October 2009

Topic(s):
Green IT
AEC

Highlights of CAD Vendors' Green Initiatives and Opportunities in the Architecture, Engineering & Construction (AEC) Market

by Marek Villermann, The Business Advantage Group

iCAD looked at CAD software vendors' recent initiatives and opportunities in the AEC market, specifically recent acquisitions, partnerships and product developments related to the growing market demand for Energy Analysis Tools. This article highlights the green initiatives and opportunities for CAD vendors in the AEC Energy Analysis software market as well as corresponding energy emissions and sustainable energy investments.

Our climate is changing, and the world is changing - creating large investments, new technologies, new green jobs and opportunities specifically for CAD software vendors in the AEC industry. The magnitude of change is global and long term; increasing energy demand has stimulated the vast majority of recent energy supply investments. Energy technologies such as solar have become cheaper and more frequently integrated into sustainable building development. To make buildings more cost efficient and greener the AEC industry continues to adopt new building practises, new project delivery methods and new Energy Analysis Tools.

October 2009

Overview of the AEC Energy Analysis Software Market

There is a wide range of building energy software tools available for the entire building analysis process - including energy simulation, load calculation, renewable energy, retrofit analysis and sustainable/green buildings. However, the AEC CAD software market is dominated by a relatively small number of leading players with a variety of SMB tools.

Significant Initiatives of Leading CAD Vendors in the AEC Energy Analysis Market

Vendor	Initiatives	Product Functionality	Target
Autodesk	Project Two Degrees - Partnership with Clinton Climate Initiative (CCI) (May, 2009)	Web-based visualization technology that provides cities with a set of tools to measure, compare, and reduce GHG emissions at a local level	Development of more sustainable cities
	Acquired Ecotect (2008)	Simulation and analysis functionality including energy, water, and carbon analysis capabilities with desktop tools to conduct detailed environmental simulations and visualize results	To provide architects and engineers with energy performance evaluation tools in the Building Information Modelling (BIM) process
	Acquired Green Building Studio (2008)	Web-based whole building energy, water and carbon-emission analysis	
Graphisoft	Developed EcoDesigner (April, 2009)	Enables evaluation of design alternatives based on energy consumption, carbon footprint and monthly energy balance	
Bentley Systems	Acquired Hevacomp (2008)	Simulation for building energy analyses	
	Acquired exclusive distribution rights for Tas (2008)	In-depth energy analysis and simulation of demanding and challenging large-scale building environments	

October 2009

Market Demand
Although there is a very wide range of energy calculation software tools available in the UK, Germany, Spain and Italy these are very limited in the rest of Europe - notably in Ireland, Belgium, Austria, Netherlands and Hungary.

Market Trends
- There is an increase in the number of analysis tools across all markets
- Analysis tools become part of sustainable building design and BIM

Opportunities for CAD Software Vendors
- Capitalize on the increasing demand for sustainable building design and energy analysis tools
- Focus on markets where the whole housing stock is developed to become more energy efficient, e.g. closely monitor Germany, which has one of the biggest new residential builds in the EU powered by the largest number of operational wind turbines and solar panels
- Size the market by expanding sustainable design product portfolios, including acquisitions, partnerships and own R&D activity
- Supply early design stages (schematic design, design development) in the BIM process with energy performance evaluation tools, specifically with energy analysis tools for solar exposure, thermal performance, lighting, shading etc.

Types of Building Energy Analysis Tools
- Screening Tools for use primarily during budgeting and programming of retrofits. Screening Tools are designed to evaluate project viability during the earliest stages of programming and often include some economic analysis capability. They also tend to be correlations, rather than full hourly simulations.
- Architectural Design Tools for use primarily during programming, schematics, and design development of new construction and major retrofit. Architectural Design Tools are intended to evaluate the relative importance of design decisions such as building orientation, glazing, and day lighting.
- Load Calculation and HVAC Sizing Tools for use primarily during design development and construction documentation of new construction and major retrofit. Designed primarily to size and help select equipment such as boilers, furnaces, or chillers.

