International Energy Agency

Energy Conservation in Buildings and Community Systems

ANNEX 31

DIRECTORY OF TOOLS

A Survey of LCA Tools, Assessment Frameworks, Rating Systems, Technical Guidelines, Catalogues, Checklists and Certificates

Energy-Related Environmental Impact of Buildings

October 2001

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Principal Contributors

All of the Annex 31 participants contributed information on tools available in their respective countries.

Thomas Lützkendorf and Karsten Tanz of Germany completed the original research on tools.

Sebastian Moffatt of Canada updated and expanded the original research, and organized the results for publication.

A SURVEY OF TOOLS BY TYPE AND COUNTRY

Purpose of Survey

Improving the environmental performance of buildings and building stocks is best accomplished using tools as decision-making aids. Many countries now have a variety of tools that have been tailored for use by specific users and to fill particular analytical needs. The purpose of this survey is to provide a quick overview of the tools that are currently available or that are soon to be released. Each tool is described in terms of its functions, audience, users, software application & tech support, data requirements, strengths, availability and contact information. Adding or updating tool information is a simple process of completing the tool survey questionnaire and submitting the results to the Annex 31 Webmaster: mailto:thomas.luetzkendorf@wiwi.uni-karlsruhe.de

US DOE Directory: Interactive Software for Energy Calculations

This Annex 31 survey is designed to complement the United States Department of Energy Tool Directory http://www.eren.doe.gov/buildings/tools_directory/

The US DOE Directory includes descriptions of interactive software tools for modelling energy use by buildings. A number of tools on the DOE site also address environmental impacts. Annex 31 survey results for energy modelling tools have been posted on the DOE Directory. Links are provided to the DOE pages for each tool of this type. All other types of tools, including LCA Tools, Assessment Frameworks, Rating Systems, Guidelines, Catalogues, Checklists and so on are described on this Annex 31 site (see index). Both the Annex 31 site, and the US DOE site, use a similar format for organising and describing tools.

Updating and Adding Tools and Methods

Anyone wishing to add a tool to the Annex 31 survey, or update their information, is requested to download the survey questionnaire and submit changes to the webmaster: mailto:thomas.luetzkendorf@wiwi.uni-karlsruhe.de.

Energy modelling tools should be listed directly on the US DOE Web site, which has instructions on how to complete an information form and send the results by email. Go to BTS: Tools Directory - Getting Your Software in the Directory

Tools by Category

Assigning tools to categories makes it is easier for potential users to identify tools most appropriate for their needs. Annex 31 Tools are categorised as follows:

- Energy Modeling software
- Environmental LCA Tools for Buildings and Building Stocks
- Environmental Assessment Frameworks and Rating Systems;
- Environmental Guidelines or Checklists for Design and Management of Buildings
- Environmental Product Declarations, Catalogues, Reference Information, Certifications and Labels

Definitions of each category, and more information on tool typologies, can be found in Types of Tools.

Tools by Country

Tools have been surveyed in all 14 Annex 31 countries. A list of countries, and surveyed tools, is provided below.

Country *(Annex 31 Member)*	Energy Modeling Software *(Most of These Tools are found on the US DOE Directory)*	Environmental LCA Tool for Building or Building Product	Environmental Assessment Framework, Rating System *(Whole Buildings or Building Stocks)*	Environmental Guideline or Checklist for Building Design / Management	Environmental Product Declaration, Catalogue, Reference Information, Certification, Label
Australia	o ENER_RATE* o NatHERS* o BUNYIP* o ECOTEC*T o GSL-GISELLE* o LCAid *	o LISA	o NABERS	o Environment Design Guide*	o EcoSpecifier*
Canada	o BASECALC o CATALOGUE o EE4 CBIP o EE4 CODE o ENERPASS o FRAME4 o FRAMEplus o GS2000 o Lighting Boy o VISION4 o HOT2000	o The Athena Model *DOE* o	o GBTool o HOMERUN (Energuide) o Cities for Climate Protection o Solution Spaces o Quest	o Banff Green Development Guidelines*	o Environmental Choice o Super E o Advanced Building Technology
Denmark	o BSIM2000 o tsbi3	o	o EDIP o BEAT o o	o Environmentally Friendly Construction Guide*	o
Finland	o BUS++ o RIUSKA o SMOG	o LCA-HOUSE o TAKE-LCA	o BSEA 1.0	o ECOPROP	o Environmental Classification of Buildings
France	o SIMBAD Building & HVAC Toolbox*	o EQUER o TEAM o ESCALE o PAPOOSE	o Performance Guidelines for Green Buildings	o REGENERS	o
Germany	o PVCad o SolDesigner o Sombrero 3.01 o SUNDIT Sol o THERMOSIM	o	o EcoPro 1.5	o LEGOE	o BAU Building Passport o Blue Eco Angel*

Country *(Annex 31 Member)*	Energy Modeling Software *(Most of These Tools are found on the US DOE Directory)*	Environmental LCA Tool for Building or Building Product	Environmental Assessment Framework, Rating System *(Whole Buildings or Building Stocks)*	Environmental Guideline or Checklist for Building Design / Management	Environmental Product Declaration, Catalogue, Reference Information, Certification, Label
Japan	o NIRM*	o LCCO2 o BRI LCA	o ECDG	o Green Housing A-Z* o Tokyo Metro Green Building Program	o MOC Checklist for Government Buildings*
Netherlands	o NEN 2916: Energy Performance of office buildings o NPR 2917: Energy Performan-ce of office buildings - Calculation program o NEN 5128: Energy Performance of housing buildings o NPR 5129: Energy Performance of housing buildings- calculation program	o EcoQuantum o Eco-Instal o MMG	o GreenCalc o EcoIndicator	o National Packages Sustainable Building o Costing Reference Model	o Dutch MRPI
New Zealand	o	o	o	o	o
Norway	o	o	o EkoProfile	o	o Swan Eco-label*
Sweden	o 1D-HAM o CELLAR o DEROB-LTH o EED o HEAT2 o HEAT3 o IDA Indoor Climate and Energy o SLAB	o EcoEffect o LCAiT*	o The Natural Step*	o	o

Country *(Annex 31 Member)*	Energy Modeling Software *(Most of These Tools are found on the US DOE Directory)*	Environmental LCA Tool for Building or Building Product	Environmental Assessment Framework, Rating System *(Whole Buildings or Building Stocks)*	Environmental Guideline or Checklist for Building Design / Management	Environmental Product Declaration, Catalogue, Reference Information, Certification, Label
Switzerland	o ACOUSALLE o LESO-[Tools]	o	o OGIP* o E2000 o Ökobau	o Planer Kit for Controlled Ventilation systems o SIA D0122: Ecology and buildings	o Ecological Submission Document o SIA 493: Declaration form for building products o Embodied energy of building materials
United Kingdom	o APACHE o Building Energy Modelling & Simulation o ESP-r o FLOVENT o FLUCS o INDUS o LifeCYcle o Microflo o Pisces o Radiance Interface o ShadowFX o Solacalc o Suncast o TAPS o TAS	o ENVEST *DOE*	o BREEAM o SPeAR	o Environmental Management Toolkits*	o Environmental Profiles of Construction Materials*
U.S.A.	0 **[REFER TO DOE DIRECTORY FOR A LIST OF OVER 150 PRODUCTS]**	o BEES*DOE*	o INDEX* o Smart Places*	o Minnesota Sustainable Design Guide o NYC High Performance Building Guide o City of Santa Monica Green Building Design & Construction Guidelines	o

DOE *Information located on US DOE Building Software Tools Directory* ******* *Descriptions incomplete as yet*

AUSTRALIA

Assessment Frameworks/Rating: NABERS

Description	National Australian Building Environmental Rating System Project (NABERS) will rate the environmental impact of buildings. The proposed structure of the NABERS rating system will have a series of headings, with "scores" of one to five stars under each heading. Stars have been chosen as the unit of measurement because the public is already familiar with them as part of a rating system, whether it is for domestic appliances, commercial buildings or houses. Once developed the system will provide information on the sustainability of existing building stocks. This in turn should lead to greater investment in sustainable building alternatives.
Keywords	Rating tool for buildings
Expertise Required	
Audience	
Existing Users	Australia
Data Collection Requirements	
Software Application & Tech Support	
Assessment Method &	

Method & Result	
Strengths & Weaknesses	Strengths: Weaknesses:
Related Policies and Programs	
Availability	Under development
Contact	Shane McWhinney Sustainable Government, Construction and Mining Team Environment Australia GPO Box 787 Canberra ACT 2600 Phone: 02 6274 1700 Fax: 02 6274 1593 E-mail: shane.mcwhinney@ea.gov.au Web Site: http://www.ea.gov.au/industry/waste/construction/abers.html

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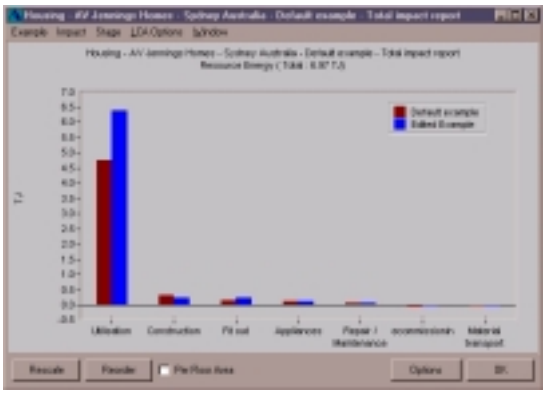
AUSTRALIA

Interactive software model: LISA

Description	LISA (Life Cycle Analysis (LCA) in Sustainable Architecture) is a streamlined LCA decision support tool for construction. It was developed in response to requests by architects and industry professionals for a simplified LCA tool to assist in green design. LISA provides preformatted reports, user definable, in graphical and table form showing the environmental impact of each stage in terms of: o Resource Energy Use in GJ o GGE in tonnes of equivalent CO2 o SPM o NMVOC o Water o NOx o SOx o Base Material Data and a Bill of Material Quantities are also reported. 
Keywords	Life cycle analysis, sustainability, utilisation, embodied energy
Expertise Required	No special training required, help files are included to assist use of interactive case studies
Audience	Architects, Construction industry professionals, educators researchers
Existing Users	+400
Data	Bill of Materials & Quantities (along with possible alternative materials such as

Collection Requirements	concrete which uses fly ash, a waste product from power production as a cement extender. From a sustainability perspective this reduces the need for energy intensive cement production) Work Schedule e.g. Fuel consumption by construction equipment, HVAC, Services and Fittings, and utilisation schedules. Data is entered into existing interactive case studies to determine the environmental impact (in terms of the sustainability and energy use) of design and material alternatives. A developer mode exists for those who wish to add their own interactive case studies and findings to the knowledge embodied in the existing case study list. This feature can only be accessed by obtaining a developer password from mailto:Info@lisa.com.au. In developer mode equations that relate to material use and service use such as water and electricity are generated. These are typically associated with stages in the life cycle of the building typical stages Include but are not confined to o Specification o Construction o Appliances o Fitout o Utilisation o Transportation o Decommissioning/ Recycling o Material Transport
Software Application & Tech Support	PC, Pentium class or higher with Windows 95, 98, ME, NT, 2000, XP. Application language is Visual Basic
Assessment Method & Result	Operating energy not included.
Strengths & Weaknesses	Strengths: LCA, highlights the strengths and weaknesses of a building in terms of energy. Weaknesses: Doesn't do thermal modeling.
Related Policies and Programs	A variant of LISA, called CHAPPY, is a Life Cycle Analysis Tool for the general public. It was designed to educate school students on the environmental effects of their family's lifestyle choices. It is bundled with educational resources and is also a free download from http://www.chappy.au.com/.
Availability	
Contact	mailto:info@lisa.au.com *IEA Annex 31 Information Last Updated on November 22nd, 2001*

CANADA

Assessment Framework & Rating: GBTool

Green Building Assessment Tool - GBTool 1.62 - a second-generation tool for building performance labelling

Description	The GBTool software was designed to assess predicted or "potential" performance of a building before occupancy. The tool was developed as part of the CIB Green Building Challenge, and in this capacity was used by a large number of countries to provide a standardized evaluation of case study green buildings. It is available as a highly customized EXCEL spreadsheet that allow users to weight and aggregate building performance on a broad range of performance categories, including: o Resource Inputs; o Environmental Loadings; o Quality of Indoor Environment; o Cost; and o Secondary Factors. Gatos V1.74 handles any user-defined occupancy, up to 4 occupancies per building including residential. User must define relevant benchmarks for each occupancy category; GBTool then pro-rates the benchmarks according to the percent area dedicated to each occupancy.
Keywords	Software to evaluate building performance
Expertise Required	User requires time to understand input process and to customize the values to meet their needs. The system is a framework, not a simulation model. Users are expected to use other software tools to simulate energy performance, estimate embodied energy and emissions, predict thermal comfort and air quality, etc.
Audience	Builders and regulatory groups
Existing Users	International. GBTool has been used as the foundation for national rating systems

Data Collection Requirements	No data is provided. Must be used in concert with modeling programs
Software Application & Tech Support	Microsoft Excel-based
Assessment Method & Result	Energy rating considers both embodied and lifecycle energy. The Secondary Factors section addresses many indicators related to long-term performance.
Strengths & Weaknesses	Strengths: Very adaptable to local conditions. Extremely comprehensive framework for evaluation. Weaknesses: Lack of documentation. User interface is crude. It is not designed to assess performance during operational conditions.
Related Policies and Programs	The GBTool software has been developed as part of the Green Building Challenge process, an international effort to establish a common language for describing "green buildings".
Availability	The software has been developed by Natural Resources Canada on behalf of the GBC group of countries and may not be used for commercial purposes, except as per agreements that may be worked out between potential users, the relevant national team and NRCan.
Contact	Information: Nils Larsson larsson@greenbuilidng.ca Download site: http://iisbe.org/

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CANADA

Rating System: HomeRun

Description	The HomeRun software is used to deliver the EnerGuide Program for existing houses. The software allows input of various building data. This data is then used to develop an energy simulation for the house. Through the EnerGuide Program, the homeowner receives a personalized computer profile of the energy performance of the house, a cost analysis of potential energy savings, an official rating label, and an air leakage test.
Keywords	Energy simulation Energy rating system Energy renovations.
Expertise Required	General building knowledge
Audience	The software is typically purchased by utilities that are implementing demand side management programs for their customers. The utilities will then hire evaluators to use the software during home visits.
Existing Users	The software has been used in more than 15,000 assessments of homes in British Columbia, Alberta and Manitoba. The software was also recently purchased by an Ontario utility.
Data Collection Requirements	Building data (e.g., number and type of windows, building dimensions, insulation levels, etc.)
Software Application & Tech Support	The software runs on any IBM compatible system and is excel-based. The output from the software is an energy use report that is easy for home owners to understand.

