La UNI/PdR13 nel contesto Europeo dei rating systems

Andrea Moro
Presidente, iiSBE Italia
the International Initiative for a Sustainable Built Environment

UNITED NATIONS

TRANSFORMING OUR WORLD:

THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT

UNITED NATIONS
THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT


11 SUSTAINABLE CITIES AND COMMUNITIES
1 NO POVERTY
3 GOOD HEALTH AND WELL-BEING
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION

Se non si può misurare qualcosa, non si può migliorarla

LORD WILLIAM THOMSON KELVIN

15 indicatori a livello di Città

11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing
11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities
11.3.1 Ratio of land consumption rate to population growth rate
11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically
11.4.1 Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)
11.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
11.5.2 Direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters
11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities
11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)
11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities
11.7.2 Proportion of persons victim of physical or sexual harassment, by sex, age, disability status and place of occurrence, in the previous 12 months
11.a.1 Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city
11.b.1 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030
11.b.2 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies
11.c.1 Proportion of financial support to the least developed countries that is allocated to the construction and retrofitting of sustainable, resilient and resource-efficient buildings utilizing local materials

Ruolo protocolli di valutazione

Protocolli a scala edilizia e urbana supportano gli Obiettivi di Sviluppo Sostenibile.

Possibilità di stabilire obiettivi di prestazione misurabili e verificabili basati su indicatori quantitativi in leggi, regolamenti, programmi di finanziamento, ecc…

Supporto ai processi decisionali attraverso informazioni oggettive e credibili.

Strumento di riferimento per tutti i portatori di interesse. Definizione di edificio sostenibile.

SFIDE E PROBLEMI COMUNI
OBIETTIVI CODIVISI

NECESSARI
PROTOCOLLI DI VALUTAZIONE DELL'AMBIENTE COSTRUITO **ARMONIZZATI** PER STABILIRE GLI OBIETTIVI DI SOSTENIBILITA' E MISURARE IL PROGRESSO

E' NECESSARIO EVITARE

INCERTEZZA E CONFUSIONE

Perché protocolli armonizzati ?

- Stabilire un linguaggio comune
- Possibilità di misurare il progresso globale nei confronti degli obiettivi transnazionali
- Accordo in merito alla definizione di edificio sostenibile

- Trasferimento di buone pratiche
- Iniziative internazionali facilitate
- Possibili regolamenti e direttive comuni

AGIRE LOCALMENTE

I PROTOCOLLI DI VALUTAZIONE

DEVONO RIFLETTRE

LE CONDIZIONI E LE PRIORITA' LOCALI

NECESSITA' DI AGGREGARE E COMPARARE I

RISULTATI A LIVELLO INTERNAZIONALE

PENSARE GLOBALMENTE

Una metodologia internazionale: Sustainable Building Tool (SBTool)

Nasce come risultato di un processo di R&S avviato nel 1998 coordinato da iiSBE (international initiative for a Sustainable Built Environment)

OBIETTIVO

Sviluppare una **metodologia internazionale** open source per la valutazione della sostenibilità degli edifici basata sul **principio della contestualizzazione**

SBTool
(UNI PdR13 – 0)

Francia	CSTB
U.S.A.	Department of Energy
Canada	NRC
Giappone	Utsunomiya University
Cina	Tsinghua University
Italia	iiSBE IT/ITC-CNR
Corea	Ministry of Environment
Taiwan	Cheng Kung University
Norvegia	Norwegian Building Research Institute
Svezia	Royal Institute of Technology
Germania	University of Karlsruhe
Olanda	Novem
Argentina	University of Buenos Aires
Sud Africa	CSIR
Australia	University of New South Wales
Austria	Ökologie Institut
Finlandia	Motiva
Grecia	University of Thessaloniki
Honk Kong	University of Hong Kong
Polonia	University of Warsaw
Gran Bretagna	BRE
Israele	iiSBE Israel
Messico	GBC Mexico
Brasile	University of San Paolo
Cile	Chamber of Construction

L’IDEA DEL GENERIC FRAMEWORK (SBTool)