October 2009

Overview of the "Green Market" Emissions and Investments

Greenhouse Gas (GHG) Emissions

- Buildings are responsible for almost half (48%) of global GHG emissions annually
- Emissions are primarily due to energy use. Today's cities consume three-quarters of the world's energy and are responsible for at least three-quarters of global pollution. The urbanization process dramatically affects energy consumption. Three quarters of all power plant-generated electricity in the United States and two fifths in Europe are used by the building sector.
- Worldwide, buildings account for about two fifths of material and energy use.
- Demand for global energy supply is increasing due to the rapid growth of the urban environment. Since 2008 over half of the world's population lives in cities. China accounts for the largest growth of cities as well as for the largest GHG emissions along with the United States. In developed countries, 75% of the population already lives in cities, compared to 35% in developing countries. But the rate of urbanization in those countries is much higher – 3% compared to 0.5% in developed countries. Estimates show that by 2030, about 84% of the population of developing countries will be living in cities.

Current Cost of Climate Change

- Currently countries worldwide spend up to 2% of GDP on green initiatives; a total of **USD155 billion** in 2008 – four times more than in 2004.
- In 2008 investment in Europe, for example, was USD49.7 billion, a rise of 2%; in North America investment totalled USD30.1 billion, a fall of 8%.

Investment Potential

- Green investment plans by geo: G-20 group of nations recently announced stimulus packages totalling USD3 trillion or 4.5% of their GDP. Europe plans to spend 1.8% of GDP (EUR220 billion) in 2009-2010; China EUR420 billion during a five-year plan from 2011; United States green projects will receive a boost of USD30 billion of spending on energy.
- Expected global expenditure: USD40 trillion will be required to build, rebuild, and repair the world's infrastructure in the next 20 years.
- Expected cost of inaction: some experts estimate as much as 5-20% of Global GDP.

Business Advantage
intelligence insight innovation
Pel House 35 Station Square Petts Wood Kent BR5 1LZ UK
Tel: +44 (0)1689 873636 **Email:** info@business-advantage.com **Web:** www.business-advantage.com

Trends in Sustainable Energy Investment

The International Energy Agency (IEA) estimates that current trends in energy demand for buildings will stimulate about half of energy supply investments to 2030.

- Sustainable energy technologies on the whole are becoming cheaper to manufacture as they reach scale and gain operating experience, e.g. solar costs set to fall 43%

Opportunities for CAD Software Vendors

- Monitor green investments by technology, i.e. wind, solar, small-hydro, biomass and geothermal in order to develop and/or adjust CAD energy analysis solutions for specific needs
- Consider targeting new positions created in the CAD market as a result of green initiatives

Impact of Energy Directives on the AEC Industry

Energy reduction will have a dramatic impact on architects and engineers responsible for designing buildings that meet the new energy requirements.

AEC Industry Response

Overall a positive response to new energy requirements, however trend is still to build quickly with minimum expenses.

Awareness of environmental building issues is relatively high in all markets, however only 30% of those who are aware of green buildings consider involvement and only about 10% of the total architects and engineers are involved in green building activity.

Opportunities for CAD Software Vendors

- Target key professionals and decision makers
- Consider factors influencing adoption of sustainable building practices
- Increase knowledge and experience of sustainable building work
- Communicate the benefits of BIM
- Consider business community acceptance

Sources used:

1. Business Advantage market studies.
2. Building Energy Data Book // U.S. Department of Energy.
3. Building Technologies Analysis // National Renewable Energy Laboratory (NREL).
4. Buildings Energy Software Tools Directory // U.S. Department of Energy.
5. Climate Change and the Global Economy. Chapter 4. World Economic Outlook // International Monetary Fund (IMF), April 2008.
6. Energy Analysis Tools. R. Paradis. June 15, 2007 // National Institute of Building Sciences.
7. Energy Efficiency in Buildings // World Business Council for Sustainable Development (WBCSD), February 2009.
8. EU lags US, China in green investment to boost economy. K. Falkenberg interview // Reuters. June 16, 2009.
9. Global Trends in Sustainable Energy Investment 2009 // UNEP. SEFI. New Energy Finance. 2009.
10. Investment in Green Energy Quadruples in 4 Years // LiveScience. June 03, 2009.

Please Click HERE to leave a comment or question.

iCAD is produced by Business Advantage, a B2B research, business development and marketing consulting practice operating in the global IT, Digital and Telecommunications sectors.

Business Advantage
intelligence insight innovation
Pel House 35 Station Square Petts Wood Kent BR5 1LZ UK
Tel: +44 (0)1689 873636 **Email:** info@business-advantage.com **Web:** www.business-advantage.com