

**CHBA Briefing Note on the
Model National Energy Code for Houses
(July 22, 2003)**

1. Current Status of the Model National Energy Code for Houses

Objective of this Paper

The CHBA has prepared this paper to present information about the Model National Energy Code for Houses (MNECH) and what it could mean to the new home building industry. The information is provided to assist our provincial colleagues with their representations to provincial code authorities.

The CHBA is opposed to the codification of the Model National Energy Code for Houses. We believe there is no public policy merit in these propositions. The MNECH is not necessary: in fact, it would be counterproductive as a mandatory code. The residential building industry has been very successful at improving the energy efficiency of new homes. The CHBA wants to reinforce the voluntary, market-driven approaches that have helped the industry to achieve this success.

Background Information on the MNECH

The Model National Energy Codes for Houses was developed under the auspices of the National Research Council of Canada (NRC) in response to renewed interest in the early 1990s in energy conservation and in regulating building energy efficiency. The MNECH, published in 1997, is intended to provide a minimum energy performance standard for new home construction.

The MNECH does not represent a logical extension of the National Building Code. Instead, it is a significant departure from the existing elements of the NBC. The NBC represents half a century of the evolution of building science and specifies construction requirements based on standardized engineering practices. The MNECH is not consistent with this approach. Its assumptions and forecasts about different price variables and economic factors represent a departure from the historical NBC development process.

The MNECH specifies the use of building assemblies using tables based on calculations that incorporate four main types of variables: 1) energy use; 2) energy sources and costs; 3) construction costs; and, 4) economic factors. A complex set of formulas developed by the NRC for the model specify the building component assemblies with the optimal combination of initial capital cost, energy performance, and energy saving investment pay-back over a 30 year period. For the purposes of the MNECH, houses were defined as residential buildings of three stories or less with an area of not more than 600 square metres.

The MNECH specifies three paths to achieve compliance: 1) Prescriptive tables specify the characteristics of different assemblies required to meet thermal objectives; 2) Trade-offs can be made to reduce thermal resistance in one portion of the envelope provided that thermal resistance in other areas is increased; and, 3) Performance path – A building can be designed with any thermal characteristics desired provided that its energy consumption will not be greater than if it had been built in strict conformity with the prescriptive requirements. Proof of compliance requires an energy analysis for both the target performance and the actual design for which a permit is requested.

The Model National Energy Code for Houses has not been updated since it was developed in 1997. The Canadian Commission on Building and Fire Codes has not incorporated it into the National Building Code and has expressed no intention of doing so. No provinces or territories have adopted the MNECH, nor have they indicated they wish to do so.

Federal Policy about the MNECH

In October 2002, federal, provincial and territorial Ministers of Environment and Energy approved Canada's National Implementation Strategy on Climate Change. The first outcome of this strategy is *Canada's National Climate Change Business Plan 2002*¹. For housing, the Business Plan identifies the R-2000 standard (“a voluntary standard for the design, construction and certification of highly energy efficient, environmentally friendly and healthy houses”) as a Canada-wide initiative that is one of the “actions approved and underway.”

Under “actions under consideration” with the objective “to improve energy efficiency for existing and new building stock”, the Business Plan identifies the Model National Energy Code – “To review and adopt new energy codes and energy efficient building standards ... In partnership with provincial and municipal governments.”

The Government of Canada has also produced a report entitled *Climate Change Plan for Canada*² that targets all new housing to be built to the R-2000 standard by 2010. This would be achieved through “actions to promote wider penetration of energy efficient construction practices and products in the building community and their adoption in the market.” This report states: “The goal would be to enable provinces to incorporate the R-2000 standard or equivalent level into building codes by 2010.” This plan also proposes that all new commercial and institutional buildings be 25 percent more energy efficient than the Model National Energy Code for Buildings by 2010. No specific reference is made to the Model National Energy Code for Houses in this plan.

¹ www.nccp.ca/NCCP/pdf/Bus_Plan2002_W_Cover.pdf

² www.climatechange.gc.ca/plan_for_canada/plan

2. There are Problems with the MNECH

Although the Model National Energy Code for Houses was published in 1997, there are important issues outstanding about the way the analytical model for the MNECH works and about its value to the industry, to consumers, and to Canada.

The validity of the model depends on the accuracy of long-term price forecasts.

There are serious questions about the validity of using 30-year assumptions about the costs of energy and construction materials, and about underlying economic indicators. Forecasting optimum requirements is a very questionable part of the model. Predicting accurately when so many variables influence the outcomes is unrealistic.

The impacts of updating the model with current values for energy and material costs are unknown.

Energy and building material costs have changed since the model was developed but the effects of these changes on the outputs of the model are unknown.

It is doubtful the model is flexible enough to be responsive to future price changes.

There are serious questions about the practicality of making timely updates to the model to keep up with changes in material and energy prices for over 30 different regions (climate zones) in Canada. Given the potential volatility of commodity prices, it is not reasonable to assume that a complex regulatory instrument will produce better outcomes than market-based decision making by new home builders and consumers. The model includes “trade-off” and “performance” options, which are supposed to offer ways to overcome distortions from the model, but the new home builder (and consumer) would bear the burden of effort and cost to comply, assuming compliance is achievable from a practical standpoint.

There are risks associated with adopting the MNECH without a resolution of the ventilation issue.

Without a specification for appropriate ventilation requirements, the MNECH could increase the risks of indoor air quality problems in new houses built to its standards. The current version of the MNECH is silent on the ventilation issue and on the potential health risks associated with indoor air quality problems. Adoption of the MNECH without a complementary resolution to the ventilation issue would invite unnecessary risks for occupants. There is no reason to have confidence that the ventilation issue will be resolved in the near term.