Generic Framework

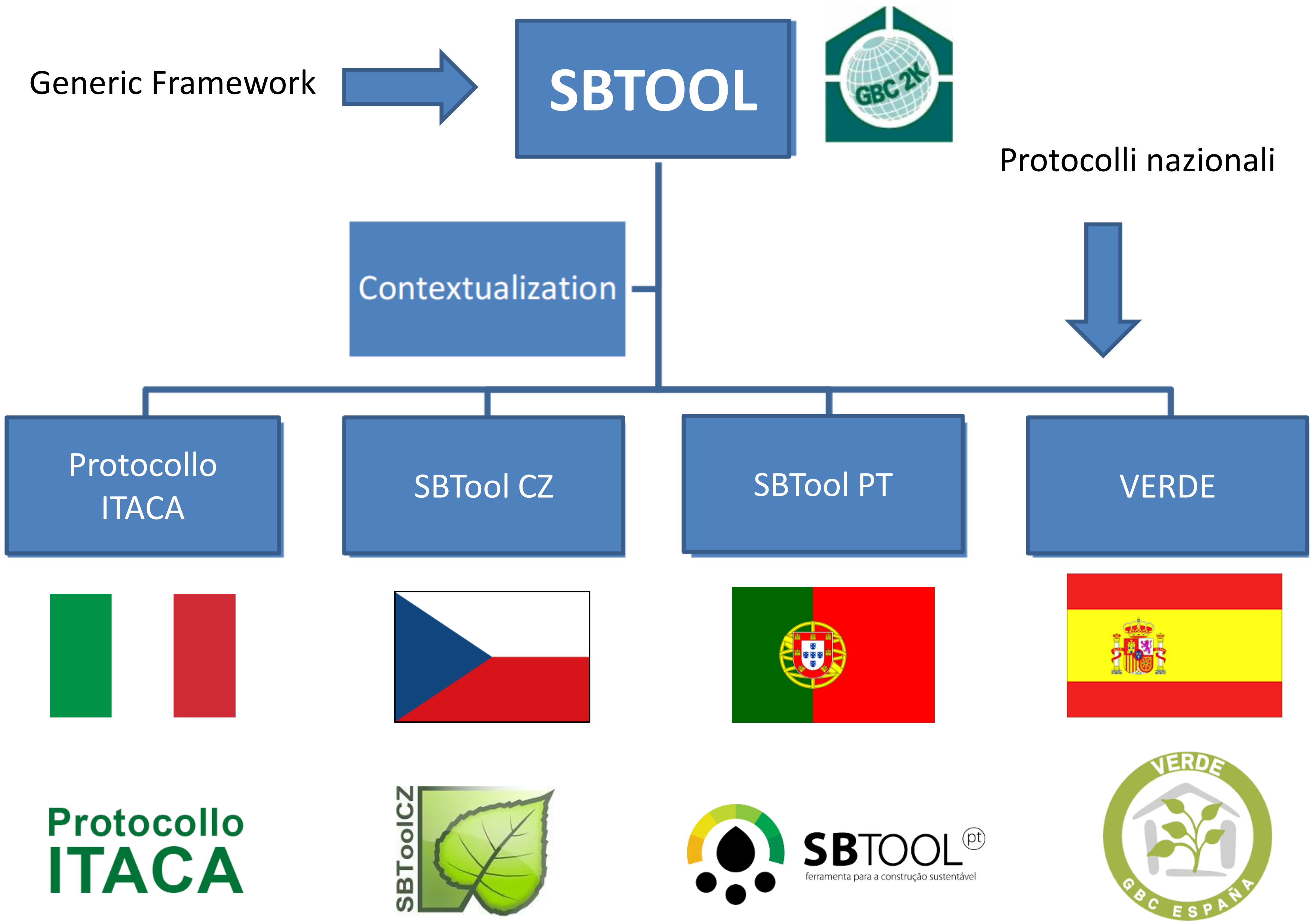
Un sistema di valutazione multicriteria generico per misurare la sostenibilità degli edifici.

