for screening purposes does not necessarily mean that the test is used as a hard “go/no-go” criterion; in many cases, the TRC is assessed for information purposes, or is used as a guide. The choice of test can depend on the nature of the DSM Administration model. For example, while TRC is more common for utility administrators, a form of SCT is more commonly applied to government agencies or third-party administrators. A 2008 Dunskey Energy Consulting review found that among eight non-utility DSM administrators: one used a strict form of the TRC, two used a strict form of the SCT, three used a modified TRC that more closely resembles the SCT, one used a hybrid SCT/PAC and one used no test at all.

¹ National Action Plan for Energy Efficiency (2008), “Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers”, Clean Energy, February 11, 2011, United States Environmental Protection Agency, <www.epa.gov/eeactionplan>

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e) The following presents the methods used in four Canadian jurisdictions:

- British Columbia: BC Hydro applies a “modified TRC” as its primary guideline at the program level; in a number of cases it includes non-energy benefits in the calculations, without which the TRC would be more restrictive. In the case of low-income programs, it includes a generic 30 percent societal benefits adder. Terasen Gas uses the TRC at the plan level.
- Manitoba: Manitoba Hydro screens its programs for multiple tests including the TRC; it allows a benefit/cost threshold of less than one, in a number of cases.
- Ontario: The Ontario Power Authority applies the TRC as its primary screen at the program level; certain programs are allowed to present a negative benefit/cost ratio.
- Quebec: Hydro-Quebec uses multiple tests and presents them for information purposes. It allows for a TRC of less than one for certain programs.

In a number of cases, the value, methodologies and role of these tests are being reconsidered.

f) According to NAPEE (2008, p.5-4), the SCT and PAC tests are the most common tests used by jurisdictions that do not use the TRC. A total of 17 jurisdictions require no specific tests. An increasing number of regions are modifying the original TRC to account for some of its inherent limitations (there are now a variety of “Modified TRCs” in use). Other variations include mixed tests, as in California where the PAC and TRC are assigned weights in a blended test. In many cases, tests are used as a goal or guideline, not as an absolute screen.

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1 **Request IR-27:**

2

3 **Please provide a copy of the paper referenced in Footnote 8 on page 15 of Appendix C.**

4

5 Response IR-27:

6

7 Please refer to Attachment 1.

Is it Time to Ditch the TRC? **Examining Concerns with Current Practice in Benefit-Cost Analysis**

Chris Neme, Energy Futures Group
Marty Kushler, American Council for an Energy-Efficient Economy

ABSTRACT

For the past two decades, the Total Resource Cost Test (TRC) has been regulators' principal test for assessing energy efficiency program cost-effectiveness and approving utility funding. However, the TRC as commonly applied today has fundamental problems. In particular, it usually ignores non-energy benefits that are often critical to market acceptance of efficiency measures and increasingly emphasized in program delivery. For example, a residential weatherization investment must typically be justified by energy savings alone, even if improved comfort was more important to the home-owner.

This problem could theoretically be solved by including in the TRC the monetary value of non-energy benefits. However, determining which benefits drive consumer decisions and estimating the value of factors such as improved comfort, health and safety, worker productivity, etc. is so difficult, expensive and controversial that this solution is simply not practical.

Use of the TRC is also inconsistent with treatment of supply alternatives. For example, when a regulator approves a utility purchased-power contract with a customer with an on-site generator, there is no consideration given to what the customer costs or other benefits from that equipment might be. All that is considered germane is the purchase price to the utility for that resource. Why should regulators apply a more stringent standard to utility investment in energy efficiency resources?

While there are other venues (e.g., public policy modeling and planning) where including a TRC perspective is still helpful, we believe it is time to emphasize the program administrator cost test when making utility system resource decisions.

Introduction

Utility regulators and other policy-makers typically require that initiatives to promote energy efficiency and other demand-side investments are shown to be "cost-effective" before they are approved. In 1983, the California Public Utilities Commission and California Energy Commission jointly published what is now widely referenced as the California Standard Practice Manual. The manual identified and defined five cost-effectiveness tests: the Participant test, the Ratepayer Impact Measure (RIM) test, the Total Resource Cost (TRC) test, the Societal test, and the Program Administrator Cost Test (PACT).¹ Almost all jurisdictions use one or more of these tests. Many have historically referenced the California Standard Practice Manual in documenting how such tests are to be applied.