3. Why the MNECH is the Wrong Away to Go

There are also several broader issues about the Model National Energy Code for Houses.

We do not need a Model National Energy Code for Houses.

Given industry successes at energy efficiency improvements, there is little or no evidence that a new energy code will have an overall benefit. Why should anyone be confident that the MNECH (and its computer simulation software) would be more effective than the voluntary approaches that have been so effective in the housing sector? Furthermore, since most new houses are built in jurisdictions with existing energy efficiency requirements, there would be little advantage to provincial authorities of adopting the MNECH as a regulatory code. If the industry continues to perform well in this area, and if responsible authorities are satisfied with the increasing level of energy performance of new homes, a new regulation will have no benefits.

A new energy code could lead to poor decisions and market distortions.

Possible flaws in the model, particularly any lags in responding to material and energy price changes and the production of new RSI tables by federal or provincial code authorities, have the potential to cause industry and consumers to make poor choices to meet an out-of-date code. It will not be practical to keep the model up-to-date with so many input variables for 30 different regions.

Arbitrary energy targets are not the only alternative to the MNECH.

An argument has been made that a cost-effectiveness model is likely to result in more appropriate code provisions than alternatives that could be based on arbitrary energy targets and decisions. This argument assumes that any alternative to the MNECH has to be another type of regulation rather than market-based decisions, made by knowledgeable builders and informed consumers, that have proven to be so successful.

The impacts of implementing the MNECH are unknown.

Implementation of the MNECH could have significant costs and other impacts for both industry and code authorities. There is no analysis of the potential impacts of the MNECH, both human resources requirements and costs, either on industry or on provincial and municipal governments that would be responsible for implementing the new regulation.

There is a relationship between new regulations and housing affordability.

Added home building costs associated with new regulations will affect housing affordability. However, the housing cost and affordability trade-offs associated with the MNECH have been ignored by proponents. Decisions about the appropriate trade-offs will require consideration of different, and sometimes competing, public policy objectives. In this regard, it is notable that the federal government's current "affordable housing" initiatives do not make reference or take into account any elements of new energy efficiency regulations.

We do not know the impacts of the MNECH on overall residential energy use, even if it were to work as intended.

The benefits and impacts of the MNECH have not been estimated and quantified to justify it as a new regulation. For example, what proportions of builders and of the newly built housing stock would it effect? What would be the estimated total energy use reduction? There is no analysis whether the benefits would justify the effort and cost.

Implementation of the MNECH may have unintended impacts.

There is risk that the MNECH could discourage builders who currently exceed the MNECH. They would have to compete with builders who would advertise houses that meet a new federally approved energy efficiency standard, by lowering their own performance standards. There is a risk that the overall effect on energy use, or the effect in some provinces, could be negative.

What We Should be Doing to Improve Residential Energy Efficiency

CHBA Support for Energy Efficiency³

CHBA has a long-standing commitment in support of increased energy efficiency of housing and reduced emissions of greenhouse gases. The new home building industry recognizes the importance of attainable Canadian targets for reducing greenhouse gases and that increased energy efficiency in the housing sector can help to meet such targets. For many years, the CHBA has actively promoted voluntary environmental action by industry members. Over the last three decades, the housing sector has achieved more significant energy efficiency improvements than any other sector of the economy. To a large extent, this result has been achieved through voluntary, market-driven initiatives such as the R-2000 Program, along with the associated diffusion of technology and building practices, rather than through regulation.

The industry believes that government must base its environmental and energy policies on a clear and accurate understanding of past energy efficiency gains in the housing sector and how these gains came about. It is imperative that governments recognize the successes and beneficial impacts of the housing sector's voluntary, market-driven initiatives before contemplating new measures.

Further incremental gains in the energy efficiency of new homes will take place as a result of market forces already at play. Codifying the R-2000 Standard would result in insignificant additional energy savings beyond those that will already be made. Codification also would jeopardize a voluntary, market-driven process that has proven to be highly effective. The imposition of new regulations would effectively eliminate the commercial motivation to market the benefits of energy efficiency, while adding to industry costs for compliance and government costs for enforcement.

³ For more details see *CHBA's Position on Residential Energy Efficiency and Climate Change*.

Importance of focusing on existing housing

Codification of the Model National Energy Code for Houses, or even the more stringent R-2000 Standard, would have at best only a marginal impact on the overall energy efficiency of Canada's housing stock. Focusing on newly built homes may take decades to achieve a net reduction of energy used in the housing sector and the impact would be small.

Currently, Canada adds 150,000 to 200,000 new homes to its housing stock each year, while the existing base stock numbers about 10 million homes, most of which were constructed prior to the development of R-2000 technology and building practices.

Measures to increase energy efficiency in the residential sector must focus on the existing housing stock. Consumers living in existing homes constructed prior to 1982 use the bulk of the energy required by the residential housing sector. To improve energy efficiency, the greatest gains by far will be made by improving the existing, pre R-2000 housing stock. Home renovators are already applying many of the energy efficiency techniques developed many of the R-2000 Program to existing homes. Much can be done to achieve significant energy gains in existing homes if the lessons learned through the R-2000 Program are applied. Support for professional renovators, technical research and training, the use of EnerGuide for Houses, and increased consumer education concerning quality-of-life advantages of energy efficient renovations will significantly accelerate energy efficient improvements on existing homes.