<u>Non è operativo, deve essere contestualizzato.</u>

Protocolli nazionali

Sistemi di valutazione operativi.

Derivano dal Generic Framework attraverso un processo di contestualizzazione.


Generic Framework
SBTOOL
GBC 2K
Protocolli nazionali
Contextualization
Protocollo ITACA
SBTool CZ
SBTool PT
VERDE
Protocollo ITACA
SBToolCZ
SBTOOL pt
ferramenta para a construção sustentável
VERDE
GBC ESPAÑA

SVILUPPO DI UN PROTOCOLLO

MEDOTOLOGIA → **SBTool**

↓

CONTESTO → **1. SELEZIONE CRITERI**
2. SCALE DI PRESTAZIONE
3. PESI

↓

PROTOCOLLO ITACA
UNI/PdR13

Protocollo ITACA

GREEN BUILDING CHALLENGE

U.S. Team GREEN BUILDING CHALLENGE 2002

The Philip Merrill Environmental Center

Chesapeake Bay Foundation
Annapolis, Maryland

- Building function type: Commercial office building
- Location: Annapolis, Maryland
- Completed: 2000
- Owner: Chesapeake Bay Foundation www.savethebay.cbf.org
- Designers/architects: Smith Group
- Site area: 127,475 m²
- Gross floor area, m² (32,000 ft² = 2,970 m²)
- Typical building population: 100 people (100,000 members and volunteers visit)

USA

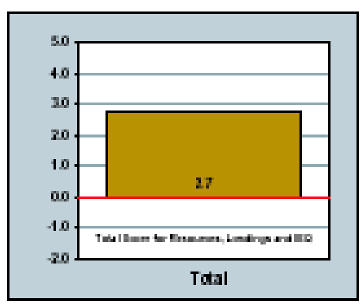
EDIFICIO PER UFFICI

Description: A unique holistic design process produced the Chesapeake Foundation's new building. This award-winning, 32,000 ft² building serves as a global model of energy conservation and sustainable building techniques. The Center's primary purpose is to "Save the Bay" through resource restoration and protection, environmental advocacy, and education, and this principle was extended to their new headquarters building, which uses two-thirds less energy than a typical office building of the same size.

Energy efficiency features include natural ventilation, which takes advantage of the Bay's breezes to cool the building without relying completely on air conditioning. When sensors determine that the outdoor climate is suitable, the mechanical system shuts down, motor-operated windows open, and "open window" signs signal employees to open their windows. Active solar features produce a portion of the building's electricity using solar-electric panels. Solar water-heating reduces electricity demand.

Flushless composting toilets reduce nutrient pollution from human waste and rooftop cisterns capture rainwater for hand washing and fire suppression. Smart parking design reduces harmful runoff from surfaces by placing parking under the building and using gravel surfacing for parking outside the building. Remaining storm-water runoff flows through a bioretention storm-water treatment system designed to treat oils and then through a constructed wetland. Geothermal heat pumps are used for heating and cooling the building.

	Selected Environmental Sustainability Indicators for the Design	per m² only	by area & by occupancy
ESI-1	Total net consumption of primary embodied energy, GJ	3.2	31.5
ESI-2	Net annualized consumption of primary embodied energy, MJ	65	631
ESI-3	Net annual consumption of primary energy for building operations, MJ	610	5923
ESI-4	Net annual consumption of primary non-renewable energy for building operations, MJ	604	5864
ESI-5	Net annualized primary embodied energy and annual operating primary energy, MJ	669	6495
ESI-6	Net area of land consumed for building and related works, m²	2.6	57.8
ESI-7	Net annual consumption of potable water for building operations, m³	1	1
ESI-8	Annual use of grey water and rainwater for building operations, m³	8	1
ESI-9	Net annual GHG emissions from building operations, kg. CO_2 equivalent	98	950
ESI-10	Predicted CFC-11 equivalent leakage per year in gm	0.002140	0.020791
ESI-11	Total weight of materials re-used in Design from on-site or off-site uses, kg	339	3297
ESI-12	Total weight of new materials used in Design from off-site uses, kg	851	8267



Note: Score level 0 in the bar charts indicates the benchmark level of performance, or performance that would be expected as a minimum for a comparable building in the applicable region.