Over the more than 25 years since the California Standard Practice Manual was first published relatively little has changed with respect to how cost-effectiveness screening of

¹ In the most recent version (2001) of the California Standard Practice Manual, the Societal test is treated simply as a variant on the TRC and the Utility Cost Test (UTC) was renamed the Program Administrator Cost test.

efficiency programs and other demand-side management initiatives is conducted. Although the Manual has been updated twice – once in 1988 and again in 2001 – the changes did not materially affect the definitions of the different tests (CPUC/CEC 2001). More importantly, there has been relatively little change in the way different states and provinces have used the tests.

In contrast, efficiency programs have changed substantially with respect to the kinds of measures being promoted, the ways in which they are promoted and the breadth and depth of their impacts. In addition, the policy imperatives for more aggressive efficiency programs – including growing concerns about global climate change – have become even more compelling. The thesis of this paper is that such changes necessitate a re-examination of how cost-effectiveness screening of demand-side investments is conducted. In particular, we suggest that there is a need to reconsider the current reliance on the TRC for determining whether an energy efficiency measure or program is cost-effective. While our thesis applies to any government initiative, the focus of this paper is on efficiency programs funded by electric and gas rate-payers and approved by public utility commissions.

The Five Cost-Effectiveness Tests

The reason the California Standard Practice Manual describes five different cost-effectiveness tests is that cost-effectiveness can be viewed and assessed from at least that many different perspectives. All of the tests compare the net present value of a stream of benefits over the life of an investment with the net present value of a corresponding stream of costs.² What follows is a brief description of each of the five tests, as well as a summary table that compares the key benefits and costs that are included in each test. Note that there are a number of nuances about the tests, including such things as discount rates and how taxes (and tax credits) are treated, that we do not address as the principal focus of this paper is on higher level issues.

Participant Test

The Participant Test measures cost-effectiveness from the perspective of the efficiency program *participant*. It simply compares the bill savings (using retail rates) that the customer will realize over the life of an efficiency upgrade to the cost incurred by the customer to make the upgrade (i.e. net of any financial incentive the program provides).

² In many cases, there is no “stream of costs” because all costs are realized immediately at the time of purchase. However, in other cases, there are costs that occur over a number of years.

Ratepayer Impact Measure Test

The RIM Test measures whether billing rates will go up or down as a result of an efficiency program. Put another way, it measures whether *non-participants* in a program will be better or worse off as a result of the program. This is why it is sometimes also called the Non-Participant Test. It compares the value of avoided supply investments by the utility – including avoided energy costs, avoided transmission and distribution costs and avoided generation costs – to the sum of program costs and utility lost revenues from reduced sales.

Total Resource Cost Test

The TRC Test theoretically measures cost-effectiveness from the combined view point of program participants and non-participants. We say theoretically because in practice the TRC measures secondary fuel, water or other resource savings using avoided costs for such resources rather than retail prices for such resources as in the Participant Test (Fulmer & Biewald 1994). In short, the TRC compares the value of avoided energy and other resources from all sources with the full cost of the efficiency measures plus all non-measure program costs.

Societal Test

The Societal Test is a variant on the TRC.³ It is intended to represent a broader *societal* view of cost-effectiveness. To that end, it is the same as the TRC except that it theoretically adds environmental and other non-energy benefits and costs to society into the calculation. We say theoretically because, as discussed more fully below, other non-energy benefits such as improved comfort, building durability, health and safety, worker productivity, public image and others are seldom addressed.

Program Administrator Cost Test

The Program Administrator Cost Test (previously known as the Utility Cost Test) measures cost-effectiveness from a *utility* perspective. It compares the value of the utility's avoided costs with the cost to the utility of acquiring the efficiency resources that produce those avoided costs. Thus, its primary differences from the TRC are that (1) it does not include any energy benefits for fuels the utility does not provide; (2) it does not include any other resource benefits such as water savings; and (3) it does not include any customer contributions to the cost of an efficiency investment.

³ Indeed, the California Standard Practice Manual no longer lists it as a separate test.