Assessment Method & Result	
Strengths & Weaknesses	Strengths: Modeling inputs are easily measured in the field. Weaknesses:
Related Policies and Programs	
Availability	The tool can be purchased by contacting Building Insight Technologies. The purchase price is variable depending upon the size of the project and the numbers of people that require training. It is currently supported in British Columbia, Alberta, Manitoba and Ontario, but is available for purchase throughout North America.
Contact	Building Insight Technologies Peter Moffatt #1 - 3661 West 4th Avenue Vancouver, BC V6R 1P2 Tel: 604-732-9106 x 315 Email: dfast@buildinginsight.com Web site: http://www.homeperformance.com/

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CANADA

Catalogue/Reference Information: Advanced Buildings Technology and Practices

Description	A web site containing information on more than 90 environmentally appropriate technologies and practices. The site covers: indoor air quality, water conservation, waste management, electricity production, non-toxic materials, recycled materials, daylighting, energy efficiency.
Keywords	Resources for green building projects.
Expertise Required	None
Audience	Architects, engineers and buildings managers
Existing Users	North America
Data Collection Requirements	None
Software Application & Tech Support	No
Assessment Method & Result	Building construction and operation
Strengths & Weaknesses	Strengths: Weaknesses:

Related Policies and Programs	
Availability	Available at http://www.advancedbuildings.org/index.htm.
Contact	Email: advancedbuildings@enermodal.com Web site: http://www.advancedbuildings.org/index.htm

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CANADA

Checklist and Certification: Super E House Program

Description	Super E™ is a program developed by Natural Resources Canada to introduce importers to Canada's best housing technologies and building practices, and to help developers in other countries provide their clients with houses that are: o **E**conomical; o **E**nergy-efficient; that o **E**nhance the quality of life; and are o **E**nvironmentally friendly. With the support and guidance of Natural Resources Canada, the Super E™ House Program is delivered by Canadian companies who have shown a demonstrated ability to successfully deliver high-quality housing systems to export markets, especially Japan. The program includes integrated training, quality assurance and after sales service support system delivered by member companies. The following technology components are included in the Super E™ House Program: o Crawlspace Technology o Wall Technology o Mechanical Systems Technology o Window Technology o Indoor Air Quality o Environmentally Friendly Materials
Keywords	Canadian export housing, high quality housing, label
Expertise Required	
Audience	Intended to introduce foreign homebuyers and builders to the benefits of energy efficient, environmentally friendly wood-frame construction.
Existing Users	Japanese marketplace, United Kingdom.
Data	

Collection Requirements	
Software Application & Tech Support	The program established minimum performance for energy use, based on Canadian government energy simulation tools.
Assessment Method & Result	
Strengths & Weaknesses	Strengths: Weaknesses:
Related Policies and Programs	
Availability	By Application to Federal Government Department
Contact	Super ETM Office c/o Oxford Media Group Fax: 519-539-7063 E-mail: mailto:office@super-e.com

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CANADA

Certification: Environmental Choice Program

Environmental Choice Program

Description

The Environmental Choice Program is Canada's only national and comprehensive ecolabelling program. Products and services certified by the Environmental Choice Program are proven to have less of an impact on the environment because of how they are manufactured, consumed or disposed of.

Certification of products and services is based on compliance with stringent environmental criteria that are established in consultation with industry, environmental groups, and independent experts and are based on research into the life-cycle impacts of a product or service.

Building and construction products are one of the many categories of materials that are certified. The building and construction category includes:

- Ab(d)sorbents,
- Hydrocarbon
- Bamboo and Other Virgin Wood-substitute Flooring
- Products
- Boilers
- Carpeting, Commercial Modular
- Combustion Fuel Manufactured from Wood Waste
- Compost Toilet
- Compost/Organic Fertilizer
- De-icing Chemical for Airport Runways
- Drainage Pipe
- Energy Efficient Exhaust fans
- Gypsum Wallboard
- Hot Water Tanks, Indirect-fired
- Retrofit Fire Door Kit
- Safety Fence/Snow Fence
- See also Paints and Surface Coatings Section
- Shingles
- Steel Reinforced Composite Structurals
- Thermal Insulation
- Thermostat Control
- Turf Management System (Organic)
- Water Conserving Showerheads

Keywords

Product Certification

Expertise Required	
Audience	Intended to influence purchasing decisions.
Existing Users	
Data Collection Requirements	
Software Application & Tech Support	Yes
Assessment Method & Result	
Strengths & Weaknesses	Strengths: Weaknesses:
Related Policies and Programs	
Availability	
Contact	mailto:ecoinfo@terrachoice.ca Building, Grounds and Construction

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CANADA

Assessment Method: Solution Spaces

Description	Propolis is described as Forecasting Information System™. The Propolis software is for use by anyone involved with forecasting the life cycle cost and impact of urban development, from both an economic and a resource perspective. For example, it can help estimate when a growing neighbourhood or community will exceed its water reservoir capacity and how changes to building technology might extend the lifetime and save dollars, preserve land, and create new jobs. The software can also calculate the changes in greenhouse gas emissions, smog, and changes in operating costs through investments in energy efficiency. The software has a database that permits users to assemble and track "what-if" scenarios for calculating performance of buildings and infrastructure. Flows of energy, water, and waste are generated from "micro-software" models that capture all the diversity and dynamic interaction at the level of individual buildings, vehicles and streets. These "end-use" models are used to represent the entire stock, and are linked to energy, water and waste management systems, so as to create a working model of the urban environment. Depending upon the needs of the user, the project may be defined as a residential subdivision, a hospital complex, a resort community, a mixed-use retail/office complex, a natural gas grid, a regional district or a city.
Keywords	Forecasting Information System, Backcasting, Stock Aggregation, Integrated Resource Plan, State of the Environment software
Expertise Required	Use of software is similar to using a Web Browser. Creation of scenarios requires specialty training or use of consultants.
Audience	The software is intended to be used by utility companies, urban developers, property managers and local governments
Existing Users	6
Data	Requires a base map in GIS software, along with basic data files on typical

Collection Requirements	categories of buildings, streets, and utility services.
Software Application & Tech Support	The software is web-enabled.
Assessment Method & Result	The system is a bottom-up model that creates Sankey Diagrams to track energy, materials and water flow through the stock.
Strengths & Weaknesses	Strengths: Comprehensive model for buildings, infrastructure and land use. Weaknesses: time consuming to intialise for a single project.
Related Policies and Programs	
Availability	Currently delivered by consulting firm: The Sheltair Group Inc. 2-3661 West 4th Ave. Vancouver Canada V6R 1P2 Email: info@sheltair.com Website: http://www. sheltair.com/
Contact	Propolis Information Technologies Inc. http://www.propolisit.com/

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CANADA

Interactive Software Model: Quest

Description	QUEST is a user-friendly PC-based tool that is custom-created to explore and evaluate alternative scenarios for the future of a region. Users create long-term future scenarios for a region by making policy choices and then seeing the environmental, economic and social implications of their decisions.
Keywords	Community scenario building tool
Expertise Required	None
Audience	General public
Existing Users	
Data Collection Requirements	None
Software Application & Tech Support	Yes
Assessment Method &	No

Result	
Strengths & Weaknesses	Strengths: Weaknesses:
Related Policies and Programs	No
Availability	Quest can be downloaded for free at: http://www.sdri.ubc.ca/research/quest.html
Contact	Tel: 604-822-9080 Fax: 604-822-9081 Email: info@envisiontools.com http://www.envisiontools.com/software.htm

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CANADA

LCA Tool: Cities for Climate Protection Software

Description	A user-friendly, "point-and-click" software tool for helping members of the Cities for Climate Protection Campaign develop their local climate action plans. Covers both in-house and community wide greenhouse gas emissions from energy use and waste. Quantifies financial savings, air pollutant reductions and other co-benefits of greenhouse gas emission reduction strategies. Automates energy conversions, embeds emission coefficients, speeds up analytical and monitoring component of local action plans.
Keywords	GHG emissions inventories tool for municipalities.
Expertise Required	None
Audience	Municipal planners and consultants
Existing Users	Many Canadian municipalities, as well as municipalities in other countries.
Data Collection Requirements	Utility data, waste generation and disposal tonnages, fleet fuel consumption, etc.
Software Application & Tech Support	Yes, using EXCEL and Visual Basic
Assessment Method &	No

Result	
Strengths & Weaknesses	Strengths: 40,000 words of illustrated on-line Help. Weaknesses:
Related Policies and Programs	This particular tool is being made available to Canadian municipalities in ICLEI's Cities for Climate Protection Campaign and the Federation of Canadian Municipalities' Partners for Climate Protect Program through the support of Environment Canada, and it is part of a suite of software products developed by Torrie Smith Associates Inc. for the International Council for Local Environmental Initiatives.
Availability	A trial version is available at the Torrie Smith & Associates web site, however it is free to members of the Partners for Climate Protection Program.
Contact	Torrie Smith Associates Inc. Unit 108, 95 Beech Street Ottawa, Ontario K1S 3J7 CANADA TEL: (613) 238-3045 FAX: (613) 238-8776 email: info@torriesmith.com http://www.torriesmith.com/

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DENMARK

Guideline: EDIP

Description	EDIP provides tools and a methodology for incorporating environmental considerations into the selection of materials for buildings. Step by step guidelines and numerous case studies are provided in the various publications. The documents also include comprehensive documentation of the scientific background for each of the assessment criteria, scientifically reviewed by leading experts.
Keywords	Environmental assessment of products
Expertise Required	
Audience	Industry, government and universities.
Existing Users	
Data Collection Requirements	Database is provided and is currently undergoing revision and updating.
Software Application & Tech Support	No
Assessment Method & Result	Yes
Strengths & Weaknesses	Strengths: Step by step guidelines and numerous case studies are provided. Comprehensive documentation of the scientific background for each of the assessment

	criteria, scientifically reviewed by leading experts. Weaknesses:
Related Policies and Programs	
Availability	The publications can be ordered from the contact provided below.
Contact	Miljøbutikken – Information and Books Læderstræde 1-3, 1201 Copenhagen K Phone: +45 3395 4000 Fax: +45 3392 7690 mailto:butik@mem.dk http://www.mst.dk/homepage/default.asp?Sub=http://www.mst.dk/indu/03030000.htm

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DENMARK

Interactive Software Model: BEAT 2000

BEAT 2000

Description	BEAT 2000 is a Life Cycle Assessments (LCA) tool developed at the Danish Building and Urban Research (By og Byg) for performing environmental assessment of products, building elements and buildings. The tool, a relational database built with Microsoft Access 97, consists of a database containing environmental data and a user interface with an integrated inventory and assessment tool. The database contains environmental data for unit processes, based on these data the inventory tool can calculate the environmental impacts, i.e. the total energy consumption (and its distribution on energy sources), the total consumption of raw materials (including fuels) and the total emissions (to air, water and soil) related to: • production of a building material; • construction, maintenance and demolition of a building element; and • construction, operation, maintenance and demolition of a building.
Keywords	Building environmental assessment tool
Expertise Required	
Audience	Building engineers Architects Producers of building materials
Existing Users	
Data Collection Requirements	Comes with a database in Microsoft Access 97

Software Application & Tech Support	Available for IBM compatible PC's. BEAT 2001 and 2002 are under development.
Assessment Method & Result	
Strengths & Weaknesses	Strengths: Weaknesses:
Related Policies and Programs	
Availability	The Tool can be ordered at: http://www.by-og-byg.dk/english/publishing/software/beat2000/prices.htm
Contact	By og Byg P. O. Box 119 Dr. Neergaards Vej 15 DK-2970 Hørsholm T +45 4586 5533 F +45 4586 7535 E mailto:info@by-og-byg.dk http://www.by-og-byg.dk/english/publishing/software/beat2000/

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FINLAND

Assessment Framework/Rating: BSEA 1.0 – Community Energy Analysis

Description	BSEA calculates the heating, cooling and electricity energy consumption of a building stock at the present and in the future. The building stock is described according to a hierarchical model. The community is formed of buildings, which are part of several building sectors. Building sectors can freely be chosen by the user. The community is at the top of the hierarchy. The user can decide the way to form the community of different buildings. He can either model all the buildings one by one or he can describe one building sector with a "type building" that represents the sector as an average. The user can take advantage of the numerous technology databases, which include thermal characteristics of building constructions (U-values of components and windows, electric appliances etc.). It is easy to choose the appropriate data from the data bank.
Keywords	District heating, district cooling, electricity, energy, building stock, arch type - modeling, energy use of the communities
Expertise Required	Expertise knowledge of the thermal calculation of buildings, Understanding the prediction of the building stock
Audience	Municipal environmental designers, the power plant designers
Existing Users	National: 2 International: none
Data Collection Requirements	Thermal statistics of the building stock (volumes, U-values, air change rates,), shares of the heating systems in the building stock, shares of the different building sectors in the building stock
Software	Hardware requirements: recommended minimum Pentium/200 MHz and SVGA

Application & Tech Support	800*600 with 256 colors or more. Physical memory > 64 MB. Operating system 32-bits Windows 95/98 or Windows NT 3.5/4.0
Assessment Method & Result	The use and maintenance
Strengths & Weaknesses	Strengths: Quite fast, not so much modelling, reduction and growth estimates of the stock can be changed easily, program recalculates the effect to the consumptions and stock volumes, different technologies can be evaluated Weaknesses: The user needs expertise knowledge of the thermal calculation of buildings, the market share estimates have great impact on consumptions in the future
Related Policies and Programs	None
Availability	Currently used at VTT. The licensing and pricing are case-specific. Supported currently only in Finland
Contact	Jari Shemeikka, Research Scientist VTT BUILDING AND TRANSPORT Mail: PB 1804, 02044 VTT, FINLAND Phone: +358-9-456 4921 Fax: +358-9-455 2408 mailto:Jari.Shemeikka@vtt.fi

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FINLAND

Guideline: EcoProP – Performance Requirements Management Tool

Description	A requirements management system consisting of o generic classification of building properties (VTT ProP) o environmental requirements classes and reference values o links to relevant verification methods o collection of other background data.
Keywords	Helps setting performance requirements for building construction project. Gives a general framework for communication for project stakeholders. Helps documenting the set objectives and further exploitation of them.
Expertise Required	Expertise on those areas where requirements are set
Audience	Owners, project management consultants
Existing Users	National (about ten private organizations) International (the current version is Finnish, but English version development is underway)
Data Collection Requirements	Those performance requirements the user of the tool wants to set (see classification above)
Software Application & Tech Support	The tool runs as an add-on to Excel (97, 2000)
Assessment Method &	The set requirements concern the whole life cycle of the building

Result	
Strengths & Weaknesses	Strengths: Setting and documenting performance requirements Weaknesses: Analysis of the life cycle costs based on the set requirements
Related Policies and Programs	The tool helps to implement performance approach and gives support to increase the eco-efficiency of the project
Availability	The current version is in Finnish only, but the English version should be available in the beginning of 2002. The tool can be bought from VTT Building and Transport, Mr. Jarkko Leinonen (jarkko.leinonen@vtt.fi). The buyer gets a site license
Contact	Jarkko Leinonen, VTT, Finland mailto:jarkko.leinonen@vtt.fi http://cic.vtt.fi/eco/ecoprop