60 Dwelligs of public housing, local retails and parking in Sabadell, SPAIN

MINISTERIO DE FOMENTO
SECRETARÍA DE ESTADO DE INFRAESTRUCTURAS
DIRECCIÓN GENERAL DE LA VIVIENDA LA ARQUITECTURA Y EL URBANISMO

OVERVIEW

Owner:	Habitatges Municipals de Sabadell, S.A.
Location:	Street Manuel de Falla, 10-16 Sabadell, Spain (Lat. 41° 26')
Architects:	R. Perich / R. Calvez
Clerks of work:	J. Cornel / J. Belloso
Year of completion:	1.999
Projete Financing:	Thermie proyect from de European Community
Main contractor:	ACS Proyectos, Obras y Construcciones, S.A.
Bulding type:	Multi-residential
Gross Floor Area:	11.800 m²


VIEW OF THE BUILDING


URBAN CONTEXT OF SABADELL

DESCRIPTION

The project is aimed as a direct application and integration of energy and environmental efficient aspects, to be easely integrated in a normalized way into the social housing buildings.

- The design approach:
  - a) Block building type with a good thermal behaviour due to a shape optimization
  - b) Doble-sided ventilation in all the dwellings
  - c) Dimensioning of the openings for solar gain in winter, combined with high inertial floors.
  - d) Glazed areas with insulated fenestration
  - e) The openings in the south are protected with overhang in summer.
  - f) Roller blinds with orientable louvers, that allow the graduation of the sun light entering
  - g) Due to the orientation of the site, design of the envelope depending on the façade.
  - h) Envelope with doble skin ventilated, avoiding the excessive warming in summer.
    - -Façades, made of 30x30cm ceramic tiles hanged, with a air chamber open to the exterior.
    - -Ventilated roof, with floating flooring with adjustable bearings

ENVIROMENTAL CONSIDERATION

ENERGY

- Construction energy saving
  - Local material suppliers
  - Optimization of the constructive systems

SPAGNA

EDIFICI RESIDENZIALI

MATERIALS

- Non PVC for drain systems
- Use of ecologic materials, recycled, re-used, non-pollutant and harmless

INDOOR QUALITY CONTROL

- Home automation, with controls for heating and gas leakage detection

WATER

- Use of sanitary systems with low consumption
- Toilet with flush stop

SERVICE QUALITY

- Installation of separate waste containers
- Bicycle parking for each owner


VIEW OF THE BUILDING

FUNCAMP Complex, Campinas, Brazil

Mostly local materials were used. Parking areas are asphalted and landscaped area is covered with grass that requires watering. No greywater system is available. Rainwater collected by buildings pipes goes to the lake. The lake water, on its turn, is used for irrigation.

Overview

Funcamp Complex is in Campinas, Brazil, around 90 Km northwest of the city of São Paulo. The site share limits with a farm, the campus and a lake surrounded by a small ecological park. Only 30% of the total 121.000 m2 of FUNCAMP´s site may be built. The office and hotel blocks were inaugurated in 1996, using a terrain parcel of 21.000 m2. Design of new blocks is on the way and includes a convention center and a second hotel block, supposed to be "greener" than the existing complex.

The hotel and office buildings sum up to 4.420 m² (gross floor area), distributed in two floors at each block. The 45 apartments of the hotel are mainly occupied by guest professors visiting the campus or by delegates attending the frequent conferences held either at the hotel itself or at the University´s convention center. The amenity area includes swimming pool, sauna, sports courts and a link to the ecological park nearby.