Table 1. Summary of Key Benefits and Costs Included in Different Tests

	Partic. Test	RIM Test	TRC Test	Societal Test	PACT Test
Benefits⁴					
Primary Fuel(s) Avoided Supply Costs		✓	✓	✓	✓
Secondary Fuel(s) Avoided Supply Costs			✓	✓	
Primary Fuel(s) Bill Savings (retail prices)	✓				
Secondary Fuel(s) Bill Savings (retail prices)	✓				
Other Resource Savings (e.g. water)	✓		✓	✓	
Environmental Benefits				✓	
Other Non-Energy Benefits			rarely ⁵	in theory only	
Costs⁶					
Program Administration ⁷		✓	✓	✓	✓
Measure Costs					
Program Financial Incentives		✓	✓	✓	✓
Customer Contributions	✓		✓	✓	
Utility Lost Revenues		✓			

Which Tests are Predominant?

We have not conducted a comprehensive assessment of which jurisdictions are currently using which tests. However, based on both our own extensive experience with regulatory practice in a variety of jurisdictions and research on this question in recent years by the American Council for an Energy Efficient Economy (Amann 2006; also unpublished research) and the Regulatory Assistance Project (unpublished), several general conclusions can be drawn.

To begin with, many states and provinces require utilities or other program administrators to assess cost-effectiveness from multiple perspectives – often all five perspectives represented by the tests identified above. This is not because those jurisdictions require programs to pass all five tests in order to be approved. Rather, it is usually to provide useful insight into a range of issues programs might raise. For example, if a program fails the RIM test miserably, a regulatory agency may still approve the program but require that other actions are undertaken to

⁴ We use the term “primary fuel(s)” to represent the fuels provided by the utility running the efficiency program; the term “secondary fuel(s)” refers to fuels not provided by the utility. For example, for an efficiency program run by an electric only utility, electricity savings are “primary fuel savings” and gas or fuel oil savings are “secondary fuel savings”.

⁵ Although not officially part of the California Standard Practice Manual definition, the original discussions underlying the TRC and the conceptual rationale for adding the participant’s out-of-pocket costs to the utility’s program costs are supportive of incorporating participant non-energy benefits into the calculation. At various times a number of states have attempted to measure and include these types of benefits, but the near-universal practice these days is to ignore them in the calculation of the TRC.

⁶ Just as savings of secondary fuels and other resources are benefits captured by different tests, any increases in secondary fuel costs or other resource use would be captured as either increased costs or negative benefits. Such increases would be estimated using avoided costs or retail prices in the same way as the benefits from reductions in use of such resources would be estimated for the different tests.

⁷ We use the term “administration” here to include all program costs other than financial incentives for efficiency measures. This includes program management, administration, marketing, training, evaluation, etc.

minimize concerns about inequities between participants and non-participants (e.g., ensuring that there is a broad enough range of programs offered so that all customers have the opportunity to participate in at least one over a reasonable period of time).

That said, most regulators rely primarily on one test to determine whether a program or portfolio of programs should be approved. In most jurisdictions with operating efficiency programs, that principal test is either the Total Resource Cost Test or Societal Test (NAPEE 2008). One or the other of those tests are the principal test used in most New England states, New York, New Jersey, Wisconsin, Missouri, California, Ontario, Quebec, British Columbia and elsewhere. A few jurisdictions, including Michigan and Connecticut, rely principally on the UCT. Although a few states (e.g. Florida) relied on the RIM test in the past, we are unaware of any states with significant energy efficiency programs that rely primarily on the RIM test today.

Concerns about the TRC and Societal Tests as Currently Applied

We have two fundamental concerns about the TRC and Societal Tests as they are currently applied:

1. Most non-energy benefits are not factored into the tests.
2. Supply investments are not subjected to the TRC, making the hurdle to pass screening greater for demand-side investments than for supply-side alternatives.

Failure to Address Non-Energy Benefits

Most efficiency measures have significant non-energy benefits. Sometimes this is just a natural by-product of the measure. For example, reducing the leakiness of a home improves comfort at the same time it saves energy. Similarly, day-lighting not only saves energy, it has been shown to improve worker productivity. On the other hand, the marriage of efficiency and other desirable attributes is sometimes an intentional result of manufacturers', designers' or builders' marketing or sales strategies. Often, such market players sell an "entry-level" product that is as basic and inexpensive as possible – usually meaning it is also inefficient; they also often bundle efficiency upgrades with other attractive features and market this bundle as a "premium" product. Consider refrigerators. It is impossible, to find two refrigerators that are identical other than in their efficiency ratings. More efficient refrigerators often have more shelves, better drawers, better aesthetics, etc. The bottom line is that efficiency is rarely the only attribute of a product that is of interest to either consumers or those who are selling to them.

