

# Development of a New EnerGuide Rating System™

Questions and Considerations

December 2009

Canadian  
Home Builders'  
Association



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## Executive Summary

The Canadian Home Builders' Association (CHBA) supports, *in principle*, the energy performance ratings of all homes sold in Canada. Home energy ratings can provide consumers with important information, and assist them in making informed purchase and homeownership decisions.

In order to serve consumers' interests in this way, a home energy rating system must be rigorous, science-based, credible, transparent, meaningful and reliable. Consumers must have trust in the rating system, and in those they hire to provide this service to them. This will become a critical issue if provinces and territories move towards mandatory home energy rating, as is the case in Ontario.

The current EnerGuide Rating System (ERS), owned and operated by Natural Resources Canada (NRCan), does not meet this standard. NRCan has announced its intention to develop the "next generation" of the ERS to address weaknesses in the current system. The CHBA supports this NRCan initiative.

This paper examines a number of questions and considerations that the CHBA believes will need to be addressed as NRCan develops a new ERS. It is hoped that this paper will contribute to the process of renewing the ERS and developing a new Canadian system that is "best in class".

The paper notes that there are a wide range of home energy rating systems in place internationally, and that Canada can benefit from examining how other jurisdictions have developed systems similar to the ERS. These systems have strengths and weaknesses – both of which can inform efforts to develop a new ERS.

Of particular significance is the considerable emphasis that other jurisdictions place on formal training and accreditation of home energy evaluators, and on quality assurance processes put in place to ensure the overall integrity of the rating system, and the performance of those who deliver this service.

The paper points to issues that will be central to the development of a new ERS regime, one that will need to be governed by rigorous and consistent Standards of Practice and a Code of Ethics, delivered by well-trained and accredited professionals, and subject to various levels of independent quality assurance and oversight.

Coupled with updated analytic software and a robust administrative structure, such a system would provide new home builders and consumers with a valuable tool in their efforts to make Canadian homes more energy efficient.

## 1.0 The Purpose of This Report

The Canadian Home Builders' Association (CHBA) supports, in principle, the energy performance rating of all homes sold in Canada, both newly built and existing.

Underlying this policy position is the CHBA's long-standing principle that consumers should be provided with the information they need to make informed home purchase decisions.

With the growing importance of home energy performance, in terms of both home ownership costs and environmental impacts, home energy ratings are becoming essential consumer information. When a home is offered for sale, buyers should have access to accurate, objective information that allows them to understand its energy performance and easily compare this with that of other homes.

In supporting the energy rating of all homes sold in Canada, the CHBA has emphasized that such a regime requires the availability of a home energy rating system that is reliable, accurate, transparent and which is governed by rigorous administrative procedures. In the Association's view, the current EnerGuide Rating System<sup>1</sup> (ERS) does not meet this test. A new ERS is required.

Natural Resources Canada (NRCan), which owns and operates the ERS, has announced that it will undertake a major review intended to develop the "next generation" of the ERS, to ensure the system is robust, credible and effective.

The CHBA has developed this background paper to identify key questions and considerations related to the energy rating of homes. The paper does not propose specific outcomes, nor does it address in detail issues raised by the pending introduction of a mandatory rating requirement by some jurisdictions in Canada.

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<sup>1</sup> The EnerGuide Rating System is owned and trademarked by the Government of Canada, and managed by Natural Resources Canada.

## 2.0 Background and Context

Natural Resources Canada has developed the EnerGuide Rating System (ERS) for Canadian homes that can be used to assess existing homes, or to assess new homes at the design stage. The current ERS, which is supported by NRCan's HOT2000 software, has evolved over a period of decades since NRCan first offered energy assessments to homeowners in the 1980s.

To date, the ERS has been used on a voluntary basis in two ways:

- By homeowners wanting information on the current energy performance of their homes, and how this can be improved. ERS energy assessments are also a prerequisite for homeowner eligibility under the ecoENERGY – Retrofit Homes initiative.
- By new home builders wanting information on the energy performance of a home they intend to build, or as a requirement for labeling under one of a number of voluntary new home labeling initiatives (i.e., R-2000, ENERGY STAR, Built Green).

In 2008, the CHBA Board of Directors, recognizing the potential for home energy ratings to assist home buyers in making informed choices, adopted a policy supporting the energy rating of all homes sold in Canada, both newly constructed and existing. This policy position was adopted *in principle*, recognizing that a home energy rating system appropriate for such widespread application does not exist currently in Canada.

Subsequently, some provincial governments have expressed interest in this policy direction as well, and one, Ontario, has enacted relevant legislation as part of its Green Energy Act. Specifically, the Ontario legislation includes the following provision:

*“Under Section 2 of the Act, the Lieutenant Governor in Council is permitted, by regulation, to require persons who are offering to sell or to lease an interest in real property to provide such information, reports or ratings as may be prescribed relating to energy consumption and efficiency with respect to a prescribed residence or other building on the property or a class of prescribed residences or other buildings on the property in the circumstances that are prescribed.”<sup>2</sup>*

The intent of this measure was made clear by the then-Ontario Minister of Energy and Infrastructure in comments to the Standing Committee on General Government, as follows:

*“The logic is clear. At the time that you make the most important investment of your life, it's important to know how much energy does it use? And what can I do to use less?”<sup>3</sup>*

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<sup>2</sup> Ontario Green Energy Act, 2009

<sup>3</sup> Notes For A Statement To The Standing Committee On General Government By The Honourable George Smitherman, Minister of Energy and Infrastructure, Queen's Park, Toronto, Ontario, April 8, 2009

Whether through legislation or as a result of increased homebuyer demand, it is likely that home energy ratings will continue to take on greater importance in both the new home and resale markets. This will become more likely when, as forecast, energy costs increase in the future.