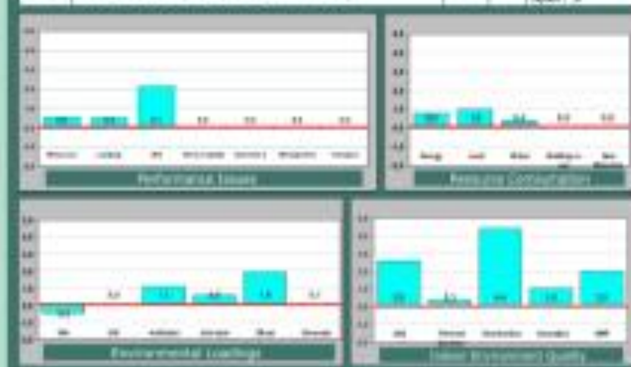
This example, though not revolutionary, explores the potential for daylighting and natural ventilation ... ergy ... ainst ... cial

At both buildings, spaces are inundated by abundant daylight coming through large windows and the upper portion of atria. Windows exposed to intense light received a combination of external shading devices and films to prevent glare. Only workspaces, apartments and auditoriums have artificial air conditioning (window or split units), what represents 69% of the building gross floor area. No space heating is used. A small parcel of renewable energy is used to provide water heating for the hotel apartments and restaurant and external illumination (PV cells).

The net ecological value of the site is expected to be not significantly different from the predevelopment condition. The site was previously unbuilt. No significant vegetation was removed and the small earth movement was accommodated within site limits.

TOTAL 1,1

[illegible]				
ES 1	[illegible]	[illegible]	[illegible]	[illegible]
ES 2	[illegible]	[illegible]	[illegible]	[illegible]
ES 3	[illegible]	[illegible]	[illegible]	[illegible]
ES 4	[illegible]	[illegible]	[illegible]	[illegible]
ES 5	[illegible]	[illegible]	[illegible]	[illegible]
ES 6	[illegible]	[illegible]	[illegible]	[illegible]
ES 7	[illegible]	[illegible]	[illegible]	[illegible]
ES 8	[illegible]	[illegible]	[illegible]	[illegible]
ES 9	[illegible]	[illegible]	[illegible]	[illegible]
ES 10	[illegible]	[illegible]	[illegible]	[illegible]
ES 12	[illegible]	[illegible]	[illegible]	[illegible]
ES 13	[illegible]	[illegible]	[illegible]	[illegible]



BRASILE

UNIVERSITA'

02 http://iisbe.org

Authors
Vanessa Gomes & Maristela Silva
Poster Giovana Bianchi & Paula Baratella

CENTRE DE LOISIRS ROUGET DE LISLE - NANTERRE
Leisure Center in Nanterre

Owner: Ville de Nanterre
Architect: Atelier d'Architecture Philippe Madec
Energy design: INGEROP
Environmental expert: TRIBU

Annual operating final energy consumption: 103 kWh/m².year
Annual consumption of potable water: 44 m^3/j (including collected rain water)

Integration into the local environment
- Compromise between the hard constraints of the site (south façade close to railway) and a good comfort level for users (visual, acoustics...)
- Priority to pedestrian paths

Structure, products and materials
- Choice of durable, and easy-to-repair and easy-to-clean materials
- Choice of materials with low impact on human health

Energy consumption
- Ventilation system with heat recovery
- Low NOx emissions gas boilers
- Building Energy Management System (in accordance with the outside temperature and the occupation)

Indoor environment
- Good quality of daylighting by large use of glazed façades and light wells
- Ventilation system permitting accelerated flows during non-heating period

Environmental management
- Involvement of the maintenance staff in the studies and choices concerning ... ngs, systems and equipments (including the

Layout plan

A restricting urban site

FRANCIA
EDIFICI RESIDENZIALI

Consalud Headquarters Building, Santiago, Chile

Function: Office building
Owner: Isapre Consalud
Architects: "May & Soler Arquitectos Asociados", Santiago
Giancarlo dell'Aquila & Mario Voerzio, Ass. Architects, Italy
Energy Design: Prof. Arch. Mario Grosso – Dr.-Ing. Paolo Oliaro
Departm. Of Environmental Sciences and Technology
Politecnico di Torino, Italy
HVAC: "Gormaz & Zenteno Limited", Santiago

Completed: February 2001
Site Area: 23.255 m²
Built-up Area: 4.271 m²
Gross Floor Area: 20.567 m²
Basement / Above Grade Floors: 2 / 4
Typical Building Population: 386 people
Typical Hours of Occupancy: Mon - Fri: 07:30 a.m. - 19:30 p.m.