If a market is valuing non-energy attributes that are by-products of or bundled with efficiency, a good efficiency program will factor those non-energy attributes into its design. Thus, many of today's most sophisticated energy efficiency programs intentionally emphasize the selling of non-energy benefits. For example, the fundamental design philosophy underlying the residential Home Performance with ENERGY STAR programs is that we should be selling consumers on all the things about which they may care, including comfort, building durability, and indoor air quality as well as efficiency. Evaluators of ENERGY STAR Homes (new construction) programs often assess whether builders are selling such homes on their non-energy benefits. An evaluation of Efficiency Vermont's 2004 program which showed that more than 60% of builders promoted increased comfort and lower maintenance costs as additional benefits of buying ENERGY STAR homes – a three-fold increase over 2001 – was seen as partial

evidence of program success (Kema 2005). Similarly, most leading programs targeting commercial and industrial customers attempt to understand the business interests of those customers and find ways efficiency investments can help address those interests. Sometimes that is just by saving money on energy bills, but more often than not reducing waste streams, improving worker productivity or other factors are at least as important.

The TRC test as originally conceptualized was a robust test looking at “total” costs and benefits. Over time, however, it became apparent that measuring and quantifying “non-energy benefits” was very difficult and often controversial for regulators to accept as a legitimate factor to consider in utility regulation. As a result, the use of non-energy benefits atrophied, and today non-energy benefits are rarely incorporated into cost-effectiveness screening under the TRC or even under the Societal Cost Test. In contrast, the full retail cost of an efficiency investment (i.e. including both the participant’s and the utility’s contribution) is easy to quantify, and is virtually always used in TRC or SCT analyses. The end result is that cost-effectiveness screening becomes an inherently skewed comparison: all the costs are compared to just a portion – i.e. the energy portion – of the benefits.

There have been attempts to address this issue. For example, for the past decade in Massachusetts, the regulators have explicitly allowed the utilities to conduct studies of non-resource benefits and include the value of such benefits in their cost-effectiveness screening. However, with rare exceptions, the utilities have not factored such benefits into their analyses. In the past, regulators in Washington, D.C. have allowed a non-resource benefit adder to be applied to low income programs. However, such examples are very rare.

Inconsistency in Treatment of Demand and Supply Options

As noted above, supply investments are not subjected to TRC or Societal cost-effectiveness screening. For example, when a regulator approves a utility purchased power contract from a customer with an on-site generator, there is no consideration given to what the customer costs of installing or operating that equipment might be. All that is considered germane is the cost to the utility of purchasing that power resource from the customer. Similarly, in utility cost-recovery under a “renewable portfolio standard”, regulators do not use the provider’s investment costs for the renewable facility to screen out sources of supply. Instead they focus on the cost of the resource to the utility system. The same basic principle applies to independent power plant generators bidding into a power pool. No one cares what the cost of constructing the plant may have been. No one cares whether the plant operators need to generate revenue by selling gypsum from the plant’s scrubber or waste heat in order to competitively price its power. No one cares whether any government subsidies (in any of their myriad forms) were essential to making the price of power competitive. All that matters is the final price for purchasing power from the plant. Simply put, applying a TRC screen to utility energy efficiency programs imposes a cost-effectiveness burden that is not applied to any other utility system resource.

Why TRC Failings Matter

The asymmetrical inclusion of participant costs while failing to include most participant non-energy benefits in cost-effectiveness screening fundamentally biases regulatory decisions against efficiency investments. The practical effect of such biases would not be great if the magnitude of the unquantified non-energy benefits were small. However, numerous studies suggest that they are actually quite large. For example, a U.S. Department of Energy evaluation of low income weatherization suggests that the value of non-energy benefits was slightly greater than the value of the energy benefits (Schweitzer & Tonn, 2002). A federally funded study of the cost-effectiveness of commercial building commissioning – a service promoted by numerous rate-payer funded efficiency programs – found non-energy benefits to be on the order of 50% of the value of energy savings in existing buildings and more than five times the value of energy savings in new construction (Mills et al. 2004). One study of 52 industrial energy efficiency improvements also found non-energy productivity benefits to be more than 120% of the value of the energy savings; another concluded that total savings from industrial energy efficiency projects are typically two to four times the value of the energy savings (Elliott, Laitner & Pye 1997) her study estimates that non-energy benefits across a wide range of efficiency programs range in value from 50% to more than 100% of the energy benefits (Skumatz 2006).