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FINLAND

Assessment Framework/Rating: LCA-HOUSE

Description	The computer program, LCA-HOUSE, was created for real estate owners, constructors and building designers. It allows them to use Life Cycle Assessment (LCA) method to evaluate different types of buildings and materials. The input data for LCA HOUSE program includes environmental profiles of Finnish building materials, the model building structures in Finland, areas of building structures and estimated consumption of energy. The output data is an environmental profile including the following factors: o consumption of material resources (renewable and non-renewable), o consumption of energy resources (renewable and non-renewable), o green house gases, o acidification compounds, o photo chemical oxidants. By changing optional constructions and comparing different choices an ecologically friendly building solution can be determined and also ecological fulfillment when it is required can be verified.
Keywords	Environmental profile of buildings
Expertise Required	None
Audience	The LCA-House program can be used for different purposes: o to examine the ecological affect of building choices related to materials used and service life of the whole building (designer and constructors use); o for verifying environmental characteristics' fulfillment, if such has been demanded (designer use); for owners to examine their building's environmental profiles (owner use); o for checking the affect of care, maintenance and repairing actions on the environment (designer use); o for comparing environmental profiles of structures having the same functional units; and o for comparing environmental impacts of produced- and competing materials in certain structure or building (use of building material producer).
Existing Users	National - use in modified program versions

Data Collection Requirements	Structure information (used structures and areas), Floor area, Maintenance and repairing actions (repairing time for materials in building structures if different than default) - default information is given.
Software Application & Tech Support	LCA-HOUSE tool is Excel based Visual Basic coded program
Assessment Method & Result	Building product information bases to the LCA from cradle to transportation to the building site Building life cycle bases to the product information from the cradle to the built house or to the end of service life (including material usage but not including disposal)
Strengths & Weaknesses	Strengths: easy-to-use tool Weaknesses: including material usage but not including disposal
Related Policies and Programs	No
Availability	This tool is the frame for the creation of modified solutions. The licensing and pricing are case-specific
Contact	Sirje Vares VTT Building and Transport P.O BOX 1804, 02044 VTT, Finland phone + 358 9 456 6969 fax + 358 9 467 927 mailto:sirje.vares@vtt.fi http://www.vtt.fi/rte/esitteet/ymparisto/lcahouse.html

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FINLAND

Assessment Framework/Rating: TAKE-LCA

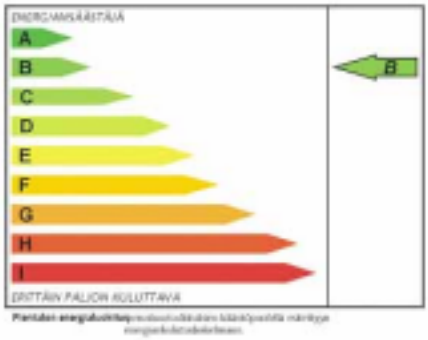
Description	TAKE-LCA is intended to provide a life-cycle assessment of HVAC products and systems. Outputs include energy resources, energy content of the materials and the HVAC-product. Atmospheric emissions (CO2, CO, NOx, SO2, HC, CH4, particles), environmental impacts, climate change (calculated with the Ecoindicator 95-method), acidification (calculated with the Ecoindicator 95-method and DAIA-method) photo-chemical oxidants (calculated with the Ecoindicator 95-method and DAIA-method).
Keywords	HVAC products, life-cycle analysis, LCA
Expertise Required	Some understanding of the life-cycle assessment and HVAC-systems needed
Audience	HVAC product-manufacturers and designers
Existing Users	National: 40 International: none
Data Collection Requirements	The masses of the materials in the HVAC-product Energy use of the HVAC-product (electricity etc.) Life-time of the products
Software Application & Tech Support	Hardware requirements: recommended minimum Pentium/200 MHz and SVGA 800*600 with 256 colors or more. Physical memory > 64 MB. Operating system 32-bits Windows 95/98 or Windows NT 3.5/4.0 MS Excel 97/2000 installed
Assessment Method & Result	Full, excluding disposal

Strengths & Weaknesses	Strengths: easy-to-use tool Weaknesses: the tool is currently in Finnish only
Related Policies and Programs	No
Availability	Currently used at VTT and companies participating in the development project. The licensing and pricing are case-specific. Supported currently only in Finland Report: Holopainen R. et al. "Talotekniikan LCA-laskentaohjelman käsikirja". TAKE F LCE REPORT 48. Helsinki 2001. 65. pages. ISBN 952-5411-01-X. (In Finnish)
Contact	Mikko Nyman, Senior Research Scientist VTT BUILDING AND TRANSPORT Mail: PB 1804, 02044 VTT, FINLAND Phone: +358-9-456 4905 Fax: +358-9-455 2408 E-mail: Mikko.Nyman@vtt.fi

IEA Annex 31 Information Last Updated on November 22nd, 2001

FINLAND

Guideline: Environmental Classification of Properties

Description	Model energy certificates and associated reference consumption levels for single family houses, blocks of flats and office buildings Environmental Classification of Properties is a guideline for evaluating the performance of building with respect to: o Environmental impacts o Use of natural resources o Ecological consequences o Environmental risk management  a
Keywords	Environmental impacts of buildings
Expertise Required	
Audience	
Existing Users	
Data Collection Requirements	
Software Application & Tech Support	Yes

Assessment Method & Result	Energy consumption for the operating stage of the building only. Energy calculations are based on methods described in prEN832 and Finnish Building Regulations part D5. Impacts of energy use are estimated in terms of environmental loadings.
Strengths & Weaknesses	Strengths: Weaknesses:
Related Policies and Programs	
Availability	
Contact	Mikko Nyman, Senior Research Scientist VTT BUILDING AND TRANSPORT Mail: PB 1804, 02044 VTT, FINLAND Phone: +358-9-456 4905 Fax: +358-9-455 2408 E-mail: Mikko.Nyman@vtt.fi

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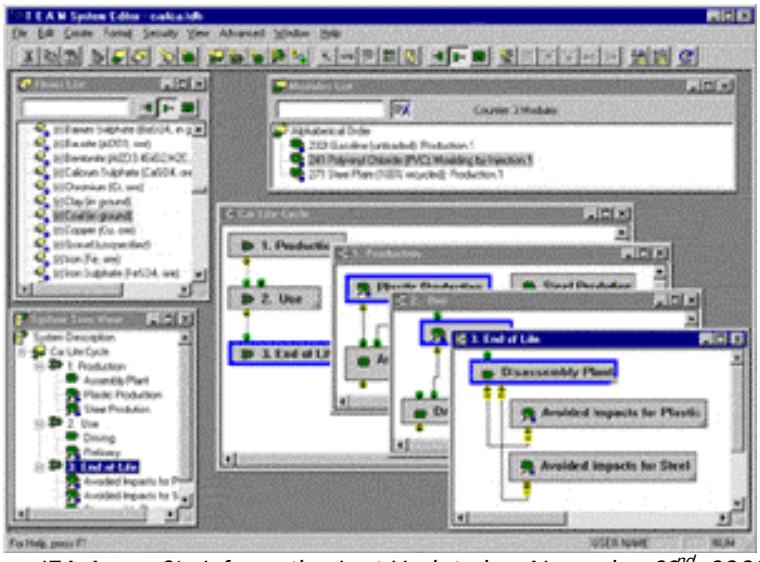
France

LCA Tool: TEAM

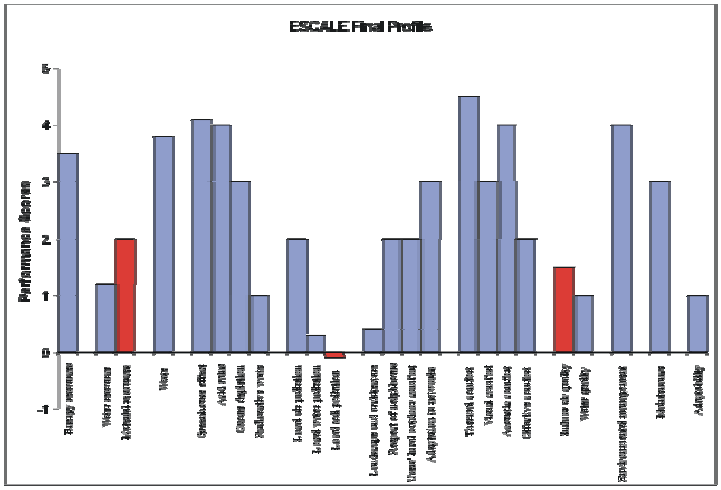
Description	TEAM™ 3.0 is a professional software tool for evaluating the life cycle environmental and cost profiles of products and technologies, including buildings.. The software is modular, with over 600 modules with worldwide coverage. A new functionality has been implemented in TEAM to enable the modelling of constant flows, whatever be the propagation value (example: daily maintenance impacts, fixed assets). By linkages to a comprehensive process and material database, TEAM™ speeds up the process of carrying out a Life Cycle Assessment (LCA) compliant with current methodology standards (e.g., ISO 14040). TEAM™ is a powerful tool used to: o Compile life cycle inventories using Ecobilan Group data or users own data; o Perform sensitivity analyses in an automated fashion to identify 'data hot spots'; o Investigate 'what if' scenarios via user friendly 'Control Panels'; o Conduct life cycle impact assessment determinations using any one of the protocols incorporated within the software; and o Report findings in a variety of different ways making use of the tabular / graphical display options.
Keywords	LCA,
Expertise Required	A Demo is available on-line.
Audience	Engineers, environmental reporting
Existing Users	N/A
Data Collection Requirements	TEAM is accompanied by an extensive LCA database on products, called DEAM.

Software Application & Tech Support	TEAM software is supported with patches, discussion forums, user groups, and troubleshooting.
Assessment Method & Result	LCA for materials used in building, including estimates of o Raw materials: crude oil, coal, iron ore, o bauxite, limestone, water, etc. o Indicators for energy consumption o Intermediate products: naphtha, ethylene, aluminum coil, etc. o Air emissions: CO2, CO, NOx, etc. o Water effluents: total dissolved solids, o COD, nitrates, chlorides, etc. o Wastes: toxic, inert, etc. o Products and co-products o Financial flows: operating cost, capital equipment cost, etc.
Strengths & Weaknesses	**Strengths**: **Weaknesses:**
Related Policies and Programs	
Availability	May be downloaded from the Web.
Contact	PriceWaterhouseCoopers, Ecobilan Global Environmental Services Leader: Thierry RAES +33 1 56 57 60 16 http://www.ecobalance.com/gb_index.html

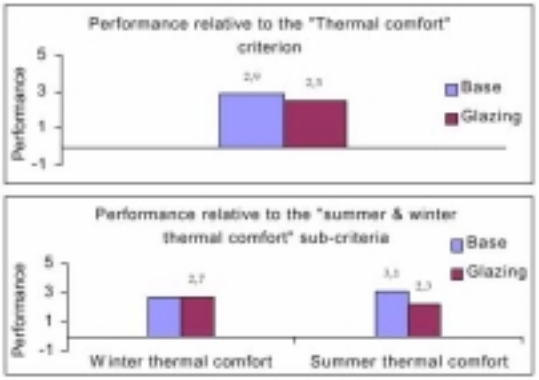


FRANCE

LCA Tool: ESCALE



Description	ESCALE allows to assess and follow the environmental performances of a building project at the design stage. The results are expressed according to assessment criteria (concerns of decision makers). 11 main criteria have been defined (corresponding to outdoor environment at different scales, and to users comfort and health). For each assessment, two levels of models are available, simplified or detailed (all are not yet operational). The final profile is expressed in performance scores, easily understandable. The building is described through the description and the physical features of its components, plus the energy and mass flows during the operation phase.
Keywords	Environmental impact assessment, Building performance, Energy
Expertise Required	
Audience	Escale can be used during the following steps of design process: o sketch and preliminary design (simplified models) o detailed design and construction (detailed models) The tool can be used by designers, and the results can be understood by the building owner. Escale allows the design team to follow step by step a building project, to adapt the assessment detail level to the available data, and to test variants when it is still possible to adjust them. Two levels of users have been defined: project assessor and configuration maker (who can modify the designs).

Existing Users	
Data Collection Requirements	Software requires technical/operational files and layouts/drawings of building project, provided by designers, data on site and infrastructures; assumptions and scenarios. Also required are outputs of simulation or calculation tools (e.g. energy demand, comfort indicies). Reference values are needed for climate data and for energy composition (Oekoinventare ETHZ)
Software Application & Tech Support	Support for external users not yet available.
Assessment Method & Result	According to the criteria assessed, not all the life cycle phases are considered. For example, the construction and the demolition phases are rarely considered. The system limits are defined criterion by criterion. Given the present state of development of the tool, emphasis is put on operation phase (energy and material flows, comfort, health). For each criterion, a performance function is defined, including limit and target values (assessment scales). Impacts are expressed in physical quantities, and also in terms of GWP, AP, depletion indicator, and air critical volumes.
Strengths & Weaknesses	**Strengths**: **Weaknesses:**
Related Policies and Programs	
Availability	The
Contact	Sylviane Nibel/ Nadège Chatagnon CSTB (Centre Scientifique et Technique du Bâtiment), 84, avenue Jean Jaurès -Champs-sur-Marne - BP 2 France F - 77421 Marne-la-Vallée cedex 2 Tel. 33.1.64.68.83.01/ +33.1.64.68.83.50/ mailto:nibel@cstb.fr www.cstb.fr

FRANCE

LCA Tool: Papoose

Description	PAPOOSE (Programmation et Analyse de Projets d'Ouvrages et d'Opérations Soucieux de l'Environnement) is a calculating tool which serves to identify and classify the environmental impacts.of buildings. The results shows the building components which have the largest contribution to environmental impact. The designer or consultant can improve performance by simply changing the most polluting component or material. This process can be continued till the environmental profile is optimal.
Keywords	Design optimization, environmental impact assessment
Expertise Required	
Audience	PAPOOSE is made for the preliminary stages of a project design. In France, there are 6 preliminary stages. This is the reason why PAPOOSE is specially dedicated to building owners and investors. But other professional actors who work on these preliminary stages can be interested by this tool : - Consultant - Services enterprise during the period of the use - Architects At each step, PAPOOSE draws up an environmental balance sheet.
Existing Users	
Data Collection Requirements	Data requirements vary with the stage of design. For detailed design assistance the software requires a list of materials and quantities, drawings and scenarios.
Software Application &	Computer-based analysis and presentations.

Tech Support	
Assessment method & result	Papoose covers all life cycle stages except construction. Addresses energy and material use, environmental emissions, and impacts on human health and comfort.