1.- Technical Information

ISAPRE CONSALUD is a health insurance and services company that belongs to the Chilean Chamber of Construction. They required a new headquarters to project their own corporate image.

CILE

CENTRO DIREZIONALE

2.- Relevant Architectural an Building Aspects

2.1 Architecture

a) SOLAR ORIENTATION
The main façade is exposed to the northern sun, optimizing the exposure in winter. The main building axis is east-west.

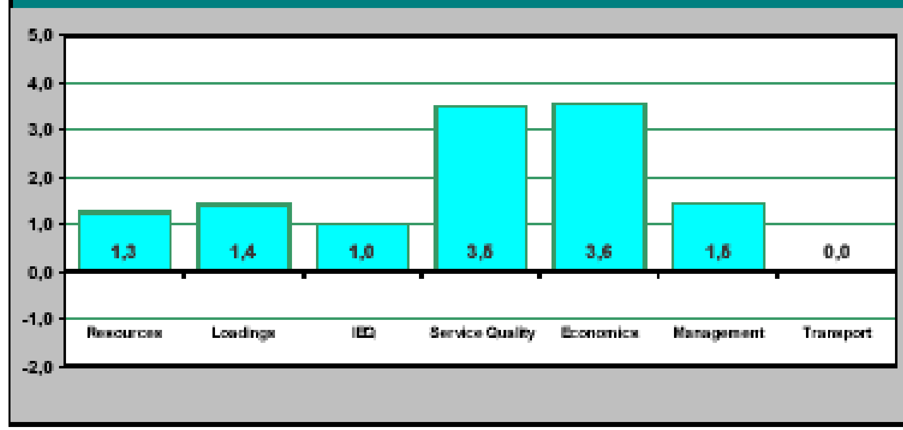
b) SHADING
A sun shade 6.10 m wide was placed in the upper part of the north façade, reducing the summer sunshine into the glassed area. At ground level, plant pots and reflecting pools with water cascades moderate temperature.

c) BUILDING ZONES
There are three distinct zones: a) Office area, with a geo-climatic system, b) Support area that can function autonomously, with cafeteria, conference room and five meeting rooms, c) Recreation & sport area, with gymnasium, squash, multipurpose room, and outdoor recreational facilities.

d) NATURAL LIGHTING – OFFICE AREA
With a volume relatively narrow and an open floor plan, it gets natural light from the two main sides, eliminating dark interior spaces, thus reducing energy consumption.

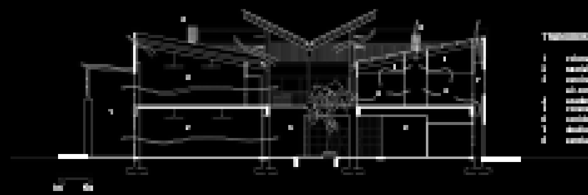
e) OPEN FLOOR PLANS
Related with above and a mechanical floor, it allows maximum flexibility.