A reliable and accurate home energy rating system must provide home buyers with a clear and objective understanding of the energy performance of any home they are considering buying. In the case of Ontario, where new home builders and existing home owners will be *required by law to obtain and disclose a home's energy rating as a condition of sale*, the technical efficacy and integrity of the entire rating regime will be of critical importance.

This has significant implications for all of the parties involved in delivering the energy rating system, as the rating given to a home could be expected to influence its the market value.

As a result, any future system for energy rating of homes needs to be viewed from a number of perspectives:

- New home builders and existing home owners must have confidence that the energy rating system used to rate their home is robust, reliable and based on sound science and technology.
- Further, they will reasonably expect that those involved in determining the rating for their home are adequately trained, competent and will carry out their work in a thorough and professional manner.
- Further still, they will reasonably expect that the management and administration of the rating system meets high and consistent standards in terms of quality assurance, transparency, accountability and long-term integrity.

It should be noted that other researchers have concluded that two factors are of critical importance in achieving consistent and accurate energy ratings outcomes – the training required of evaluators, and the quality assurance protocols that monitor performance of the system. This was highlighted in a report by the British Research Establishment (BRE) comparing 13 rating schemes to determine their compliance with the EU Standard (EN832). This report noted the following:

*“The key factor to achieving repeatability and quality of energy ratings is surveyor (evaluator) training and quality control monitoring procedures”. . . “A complex methodology may appear to be more technically ‘correct’, but given the ‘human’ variation that results from individual surveyors making differing inputs, this is of little benefit, particularly if there are a large number of complex inputs that exacerbate this.”<sup>4</sup>*

This observation speaks to the critical importance of addressing the overall administration of the “next generation” ERS. Highly sophisticated, “state-of-the-art” modeling software will not, in itself, ensure consistent and reliable rating results. Evaluator qualifications, a range of quality assurance procedures and a high level of rigour in system management are essential.

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<sup>4</sup> *Review of Home Energy Rating Schemes*, BRE for Sustainable Energy Ireland, March 2004

In the future, home energy rating could have a significant impact on the value and marketability of a home – be it newly built or resale – and any failure in operational or administrative areas could give rise to litigation, as the potential for harm exists.

That is the context of this paper – it examines the many questions and considerations that flow from the assumption that home energy ratings will have an increasingly important role in the home buying process in the future.

### 3.0 Reference Elements

In order to provide useful context for considering the questions that surround development of a “next generation” home energy rating system in Canada, it is necessary to define, in very broad terms, what the key components and elements that such systems could be expected to include.

There are a great many home energy rating regimes in place internationally, in addition to the ERS in Canada. Generally, these regimes have a number of features in common:

#### A Centre of Responsibility

- A designated **Authority** that has overall responsibility for the operations of the rating system; this is typically a government agency, which can also be the proprietor of the system.

#### A System for Rating Home Energy Performance

- A home energy rating report format is developed by the Authority, most often based on the use of a **rating index**. This presents the rating results for a specific house within a scale that indicates the full range of possible rating outcomes. There are a wide variety of such indexes in use in various jurisdictions. The principal goal of an index is to present results in a manner that is easily understood, clear, representational and meaningful to consumers.
- The Authority also establishes the **period of validity** for home energy ratings after which the rating is considered to be expired and invalid. Conditions which would render a rating invalid prior to expiry may also be specified (i.e., a significant renovation or addition to a home, substantial damage resulting from fire or act of nature).

#### Technical Infrastructure

- The Authority approves one or more **computer modeling programs** that are to be employed to analyze data on house design or construction, including building characteristics, heating/cooling equipment, other energy-consuming equipment, site orientation, air leakage characteristics, and climate variables. These modeling engines are used to calculate the actual home energy rating, and also provide the basis for establishing procedures and protocols to be used to gather or generate input data.
- In some cases, the Authority will draw upon independent technical experts to advise on the development and updating of the modeling engine and procedures, and to ensure that there is appropriate oversight of, and expert consensus concerning, the validity of the process. This can include a review schedule and procedures for introducing software upgrades.

#### A Delivery System

- The Authority establishes both the technical basis for the rating system, and the procedures and standards that govern its use by third party **evaluators** involved in delivering the rating service to builders and consumers. The evaluator network may be developed and managed directly by the

Authority, or through regional agreements with **service organizations** responsible for recruiting, supporting (and sometimes training) evaluators in their region.