Issue of Concern	Example Result: (Inventory)
1. Resources	% of recyclable, reuse and renewable materials
2. Energy	kWh/unit
3. Emissions	t CO2/unit, g Sox/unit, g Nox/unit
4. Waste	cm3 nuclear waste/unit
5. Water	m3/unit
6. Acoustic Level	dB(A)
7. Daylighting factor	%

Strengths & Weaknesses	**Strengths**: **Weaknesses:**
Related Policies and Programs	
Availability	
Contact	Alain BORNAREL TRIBU, FRANCE 19, rue Frédérick Lemaître 75020 Paris Phone/ fax/ 33 1 43 49 55 75/ 33 1 43 49 57 07/ mailto:tribu conseil@wanadoo.fr

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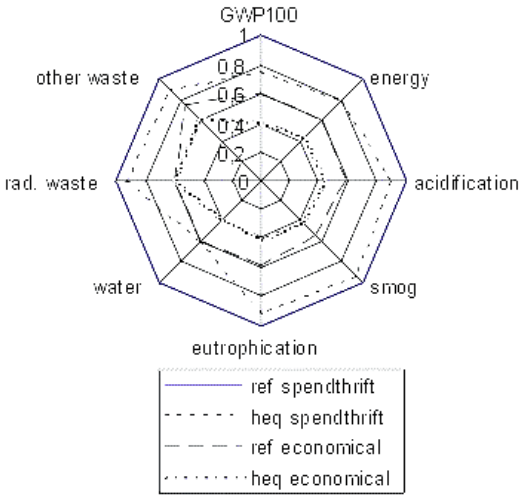
FRANCE

LCA Tool: EQUER

Description	EQUER is a life cycle simulation tool providing quantitative indicators of environmental quality to various actors. The tool is primarily intended to work at the whole building level, in order to capture the trade offs between different systems. For example, a concrete slab may store the heat collected by a window and thus increase the environmental benefit of this window (and vice-versa). The system limits can be chosen according to the purpose of the study. For instance, work-at-home transportation can be included in the analysis when choosing the building site, but it may be excluded in the design steps. Finally, the tool allows for a comparison with a reference building, providing an evaluation of the improvement of environmental performance compared to a present construction standard. 
Keywords	LCA, Building Environmental Performance,
Expertise Required	Not yet available as a stand-alone tool.
Audience	Clients or investors can use EQUER to choose a building site, to define a program (client's brief), or to select proposals in an architectural competition. Designers can compare technical alternatives in a preliminary or a detailed design. They can compare a project with a reference and present the improvements to their clients. Urban design issues can be addressed in a limited scale (estates) with the objective of balancing e.g. heating and transportation related impacts. End-users can assess the role of occupants regarding environmental performance (e.g. choice of thermostat set point, water and domestic waste management, electricity consumption, etc.). Manufacturers can compare technological alternatives during R&D activities concerning building products. Public authorities can use the tool as an aid to define labelling policies. Consultants can participate in the selection of projects in architectural competitions.

Existing Users	
Data Collection Requirements	The data structure is categorized into materials, components and sub-systems based upon the following issues: o Resource depletion o Material and energy flow o Environmental loadings (emissions, waste, and so on).
Software Application & Technical Support	This is a spreadsheet application employed only be the developer.
Assessment Method & Result	EQUER is a life cycle model with user defined life times. Impacts for domestic waste management, transportation, water consumption can be included, according to the purpose of the study. The tool analyses a building in relation to a building site (and the infrastructure networks) as occupied for a certain use
Strengths & Weaknesses	**Strengths**: Use of a 'spider-web' chart helps to compare different scenarios using a large number of environmental indicators. For example, the web shown above compares 4 alternatives: o 2 different building designs, a reference ("ref ") corresponding to the present construction standard in France and a "high environmental quality" ("heq"), and o 2 different users behaviour patterns, a spendthrift and an economical one, differing by the waste, water and energy management. This cross comparison shows that occupants behaviour can be as important as design in the final performance. **Weaknesses:**
Related Policies and Programs	The
Availability	Used for project and research work by staff at the Centre d'Energetique
Contact	Bruno Peuportier Ecole des Mines de Paris, Centre d'Energetique 60 Bvd Saint Michel, 75272 Paris cedex 06 France Phone +33 1 40 51 91 51/ +33 1 46 34 24 91/ mailto:euportier@cenerg.ensmp.fr

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FRANCE

Rating System: Performance Guidelines for Green Buildings

(Les caractéristiques HQE des projets de bâtiments)

Description	A framework has been developed that explicitly defines the characteristics of green buildings, and establishes key indicators or performance in a wide range of areas, from pollution, to resource consumption, accessibility and occupant health and comfort. HQE is also establishing environmental management guidelines for construction of buildings, and renovation. These guidelines will all serve as a foundation for a green labeling scheme for buildings, supported by the national government.
Keywords	
Expertise Required	
Audience	Architects and developers
Existing Users	Still in development
Data Collection Requirements	Unclear
Software Application & Tech Support	Yes

Assessment Method & Result	All stages are considered
Strengths & Weaknesses	Strengths: Comprehensive framework. Weaknesses: Still not operationalised.
Related Policies and Programs	N/A
Availability	Draft guidelines are available from CSTB
Contact	Mme. Sylviane Nibel, CSTB, France mailto:NIBEL Sylviane <nibel@cstb.fr>

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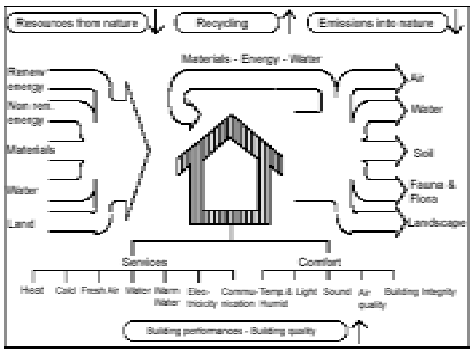
FRANCE

LCA Tool: REGENERS



Description	REGENERS is a simulation tool that allows the comparison of alternative designs. The functional unit considered is the whole building over certain duration. Impacts due to the activities of occupants (e.g. home-work transportation, domestic waste production, water consumption) may be taken into account, e.g. when comparing various building sites with different home-work distances, waste collection and treatment system, water network efficiency etc. Coupling LCA and energy calculations simplifies the use of the tool, and makes the comparison of design alternatives easier. The two models are linked according to a formalism taken from the STEP approach (standard for computer data exchange.
Keywords	Rating tool for buildings
Expertise Required	
Audience	Architects
Existing Users	France
Data Collection Requirements	
Software Application & Tech Support	

Assessment Method & Result	
Strengths & Weaknesses	Strengths: Coupling LCA and energy calculations simplifies the use of the tool, and makes the comparison of design alternatives easier. Weaknesses:
Related Policies and Programs	
Availability	
Contact	Bruno Peuportier Ecole des Mines de Paris Centre d'Energétique - Etablissement de Paris 60 Boulevard Saint-Michel - 75272 Paris Cedex 06 Tél (1) 40 51 9151 - Fax (1) 46 34 24 91 mailto:bruno.peuportier@cenerg.ensmp.fr Web site: European REGENER Project, evaluation of environmental impacts of buildings.

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FRANCE

Energy Modeling Software: SIMBAD

Description	The SIMBAD Building and HVAC Toolbox can be used to design new control strategies for HVAC systems or local controllers. It is also used to build simulators for the development of fault detection techniques. These simulators can also act as emulators to test real controllers or energy management systems. The toolbox is made up of 10 main groups of models: Building Zone, Generation, Distribution, Emission, Control Device, System Environment, System Utilities, Psychrometrics, Math & Control Utilities, and Coils. The open structure of the models enables users to modify and personalize them. This product is used by manufacturers of control products for building systems, such as HVAC or lighting equipment, as well as research institutes and universities working in the field of building control and automation or energy management systems. The SIMBAD and HVAC Toolbox is built using the standard block libraries in Simulink. The models are built hierarchically to make optimal use of the graphical environment. Simulation data are stored in MAT-files; post processing and graphical displays are done in MATLAB.
Keywords	Control design, Simulation, Thermodynamics, Utilities/energy
Expertise Required	
Audience	
Existing Users	
Data Collection Requirements	

Software Application & Tech Support	Online documentation for these models is available. The software is based on specialized programs that must be purchased: MATLAB, Simulink
Assessment Method & Result	
Strengths & Weaknesses	**Strengths**: **Weaknesses:**
Related Policies and Programs	
Availability	
Contact	Centre Scientifique et Technique du Batiment (CSTB) 84 Ave Jean Jaures Champs Sur Marne, Marne La Vallee 77421 FRANCE Tel: 33 1 64 68 83 18 Fax: 33 1 64 68 83 50 mailto:simbad@cstb.fr http://www.cstb.fr/

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GERMANY

Checklist: BM Bau Building Passport

Description	The Bau Building Passport is a user handbook and product specification guide that is created for buildings and provided to the owner. The building passport consists of a number of modules and contains an energy passport. Typically the building particulars would include: o Geometric form and volume o Type and quantity of building material o Thermal and noise insulation, fire protection o Health and environmental protection o Predicted energy and water consumption rates o Maintenance, care, renovation, and demolition The building passport is based upon regulations set out by trade organisations and the national authorities. These determine content and appearance. The objective is a complete description (and possibly evaluation) of the building with regard to its constituent parts and its and their properties. It is analogous to a user handbook and product specification.
Keywords	Product specification guide
Expertise Required	A building passport is drawn up by the planner, surveyor or engineer and handed over to the owner to be kept with the remaining building documents.
Audience	Planner, owners
Existing Users	
Data Collection Requirements	Energy usage data and inventory of equipment
Software Application & Tech Support	No, computerised tools are still in the development stage.

Assessment Method & Result	No
Strengths & Weaknesses	Strengths: A complete and specific documentation of a building in one document Weaknesses: degree of work involved when drawing it up manually
Related Policies and Programs	
Availability	
Contact	

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GERMANY

LCA Tool: EcoPro

Description	EcoPro is a Life Cycle Analysis (LCA) tool. It calculates the impacts of energy and material usages and flows on the environment. It allows modeling of life cycles of products in graphical flow-chart manner. The life cycle systems can contain as many subsystems as you like, a top-down approach is possible.
Keywords	LCA tool for building materials
Expertise Required	CAD
Audience	Ecopro can be used by architects during: preplanning, preliminary design and definite design
Existing Users	
Data Collection Requirements	The building will be descried by elements. The elements consist of building components, which are described by materials. Data is provided on materials.
Software Application & Tech Support	Computer-based application.
Assessment Method & Result	Whole life cycle: construction, use/operation, maintenance/modernization, and demolition. The lifetime is variable. Impacts expressed using standard LCA classifications, environmental loadings, toxicity and monetarisation.
Strengths & Weaknesses	Strengths: Weaknesses:
Related Policies and	

Programs	
Availability	
Contact	Institut für industrielle Bauproduktion (ifib), Universität Karlsruhe, 76128 Karlsruhe, Germany Prof. N. Kohler, Dipl.-Ing. M. Koch +49 721 608-2167/ +49 721 608-6980/ mailto:markus.koch@ifib.uni-karlsruhe.de http://www.ecopro.de/

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GERMANY

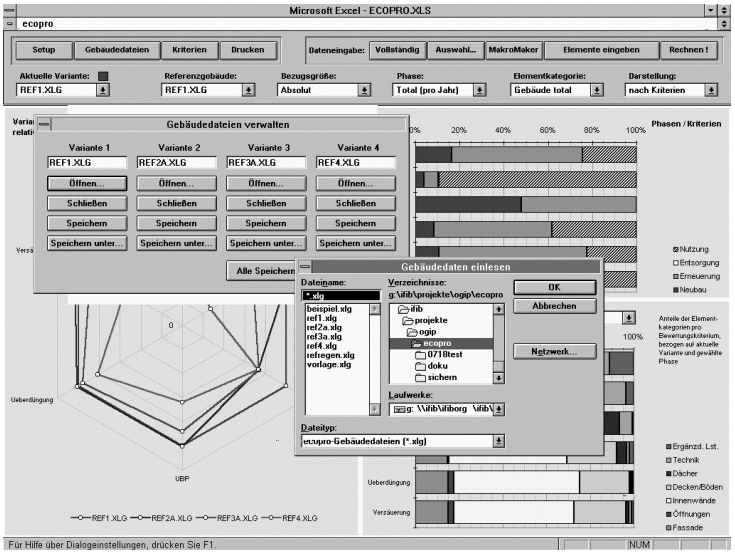
LCA Tool: Legoe

Description	Legoe is a CAAD system with integrated quantity surveying & energy calculations. The goal of the LEGOE-project is the integration of an ecological evaluation into normal work routines and tools used by architects and engineers. This integration will take the form of complex integrated design and construction tools. In addition to usual building cost rates and performance certifications. The designer will be be provided with additional information during the design process, which will allow a direct feedback in terms of economic data, ecological data, energetic data and comfort. Unlike in conventional design tools, the whole life cycle of a planned construction is intended to be represented. To support an analysis - the contribution of each element or building part to the energy and mass flow during the life cycle is shown.
Keywords	
Expertise Required	CADD skills.
Audience	LEGOE can be used by designers during: preplanning, preliminary design and definite design. Results help decision making during the planning stage, for investors, architects and users.
Existing Users	

Data Collection Requirements	The building data is organized elements, composed of building components, composed of materials.
Software Application & Tech Support	CADD application with database.
Assessment Method & Result	Legoe addresses the whole life-cycle: construction, use/operation, maintenance/modernisation, and demolition. The lifetime is variable. Energy end use demand is calculated according to SIA 380/1 and EN 832. The analysis considers energy demand,water consumption and waste. All LCA classification factors are included. Full aggregation is accomplished by means of eco-indicators addressing environmental loadings, effects to flora and fauna and effects to human beings
Strengths & Weaknesses	**Strengths**: **Weaknesses:**
Related Policies and Programs	
Availability	

Contact

http://www.legoe.de/



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JAPAN

Technical Guideline/Reference: ECDG

Description	The main aim of this 28-page guide is to define environmental design. The correlation chart and cross map which shows relationship of environmental issues are especially visible and understandable for the planners or designers. Each design issue is rated over a range of three: credit 0 for no features; credit 1 for a general response; and 2 for a positive response. The issues addressed include: A: Attitude for environment problem B: Pollution of atmosphere C: Reservation of resource D: Protection of biosphere E: Safety of city F: Wastes G: Landscape H: Amenity
Keywords	
Expertise Required	
Audience	
Existing Users	
Data Collection Requirements	
Software Application & Tech Support	none
Assessment Method &	Covers the following life cycle stages: material and energetic preliminary stages; manufacture of building products; manufacture of technical systems erection of

Method & Result	building (construction process); operation of building (heating illumination, air-conditioning etc.), use, and demolition.
Strengths & Weaknesses	Strengths: Weaknesses: Rating scale is restricted to only three levels.
Related Policies and Programs	
Availability	
Contact	Yasuhiko Konno, Institute of Technology & Development, Sumitomo Construction Co., Ltd. mailto:yskonno@sumiken.co.jp http://buswww.dad.kit.ac.jp/cop3c-aij/c4n-sample-e.html

IEA Annex 31 Information Last Updated on November 22nd, 2001

JAPAN

Guideline: Tokyo Metro Green Building Program

Description

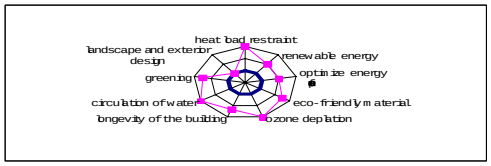
The Tokyo Green Building Program includes a set of building guidelines that will become mandatory in June 2002. The guidelines will apply to every new and retrofit building over 10,000m2. Scope of the guidelines is:

- o Energy Efficiency
- o Materials, and
- o Natural Conservation.