Because they can be so large, omitting such benefits from cost-effectiveness screening can significantly reduce the magnitude of savings that are realized from efficiency program portfolios by reducing the number of measures that can be promoted within programs or rejecting cost-effective programs altogether.

Consider a program designed to promote the purchase of efficient residential water heating equipment. If avoided supply costs were \$0.14 per kWh,⁸ \$115 per peak kW, and \$1.35 per therm – all approximately what is currently estimated in New England (Hornby et al. 2009) and higher than many other parts of the country – the net present value of the benefits of upgrading from a standard new electric water heater to a heat pump water heater would be roughly \$3000, or about three times the incremental cost of a standard unit. Thus, a program administrator faced with such avoided costs could justify offering rebates for heat pump water heaters.⁹ However, under the TRC or Societal Cost Test as they are typically used, the same program administrator would not be permitted to offer the very same rebate to a consumer who preferred instead to install a \$6000 solar water heating system – even if the savings were slightly greater and the customer was willing to bear all of the added expense because it valued highly the ability to show off its commitment to the environment to its neighbors. While some of us may not support assigning a high value to such an attribute, the reality is that some people do. We use this somewhat extreme example to make the point that if we ignore the value that some people put on such attributes, we essentially begin using our personal values rather than market values to determine what is cost-effective. The result will be efficiency programs with at least somewhat lower levels of participation and savings.

Now consider Home Performance with ENERGY STAR programs. A good program in a northern climate should achieve on the order of 500 to 750 kWh and 300 therms of energy savings per home. This level of savings typically costs \$7000 to \$10,000 per home plus another \$1000 to \$2000 per home for marketing and administering the program. Using the same avoided supply costs described above, the net present value of the energy benefits would be on the order

⁸ Roughly \$0.03 of this is for environmental externalities.

⁹ Assuming the program could be run for an administrative cost of less than \$2000 per home.

of \$5500 to \$6500, depending on how much of the electric savings were cooling savings.¹⁰ That is not enough to justify a program under the TRC test. This is not an extreme example. It addresses the largest energy end use of the residential sector in a large portion of the U.S. and all of Canada.

In the past, when efficiency programs were never funded anywhere close to levels necessary to achieve even all the efficiency that was cost-effective under the restrictive application of the TRC or SCT, such concerns may not have been as important. However, in the current era in which the policy imperatives for truly pursuing all cost-effective efficiency are more compelling than ever and several jurisdictions are actively pressing to determine how much efficiency savings can be achieved, restrictive applications of cost-effectiveness screening standards has become highly problematic. How can we talk about figuring out how to do deep energy retrofits if we cannot even justify the 25% to 30% heating savings values achieved by current Home Performance with ENERGY STAR programs?

Possible Solutions

Conceptually, we see three potential solutions to this problem:

1. Adjust the TRC so that only the “energy portion” of measure costs are included in the test;
2. Fix the TRC and Societal Tests by quantifying – even in approximate ways – and including in cost-effectiveness screening all non-energy benefits; or
3. Change the test being used – specifically, relying instead on PACT.

Each of these options has its proponents. Each also has both advantages and disadvantages. These are discussed briefly below.

Using Only the “Energy Portion” of Measure Costs in the TRC

If the problem with the TRC is that it compares total costs to only the energy benefits, then one option is to assess how much of the total cost is attributable to energy savings and use that energy portion of the total cost in the TRC cost-effectiveness calculation. This could theoretically be done by conducting studies on the factors that contributed to consumer decisions to make an efficiency investment and estimating the portion of the decisions that were attributable to interest in energy savings. Such an approach has recently been put forward for consideration in a docket of the Vermont Public Service Board.¹¹

This approach would be a significant improvement over the current situation in that it would at least transform the TRC from a biased test to a comparison of apples (energy costs) to apples (energy benefits). This could enable some important and societally cost-effective efficiency programs that would otherwise fail the TRC as it is commonly applied to pass screening. Consider the Home Performance with ENERGY STAR program discussed above. If the average measure cost was \$8500 per home, the average program administration cost was

¹⁰ Assumes a real discount rate of 6%. The low end of the range assumes an average life of 10 years for the electric savings (mostly lighting) and 20 years for the gas savings. The high end of the range assumes significant cooling savings (with 15 year life) as well.

