



MAY/JUNE 2015

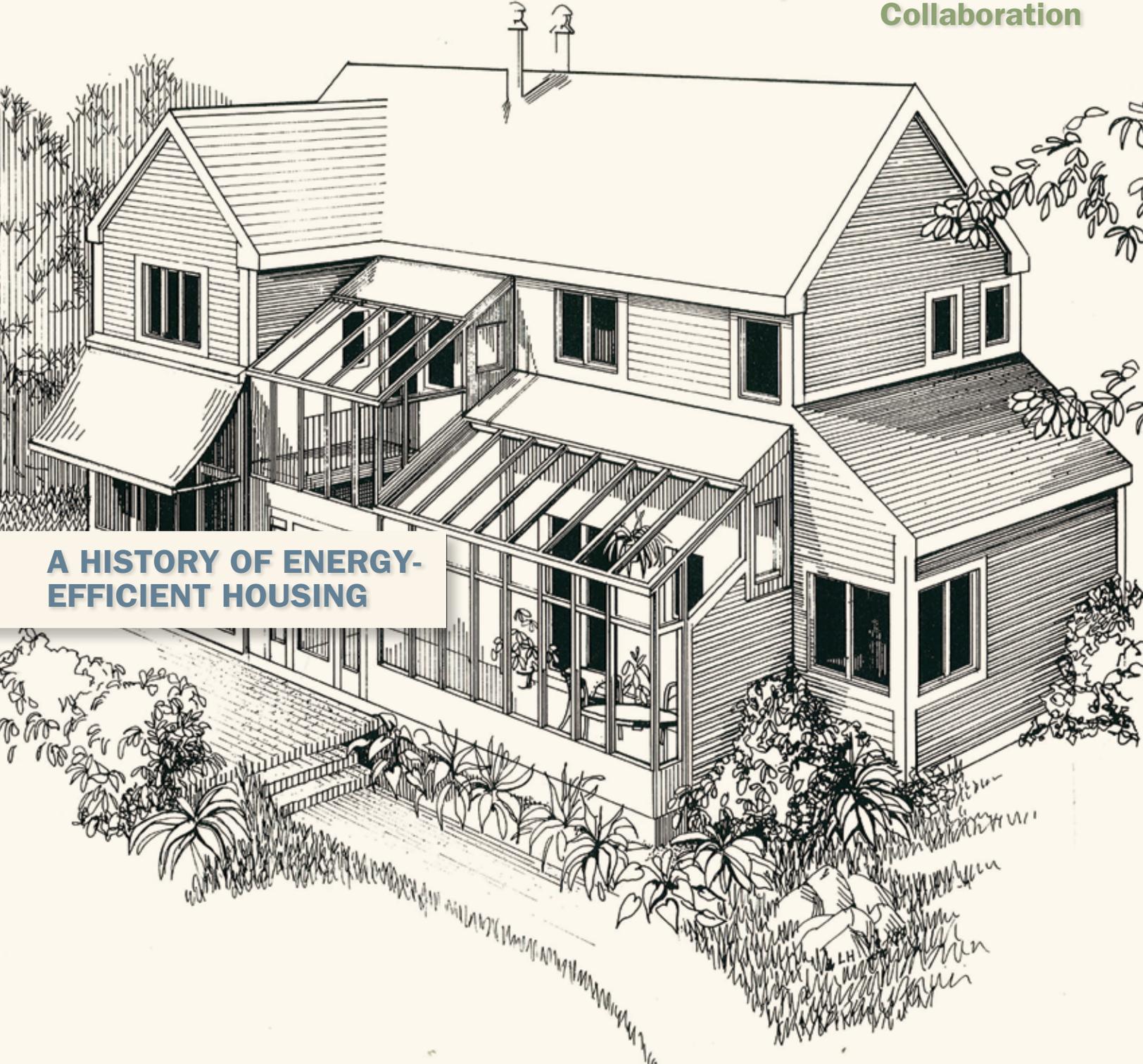
# Home energy

\$15

**Infiltration of  
Outdoor Pollutants**

**Favorite Multifamily  
Retrofits—Part 1**

**Expanded International  
Collaboration**



**A HISTORY OF ENERGY-  
EFFICIENT HOUSING**



STEFANO PALLERIA

## A Proposal for **Expanded** INTERNATIONAL COLLABORATION

**We can all benefit from the sharing of knowledge across the construction industries and among countries**

by Chris Dorsi

Photos courtesy of  
U.S. Department of Energy Solar Decathlon

**W**e live in the most extraordinary of times, with unprecedented access to ideas, people, and stuff. This new flood of resources, as I see it, springs from a convergence of several factors: new communication tools, a more open sharing of information by governments, widespread wealth, and a mixing of social strata, among other influences. And though we could discuss this evolution on several levels, this article addresses the sharing of information on the business and technology of high-performance construction as it's being developed on both sides of the Atlantic.