- The relationships between the Authority, evaluators and service organizations are governed by contracts or licensing agreements under the control of the Authority. These agreements give commercial rights to service organizations and evaluators, while requiring that these entities meet license conditions set out by the Authority. Such conditions include service quality standards, reporting obligations and business requirements such as liability insurance.

### **An Education, Training and Accreditation Process**

- The Authority establishes a **training and accreditation regime** for qualifying individuals to provide the home energy rating service – to collect and input data to the modeling engine, and to deliver evaluation reports and related advice to clients. Separate training and accreditation processes are often in place for individuals who will evaluate existing homes, and those involved in new house construction where analysis is conducted at the design stage. The Authority may have direct involvement in training and accreditation, or delegate this to a qualified third party through a contract or licensing agreement. In many jurisdictions, accreditation is linked to formal occupational recognition.
- A **registry** of accredited service providers and evaluators is established and kept current, allowing builders and home owners to identify firms that are authorized to provide energy rating services.

### **A Quality Assurance System**

- A **system of quality assurance** procedures is established by the Authority. This can focus on the performance of individual evaluators, as well as on the operations of service organizations. An overarching quality assurance regime can also be implemented to monitor the overall operations of the rating system, including the efficacy of the modeling engine and training systems. Some jurisdictions also provide for periodic independent, external review or auditing of the overall rating system operations to assess all aspects of its operation.<sup>5</sup>

### **An Administration System**

- The authority establishes **Standards of Practice** and a **Code of Ethics** for service providers and evaluators, in conjunction with the training and accreditation process. The Authority then implements a compliance audit mechanism to verify performance of licensees. A disciplinary and appeal process is a necessary component of this system.
- The Authority maintains an **administrative regime** to support the overall operations of the rating system. This includes licensing or other contractual mechanisms that govern the role and responsibilities of all entities involved in delivery of the rating system. As mentioned previously, a registry is established to track accredited service providers and evaluators, and also to maintain home

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<sup>5</sup> A recent example of this is a report by the UK Energy Research Centre, *Implementation of Energy Performance Certificates in the Domestic Sector* (May 2008), which assesses the operations of the U.K.'s Energy Performance Certificates initiative after its initial year of operations.

energy rating records. In some jurisdictions, these roles and responsibilities are established through statute.

- The Authority establishes a **rating appeal mechanism** that builders and homeowners can access, should they believe their home energy rating to be inaccurate, or to have been conducted improperly. The appeal mechanism may involve a designated independent third party to ensure impartiality.

### **Marketing and Communications**

- The Authority carries out, or otherwise directs, ongoing **marketing and communications** activities to inform builders and homeowners about the rating system, the value of the information it provides, and how to locate an accredited evaluator in order to get a rating done.

Questions and considerations concerning the structure and operations of a new ERS are presented, in the following section, based on this model.

## 4.0 Key Questions and Considerations

### 4.1 The Authority

As the Authority for the ERS, NRCan controls all aspects of the process through development of the required software, and the licensing of all ERS participants.

It is understood that the department will continue in this role as a new ERS is introduced. However, it is also anticipated that with a new ERS, NRCan intends to give greater importance to ensuring transparency and providing for independent oversight of all aspects of the system. This is evidenced by the pending creation of the ERS Advisory Committee to provide NRCan with input on the future direction of the ERS.

As a new system is developed and put into place, NRCan can be expected to determine how its role, as system Authority, may need to evolve so as to ensure appropriate checks, balances and oversight are in place.

In short, NRCan, as *proprietor* of the ERS, would appear to have a clear and overarching responsibility to ensure that all aspects of the system have integrity and long-term efficacy, and that clear quantifiable Standards of Practice and a Code of Ethics are in place, and being met, by all entities involved in providing the ERS service to new home builders and home owners.

Ensuring the integrity of the ERS would appear to involve two levels of administrative oversight:

- 1) Those entities involved in delivery of the ERS (evaluators, service organizations) must adhere to clear competency, Standards of Practice, Code of Ethics, quality assurance and record-keeping requirements, subject to audit. It is likely that NRCan would set out such operational requirements as a condition of license, and that it would conduct adequate auditing to ensure these requirements were being met.
- 2) The overall integrity of the ERS must be monitored over time to ensure that there are no significant systemic weaknesses in the overall ERS and its delivery system. Such weaknesses could well be independent of the prescribed requirements in place, and reflect technical issues, changes made to the rating software, training weaknesses, issues in the data gathering protocols, etc.

This two-fold responsibility raises a central question: can NRCan delegate this responsibility, or aspects of it, to other entities that are in the business of delivering the ERS service? Or must NRCan itself ensure that there is fully independent third-party oversight and quality assurance? Particularly in relation to the second level of oversight, how is an entity involved in the delivery of the ERS, as a business activity, expected to ensure the oversight process is adequately objective and transparent? How can the oversight process best be facilitated, and under what administrative arrangements?

## 4.2 The Rating Index and Home Owner Advisories

It is widely recognized that the current ERS rating scale makes it quite difficult for consumers to understand the comparative performance of old and new homes. While the ERS scale may be technically sound, it fails the critical test of being meaningful to consumers.