¹¹ <http://psb.vermont.gov/docketsandprojects/eeu/screening>

\$1500 per home and the average energy benefits were \$6000 per home, the program would fail the TRC with -\$4000 in net benefits. However, if participant surveys suggested that, on average, only half of the participant cost should be attributed to an interest in energy savings (the remainder being associated with improved comfort and other benefits, the “adjusted measure cost” would be reduced to \$4250. At that cost, the \$6000 in energy benefits would exceed the \$5750 (\$4250 plus \$1500 in administration costs) in “energy related costs”, making the program cost-effective.

However, this approach also has some disadvantages. For one, it would also require potentially significant additional expenditure on evaluations. Such research would ideally need to be undertaken for numerous programs and markets. It may also need to be undertaken numerous times for the same market as programs evolve. Participants in the first year or two of a program may be fundamentally different than those in later years. The program could also change in ways that result in different customer perceptions of value. Moreover, market research into consumer decisions should ideally be undertaken retrospectively.¹² That is, one would ideally have a cadre of program participants to survey. This raises questions about how program administrators would assess *new* programs that have not yet been tested in the field, and more importantly, how regulators would view proposals from program administrators to pursue new programs that required significant non-energy benefits to pass screening. If the default would be for program administrators to not propose such programs and for regulators not to approve them, progress will have been very limited. In addition, the approach could still result in sub-optimal levels of efficiency investment because using customers’ assessments of why they purchased a product to adjust cost rather than capturing the actual value of those benefits is likely, in at least some cases, to result in cost reductions that are worth much less than the full value of the non-energy benefits.¹³ Finally, the process for getting such a different approach adopted by regulators could be difficult and lengthy.

Taken together, these disadvantages likely mean that efforts to address non-energy benefits through adjustments to the cost side of the equation are likely to be a sub-optimal but workable solution for only a limited set of markets or programs in only a few jurisdictions.

Quantifying All Non-Energy Benefits

The second option for fixing the TRC is to tackle the benefits side of the equation. Specifically, regulators could theoretically require that all non-energy benefits are estimated and factored into TRC screening.

Like the approach discussed above, this approach would also lead to a more balanced assessment of costs and benefits. From the perspective of pure economic theory, it is the best approach in that it ensures that both all societal benefits and all costs are factored into decision-making. Again, consider the Home Performance with ENERGY STAR program discussed above. We have already shown that an average per home measure cost of \$8500, average per participant administration cost of \$1500 and average per home energy benefits of \$6000 would

¹² In theory, one could conduct prospective market research about customers’ willingness to pay. However, such assessments are likely to be less accurate than research on reasons why consumers *did* pay, in part because actual participants are likely to be different (demographically or otherwise) than those surveyed prospectively.

¹³ Consider a case in which health and safety benefits were large enough to fully offset measure costs, but the consumer assigned only 20% of the reason they invested in the measures to such benefits. In that case, this approach would understate the value of the non-energy benefits by a factor of 5.

lead to a program failing the TRC with - \$4000 in net benefits. However, if participant non-energy benefits such as improved comfort, health and safety, building durability and other factors were estimated to be worth the same as the energy benefits (i.e. another \$6000), a corrected TRC test would appropriately show the program passing screening with \$2000 in net benefits.

That said, this approach also has a number of disadvantages. First, if the aim was to comprehensively value all – or even just the most important – non-energy benefits, a potentially enormous additional investment in evaluation could be required. The fact that such benefits can vary from customer to customer, change as programs mature, and change as program designs themselves change only adds to the complexity and cost. Second, it is impossible to fully understand the full range of non-energy benefits that are valued by participants in large portfolios of efficiency programs. We are likely to only try to quantify those we already know – meaning we will understate the true value of such benefits. Third, just as with the adjustment to costs described above, valuation of non-energy benefits should ideally be performed retrospectively. It may be difficult to introduce new programs that rely on untested non-energy benefits. Fourth, because methods for quantifying non-energy benefits are imperfect, the results could be very controversial. Imagine, for example, attempts to quantify the health and safety benefits associated with replacing boilers with cracked heat exchangers. Finally, the regulatory process for considering this approach to fixing the TRC is likely to be extremely difficult, with regulators in many jurisdictions resisting the formal inclusion and monetization of factors they consider outside the realm of utility regulation.