The 2014 International Energy Efficiency Scorecard, produced by the American Council for an Energy-Efficient Economy (ACEEE), rates the overall efficiency practices of 16 of the world's largest economies in each of four categories: National Efforts,

Industry, Transportation, and Buildings. (See Figure 1, p. 26.) When it comes to buildings, North Americans could learn a few things from their international counterparts: out of a possible total score of 25 for buildings, the U.S. receives a score of only 13, with Canada scarcely higher at 15. It's a disappointing showing for two countries that have often been known for innovation in building science and practical application.

The good news is that the achievements needed to meet the benchmarks set by ACEEE are completely achievable. In ACEEE's words, "The conditions required for a perfect score are currently achievable and in practice somewhere on the globe. For every metric, at least one country (and often several) received full points."

## Why This Matters

I think that everyone involved with the various sectors of the construction industry would benefit from better communication among the parallel channels of commerce, technology, and science. With modern communications, there is no point in re-inventing the wheel, and during those few points in history when we *do* need to invent something, the process goes a lot faster if we have the help of knowledgeable collaborators everywhere.

We can all benefit from the sharing of knowledge across the construction industries and among countries. Like children sent away on a foreign exchange program, our ideas are often much richer when they return home. What do we gain from this type of exchange?

- \* We save money, in both industry and government, by avoiding duplicate research and development.
- \* We gain access to a bigger pool of human resources by working alongside professionals everywhere.
- \* We meet targets for energy efficiency, emission reductions, or other metrics more quickly when we share and implement the very best practices as they are developed in all markets.
- \* We solve immediate problems within our own organizations by expanding our knowledge base to include others who are addressing the same problems.



*Facing page*, Solar Decathlon 2013 visitors tour the deck outside the Czech Republic house at the Solar Decathlon on October 5, 2013. *Center*, Team Ontario celebrates after learning of its first-place finish in the Solar Decathlon 2013 Engineering Contest. *Right*, Jacob Morgan gives a tour of the house built by Team Ontario.

International cooperation is not a new concept. But the difference, at this point in history, is that we now have the means and motivation to build powerful new collaborations among individuals and small organizations, giving us the potential to bypass the big, slow-moving entities that have usually been our international emissaries. There are plenty of times when this has happened recently, and several areas where it's about to happen in the housing industry.

## Historical Examples

History tells us that we often develop technologies in North America and Europe on parallel but separate paths. In most cases, someone eventually looks at the work performed by their international colleagues and decides that it's worth sharing, borrowing, or stealing. We have plenty of examples of this cross-pollination among separate-but-related technical camps.



\* **Electrical engineering.** The early development of the electrical grid involved a melting pot of scientists and experimenters from around the world. One of the most influential of these may have been Nicola Tesla (1856–1943), the Serbian electrical engineer who in the course of his storied career shopped his skills around Europe and then North America in search of collaborators and funders. He first gained the support of Thomas Edison and his ill-fated DC distribution scheme. He ultimately teamed with George Westinghouse, and when the alternating-current system was established in North America, it was indelibly imprinted by Tesla's work.