Building owner will have to prepare and submit an Environmental Statement. Details of the required statement are posted on the TMG website.

The Goals of this program are to;

1. Create value for green building in the marketplace; and
2. Promote development of new environmental technology.



evaluation of each item

area	item	item (in detail)	points (applied/max)	objective evaluation level1	level2	level3	subjective level2	level3
efficiency energy	1 heat load restraint		2 / 2					
	2 renewable energy	active	1 / 2					
		passive	1 / 2					
	3 energy efficiency	energy efficiency	1 / 2					
		optimize energy performance (BEMS etc.)	1 / 2					
	¡ district heating&cooling		NA					
material construction proper use of	4 eco-friendly material	recycled aggregate	1 / 1					
		[illegible]	1 / 1					
		[illegible]	/ 1					
		other eco-friendly materials	1 / 1					
	5 ozone depletion	insulation material	1 / 1					
		HVAC &refrigeration equipment	1 / 1					
	6 longevity of the building	adaptability for renovation/renewal	2 / 2					
		longevity of the structure	/ -					
		reuse of construction material (applied for short span buildings)	NA					
	7 circulation of water (1)	use of captured rain or recycled water	1 / 1					
natural conservation of	7 circulation of water (2)	minimizing water runoff and increasing on-site infiltration	1 / 1					
	8 greening	quantity: greening on site	1 / 1					
		quantity: greening on roof	1 / 1					
		quantity: greening by trees	1 / 1					
		greening for eco-habitation	/ 1					
	9 landscape and exterior design	covering material of ground	/ 1					
		covering material of building	/ 1					

@@@Ftargets of evaluation

@@@Ftargets of evaluation achieved for this building

NA@@@@@Ftargets of evaluation which are not applied for this building

Keywords

Green Building, Regulation, Guideline

Expertise Required

No special expertise required.

Audience

All building Owners in Tokyo

Pending launch of guidelines in June 2002.

Existing Users	
Data Collection Requirements	
Software Application & Tech Support	No software support at present.
Assessment Method & Result	A detailed assessment is required on at least 11 key indicators of performance (see summary table).

Energy	Reducing Heating and Cooling Loads	Layout^ Thermal Insulation Roof , Wall and Window
	Renewable Energy	Passive^ Active
	Energy Conservation Technique	Air Conditioning^ Mech. Ventilation^ Lighting^ Hot Water^ EV^ BEMS
	District Heating &Cooling	District Heating and Cooling
Materials	Eco-Material	recycled aggregate^ mixed cement^ recycled steel^ other eco-friendly materials
	Ozone Depletion	insulation material^ HVAC &refrigeration equipment
	Longevities	adaptability for renovation/renewal^ longevity of the structure^ reuse of construction materia
	Water(1)	use of captured rain or recycled water
Natural Environment	Water(2)	minimizing water runoff and increasing on-site infiltration
	Greening	quantity of greening^ greening for eco-habitation
	Land & Exterior	covering material of ground and Building

Strengths & Weaknesses	**Strengths**: **Weaknesses:**
Related Policies and Programs	
Availability	An outline of the Guidelines is available on the Tokyo Metropolitan Government website.
Contact	Urara SANO Director of Green Building Section Bureau of Environment, Tokyo Metropolitan Government mailto:building@kankyo.metro.tokyo.jp http://www.kankyo.metro.tokyo.jp/

IEA Annex 31 Information Last Updated on November 22nd, 2001

JAPAN

LCA Tool: BRI LCA

Description	BRI LCA TOOL is a life cycle energy and CO2 analysis program, which can be operated on personal computer. This tool evaluates office, Multi Unit Residential Housing and single family houses. The program is composed of several main routines which in combination evaluate the impact of building type, location, choice of materials and components, life style of occupants, characteristics of the office work spaces, construction and demolition methods and the transportation methods.
Keywords	LCA, Energy and CO2
Expertise Required	The software is relatively easy to use for those familiar with Windows software. By clicking on the caption icon, the main menu of the Life Cycle Analysis Program is accessed. This main menu is composed of fourteen dialog boxes. By clicking each dialog box the sub menus can be viewed and accessed.
Audience	Intended for use both as a design tool and a research tool
Existing Users	Currently in use by designers, engineers, researchers and students in Japan
Data Collection Requirements	The program includes an LCA database for energy and CO2. The basic data for energy were collected through enormous surveys that included not only input/output analysis, but also investigations of direct energy input.
Software Application & Tech Support	The program is developed in Microsoft Visual Basic, and operated on Windows 95.
Assessment Method & Result	The results of the calculation can be described in both MJ unit and kcal unit. Also results of several different analyses can be compared. The detailed data tables of the results of the calculation and some figures can be printed out. The database is organized into three categories of impacts. Users of the program can add and

	organized into three categories of impacts. Users of the program can add and change the range of items and default values within the database.
Strengths & Weaknesses	**Strengths**: **Weaknesses:**
Related Policies and Programs	
Availability	The software is available from the Building Research Institute in Japan A new version is now being developed.
Contact	Takao Sawachi, Head, Building Service Division, Department of Environment Building Research Institute, Japan mailto:tsawachi@kenken.go.jp http://www.kenken.go.jp/english/index.html

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NETHERLANDS

Assessment Method: EcoQuantum

Description	Eco-Quantum assesses the environmental burden of a complete building on the basis of LCA. The software evaluates the impact of energy use, maintenance, and differences in durability of building components and product reuse and renovation. Architects can use the computer program to assess in a quick, simple and objective way the total environmental burden (full life cycle) to improve their building design. It is a useful decision support tool because it allows for easy comparison of building design alternatives.
Keywords	LCA-tool, full life cycle, material, energy, water, housing
Expertise Required	The input process is simple but requires time to fully understand.
Audience	Designers, consultants and regulatory groups (like local authorities)
Existing Users	Domestic (Netherlands). Clients and civil servants use Eco-Quantum as a policy instrument to determine environmental targets for housing programmes. Architects use the programme to optimise the environmental terms of their designs.
Data Collection Requirements	Yes, buildings specifications (materials, installation). Data on Environmental effects are embedded
Software Application & Tech Support	Yes

Assessment Method & Result	Eco-Quantum has three types of assessment. • 12 internationally agreed environmental impact categories. 1. 4 environmental measures (depletion, emissions, energy and waste). 2. 1 Eco-Quantum score; an aggregation and weighting of the impact categories.
Strengths & Weaknesses	Strengths: Easy to use and extensive database with the most common materials and products. Wide variety of assessment methods. Weaknesses: Eco-Quantum is only applicable to single residential buildings. Subjective weighting in assessment. The user cannot extend extensive database with new products or materials.
Related Policies and Programs	The development of the MMG method (Material related Environmental impact of a building) is partly based on the Eco-Quantum method
Availability	The program can be purchased as a multi-user version (MS Windows): 1-25 users at ca 350 Euro and 10-25 users at ca 590 Euro
Contact	Foundation for Building Research (SBR) or National Green Building Centre, Telephone +31 10 4124766. http://www.ecoquantum.nl

IEA Annex 31 Information Last Updated on November 22nd, 2001

NETHERLANDS

Rating System: EcoIndicator

Description	Designers need some kind of a yardstick to measure the environmental impact of a material, or process. Without such a tool a designer is left guessing if he or she wants to take the environment into account. The Eco-indicator 95 is developed to provide such tool. An Eco-indicator is a score or value that expresses the total environmental load of a material or process in a single figure. Weighting is considered to be the most controversial step in life cycle impact assessment. In the Eco-indicator 99 project the weighting step is performed by a panel in a careful procedure. All efforts were made to make this step as straightforward as possible.
Keywords	Weighting, life cycle impact assessment
Expertise Required	None
Audience	Product developers
Existing Users	Nedcar, Philips, Océ, tools like Eco-Quantum
Data Collection Requirements	
Software Application & Tech Support	
Assessment Method & Result	Weighting by expert judgment, the result is the indicator
Strengths & Weaknesses	Strengths: expert judgement to weight the environmental impacts Weaknesses: aggregating results into one indicator: apples and pears are compared, it is a political indicator

Related Policies and Programs	The weighting figures according to Eco-indicator is used in Eco-Quantum
Availability	All Eco-indicator reports are available at the website
Contact	http://www.pre.nl/eco-indicator99

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NETHERLANDS

LCA Tool: EcoInstall

Description	Eco-Install is a programme that determines the integral environmental performance of installations in a building. Ongoing energy and water savings can results in more equipment and materials. Eco-Install is based on LCA (Life Cycle Assessment) methodology and provides the installation manager with information to adjust its design on time. The programme is developed by ISSO in cooperation with TNO-MEP in Apeldoorn. Eco-Install is a LCA software tool, which calculates the overall environmental effect of an installation within the context of the civil infrastructure. The results can be used for conceptual choices in the design stage. The tool calculates the environmental effect of the installations in a building.
Keywords	LCA tool, installations
Expertise Required	unknown
Audience	The main aim of this tool is to support the decision-making in the design phase. However during the total life cycle of the combination of a building and its installation, decisions must be made on replacement, maintenance, etc. Also the tool can be helpful in making design decisions when combined with life cycle costing.
Existing Users	none
Data Collection Requirements	Specifying components of an installation is the responsibility of the user. In near future a component database will be available, to provide LCA data for the various materials, processes and disposal/ recycling values.
Software Application & Tech Support	
Assessment Method & Result	The LCA model applied is a modification of CML 1992. The modification is that improved characterisation factors have been established. The scope includes the installation (heating, cooling, hot water supply, ventilation, humidification) and the civil construction in order to maintain a specific degree of comfort. The model

	is based on a total life cycle of the building (presently 70 years). Real lifetime of the installation and the elements of the installation are determined as default in the tool. The replacement and maintenance processes are calculated on a yearly basis. Scores on the environmental themes are aggregated score for all themes, including emissions of individual pollutants, resource depletion, energy and materials.
Strengths & Weaknesses	Strengths: focus on installations which can be responsible for a major part of the environmental impact of a building Weaknesses: very much in dept
Related Policies and Programs	In the future it should be integrated in Eco-Quantum
Availability	Not yet
Contact	ISSO P.O. Box 1819 3000 BV Rotterdam The Netherlands Phone: 010- 206 59 69 Http;\\www.isso.nl

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NETHERLANDS

Assessment Method: MMG

MMG –Material related environmental aspects of buildings

Description	The MMG is an assessment method to determine the integral environmental impacts of a complete building. Its being developed by the Dutch Standardisation Institute and concerned organisations. The MMG is based on the LCA-methodology. The Dutch Ministry of Housing, Spatial Planning and the Environment sponsors the development of the method. In the near future the MMG method could become part of the Dutch Building Code.
Keywords	Integral environmental assessment of building, LCA, standard
Expertise Required	The users should have building experience. In the future there will be
Audience	Designers, architects, local authorities
Existing Users	None
Data Collection Requirements	Complete description of building
Software Application & Tech Support	None
Assessment Method & Result	LCA
Strengths & Weaknesses	**Strengths:** complete environmental assessment of material use in buildings **Weaknesses:** not yet published, very extensive method.
Related Policies and Programs	Eco-Quantum, MRPI, Building Code

Availability	No
Contact	Dutch Standardisation Institute http://www.nen.nl/ Ministry of Housing, Spatial Planning and the Environment http://www.minvrom.nl/

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NETHERLANDS

Guideline or Checklist:

National Packages Sustainable Building

Description	This package is used for planning and realisation of sustainable residential and office buildings. It consists of hundreds of measures sustainable buildings and information on their application, environmental impact, aspects of implementation and costs per measure. The package compiled for new residential buildings, new office buildings and maintenance
Keywords	Guideline, measures, sustainability, theme's
Expertise Required	None
Audience	Local authorities, designers/architects and consultants
Existing Users	Dutch local and regional authorities, Dutch government, designers/architects and consultants
Data Collection Requirements	None
Software Application & Tech Support	Yes, the package is published on CD and as booklet.
Assessment Method & Result	Selection of measures by theme, obligatory, cost level
Strengths & Weaknesses	**Strengths:** extensive amount of measures to improve the sustainability of buildings. Clear distinction in themes. Combination of ambition levels of sustainability and indication of investment costs. **Weaknesses:** with increasing amount of measures it becomes less manageable.
	National sustainable building policy, many local policies, convenants/agreements

Related Policies and Programs	and Cost Reference Model
Availability	Available at Foundation for Building Research
Contact	Foundation for Building Research (SBR) P.O. Box 1819 3000 BV Rotterdam The Netherlands phone: +31-10-2065959 http://www.sbr.nl

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NETHERLANDS

Guideline or Checklist: Costing Reference Model

Description	The Cost Reference Model is an LCC tool for residential houses. It aims at the professional client (housing corporations, project developer, investor) and guides sustainability decisions. The Cost Reference Model can be used in an early phase. The tool gives guidance to clients briefing and adds objectivity to the discussion between client, developer, architects and other stakeholders. Cost Reference Method developed by DHV in co-operation with the SBR (Foundation for Building Research). The model calculates investment and exploitation costs for additional sustainability measures.
Keywords	Investment and exploitation costs, measures for sustainable buildings,
Expertise Required	Little or no expertise needed to work with the model.
Audience	Civil servants, consultancy and housing corporations
Existing Users	Dutch civil servants, consultancy and housing corporations
Data Collection Requirements	The project needs to be defined in terms of: o general building design: amount of floors, archetype, dimensions, amount of units. o quality parameters: additional measures for sustainable building need to be selected from the 'National Package'(catalogue / national standard for sustainable building) o cost information: investment category, exploitation trend, start rent, subsidies
Software Application & Tech Support	SBR and DHV
Assessment Method & Result	LCC method based on investment and exploitation costs.
Strengths & Weaknesses	Strengths: Weaknesses:

Related Policies and Programs	National Packages Sustainable Building
Availability	Available at Foundation for Building Research at 192.86 euro
Contact	Foundation for Building Research (SBR) P.O. Box 1819 3000 BV Rotterdam The Netherlands phone: +31-10-2065959 http://www.sbr.nl