One oft-cited example of this problem is in relation to higher-performance homes (those above ERS 80). Given that the current ERS scale runs from zero to 100, most consumers assume it portrays percentage differences. On this basis, a home delivering ERS 82 is believed to be 2% more energy efficient than one delivering ERS 80. The actual difference in performance is closer to 10%.

It has also been noted widely that an index intended to portray energy efficiency should likely have homes that require no net purchased energy rated at zero, rather than at 100.

It can be expected that, in the development of the next generation of ERS, the priority in developing a new rating scale will be how best to portray energy performance in new, higher-performance homes, while also being meaningful for owners of older energy-inefficient homes.

The introduction of a new rating scale as part of the next generation ERS will create some issues in relation to homeowners who have existing ERS ratings for their homes. A new scale may not be directly “translatable” to the current one, leading to discontinuity between the two ERS rating systems. To a large extent, this matter would be resolved over time if, under the new ERS, ratings had a defined period of validity (see section 4.2.1 for discussion).

As well, it can be assumed that many, if not most, ERS ratings for existing homes were obtained by homeowners intending to apply for ecoENERGY Retrofit grants. Clearly, some administrative arrangements would be required to ensure that these homeowners could still utilize existing ERS ratings to support their grant applications, within the prescribed period of eligibility that is already incorporated in the ecoENERGY grant regime.

It is noted that other rating schemes, specifically HERS in the U.S., previously employed a rating scale similar to the current ERS scale, and abandoned it subsequently in favour of a more nuanced scale that is better able to communicate rating outcomes to consumers.

It is also noted that a generally accepted approach to presenting rating results to consumers appears to be emerging internationally.<sup>6</sup> Will this approach be considered and tested in relation to the next generation of ERS?

An emerging issue for builders of high-performance homes is the need to advise homeowners about the impact of lifestyle choices on their total energy costs. Plug loads and the use of equipment such as home spas can have a significant impact on energy use. Should the new ERS provide homeowners with information that illustrates the potential impact of their lifestyle choices on total household energy use?

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<sup>6</sup> Of note here are the strong similarities between the U.K.’s Energy Performance Certificates, those in use elsewhere in the E.U. and the proposed ASHRAE Building EQ rating label.

In its application to existing houses, the current ERS also “red flags” homes where there is potential for depressurization to cause indoor air contamination by spillage-susceptible fuel-burning appliances. This notation is included in the written evaluation report, and evaluators normally highlight this cautionary message to their clients. Is this procedure adequate to address potential liability on the part of evaluators and the Authority? Or are more rigorous procedures required?

Similar concerns could arise if, in the process of gathering data, evaluators became aware of other health-related hazards within the home such as the presence of asbestos or mold. Given that evaluators are providing a service that requires professional capabilities, what “duty of care” is implied, and how can this be addressed adequately? How can it be assured that evaluators will not provide opinions or advice to clients which lies outside their competency?

#### **4.2.1 Period of Validity**

Jurisdictions that have implemented mandatory energy rating requirements for houses have also, of necessity, set the period of validity of a home’s energy rating. Research supporting the establishment of such periods of validity has considered a wide range of pertinent factors.<sup>7</sup>

Key considerations include the consumer’s expectation that the energy performance rating of a home is current and can be trusted, that the technology and procedures available to generate a rating are likely to improve over time, and that occupants make changes to their homes that can render a rating inaccurate. Considerations that would suggest a shorter period of validity are often set against the cost involved in re-rating a home.

Should an ERS rating have a “lifespan” after which it would no longer be considered valid by NRCan? Should homeowners also be advised that modification to their home that could impact its energy efficiency automatically voids the ERS rating? For example, in jurisdictions like Ontario, where a next generation ERS may well be referenced in regulation under the Green Energy Act, how can these issues best be addressed?

### **4.3 Technical Infrastructure**

Clearly, for both existing and new home energy evaluation, the energy analysis software needs to accommodate the full range of construction and equipment types encountered in both existing and new housing. It is anticipated that the process of developing the next generation ERS will involve extensive consideration of software issues, so specific details related to the existing HOT2000 engine will not be addressed in this paper.

It is sufficient to note that the ERS will need to generate ratings for both existing and new homes that are highly accurate and consistent. A wide range of technical issues related to the current ERS software have been raised by others with expertise in this area, particularly related to the “stability” of ratings among similar or identical homes.

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<sup>7</sup> A particularly thorough example is *Energy Performance Certificates for Private Marketed Sales of Dwellings: Validity Periods of Certificates* consultation document, Department for Communities and Local Government, U.K., December 2007

This raises questions concerning the level of confidence builders and homeowners can have with ERS ratings. Is it appropriate for the new ERS to include some qualification related to the expected variability of rating results (e.g., “accurate to within +/- x points)?

In relation to a future ERS modeling engine, experience in Canada and in other jurisdictions does raise some broader issues concerning the objectivity or neutrality of the software. These issues, and the questions they involve, are as follows:

#### Software as a “social engineering” mechanism

The central challenge for analysis software designers is that their product should provide a consistent and objective method by which the energy performance of a home can be rated.