The bottom-line is that while this approach is theoretically ideal, it is also likely to be so complex, controversial, and expensive that it is unworkable. It is almost certain that no jurisdiction will “go all the way” or even “most of the way” to fully address non-energy benefits in cost-effectiveness screening.

Switching to the Program Administrator Cost Test

The alternative to the two options for fixing the TRC is to replace it with a different test, specifically the PACT.¹⁴

This approach has a number of advantages. First, it is much simpler. There is no need to quantify non-energy benefits, which means much less complexity and controversy. Second, it is much less expensive. Not only do we not need to add potentially enormous new evaluation costs, we can even modestly reduce some existing expenditures because we no longer need to routinely estimate the full cost of efficiency measures since the PACT is concerned only with program spending.¹⁵ Third, this approach would create some symmetry with how supply-side investments are assessed. Finally, while one should not underestimate the difficulties in persuading regulators to change the test that they use, for all of the reasons noted above we expect this approach could be adopted more easily, more comprehensively and more quickly than the other options discussed above.

¹⁴ The PACT could be supplemented with the Societal test when benefits external to the utility system need to be considered.

¹⁵ There would still be some value to estimating full measure incremental costs. In particular, such estimates could be useful in informing program design, including incentive levels. However, such work would not need to be as routine or comprehensive as it is today.

Again, it is worth considering the Home Performance with ENERGY STAR program discussed above. It would fail the TRC as commonly applied today because the full \$8500 customers paid on average for improvements to their home, plus the average program administration cost of \$1500 per home, exceeds the average \$6000 in energy benefits. Under the PACT, as long as the program provided a rebate of no more than \$4500, it would pass cost-effectiveness screening.

The principle disadvantage of this approach is that it could theoretically result in the promotion of some efficiency measures that are not cost-effective from the perspective of society as a whole, even after accounting for non-energy benefits. However, the PACT ensures that all programs are cost-effective from an all rate-payers' perspective. By definition, any investment made by an efficiency program participant will be cost-effective from its perspective as well (otherwise they would not have made the investment).

In our view, switching to the PACT is the most workable solution for the purpose of selecting among utility resource options in the regulatory context.¹⁶ Because so many measures have non-energy benefits, many of which are very large, we suspect that the potential for promoting some investments that are not societally cost-effective would be swamped by the significant increase in societal benefits that would accrue from pursuing investments that are societally cost-effective (when considering non-energy benefits) but would have failed the TRC.

Conclusions

We believe it is clear that the TRC,¹⁷ as currently applied, has significant flaws. Because of the asymmetrical application of the TRC test to energy efficiency resources, but not other utility resource options, efficiency resources are systematically disadvantaged. While historically this has had a rather limited practical impact (because energy efficiency programs have tended to pass both the TRC and PACT), that situation is beginning to change. As we move into an era of greatly expanded energy efficiency objectives, this additional burden for energy efficiency programs will likely result in substantially less energy savings being realized than if we were truly pursuing all cost-effective energy efficiency. If non-energy benefits are roughly equal to energy system benefits of typical efficiency investments, failing to account for such benefits is tantamount to reducing the cost-effectiveness of such programs by half. The "flip side" of that statement is that if participant costs are half the total cost of the installed energy efficiency measure, including those costs in the TRC greatly reduces the apparent cost-effectiveness of the energy efficiency program relative to other utility resource options. Maintaining the current TRC cost-effectiveness regime will mean that the savings realized will ultimately be substantially less than they would be if we were truly pursuing all cost-effective efficiencies. Given the currently very compelling policy imperatives for maximizing the amount of energy savings we can achieve, it is critical that this issue be addressed.

Given the options before us, switching from reliance on the TRC to the PACT appears the best way to address the problem both comprehensively enough and expeditiously. This is not to say that there is no role for a TRC type of analysis. There may well be important policy questions that would benefit from a more thorough assessment of the TRC perspective. There

¹⁶ There are other purposes (e.g. macroeconomic modeling; overall public policy analysis and planning; etc.) for which a more comprehensive analysis of all energy and non-energy benefits and costs is very appropriate. We do not seek to minimize the importance of such analyses.

¹⁷ And by extension, the Societal Test.

may also be value in furthering our understanding of the nature and value of non-energy benefits – to inform program design if nothing else. Such work could conceivably lead to more workable adjustments to the TRC in the future. However, we believe that the theoretically perfect solution is not attainable. Even if it was, we cannot afford to wait a decade for it to develop. This all suggests that a switch to primary reliance on the PACT for utility resource selection (supplemented as necessary by the Societal Test) is the best course of action today.