IEA Annex 31 Information Last Updated on January 18nd, 2002

NETHERLANDS

Environmental Product Declaration: MRPI Netherlands

Description	Dutch MRPI (Environmental Relevant Product Information). Environmental Relevant Product Information (MRPI®) stands for: "reviewed information about the environmental aspects of a building material, building product or building module, based on an environmental life cycle assessment (LCA) and initiated by the manufacturer or its representative". Individual or co-operative manufacturers communicate through MRPI® about the environmental aspects of their building materials, products or elements. The information is set up under the responsibility of the manufacturer, and is released after it has been reviewed externally. The underlying MRPI®-project determined the rules for composing Environmental Relevant Product Information (MRPI®). the members of the Dutch Society of Suppliers for the Building industry (Nederlands Verbond Toelevering Bouw, NVTB) broadly endorse the agreements about the rules. An example of such an agreement is that MRPI® has to be based on a life cycle assessment (LCA, a method to determine the environmental burden from cradle to grave). Another agreement says that data have to be reviewed (verification) by an independent organisation prior to the market introduction of the MRPI®.
Keywords	Product information, standardised, LCA.
Expertise Required	LCA expertise and extensive knowledge of the product and the production process is required.
Audience	Branch organisation, industry and consultants.
Existing Users:	Dutch branch organisations or industry in cooperation with engineering agencies.
Data Collection Requirements	Yes, LCA data needed of specified product
Software Application & Tech Support	None
Assessment Method &	A completely conclusive standard has not been determined for the LCA-methodology yet. MRPI® limits the degrees of freedom when performing an LCA,

Method & Result	methodology yet. MRPI® limits the degrees of freedom when performing an LCA, which means that there is a standard format for building materials, products and modules. The environmental profile of the LCA is used to calculate the environmental measures. Developing "Environmental measures on a product and building level" is one of the foremost items in the Dutch Sustainable Building campaign. Agreements have been made on the NVTB stimulating the market introduction of environmental relevant product information. MRPI® systematic has been developed in order to be able to conduct an LCA in uniform fashion. Based upon this uniform system, the supplying industry for the building trade is able to present reliable information to all actors in the building column.
Strengths & Weaknesses	Strengths: clear sheets and easy to communicate. Standardised format and method. Weaknesses: time intensive procedure especially when a complete LCA has to be conducted.
Related Policies and Programs	MRPI sheets are used to expand databases of programs such as Eco-Quantum. In the future MRPI will follow the MMG method.
Availability	Engineering agencies that are approved by the MRPI Foundation check the MRPI scans.
Contact	MRPI Foundation Postbus 2149 6802 CC Arnhem The Netherlands Telephone: 026-3633575 Fax : 026-3633579 Email: info@mrpi.nl http://www.mrpi.nl

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NETHERLANDS

Energy Modelling Software: NEN 2916/5128, NPR 2917/5129

Description	NEN 2916, NEN 5128, NPR 2917 and NPR 5129 are national standards to describe and calculate energy performance in residential and office buildings. The Dutch Standardisation Institute publishes these standards. o NEN 2916: Energy Performance of office buildings o NPR 2917: Energy Performance of office buildings - Calculation o NEN 5128: Energy Performance of housing buildings o NPR 5129: Energy Performance of housing buildings - Calculation program The Dutch Building Code refers to these standards in chapter 5: requirements for energy savings.
Keywords	Calculation method, energy performance, Dutch standard, residential buildings, office buildings, energy performance coefficient
Expertise Required	Extensive knowledge of building physics is required. Several software tools are available that simplify input and calculation. Broad variety on energy data is required: energy use, energy installation and thermal insulation.
Audience	Building engineers
Existing Users	Dutch engineering agencies
Data Collection Requirements	Broad variety on energy data is required: energy use, energy installation and thermal insulation.
Software Application & Tech Support	Variety of software available for MS Windows. For example: EPW for Windows v1.1 developed by DGMR
Assessment Method & Result	Energy efficiency and performance are calculated with heat losses, thermal insulation, and energy use of the building. The result of the assessment is the Energy Performance Coefficient (EPC), which is based on a quota for energy use of a building per m^2 AG.
Strengths &	**Strengths**: The EPC makes performance driven policy possible.

Weaknesses	**Weaknesses**: Calculation does not result in an indication of environmental impact. Only takes energy use and losses into account.
Related Policies and Programs	EPC's for residential and office buildings are enclosed in law (Building Code or –in Dutch "bouwbesluit"). New buildings have to comply with a maximum EPC.
Availability	Official documents are available at the Dutch Standardisation Agency
Contact	**Documents:** http://www.nen.nl **Software, e.g.:** http://www.dgmr.nl

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NORWAY

Assessment Framework and Rating: Ekoprofile

Description	A top down method used to assess existing office buildings and new residential housing. Each parameter (energy, water, materials, land, temperature, emissions etc.) is compared with an actual value. The assessment and results are presented for the three areas: External climate, Resources and Indoor climate. The tool is split into two main parts. One part can be used to analyse the site before the building is decided. The other main part contains the total project, with the result from the site analysis included. The site analysis contains 21 parameters, while the tool for the total project include 87 parameters. The total result is both given as a main profile of the three main areas and as more detailed result as rose diagrams for each of the three areas.
Keywords	Building environmental assessment method, Energy consumption,
Expertise Required	
Audience	The tool can both be used as a checklist during the planning process and as a tool to document the planning results. When the method is used to classify existing buildings the user must be trained and neutral. The results can be used in connection with sale and hire of office buildings. With some adjustments, the method can either be used as internal management and guidance tool or/and a planning tool for new buildings.
Existing Users	
Data Collection Requirements	
Software Application & Tech Support	The excel sheet contains parameter descriptions, documentation sheets and calculation sheets that calculate and present the Ekoprofile result.

Assessment Method & Result	Three main areas are assessed; the external environment, resources and the indoor climate. Each main area contains several subgroups and parameters. The 100-parameter descriptions contain short explanations of the different categories for each parameter. Reference is made to the national building regulations and relevant information from the Norwegian State Housing Bank, and also to the stage at which decisions are made in the building process and the type of decision-maker. Almost all parameters are given as 4 categories or classes, where the best category is represented with a value 0. The method can to some extent be compared with the British BREEAM method. The different parameters within each group are weighted to some extent, but the weighting is until now not documented. The main groups are not weighted.
Strengths & Weaknesses	Strengths: Weaknesses:
Related Policies and Programs	
Availability	
Contact	The Norwegian Building Research Institute (NBI), GRIP, Storebrand, Gjensidige, NTNU, SINTEF, Entro Energi AS, NVE P.O.Box 123 Blindern Box 0314 Oslo, Norway mailto:Trine.Pettersen@byggforsk.no http://www.norgit.no/projects/okoprofil/

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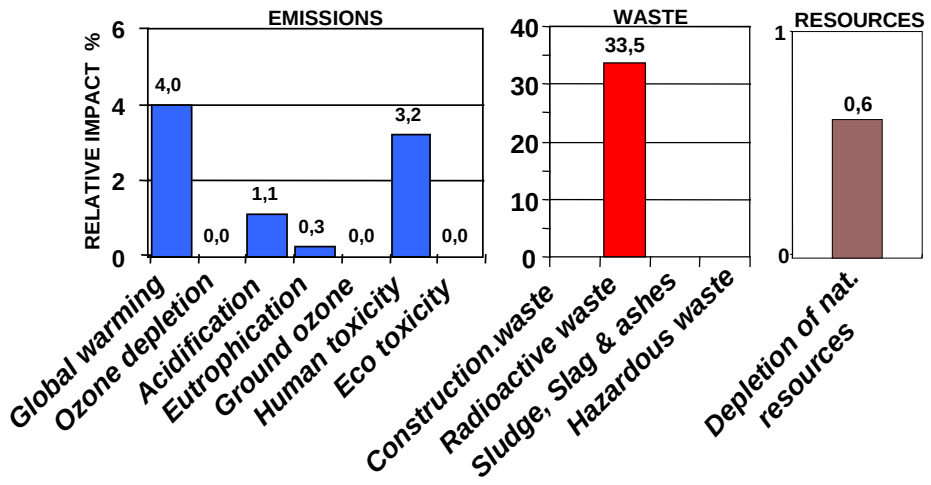
SWEDEN

Interactive Software Model: EcoEffect



Environmental profile for energy and materials in EcoEffect

Description

EcoEffect is a method to calculate and assess the long-term environmental effects caused by the use of a real estate and impact on users staying at the estate. It is developed for managers, consultants and contractors who need information about the environmental impacts associated with the built environment. Energy use, Materials use, Indoor environment, Outdoor environment and Life cycle costs are treated individually in the analysis. For use of energy and materials load numbers for ***emissions***, ***waste*** and ***natural resource depletion*** can be calculated and for indoor and outdoor environment the load numbers that may be calculated represents ***health, comfort***, ***biodiversity*** and ***biological productivity.*** EcoEffect calculates the life cycle costs for issues, which give impacts on the exterior environment like energy, water and waste costs, materials costs, etc.

Keywords

LCA, Assessment Method for Buildings, Assessment of indoor environment, Weighting of environmental impact.

Expertise Required

Familiar to Microsoft Windows

Audience

Variants are intended for use as a design tool and a research tool.

Existing Users

To date the tool has been used on only a few buildings.

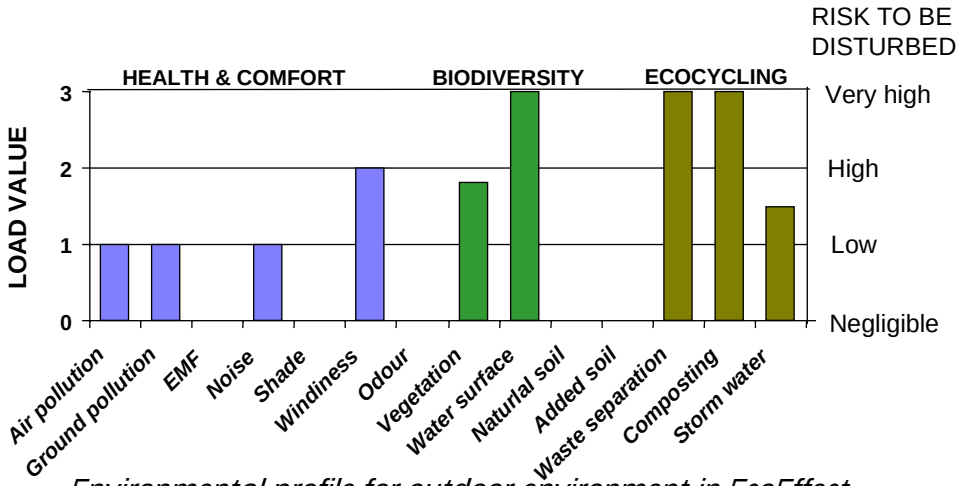
Data Collection Requirements

For existing buildings a user questionnaire along with data on energy, water, waste and materials are used as input. The building and site have to be inspected and if needed radon, EMF and water temperatures are measured. At a planning stage the building is assessed in two steps, first the goals are assesses secondly the solutions to reach the goals. The tool is accompanied by a database for energy and materials.

Software Application & Tech Support

A beta-version of the EcoEffect-computer program has been developed in Microsoft Access. The layout of the program makes it easy to scroll between input data and different levels of detailed and aggregated information to find the reasons for any result. ***Severity (based on the DALY concept), Extent*** and ***Duration*** have been chosen as weighting aspects. The suggested weights are default values that are easy to change.

Assessment Method & Result



Environmental profile for outdoor environment in EcoEffect

The assessment is based on life cycle analysis (LCA) for use of energy and materials and on criteria for indoor and outdoor environment. The result is presented as an environmental profile for each area with bars showing potential environmental effects for different impact categories. A possibility to aggregate this information into a few environmental load numbers for each area is offered to simplify a comparison between elements, buildings or estates. Standard is to compare with a reference building or reference values. The methodology and effect categories are to a considerable extent taken from the Danish LCA methodology, EDIP. The impact scale expresses the relative impact of an average user of the estate in relation to the average impact per capita in the country. Since this normalisation brings all the effects into the same unit, if weighted with respect to their relative importance, they can be added.

Strengths & Weaknesses

Strengths: All measurable impacts have been included
Weaknesses: Details can be difficult to understand for an inexperienced user

Availability

The software is still used only by researchers and the support group of the project (Real Estate companies and consultants)

Contact

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Information Last Updated on December 18nd, 2001

SWEDEN

LCA Tool: LCAiT

Description	LCAiT provides LCA data with many specialized features: o View and add the components of your LCA system o Search the LCAiT databases using predefined SQL questions o Build the structure of your LCA system in the graphical interface o Your system, as well as Inventory Impact results are easy and accessible o View the nomenclatures of your databases o Define or import any Impact assessment method Numerous databases can be viewed simultaneously and the data you need can be copied directly from a database on the network to your own database. Impact factors can be entered from the impact assessment database, inserted manually, or inserted by ASCII file import. Different impact assessment factors can also be copied between databases. LCA data is documented according to the SPINE documentation format allowing you to communicate the information to a third party electronically and transparently.
Keywords	
Expertise Required	
Audience	
Existing Users	
Data Collection Requirements	CIT Ekologik offers an impact assessment database, including characterisation factors (e.g. for type III environmental declarations) and weighting factors. Users can build, view and edit systems in a flexible graphical interface. The graphical interface shows its internal flows and parameters. The inputs and outputs of the processes can easily be edited, entered or deleted, and all the documentation is entered and edited in this window in accordance with the SPINE data format. SPINE (Sustainable Product Information Network for the Environment) has been developed within the Nordic NEP-project, in order to enable an efficient handling of environmental information used in life cycle assessments. CIT Data (including

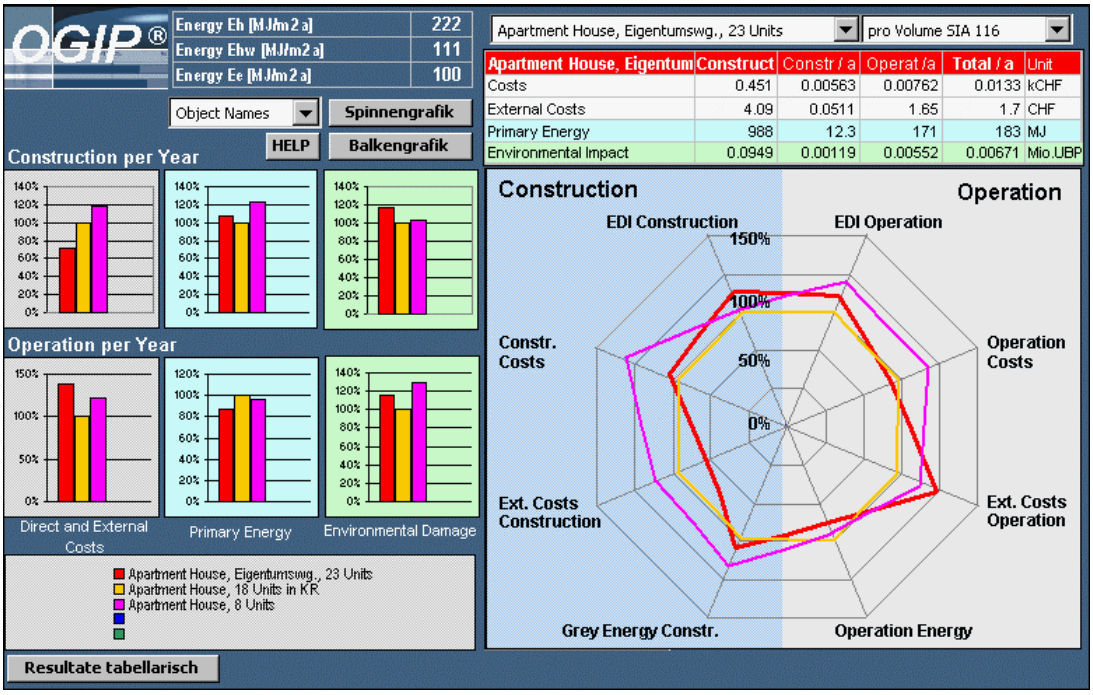
	documentation) can be exported to or imported from other software. Process flows and impact assessment factors can be imported from any spreadsheet or word processing program by ASCII file import. The LCA data are stored in a relation database making them readily accessible through search functions and easy to update.
Software Application & Tech Support	CIT Ekologik offer several customisable LCAiT packages - available with or without support. The packages are composed to suit different needs and there are special packages available for Universities. Most of the LCAiT packages come with an energy and transport database, which includes production and combustion of fuels, production of electricity, and different transport modes.
Assessment Method & Result	
Strengths & Weaknesses	**Strengths**: **Weaknesses:**
Related Policies and Programs	
Availability	
Contact	CIT Ekologik Chalmers Sciencepark SE 412 88 Gšteborg, Sweden Phone: +46-31 772 40 20 Fax: +46-31 82 74 21 mailto:info@lcait.com