It is understood that some accommodation will likely be needed to address the volume effect on energy performance, as a home’s heat loss is partially a function of the ratio of its volume to exterior surface. If unaddressed, this has the effect of making it more difficult for smaller homes to achieve a given energy rating. Conversely, it can result in very large volume homes achieving a higher energy rating than smaller homes of similar construction.

The current HOT2000 program includes a single size adjustment factor to address this issue. Would it be more appropriate to consider a variable adjustment factor that would ensure a more accurate rating outcome?

In considering this issue, it will be necessary to produce reliable rating results that reflect the underlying physics involved, rather than impose, within the software, assumptions concerning what is the “correct” size of a home.

This point is relevant, as energy rating software used in other jurisdictions includes house size adjustment factors based on social perspectives about the appropriate size of a home, rather than on the physics of heat loss. Specifically, the proposed HERS California rating scheme applies very significant rating penalties on larger homes, on the apparent assumption that those who can afford such homes should be required to pay for much higher levels of energy performance. By incorporating such bias in the rating software, California is sacrificing the integrity of its rating scheme and entering the realm of social engineering.

How can it be assured that the ERS will not be subject to such social engineering?

#### The importance of fuel neutrality

Given that climate change is the dominant public policy driver behind government support for increased home energy efficiency, it is important to ensure that the rating software is not compromised by the politics of fuel preferences.

In this regard, it is noted that the Canadian Commission on Building and Fire Codes has adopted the principle of “fuel neutrality” in relation to proposed energy efficiency requirements under consideration for inclusion in the model National Building Code.

One important implication of fuel neutrality is related to a home's "carbon footprint". Other jurisdictions, notably the U.K. and Europe, have attempted to introduce rating systems that provide a value for both the energy efficiency and carbon footprint of a dwelling.

This would appear extremely difficult, given the very significant regional differences in carbon factors for electricity across Canada, and the fluctuations in these factors within provinces over time.

#### Air Leakage (blower door) Testing

In generating an ERS rating for either an existing or new home, the air leakage testing process represents a considerable portion of the time and cost involved. Yet this procedure may be considered crucial to the validity of the rating process, given the considerable impact of infiltrative heat loss in Canadian homes.

During the development of the Energy Performance Certificate (EPC) regime in the U.K., it was decided, after some consideration, not to require an air leakage test. In reviewing the rationale for this decision, it is clear that the U.K. government was concerned that requiring a blower-door test would increase the cost of energy rating beyond what consumers would consider acceptable, and would generally make the process more onerous. It is likely that this decision has significantly undermined the efficacy of the EPC regime. Subsequent research has reported air leakage rates in British homes commonly exceed 17ACH@50 Pa.

In relation to the ERS, what margin of error would be introduced in the energy rating of new and existing homes if an air leakage test were not including in the rating process?

## **4.4 The Delivery System**

### **4.4.1 Evaluators**

ERS evaluators carry out the actual rating of a home, either through design evaluation and as-built testing (in the case of a new home), or through physical inspection and testing (in the case of an existing home). In recent years, NRCan has licensed multiple evaluation firms in market areas, establishing the basis for competitive provision of ERS evaluation services.

In looking to the future of the ERS, a number of questions arise related to Standards of Practice required of evaluators:

- Given the significant differences in the data-generation procedures required to evaluate new and existing homes, does it make sense to create separate categories of evaluator for the two areas, and to establish corresponding and specific training and accreditation requirements for each?<sup>8</sup>

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<sup>8</sup> An example of this would be the training and accreditation system operated by the Awarding Body for the Built Environment (ABBE) that supports the British regime for Energy Performance Certificates. This system differentiates Domestic Energy Assessors who deal with existing buildings, and On Construction Energy Assessors, who deal with new-builds.

- Unlike an ERS evaluation of a new home based on construction drawings and specifications, an ERS evaluation of existing homes involves protocols for characterizing the building and generating reliable data. This process can be challenging. Past investigation by the media into the work of evaluators has produced troubling results.<sup>9</sup> Given this, what reasonable technical qualifications should be established for anyone applying to be trained as an ERS - existing home evaluator? Are current training and accreditation requirements adequate? Are there sufficient measures in place to support such a determination, and to detect the type of problems that have been experienced in the past?
- What should be the acceptable business relationship between evaluators and service organizations? What requirements would be needed to secure conformity with Standards of Practice and a Code of Ethics?
- Similarly, is it acceptable that business linkages exist between evaluators, new home builders and contractors who might be hired by home owners to carry-out energy efficiency retrofit measures? What requirements would be appropriate in this area to secure confidence in the evaluation process?
- In relation to new homes, should a new home building firm be able to train and certify its own employees to conduct evaluations of new homes built by the firm? Or should new home builders be required to engage a third-party to validate any analysis conducted “in house” and carry out the required testing. What Standards of Practice would be needed to secure confidence in the evaluation process?

In addition to these questions, there are issues related to business operations, insurance and liability relevant to all evaluators. These are addressed in other sections of this paper.

#### **4.4.2 Service Organizations**

In general, Service Organizations both recruit and train evaluators, and deliver ERS services. The evaluators they train may work as employees of the Service Organization, as independent contractors, or simply benefit from consumer/builder referrals provided by the Service Organization.