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Request IR-28:

With respect to Figure 3 on page 21 of Appendix C,

a) Please confirm that the data for this graph is calculated on the basis of energy (Gwh) rather than demand (MW).

b) Please provide any available data on each of the following for each state compared to NS:

- **Renewable energy standards**
- **Hard caps on carbon dioxide emissions**
- **Hard caps on mercury emissions**

Response IR-28:

a) Confirmed.

b) Comparative data:

- **Renewable energy standards:**

The figure below presents the renewable energy standards or requirements for each of the states referenced in figure 3 of Appendix C. Please note that different states use different criteria to determine eligible power sources.

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1 **Renewable Energy Standards or Requirements**

Jurisdiction	Renewable energy target	Target year
California	33%	2020
Connecticut	23%	2020
Maine	40%	2017
Massachusetts	26%	2020
Minnesota	30%	2020
New York	29%	2015
Vermont	20%	2015
Nova Scotia	25%	2015

- 2
- 3 • Hard caps on carbon dioxide emissions:
- 4

5 To the best of our knowledge, none of the states mentioned have adopted hard
 6 caps on carbon dioxide emissions. Most of the states – Connecticut, Maine,
 7 Massachusetts, New York and Vermont – have, however, adhered to the Regional
 8 Greenhouse Gas Initiative (RGGI), a trade-able emissions credit system that
 9 provides for greater flexibility in meeting CO₂ reduction targets. For the RGGI
 10 participants as a whole, the absolute reduction target amounts to roughly 10
 11 percent from 2014-2018. In California, utilities are required to reduce CO₂
 12 emissions to 1990 levels by 2020 – or approximately 16 percent from 2010 levels
 13 – also through a tradable emissions credit system.

14

- 15 • Hard caps on mercury emissions:
- 16

17 ENSC does not have information on mercury emissions caps in the noted
 18 jurisdictions.

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Request IR-29:

With respect to the first sentence of Issue C on page 23 of Appendix C, please provide the source of the \$0.27 - \$0.28 per Kwh. If these are calculated, please provide their derivation.

Response IR-29:

The range is derived by dividing the annual costs (expressed in millions of constant 2010 dollars) by the incremental annual savings (in kWh), for the years 2010-2020, as provided in Attachment 4 of Appendix D of the Nov. 30, 2009 IRP Update Report submitted by NSPI to the UARB.

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Request IR-30:

With respect to the program cost comparisons on page 24 of Appendix C,

a) Please describe how ENSC developed its program costs.

b) Does ENSC's costing methodology include the use of data from other jurisdictions?

c) Please explain why ENSC's cost estimates might be so much lower than those in Massachusetts and Vermont?

Response IR-30:

a) The 2011 program costs listed for ENSC are from the Evidence of the 2011 DSM Plan as filed on February 26, 2010, page 10, Figure 3.2. The program costs on page 24 of Appendix C were calculated from Figure 3.2 of the 2011 DSM Plan by dividing the proposed budget for each program by the projected Incremental Annual Net Energy Savings at Generator (kWh).

b) No.

c) ENSC's cost estimates might be lower than those in Massachusetts and Vermont due to differences in administrative/delivery (either program administrator or third party), incentive, technical analysis or evaluation costs.

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Request IR-31:

With respect to page 29 of Appendix E and the two main factors that will be used to select the schools that will be included in the pilot program,

a) Please elaborate on what is meant by “the school is in need of the program”.

b) Please clarify whether the heating source in the school is a factor in school selection and explain why or why not.

Response IR-31:

a) This refers to schools identified as having opportunities to implement measures to reduce energy and resource use, whether through behaviour or infrastructure enhancements. Also, individuals in the school community (including teachers, principals, students and facilities staff) are currently engaging in sustainability initiatives, but could benefit from added support to organize initiatives under common goals, identify new opportunities and sustainability resources, facilitate learning opportunities for students and staff and network with other Green Schools, thereby enhancing and accelerating outcomes.

b) The heating source in the school is not a factor in school selection. There are many opportunities, independent of heating source, to implement energy efficiency behaviours and measures. The Green Schools program aims to build an energy-efficient culture through education and action, while reinforcing the concept through demonstrated energy saving results within the school.