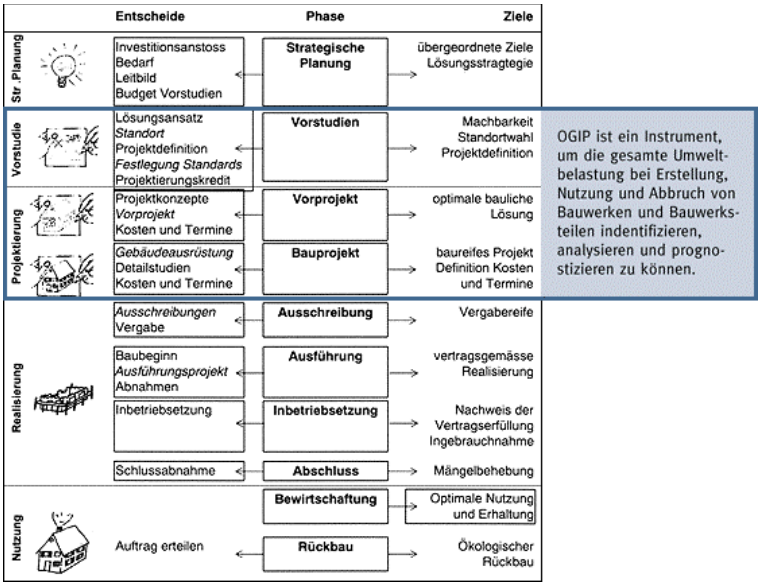
IEA Annex 31 Information Last Updated on November 22nd, 2001

SWITZERLAND

LCA Tool: OGIP

Description	OGIP is an LCA-software tool based on the BEK (building-element-catalogue of the national center of rationalization of building processes CRB) which enables the user to compare building-projects regarding costs, external costs, UBP (Eco-points) and energy. It can be used for all kind of buildings, for new constructions and for refurbishment projects. OGIP presents the complex results graphically and allows a simultaneous optimisation of costs, energy and environmental impacts over the whole life cycle of a building.
Keywords	Life cycle assessment; integrated planning; energy; costs; environmental impacts
Expertise Required	Knowledge of construction processes, the CRB-tools and the calculation of building energy demand is of big advantage.
Audience	





Existing Users	Different consultants and architects and (for development:) scientists
Data Collection Requirements	Data about the building, its constructive elements (surfaces, materials, etc) are needed. The predicted energy consumption will be calculated automatically or can be integrated manually using existing data of the use phase.
Software Application & Tech Support	Running on Windows 95, 98, 2000, NT 4.0, 32 MB-Ram, CD-Rom Drive, 250 MB free space on the hard disk, Excel 4 or higher, Internet Explorer / Netscape
Assessment Method & Result	Construction costs, energy costs and renovation costs in Swiss Francs Primary and End-use Energy in MJ/m^2a Ecological Scarcity, Swiss Eco-points method UBP 97
Strengths & Weaknesses	**Strengths**: The use of the same systematic as quantity surveying, cost calculation and energy tools; the use of a life cycle approach**Weaknesses:** Extensive data needed because it uses the cost calculation method
Related Policies and Programs	
Availability	Available only in German and in combination with introduction course, contact see below

Contact	Mark Zimmermann, EMPA-ZEN, Ueberlandstrasse 129, CH-8600 Dübendorf, Switzerland mailto:mark.zimmermann@empa.ch http://www.ogip.ch/

IEA Annex 31 Information Last Updated on December 5, 2001

SWITZERLAND

Checklist: SIA 493

Description	A method for detailing the properties and characteristics of building products, including: technical characteristics, chemical contents and their sources, information about manufacturing, use, and disposal of the product and energy, health and environment-related information.
Keywords	Product Declaration
Expertise Required	No special expertise is required, but general knowledge of environmental aspects of materials and processes is helpful
Audience	Planners and architects
Existing Users	Planners and architects
Data Collection Requirements	If no data exists, the declaration form can be sent to the producer. He has to fill in the data, which is then published on the net.
Software Application & Tech Support	No software application (only data collection), but technical support available.
Assessment Method & Result	
Strengths & Weaknesses	Strengths: Simplicity Weaknesses: Self-declaration by manufacturer
Related Policies and Programs	

Availability	SIA Schweizer Ingenieur- und Architekten-Verein Postfach 8039 Zürich
Contact	**Ingenieur- u. Architektenverein sia** Generalsekretariat Selnaustr. 16 8002 Zürich Tel. +41 (0)1 283 15 15 Fax. +41 (0)1 201 63 35 http://www.sarnafil.ch/deutsch/produkte/dienstleistungen/3910.htm

IEA Annex 31 Information Last Updated on November 22nd, 2001

SWITZERLAND

Assessment Framework: E2000

Description	E2000 Checklist is an assessment framework based upon the E2000 Öko-Bau-Standard. It allows users to complete a rough ecological assessment of a building based on six E2000 Öko-Bau criteria: Energy supply in use, building technology (efficient ventilation, renewable energy), ecologic materials, efficient use of water, integrated mobility, and cost of construction. The tool is intended for use with residential buildings. It is also used to get better financing conditions.
Keywords	Ecological checklist; sustainability
Expertise Required	No expertise required
Audience	Architects and planners
Existing Users	Architects and planners
Data Collection Requirements	Only data needed for the building permission is used.
Software Application & Tech Support	Not an interactive tool
Assessment Method & Result	Checklist with point-system
Strengths & Weaknesses	Strengths: simplicity Weaknesses: not a "scientific" rating.
Related Policies and Programs	
Availability	

Contact	http://www.energiekonsens.de/info/workshop170500/fassbind/rating e-top/ rating e-top.html

IEA Annex 31 Information Last Updated on December 5th, 2001

UNITED KINGDOM

Assessment Framework/Rating: BREEAM

Description	BREEAM allows owners, users and designers of buildings to review and improve environmental performance throughout the life of a building. BREEAM is regularly updated as new research becomes available in order to ensure that the tool represents the current best practice. The tool considers issues ranging from the global, local and internal environments, and includes resource depletion, material and energy flow, environmental loadings, effects to flora and fauna and effects to human beings. A BREEAM assessment can consist of three elements: A core assessment of the building fabric and services (which provides the basis for the Environmental Performance Index and allows buildings of any age to be compared across the range of issues covered). 1. Design and procurement and management and operation assessments (optional). 2. Pre-assessment design support (optional)
Keywords	
Expertise Required	
Audience	
Existing Users	

Data Collection Requirements	
Software Application & Tech Support	Yes
Assessment Method & Result	
Strengths & Weaknesses	Strengths: Weaknesses:
Related Policies and Programs	The
Availability	The
Contact	http://www.bre.co.uk/sustainable/breeam.html

IEA Annex 31 Information Last Updated on November 22nd, 2001

UNITED KINGDOM

Catalogue: Environmental Profiles of Construction Materials, Components and Buildings

Description

The Environmental Profiles UK National Database is a computer based tool providing LCA information for building materials, and complete buildings based on data provided by UK manufacturers. The Database provides various levels of data ranging from per tonne inventory for individual materials to characterised and normalised data for over 200 building elements. The UK National Database from the Environmental Profiles of Construction Materials, Components and Buildings provides the User with the ability to compare the environmental profile of different materials and components using either functional units (eg m2 of building façade) or for some materials, per tonne. Enviornmental criteria include:

- Primary Energy
- Delivered Energy
- Fossil Fuel Depletion
- Water Input and output
- Transport
- Air Emissions
- Emissions to Sewer
- Emissions to Surface Water
- Emissions to Landfill
- Other solid emissions
- Inputs
- Products/Co-products

Effects are aggregated in accordance with the following classifications:

- Climate Change
- Acid Deposition
- Ozone Depletion
- Human Toxicity (Air, Water)
- Ecotoxicity (Air, Water)
- Fossil Fuel Depletion
- Eutrophication
- POCP
- Dust pollution

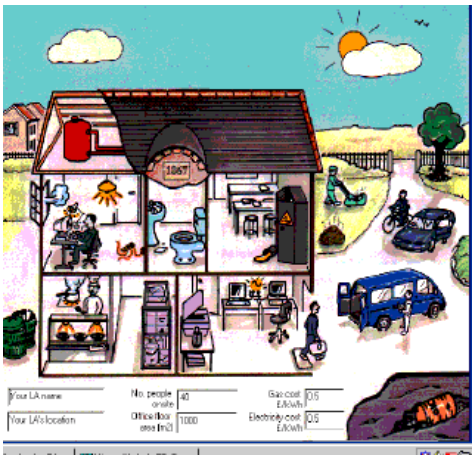
Keywords

Expertise Required	
Audience	The tool can be used to compare the environmental performance of different specifications for materials.
Existing Users	
Data Collection Requirements	
Software Application & Tech Support	Yes.
Assessment Method & Result	LCA assumptions include a 60 year life, and specific data for the actual service life for elements in UK Offices.
Strengths & Weaknesses	**Strengths**: **Weaknesses:**
Related Policies and Programs	
Availability	
Contact	http:/

IEA Annex 31 Information Last Updated on November 22nd, 2001

UNITED KINGDOM

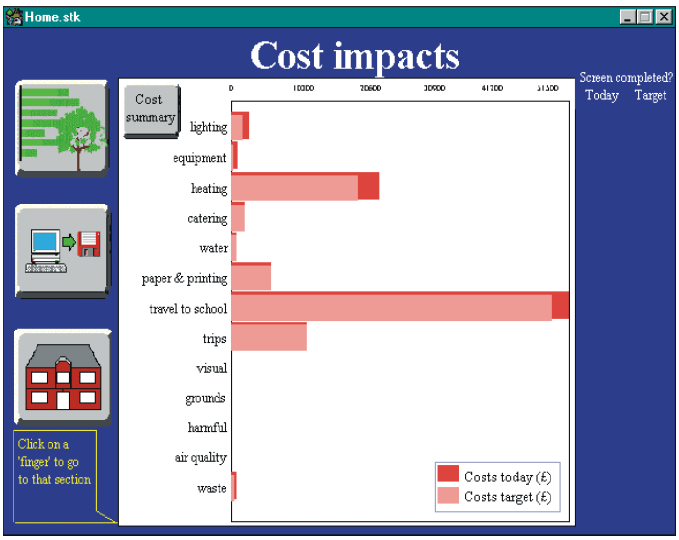
Guideline: Environmental Management Toolkits

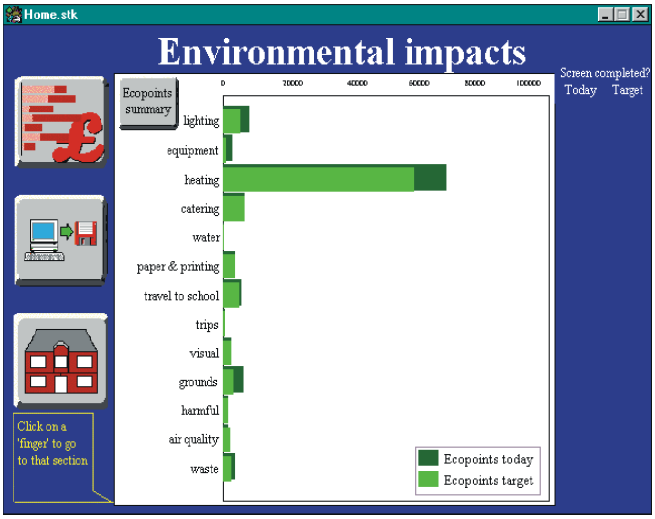


Description	BRE's three Toolkits – for Schools, Local Authorities and Offices – guide organizations through the stages necessary to make reductions in their environmental impacts and save money. They utilise a dual accounting system: recording financial costs in the usual way but also in 'ecopoints' for environmental impact. The Toolkits help the users through the three key steps of reviewing environmental impacts, determining priorities and implementing actions. In establishing these processes, the Toolkits provide a method for managing environmental impacts, and can be a stepping stone towards recognised environmental management standards such as ISO14001. Through a simple review the toolkits allow a rapid overview to be taken and presented in financial and environmental impacts. Actions can be prioritised. Suggested actions can be evaluated to establish likely benefits and an action plan devised and progress monitored. This process allows for continuous improvement over time to optimise performance.
Keywords	
Expertise Required	
Audience	Versions cover Office based SMEs, Schools and Local Authority Building Portfolios. The Toolkits allow a quick review to guide planning. They also allow more informed prioritisation to take account of both financial and environmental impacts and benefits.