Since the establishment of the ERS, the role of Service Organizations has evolved. Initially, these entities were granted a virtual monopoly on operations of the ERS within their business area. NRCan has since moved to secure competition within the ERS delivery network. However, there remains some variation in terms of the role that Service Organizations fulfill across the country, and it is anticipated that additional refinement of the Service Organization role will be needed for the next generation of the ERS.

There is also variation among service organizations in terms of their business linkages with rating service end-users. NRCan will likely want to consider what business linkages are acceptable for Standards of Practice which would apply, consistently, across the country.

A central question in relation to Service Organizations has to do with their current role in the training of evaluators. In other jurisdictions, the training and accreditation of evaluators is carried out independently

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<sup>9</sup> *Home energy audits flawed*, Toronto Star, July 21, 2007

from the service delivery network so as to reinforce the integrity of the training and accreditation process.<sup>10</sup> Prospective evaluators enroll in an accredited training program and, upon successful completion of examination and receipt of accreditation, can then seek employment as evaluators.

Should Service Organizations retain their training role in a new ERS? Or should training and accreditation be delivered independently by a recognized training institution or organization that has no other involvement in ERS delivery?

If the latter model is adopted for the ERS, would Service Organizations have any remaining functions other than to operate as ERS delivery entities – companies that provided ERS services directly to consumers and builders? In either case, where would responsibility for maintaining a registry of current accredited evaluators reside, and how would this be managed?

Another concern that the CHBA has expressed in relation to the current ERS delivery network is the provision of adequate liability and business insurance. Firms involved in delivering ERS services incur potential liability in a number of ways. As is the case for any business operation that delivers services on a customer's property, the requirement for liability coverage for accidents and injuries caused by the evaluator is clear. Beyond this lies the issue of *professional liability* for errors and omissions related to the rating process itself.

As evidenced by a recent court case in British Columbia involving pre-sale home inspection services, an inspection error or omission that results in a material loss for a homeowner or homebuyer can trigger considerable financial liability for the firm conducting the inspection. Given Ontario's pending statutory requirement for provision of pre-sale energy ratings of all homes sold, the court's direction is instructive.

What insurance coverage for business and professional liability should Service Organizations and independent ERS evaluators be required to carry? Is such insurance coverage currently available?

#### **4.5 Education, Training and Accreditation Regime**

As noted previously, a central question facing the development of a new ERS has to do with the training and accreditation process through which home energy evaluators become qualified. Should these processes be independent and separate from the entities involved in the actual delivery of the ERS?

A second key question has to do with the skill requirements for evaluating existing homes, versus those required to evaluate a new home at the design stage. Are these skill requirements sufficiently different so as to require separate training and accreditation procedures?

As noted, at present ERS Service Organizations are responsible for recruiting and training energy advisors to standards set by NRCan. This creates the situation where prospective evaluators are trained and

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<sup>10</sup> One example being the British system that supports delivery of Energy Performance Certificates (EPC) for homes. In this scheme, the training and accreditation of Domestic Energy Assessors (evaluators) is governed by an independent government agency and delivered by training institutions (awarding bodies) that meet required standards. A similar system is in place in Australia.

“accredited” by their prospective employers. Home energy rating schemes in other jurisdictions take a different approach:

- In the mandatory U.K. Energy Performance Certificates system, the training and accreditation of Domestic Energy Assessors (evaluators) is governed by nationally recognized requirements set down by the Office of Qualifications and Examinations Regulator (Ofqual). Under this system, organizations must apply to be “Awarding Bodies” for specific qualifications.

The route to becoming an Awarding Body is prescribed as follows:

*“To become a recognized awarding body and submit qualifications within the National Qualifications Framework (NQF), a two-stage process must be completed:*

- *the recognition process*
- *the application for accreditation of qualifications.*

*The recognition process is outlined in The Statutory Regulation of External Qualifications in England, Wales and Northern Ireland (2004). The recognition process is very precise because operating as an awarding body is a specialist function, requiring a high level of governance, experience, expertise, financial stability and quality assurance.”<sup>11</sup>*

As a result of these requirements and procedures, those involved in delivering home energy assessments in the U.K. have a formal and independent occupational training process through which they are accredited.

- In Australia, the Australian Capital Territory (Canberra and region), which also has a mandatory energy rating requirement for houses, has introduced licensing requirements for Building Energy Efficiency Assessors. Licensing is tied to prerequisite qualifications prescribed under the *Australian Qualifications Framework and the Construction Occupations (Licensing) Act (COLA)*. This system ensures that the training and licensing of Assessors takes place independently from the delivery of the assessment service. The requisite courses and qualification must be obtained from a registered training organization.
- In the U.S. RESNET process, Home Energy Raters must be trained and certified by an accredited Training Provider based on an approved curricula and certification of all instructors. RESNET is the national standards making body for building energy efficiency rating systems in the U.S. Under RESNET requirements, Home Energy Raters are required to re-qualify every three years by passing the Energy Raters Test.