\* **Rocket science.** When aerospace engineers in the United States began to create a space program after the Second World War, they knew they had a knowledge gap. It was a poorly kept secret that German engineers had gone further in their research on rocketry than those in any other country's program. So the U.S. government set about identifying these best rocket scientists, bringing them to the United States, and embedding them in research institutions. Though these programs were shaded by the politics of the Cold War, these brilliant scientists nonethe-

## 2014 ACEEE International Energy Efficiency Scorecard for Buildings

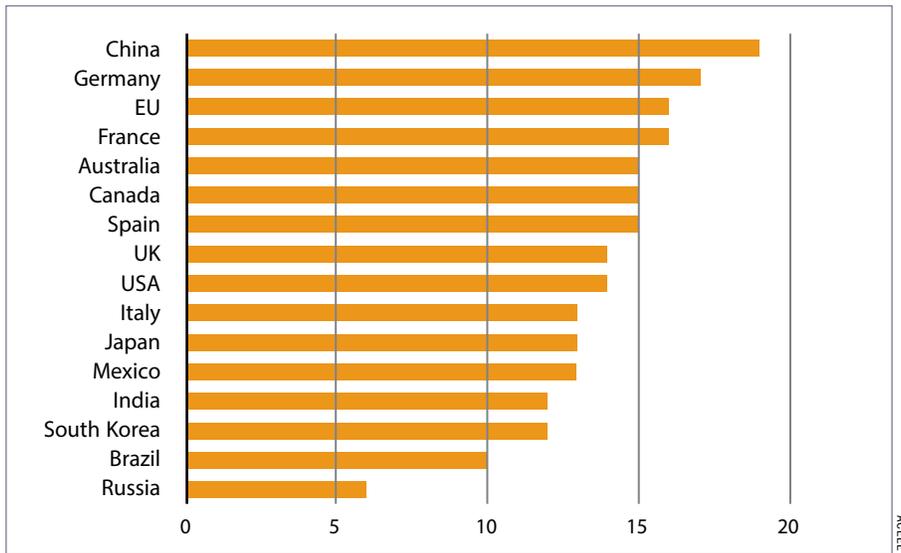


Figure 1. Total score is compiled from an assessment of energy intensity, building codes, building labeling, appliance standards, appliance labeling, and building retrofit policies.

less performed the core research and development that made it possible for humans to visit the moon only 20 years later.

\* **Passive House.** The simple idea of improving upon the minimum building codes by installing high levels of insulation, addressing thermal bridging, managing ventilation, and installing micro-HVAC systems, was first put into practice by visionaries in the Canadian R2000 program during the 1970s. German experimenters subsequently picked up the nascent North American concept, perfected it as if their lives depended upon it, and promulgated the standard under the banner of Passivhaus. When the improved package was brought back to North America decades later, the housing industry on both continents had gained from the collaboration.

### Current Hotspots

The current housing industry is ripe for such international collaboration. I think that individuals and organizations that learn how to identify and leverage specific market blind spots will gain advantages over their stay-at-home competitors. Though it may seem daunting to embark upon the industry-shifting initiatives outlined here, there are immediate and simple opportunities embedded within each one that any of us can implement right away.

\* **Exchange of knowledge.** It's been almost a generation now since we started assembling web-based knowledge management systems in government, schools, and industry. Yet, much to the detriment of the housing industry, many well-meaning organizations still tend to shelter a lot of their knowledge within their proprietary silos. In some cases, these creators of knowledge have attempted to share their resources with others, but often the average user cannot wade through the flood of randomly dispersed information to find the knowledge he

or she needs. Though there may have been a day when privatization of knowledge had its benefits, or when simply posting it to the Internet meant that knowledge had been effectively shared, that time is clearly past. What we now need is organizations that can identify, organize, and share knowledge in ways that are transparent and widely accessible to users at all skill levels. We have already seen the huge benefits that accrue to organizations in other sectors when information is aggregated and shared across borders and throughout organizations. But no one has come close to doing so in the housing industry.

**THE CHALLENGE.** *I think there is a huge opportunity waiting for organizations that learn how to supercharge the management of technical knowledge, translate it to the most common languages, and share it with researchers, managers, and on-the-ground practitioners everywhere.*

\* **Portability of credentials.** The professionals who work in the housing industry will always need ongoing training to stay abreast of evolving methods, materials, tools, and standards. Their employers and collaborators will always look to credentialing organizations to qualify members of the workforce. Yet the market today is littered with an excess of conflicting and overlapping credentials, creating doubt for everyone about the value and practicality of credentialing. This also makes it difficult for individuals and organizations to work across borders. The high-performance construction industry needs a standardized set of professional credentials that are general in scope and universal in application, so that every government, company, and individual can understand, support, and apply them.

