

Policy for Public Investment in Energy Software

B a c k g r o u n d

In the past several years, considerable public funds have been invested in energy software for the building industry. These investments include projects funded through the U. S. Department of Energy, the U. S. Environmental Protection Agency, the California Energy Commission and California utilities (through public goods funds). Overall, public investments have caused a reduction in private sector investments. As private sector software developers reduce investment, the market for energy software becomes more and more dependent on continued public investment. Instead of fostering the growth of a sustainable private sector industry and affecting market transformation, public investment has caused many private sector companies to reduce their investment. Ultimately, many private sector developers may leave the market altogether.

A public/private partnership is greatly needed, and a policy is needed to guide this partnership. The partnership should assure the private sector that the market for their products will not be undermined by a similar, but free product provided through public funding, and the policy should provide guidance to the public sector on how to make investments in a manner that supports, rather than competes with the private sector.

G o a l

A policy statement must start with a goal.

Improve the quality, diversity, usefulness, and availability of energy software for the building design and construction industry through a partnership with the private sector.

A simple goal statement such as this has a lot of meaning packed in it. *Quality* means that the software should be accurate and work for common building types and systems. The software should be reliable and well supported. *Diversity* means that software should be available in many forms, ranging from CADD plug-ins, to special versions for specific building types, to full-featured general energy analysis programs. *Usefulness* means that the software should meet a variety of needs, be easy to use, and become an essential part of mainstream practice. *Availability* means that the software should be readily available to all members of the construction industry at an affordable price.

The goal should be achieved through a partnership with the private sector. This is an important part of the goal statement. Public investments should cause the private sector to invest more not less in energy software. This is another way of saying that public investments should be market transformation projects, e.g. they should result in lasting and sustainable changes in the market for energy software that will persist when the public investment is reduced or even eliminated.

G u i d e l i n e s f o r a P u b l i c / P r i v a t e P a r t n e r s h i p

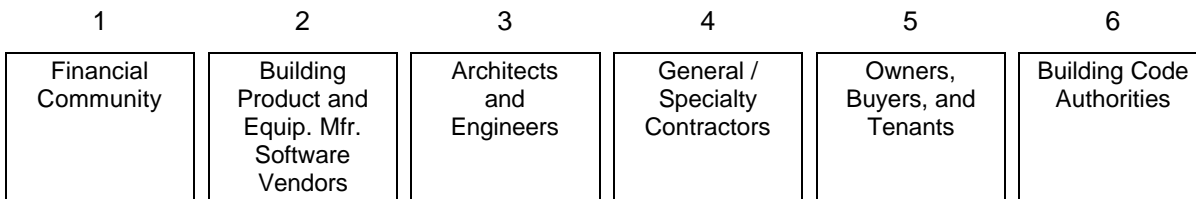
- Focus public investments on engines, software components, databases, and rule sets. Encourage the private sector to develop, support and maintain end-use applications and user-interfaces that use the publicly supported software components. DOE-2 and EnergyPlus are examples of engines. Software components are dynamic link libraries (DLLs) and custom controls (OCXs), which all software developers can use to easily add functionality to their programs. Databases include cost data, performance data, and other information needed for accurate energy calculations. Rule sets are procedures for making standardized calculations such as code compliance or energy ratings.
- Use Open Source licensing for publicly funded calculation engines, software components, databases and rule sets. Open Source licensing will enable the private sector, educators and others to review and make

contributions while assuring that the entire body of intellectual property (including private sector contributions) will be available to everyone on the same terms as the original intellectual property¹.

- Strengthen the market for energy software through publicly funded marketing campaigns, government/utility purchases, and through energy efficiency programs that encourage the use of energy software. Multi-year programs are needed for the greatest impact. Otherwise, short-term demand might be created, and before the industry can respond, the program may be over. The 1999 Savings by Design program in California has the potential to strengthen the market if it continues for a sufficient period of time.
- Disclose the details of public investments in energy software, including funding levels, project scopes of services, and schedules for completion. The private sector needs to be fully aware of projects that are receiving public funding in order to respond with appropriate private sector investments.
- Solicit input from private sector software developers when specifications are developed for publicly funded projects. It is especially important to have a dialog on the interfaces between publicly funded components and privately developed end-use applications. A specification for the interface should be developed before the publicly funded software component is developed. This will enable the private sector and the public sector to work in parallel, reducing the time of bringing new products to the market.
- Require a market transformation component of all publicly funded energy software projects. Projects should show how they would become sustainable without continued public investment; how they will solicit input from and work with the private sector; and how licensing arrangements with the private sector will be managed.

T h e M a r k e t

The market for energy software is the industry that designs, constructs and delivers new buildings and renovates existing buildings. This market consists of the financial community that provides construction and long-term financing, manufacturers of building products and equipment (including software developers), design professionals (architects and engineers) who design the buildings, general and specialty contractors who construct the buildings, building users (owners, buyers and tenants), and building code authorities.



Currently, architects and engineers (group 3) are the primary users of energy software. In a more limited way, however, groups 2 and 4 also use the tools. Building product and equipment manufacturers (group 2) use the tools to demonstrate the benefits of their more efficient products and to analyze the cost effectiveness of making improvements to their product lines. General and specialty contractors (group 4) use the tools to evaluate material and equipment substitutions. In a perfect market, all actors would use the tools to obtain information about the decisions they make about buildings.

The market for energy software is currently small, in part because specialized knowledge is needed to use the tools. The number of DOE-2 users in the world is probably on the order of 2,000². The market has the potential to be much larger, but only with training, education and the development of new software products. The big players in the buildings software market are the CADD (computer aided design and drafting) companies. Most of the major CADD manufacturers provide ways to extend the functionality of their applications through plug-ins or add-ons. Integrating energy software with CADD programs might significantly increase the size of the market.

¹ Open Source licensing is used for the Linux operating system, Apache web server, and Mozilla/Netscape Navigator. For more information see, Open Sources, Voices from the Open Source Revolution, Chris DiBona editor, O'Reilly, 1999.

² Based on the subscription list for the Building Energy Simulation User News, a publication of LBNL.

S u m m a r y

The following are two cartoons of how to invest public funds. The first is to work cooperatively with the private sector and the second is to compete. If the goal is to invest public funds effectively, the strategy choice is a "no brainer". Cooperation is less costly, results in greater diversity, and fosters a more healthy software industry that can compete in the international market and continue to develop, support and maintain software even if public funding is reduced or eliminated.

	Strategy #1	Strategy #2
	Work cooperatively with the private sector software industry	Develop software products that directly compete with private software.
Public Investment Example	DOE-2, EnergyPlus and other engines. Software components that end-use application developers can use.	eQuest, Energy 10, Building Design Advisor ³ .
Effective Use of Public Funds	Additional private sector investment is encouraged, i.e. public funds are leveraged.	Private investment is reduced or eliminated (can't compete with free software). A net reduction in investment may result.
Diversity	A wide variety of products will emerge from a range of companies, each with a different perspective and close ties to sub sectors of the market. Natural selection in the marketplace will decide the winners and losers.	Only software projects that receive public funding survive. If these miss the mark, there are no alternatives. Public policy makers decide the winners (those projects that receive funding) and the losers (those that do not).
The Private Sector Software Industry	The software industry will be much stronger and diverse. Private software companies will be encouraged to invest and develop new products.	Private software companies will first reduce investment and will eventually move on to other endeavors (drop out of the business). Only a few players will be left.

³ The stated goal of BDA is to provide a framework for other tools, but at present it only works as a stand-alone program and falls in the category of a product that competes with the private sector.