Clearly, the development of a new ERS in Canada can be expected to involve careful consideration of how best to address evaluator training and accreditation. For instance, should all those involved in delivery of evaluations receive some basic training related to House-as-a-System building science?

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<sup>11</sup> Office of Qualifications and Examinations Regulator, U.K.

It is noted that, in the U.K., energy assessment is a Vocationally Related Qualification (VRQ), directly related to a National Occupational Standard. Should a similar, formal definition be developed under Canada's Occupational Classification System for ERS evaluators?<sup>12</sup>

The second question, raised previously, pertains to the somewhat differing skills required to evaluate an existing home, versus those needed to carry out evaluation on a new home based on its design.

It is instructive to note that the British Energy Performance Certificate system has chosen to accredit these as separate occupations.<sup>13</sup> Accreditation for *Domestic Energy Assessors*, who provide rating services for existing dwellings, represents the entry-level accreditation. One accredited training institution in Britain, BRE, offers this training for a fee of approximately \$3,500. The training involves both self-directed home study and classroom sessions, and requires examination on completion.

Domestic Energy Assessors can then opt to take additional training and obtain a Diploma in *On Construction New Build Dwelling Energy Assessment*, allowing them to provide rating services at the design stage in new residential construction. BRE indicates that this course will require between two and six months to complete, depending on previous experience. The additional cost is approximately \$3,750.

In Australia, a somewhat different training emphasis has been adopted.<sup>14</sup> Those involved in rating the thermal performance of new residential buildings at the design stage are required to take basic training, primarily related to the correct use of approved modeling software programs. There are additional qualifications in place for the licensing of those carrying out the Sale of Property Assessment required for existing homes at resale. However, in both instances, licensing of assessors requires previous qualification in a building, construction or design-related profession.

The approaches taken in the U.K. and Australia raise relevant questions concerning the level of technical expertise required by energy evaluators, and whether ERS service providers should be separately accredited and licensed for existing and new homes, given the differing skill requirements in the two areas. There are some specific characteristics of the ERS that reinforce the importance of this consideration.

For those involved in providing evaluations of existing homes, knowledge of the construction techniques common to various vintages and types of house would seem essential. As well, these evaluators are often involved in assisting the homeowner in interpreting their energy rating report and understanding the various upgrade measures identified by the rating software. This can include situations where the rating procedure has indicated a potential health concern related to depressurization of the home where spillage-susceptible fuel-burning appliances are in use. Has there been an assessment of the knowledge requirements to appropriately support such activities by existing home evaluators?

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<sup>12</sup> Creating a formal occupation for energy evaluators would seem to be consistent with the expressed expectations of governments that moving towards a more energy efficient future will generate a significant number of new "green jobs".

<sup>13</sup> The Awarding Body for the Built Environment (ABBE) is a specialist awarding body that provides nationally recognized qualifications for the Built Environment industry. It offers two relevant diplomas, one in "Domestic Energy Assessment" for existing homes, and a second in "On Construction Energy Assessment" pertaining to new-built homes.

<sup>14</sup> *Discussion Paper: Proposal to Amend Energy Rating Provisions Under the ACT House Energy Rating Scheme and to Introduce Licensing for Building Energy Efficiency Assessors*, ACT Planning and Land Authority, April 2009.

In terms of skill and knowledge requirements for evaluating new homes at the design stage, is knowledge of applicable provincial and territorial building codes essential, as these evaluators are likely to provide builders with advice on trade-offs and performance options?

## 4.6 A System of Quality Assurance

It is widely recognized that quality assurance must be a core component of a home energy rating system, if it is to achieve and sustain integrity and credibility.

It is clear that, in the development of the next generation of ERS, quality assurance must be a central preoccupation. In jurisdictions such as Ontario, where home energy rating is likely to be a statutory requirement, the integrity of the rating scheme also has significant liability implications for all involved.

There are two general aspects of quality assurance that will require attention in the development of the next generation of the ERS:

- 1) The operational quality assurance procedures related to Standards of Practice required of service providers licensed to deliver ERS services to homeowners and new home builders.
- 2) Systemic quality assurance mechanisms in place to test the overall efficacy of the ERS and which would provide oversight in key areas where variability of service quality or technical weaknesses is a potential concern.

In relation to the first point, the current ERS establishes quality assurance requirements for service providers. Are these procedures adequate? Are they sufficiently objective and transparent? How can the efficacy of these procedures be tested, and by whom, appropriately? What level of auditing is required to ensure acceptable compliance with Standards of Practice? Should such audits be performed by NRCan or by an independent agent?

In relation to the second point, the issues involved appear to be somewhat broader, but no less important. As the investigative report carried out in 2007 by the Toronto Star showed,<sup>15</sup> there can be significant variability in the evaluation results produced by different evaluators, for a given home. Such variability would not necessarily become evident through operational quality assurance mechanisms put in place within individual service provider firms.

In the current ERS, it appears possible that different evaluators, following standard procedures, can generate different results for the same home. What are less obvious are the factors that can lead to such anomalies. Does this reflect a lack of skill, best addressed through upgraded training and accreditation requirements? Or does it reflect limitations in the modeling software? Or is it linked to specific difficulties in generating accurate input data for specific types of homes? And what level of variability is considered acceptable in evaluation outcomes – how accurate do the ratings have to be to protect the integrity of the ERS?