**THE CHALLENGE.** *The housing industry will be one step closer to maturity when an organization, or a consortium of organizations, promulgates a set of professional credentials that are aligned with accepted best practices and are recognized in both Europe and North America.*

\* **Standardization of best practices.** The design, construction, and maintenance of buildings is subject to the same rules of science and physics everywhere. Yet our attempts to describe those practices—our codes, standards, and regulations—are complicated, contradictory, and sometimes just plain wrong. It will never be a simple thing to harmonize building practices,



Visitors line up to tour the Team Austria house, built by students from Vienna University of Technology, after it came in first place overall at the U.S. Department of Energy Solar Decathlon.

STEFANO PALERA

since we'll always need to account for regional variations in climate, soils, materials, fuels, and traditions. But the current hodgepodge of best practices creates barriers to innovation and improvement that have sometimes crippled the advancement of high-performance construction. The housing industry is ready for a comprehensive set of prescriptive standards that are coupled with realistic protocols for performance testing. We already

have several examples of at-least-partial best practices in existence in North America and Europe. They give us a good place to start, though they'll need to be expanded, aligned, and ultimately, harmonized with the building codes.

**THE CHALLENGE.** *We now have the means to assemble a nimble and realistic collaboration—with individuals from every region—that gathers all of our best practices into a comprehensive and accessible system. It'll happen when the most forward-looking individuals and organizations see what's possible, gather the best minds from everywhere to do the work, and build a smart collaborative platform to capture the best knowledge.*

## How to Build Your Own Professional Bridges

Each of these challenges will require the involvement of committed individuals who understand the power of modern collaborative tools. I offer here some ideas to help you expand your ability to work with others.

✦ **Include the rest of the world in your research.** You'll be surprised how much you learn if you expand the geographical reach of your web-based inquiries. Whether you're studying the effects of pollutants on human health, searching for that perfect detail for an air barrier, or looking for statistics on home energy consumption, you'll benefit from the exposure to other methods, materials, and programs. You'd be surprised how many people around the planet face the same opportunities and issues that you do!

✦ **Develop new professional relationships.** It's become ridiculously easy to connect to colleagues all over the world. A good way to do so is through LinkedIn, Google Plus communities, Home Energy Pros, or other social media. Start by identifying a group that addresses an area in which you're interested, do some research into the topic, make a few posts, share some photos, and ask questions of professionals who share your interests. Wherever you live, I can assure you that people will be thrilled that you've reached out to them. And if you are so lucky as to

travel internationally, it's a bonus to arrive in a country where you have professional connections!

✦ **Don't worry about the language barrier.** Don't let your lack of a second language stop you from connecting with others. International communication has become easier than ever as English is becoming the language of commerce. But if you *are* studying a second language, it's a great idea to keep at it. Try, for example, scheduling a free web-based language exchange with an allied professional on a website such as Verbling, where you can engage in no-obligation language practice with other learners. It's a bonus if you connect with allied professions in a far-off place during these exchanges, and you'll gain a greater grasp of your own skills when you need to explain them in a second language!

## Where We Stand

We're all part of the new globalization, whether we actively choose to participate or not. I view this flow of ideas, materials, and people as simply another stream of raw materials to be utilized to great advantage for everyone. For each of us, it'll take some time to learn how to work with these global resources, to sort the wheat from the chaff, and to integrate the new knowledge into our organizations. But the opportunity is huge, and the future will include big options for those who learn how to reach out, connect with allied professionals in smart and responsive ways, and manage this new flood of opportunity. 

*Chris Dorsi is the founder of Habitat X. He's spent the last 40 years developing best practices for the housing industry, running successful construction companies, writing and publishing respected textbooks, and developing professional training events. He currently divides his time between Madrid, Spain, and Helena, Montana.*

### >> learn more

Contact the author by e-mail at [cdorsi@habitatx.com](mailto:cdorsi@habitatx.com), or on the web at [www.habitatx.com](http://www.habitatx.com).

Join the dialogue. Visit the Home Energy Pros group International Knowledge Exchange at <http://homeenergypros.lbl.gov/group/international-home-performance-forum>

Start your own language exchange at [www.verbling.com](http://www.verbling.com).

Translate text to a foreign language at <http://translate.google.com>.

Join the Global Buildings Performance Network at [www.gbpn.org](http://www.gbpn.org).

Read and download the 2014 ACEEE International Energy Efficiency Scorecard (the source of the information included in Table 1) at [www.aceee.org](http://www.aceee.org).