Existing Users	
Data Collection Requirements	A building and the operations within it are reviewed through inputing simple and available data. Where possible quantifiable consumption figures are used from bills, meter readings etc. Building features are identified from simple lists by the user - lighting/control types; sanitary installations etc. Other input data include: o Fuel Consumption (net delivered) o Water consumption o Paper consumption o Type of fittings – lighting water use etc. o Cleaning materials etc o Energy - Lighting o Energy - equipment o Energy - heating/cooling o Water/Sewage o Paper/printing o CFCs/HCFCs/Halons o Waste Disposal/Recycling o Commuting o Business travel o Internal Air quality o Harmful Substances o Legionaires disease o Workplace environment o Electrical Safety o Visual Impact o Traffic/noise o Contaminated Land
Software Application & Tech Support	Yes.
Assessment Method & Result	The Environmental Management toolkits provide a simple to use first step environmental management system for smaller organisations. The method focuses on the financial and environmental benefits that can be achieved and allows a comparison of these to allow for better informed prioritising of action plans. Makes use of the Dutch 'Eco indicator' system for measuring Environmental impacts.
Strengths & Weaknesses	**Strengths**: **Weaknesses:**
Related Policies and Programs	

Availability	The
Contact	Building Research Establishment Alan Yates Building Research Establishment Garston, Watford, Herfordshire, WD2 7JR, England Phone/fax/email +44 (0)1923 664480/ +44 (0)1923 664103/ mailto:yatesa@bre.co.uk





IEA Annex 31 Information Last Updated on November 22nd, 2001

UNITED KINGDOM

Assessment Framework: SPeAR

Description	SPeAR™ (Sustainable Project Appraisal Routine) is a project appraisal methodology, to be used as a tool for rapid review of the sustainability of projects, plans, products and organisations. It is the intention that the use of SPeAR™ upstream in a project programme would ensure a more integrated cross-discipline design process, enabling the introduction of emerging and non-standard technologies, practices to project commissions, increasing the opportunity for innovation. This would provide more options for successful project solutions with added commercial and sustainability value for enlightened clients. SpeAR allows the sustainability of a project to be assessed and illustrated graphically at all project stages, demonstrating continual improvement and evloution of a project over time; The SPeAR™ Diagram combines, in a graphical format, the diverse issues that need to be considered for sustainable design, including social, economic, natural resource and environmental issues. This benchmarking diagram shows both negative and positive effects. The ultimate aim of a project, therefore, should be to arrive at the centre of the circle.
Keywords	Sustainability, Project Appraisal
Expertise Required	Available from ARUP consultants
Audience	All types of development projects.
Existing Users	
Data Collection Requirements	Projects are scored using a set of indicators, originally based on the DETR 'background indicators' detailed in **'A Better Quality of life, A Strategy for Sustainable Development for the United Kingdom'** (May 1999), which have been developed and tailored to suit the task of appraising the sustainability of individual projects. Each indicator is scored on a scale ranging from 'optimum case' to 'worst case' scenarios.

Software Application & Tech Support	The spreadsheet behind the production of the SPeAR Diagram that all assessments are fully audit traceable;
Assessment Method & Result	The logical and transparent methodology is adaptable; the indicators demonstrate interaction between the various social, environmental, economic and natural resource indicators of sustainability;
Strengths & Weaknesses	Strengths: Weaknesses:
Related Policies and Programs	
Availability	SPeAR is available as a consulting service from any of the ARUP offices around the world. http://www.arup.com/locations/offices.cfm
Contact	ARUP Environmental Email: environmental\@arup.com; Web Site: http://www.arup.com/

IEA Annex 31 Information Last Updated on November 22nd, 2001

UNITED STATES

Assessment Framework/Rating: LEED Green Building Rating System

Description	A voluntary, consensus-based, market-driven building rating system based on existing proven technology. It evaluates environmental performance from a "whole building" over a building's life cycle. It is designed for rating both new and existing commercial, institutional, and high-rise residential buildings. Within the system, points, or credits are earned for satisfying each criteria, and based on the evaluation, different levels of green building certification are awarded.
Keywords	Rating tool for buildings.
Expertise Required	Users of LEED should obtain accreditation through coursework and an exam.
Audience	Building design, construction industry and/or building business professionals or facilities staff or executive.
Existing Users	North America
Data Collection Requirements	
Software Application & Tech Support	No
Assessment Method & Result	

Strengths & Weaknesses	Strengths: The system is designed to be comprehensive in scope and simple to use. Weaknesses:
Related Policies and Programs	
Availability	Available at http://www.usgbc.org/programs/index.htm
Contact	US Green Building Council 1015 18th Street, NW, Suite 805Washington, DC 20036 Tel: 202/82-USGBC (828-7422) Fax: 202-828-5110 Email: mailto:leedinfo@usgbc.org Web site: http://www.usgbc.org/programs/index.htm

IEA Annex 31 Information Last Updated on November 22nd, 2001

UNITED STATES

Checklist: The BUILT GREEN Checklist

Description	The BUILT GREEN checklist provides the framework for builders to qualify homes for inclusion in the program. The checklist addresses: Site and Water, Energy Efficiency, Indoor Air Quality, Material Selection
Keywords	
Expertise Required	Identify special expertise or training that is needed
Audience	Builders
Existing Users	King and Snohomish Counties, Washington
Data Collection Requirements	
Software Application & Tech Support	None
Assessment Method & Result	Occupancy, and material procurement
Strengths & Weaknesses	Strengths: Weaknesses:
Related Policies and Programs	BUILT GREEN is an environmental building program of the Master Builders Association of King and Snohomish Counties, developed in

	partnership with King County, Snohomish County, and other government agencies. BUILT GREEN provides consumers with an easy-to-understand rating system, which quantifies environmentally friendly building practices for remodeling and new home construction. The Built Green checklist acts as a decision making tool for homeowners, homebuyers, and builders during the home building process.
Availability	Free for download (adobe) at http://www.builtgreen.net/checklist.html
Contact	Master Builders Association of King and Snohomish Counties 2155 112th Avenue NE Bellevue, WA 98004 Tel: 425-451-7920 or 800-522-2209 Email: mailto:builtgreen@mba-ks.com Web site: http://www.builtgreen.net/

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UNITED STATES

Assessment Framework/Rating: Minnesota Sustainable Design Guide

Description	The Minnesota Sustainable Design Guide is a tool to learn about sustainability, manage design decisions, and integrate sustainable design into the building design and operation processes for new and renovated facilities. It can be used to design priorities and goals, strategies, and to determine performance standards to guide the design and decision making process. It builds on other rating systems such as LEED, GBC 98, and BREEAM, but it also provides ecological resources and step-by-step process to implement sustainable design practice.
Keywords	Design rating system
Expertise Required	
Audience	Design teams, building operators, and agency staff
Existing Users	Minnesota region
Data Collection Requirements	
Software Application & Tech Support	No, but guide is available electronically
Assessment Method & Result	Planning, design, construction and occupancy

Strengths & Weaknesses	Strengths: The scoring system can be tailored to specific types of projects. Weaknesses:
Related Policies and Programs	
Availability	The guide can be downloaded free of charge at: http://www.sustainabledesignguide.umn.edu/default.htm
Contact	Kerry Haglund CALA Building Research 1425 University Avenue SE, Suite 230 Minneapolis, MN 55455 Email: mailto:msdg@tc.umn.edu Web site: http://www.sustainabledesignguide.umn.edu/default.htm

IEA Annex 31 Information Last Updated on November 22nd, 2001

UNITED STATES

Technical Guidelines: NYC High Performance Building Guidelines

Description	The guidelines were designed to help each of the players (planning, programming, funding, design, construction, and operation) in a municipal facility to produce improved, more efficient buildings with reduced environmental impacts.
Keywords	Green building resource guide
Expertise Required	Each of the players involved in building and operating a municipal facility (planning, programming, funding, design, construction, and operation)
Audience	New York public sector employees
Existing Users	New York City
Data Collection Requirements	
Software Application & Tech Support	No, but guide is available electronically

Assessment Method & Result	All stages
Strengths & Weaknesses	Strengths: The scoring system can be tailored to specific types of projects Weaknesses:
Related Policies and Programs	
Availability	The guide can be downloaded free of charge at: http://www.ci.nyc.ny.us/html/ddc/html/highperf.html
Contact	http://www.ci.nyc.ny.us/html/ddc/html/highperf.html

IEA Annex 31 Information Last Updated on November 22nd, 2001

UNTITED STATES

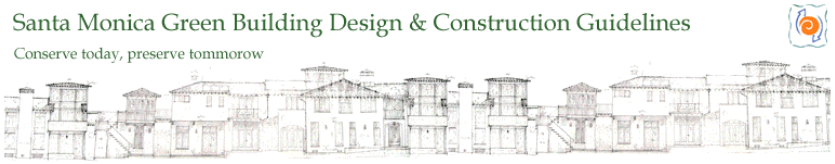
Catalogue: Green Building Advisor

Description	Green Building Advisor (GBA) is a software program that helps you identify actions to reduce the environmental impacts of a building project, while ensuring healthy and productive indoor spaces. It's a revolutionary way of learning about green design and the cutting edge techniques and technologies to accomplish it. GBA will show you specific design strategies that can improve the environmental performance, cost-effectiveness, and healthiness of all phases of a building and its site, from pre-design through occupancy. The strategies are prioritized by the program based on information you give it about your project, such as the location, type and size of the building, and characteristics of the site. GBA uses artificial intelligence technology to supplement standard decision-making processes in facility design, construction, and operations with current environmental data.. The designer can use GBA advice at any point in the design process to help make design decisions or changes to an existing building to improve environmental impact. It does not replace professional judgement, nor does it replace more quantitative calculations of energy use and environmental impact. It may be used in conjunction with another program to determine more accurate building data. . Recommendations for the planning process GBA can be used, as described above, to plan a building design, or evaluate an existing design.
Keywords	
Expertise Required	
Audience	The program is designed for architects, designers, planners, students, and educators who want to evaluate the environmental opportunities of specific

	projects or learn about the many elements of green building design. It will also prove invaluable for those hiring design services -- private companies, government agencies, and homeowners who are planning to build and want to make sure their designers are aware of green building opportunities.
Existing Users	
Data Collection Requirements	
Software Application & Tech Support	The current version of GBA is 1.0. GBA is on a CD-ROM which works on both Microsoft Windows 95/98 and Apple Mac OS 7.5 and later operating systems.
Assessment Method & Result	
Strengths & Weaknesses	**Strengths**: **Weaknesses:**
Related Policies and Programs	The
Availability	Green Building Advisor can be purchased. Discounts ranging from 30% to 45% are available for orders of five or more copies of this title. Site licenses is available, as are discounts for selected groups, including government agencies, educational institutions, EBN subscribers, and retailers. Costs can be obtained from 1-800-861-0954.
Contact	Mary Kathryn Campbell Director: Marketing and Publications REPP/CREST 1612 K St., NW, Suite 202 Washington, DC 20006 U.S.A. Telephone: +1-202-293-2898 mailto:gba@greenbuildingadvisor.com Website: http://greenbuildingadvisor.com/

UNITED STATES

Guideline: City of Santa Monica Green Building & Construction Guidelines



Description	Santa Monica's Green Building Design and Construction Guidelines include required and recommended practices that are intended to reduce life-cycle environmental impacts associated with the construction and operation of both commercial and municipal developments and major remodel projects in Santa Monica. They provide specific "green" design and construction strategies in the following topic areas: Building and Form, Landscaping, Transportation, Building Envelope and Space Planning, Building Materials, Water Systems, Electrical Systems, HVAC Systems, Control, Construction Management, and Commissioning. The Guidelines were developed for, and specifically apply to, the following building types: Institutional and Commercial Offices, Light Industrial Buildings, Retail Buildings, Multi-Family Residences, Hotels and Motels. The Guidelines were developed over a three-year period by The Sheltair Group Inc., a sustainable design consultant team, with extensive input from the local design, construction and development community.
Keywords	
Expertise Required	
Audience	
Existing Users	
Data Collection Requirements	

Software Application & Tech Support	Yes.
Assessment Method & Result	These Guidelines provide designers and builders with guidance on the ways that buildings can provide better health, ecological and resource performance effectively and economically. It is most helpful when decisions have the greatest effect: during the conceptual and schematic stages of design; during construction; and in commissioning. Most chapters provide advice for conceptual and schematic stages of design. In these early stages, it is easy to explore, and accept or reject design strategies. The Construction Management and Commissioning chapters focus on later stages of development. Builders make many material and equipment choices during construction, and commissioning ensures that design intentions and performance targets are realized. Each chapter also provides plain-language summaries of "Required Practices" – Santa Monica Municipal Code ordinances that have a significant effect on the environmental performance of buildings. The Guidelines are tailored to introduce designers and builders to green design and construction strategies that may be unfamiliar, while avoiding information overload. To that end, information is presented in several ways, with details appropriate to early design, or commissioning.
Strengths & Weaknesses	**Strengths**: **Weaknesses:**

Related Policies and Programs	The **Minimize Storm Runoff** **SMMC 7.10.060** By diverting stormwater from impervious areas such as roofs and paths, and by reusing it when-ever possible, urban runoff can be greatly reduced. This can be achieved by directing rain gutters to landscaped areas, drywells and infiltra-tion basins where water can seep into the ground. Placing landscaped areas directly below eaves allows roof runoff to percolate into the sub-soil. Plants should be sturdy enough and provide a subsurface matrix of roots to tolerate heavy sheet flow runoff and periodic saturation. Landscaped infiltration basins for storm-water retention should have flow directed toward them with curbs, berm, or similar structures, and slightly concave to retain surface water until it infiltrates. Drywells (also known as "French drains") are particularly valuable for small sites, since they can supplement limited infiltration areas. These consist of a hole filled with open-graded aggregate, such as #2 or 3 stone, wrapped on the top and sides with filter fabric. Drywells should be at least 15 ft. from building foundations at the bottom of sloped landscaped areas, covered with at least 1 ft. of soil. Manufactured sediment traps are available that intercept runoff from drainage areas, and slowly release it while trapping sediments. **Cautions** • A soils engineer should be consulted for soil suitability, and to size drywells.
Availability	The Guidelines are available on-line as html and pdf files.
Contact	Susan Munves Environmental Programs Division City of Santa Monica 200 Santa Monica Pier, Ste. C 310-458-2213 http://greenbuildings.santa-monica.org/index.html

IEA Annex 31 Information Last Updated on November 22nd, 2001

APPENDIX: QUESTIONNAIRE FOR TOOL SURVEY ADDITIONS & UPDATES

IEA BCS Annex 31: Energy-Related Environmental Impacts of Buildings

Name of Tool	❑
Category of Tool	List which of the following category (or categories) best describe the tool: 1. Assessment Framework, Rating System 2. Technical Guideline 3. Catalogue, Reference Information, Product Declaration 4. Checklist, Certification, Label
Description	Provide a brief, one/two paragraph description of what the tool evaluates, its scope, and/or the issues it addresses. ❑
Keywords	List 3-5 keywords that best describe what the tool does. ❑ ❑
Expertise Required	Identify special expertise or training that is needed. ❑
Audience	Who is the tool directed toward? ❑
Existing Users	What is the approximate number of users? In what locations (national and international)? ❑ National ❑ International
Data Collection Requirements	Outline the information required to use the tool (e.g. floor area, weather data, etc.). ❑ ❑

Software Application & Tech Support	Is there a software application associated with the tool? If so, describe the use of computers and outline the hardware and software requirements. ❑
Assessment Method & Result	What is the analytical approach? Which stages of the product or building life cycle are addressed? ❑
Strengths & Weaknesses	What does the tool do best and what is it typically used for? What doesn't the tool do, and when shouldn't it be used? What reports or articles are available that review and evaluate the effectiveness of the tool? ❑ Strengths: ❑ Weaknesses:
Related Policies and Programs	Does the tool help to support specific policies and programs? ❑ ❑
Availability	How can the tool be obtained? Is there a cost? In what countries is the tool supported? ❑
Contact	Provide contact information including contact name, address, phone, fax, e-mail, and tool web page. ❑
Images	If possible please include at least one illustration (logo, front page, graphic, photo) and also 1-3 screen-capture images from associated software application. (jpegs (.jpg) are preferable.)