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<sup>15</sup> Ibid.

These are the sorts of questions and considerations that suggest that some level of systemic quality assurance procedures are needed to monitor the overall functioning of the ERS, and determine if evaluation outcomes are sufficiently consistent and accurate. Such data would prove valuable in guiding continuous improvement in the development and refinement of the ERS, as it would provide a useful diagnostic function.

Does NRCan foresee the implementation of quality assurance protocols that will function at the system level? If so, how should such oversight be carried out? Is it acceptable for NRCan as the ERS proprietor to manage this function? Or should it be carried out by an independent agent?

## **4.7 An Administrative System**

A robust and comprehensive administration system is essential in order for the Authority to exercise proper control over all aspects of an energy rating system.<sup>16</sup> Many of these administrative functions are already in place within NRCan, however these may lack the requisite level of formality going forward. As well, there will be a requirement for new administrative mechanisms to reflect NRCan's intention to incorporate independent external advisors into the management regime.

### **4.7.1 A Disciplined and Transparent Advisory Process**

NRCan has indicated it intends to create a system of external advisory committees to guide the development of the next generation of the ERS. NRCan is modeling this advisory process on that utilized in the development of Standards, as laid out by the Standards Council of Canada.

This commitment to a disciplined, transparent and independent advisory function in relation to the redevelopment of the ERS has been welcomed by the CHBA.

Will this committee, or a similar external advisory/oversight capacity, be maintained to monitor the operations of the next generation of the ERS once it is in place?

### **4.7.2 Setting Standards and Ensuring Compliance**

Internationally, most energy ratings systems include the formal establishment of administrative procedures to govern all critical aspects of the rating process, from the training of evaluators, to auditing and compliance processes, to ensuring accuracy of records. This raises a number of considerations.

These functions can be generally characterized as follows:

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<sup>16</sup> For instance, in establishing the European Union requirement for energy rating of buildings, the European Parliament stipulated that national systems should utilize “a common approach to this process, carried out by qualified and/or accredited experts, whose independence is to be guaranteed on the basis of objective criteria”. (Directive 2002/91/EC)

### Procedures governing the accreditation of evaluators and service providers

- As indicated in the discussion of education, training and accreditation, the occupation of energy evaluator is defined formally, and a suitable training and accreditation regime is stipulated.<sup>17</sup>
- This process involves the licensing of expert, independent third-parties to oversee and manage development of the training and accreditation process, as is the case in the U.K.
- Either directly, or through a qualified and independent third-party, the Authority has a method by which it audits and confirms courses, training regimes and examinations.
- A registrar function records and tracks accredited practitioners, and ensures listings are kept current. Builders and homeowners have access to these listings.
- There is a hearing or adjudication process related to training and accreditation, in the event that candidates challenge outcomes.<sup>18</sup>

### Procedures governing the provision of rating services

- The Authority sets out formal Standards of Practice and a Code of Ethics that establish operational norms for evaluators and service providers.<sup>19</sup>
- In order to ensure adequate accountability, the Authority establishes a formal mechanism for resolving complaints concerning a given rating, or the professional conduct of an energy evaluator or service organization. Such complaints are adjudicated by the Authority, or by a credible and independent third-party.
- In the event that an evaluator or service provider is found to be in contravention of service norms, disciplinary measures including sanctions or requirements for additional training are available. Appropriate adjudication procedures include provisions for appeal.
- In some jurisdictions, the formation of a professional association representing energy raters has taken place, in order to reinforce the adoption of occupational standards, and to facilitate insurance solutions. The Authority should take a position on such a development.

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<sup>17</sup> Particularly useful examples are the two Qualification Handbooks published by ABBE (U.K.) entitled, *Level 3 Diploma In on Construction Energy Assessment*, and *Level 3 Diploma in Domestic Energy Assessment*

<sup>18</sup> ABBE stipulates such appeal mechanisms, and identifies a number of dispute resolution and adjudication options.

<sup>19</sup> For instance, RESNET has adopted both a Code of Ethics and Standards of Practice that incorporate complaint mechanisms and allow for adjudication by RESNET if prescribed dispute resolution procedures are unsuccessful.

### **4.7.3 Ensuring Adequate Service Capacity**

This area raises the following considerations.

In order for the ERS to be utilized properly by new home builders and existing homebuyers and sellers, it must be readily available on a timely basis. In the past, ERS service availability has been problematic in some regions.

With the recent expansions of the ERS service delivery network by NRCan, this has become less of an issue. However, it is not known how adequately the ERS delivery network is coping with the current high level of demand for ERS services stimulated by the Federal Government's ecoENERGY grants and Home Renovation Tax Credit.

The next generation of the ERS may require increased evaluator training and more rigorous accreditation procedures. In this event, some administrative planning will be required to ensure a smooth transition without adversely impacting service availability.

Similarly, should a jurisdiction like Ontario specify the ERS under its mandatory energy rating legislation, considerable planning will be required to ensure that neither the resale or new home markets are disrupted or distorted.