Levels of Performance relative to benchmarking practices, Total score = 1.2



Selected Environmental Sustainability Indicators for the Design		per m^2 only	by area & by occupancy	
ESI-1	Total net consumption of primary embodied energy, GJ	2,6	36,4	(MJ/m2) / (kaph/m2)
ESI-2	Net annualized consumption of primary embodied energy, MJ	35	485	(MJ/m2) / (kaph/m2)
ESI-3	Net annual consumption of primary energy for building operations, MJ	574	8022	(MJ/m2) / (kaph/m2)
ESI-4	Net annual consumption of primary non-renewable energy for building operations, MJ	338	4714	(MJ/m2) / (kaph/m2)
ESI-5	Net annualized primary embodied energy and annual operating primary energy, MJ	372	5199	(MJ/m2) / (kaph/m2)
ESI-6	Net area of land consumed for building and related works, m^2	0,4	17,7	m^2 / occupant
ESI-7	Net annual consumption of potable water for building operations, m^3	52	313	m^3 / (aph/m^2) *yr
ESI-8	Annual use of grey water and rainwater for building operations, m^3	0	0	m^3 / (aph/m^2) *yr
ESI-9	Net annual GHG emissions from building operations, kg. CO_2 equivalent	41	568	(Kg. eCO2 / m^2) / (kaph / m^2)
ESI-10	Predicted CFC-11 equivalent leakage per year in gm.	0,00351	0,04904	(gm CFC-11 equiv / m2) / (kaph * m2) * yr
ESI-11	Total weight of materials re-used in Design from on-site or off-site uses, kg.	0	0	kg / (aph/m^2) *yr
ESI-12	Total weight of new materials used in Design from off-site uses, kg.	309	4311	kg / (aph/m^2) *yr

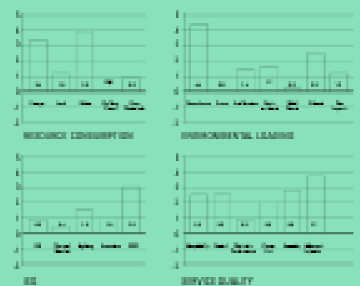
FACULTY OF THE ARTS BUILDING
UNIVERSITY OF THE SUNSHINE COAST
QUEENSLAND, AUSTRALIA

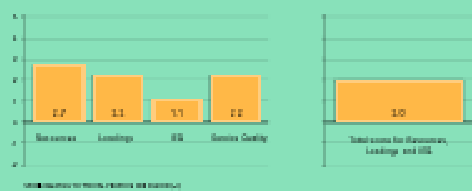


TRANSVERSE SECTION

GBTOOL ASSESSMENT NOTES

[illegible]

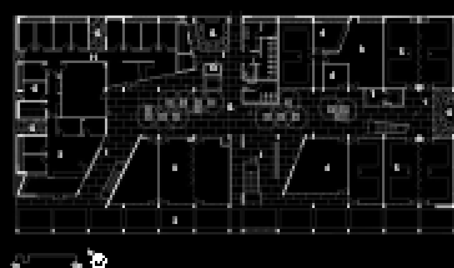




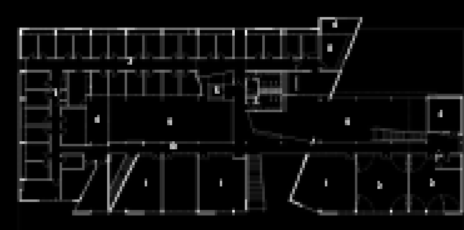
SELECTED ENVIRONMENTAL SUSTAINABILITY INDICATORS

ES-01 Total net consumption of primary embodied energy, GJ	10.4	521	[illegible]
ES-02 Net annualised consumption of primary embodied energy, MJ	113	596	[illegible]
ES-03 Net annualised consumption of primary energy for building operations, MJ	[illegible]	[illegible]	[illegible]
ES-04 Net annualised consumption of primary non-renewable energy for building operations, MJ	[illegible]	[illegible]	[illegible]
ES-05 Net annualised primary embodied energy and annual operating primary energy, MJ	[illegible]	[illegible]	[illegible]
ES-06 Net area of land consumed for building and related works, m²	[illegible]	[illegible]	[illegible]
ES-07 Net annual consumption of potable water for building operations, m³	[illegible]	[illegible]	[illegible]
ES-08 Annual use of grey water and rainwater for building operations, m³	[illegible]	[illegible]	[illegible]
ES-09 Net annual GHG emissions from building operations, kg CO_2 equivalent	[illegible]	[illegible]	[illegible]
ES-10 Predicted CFC-11 equivalent leakage per year in gm	[illegible]		
ES-11 Total weight of materials re-used in design from on-site or off-site uses, kg	[illegible]	[illegible]	[illegible]
ES-12 Total weight of new materials used in design from off site uses, kg	[illegible]	[illegible]	[illegible]

SITE PLAN



GROUND FLOOR PLAN

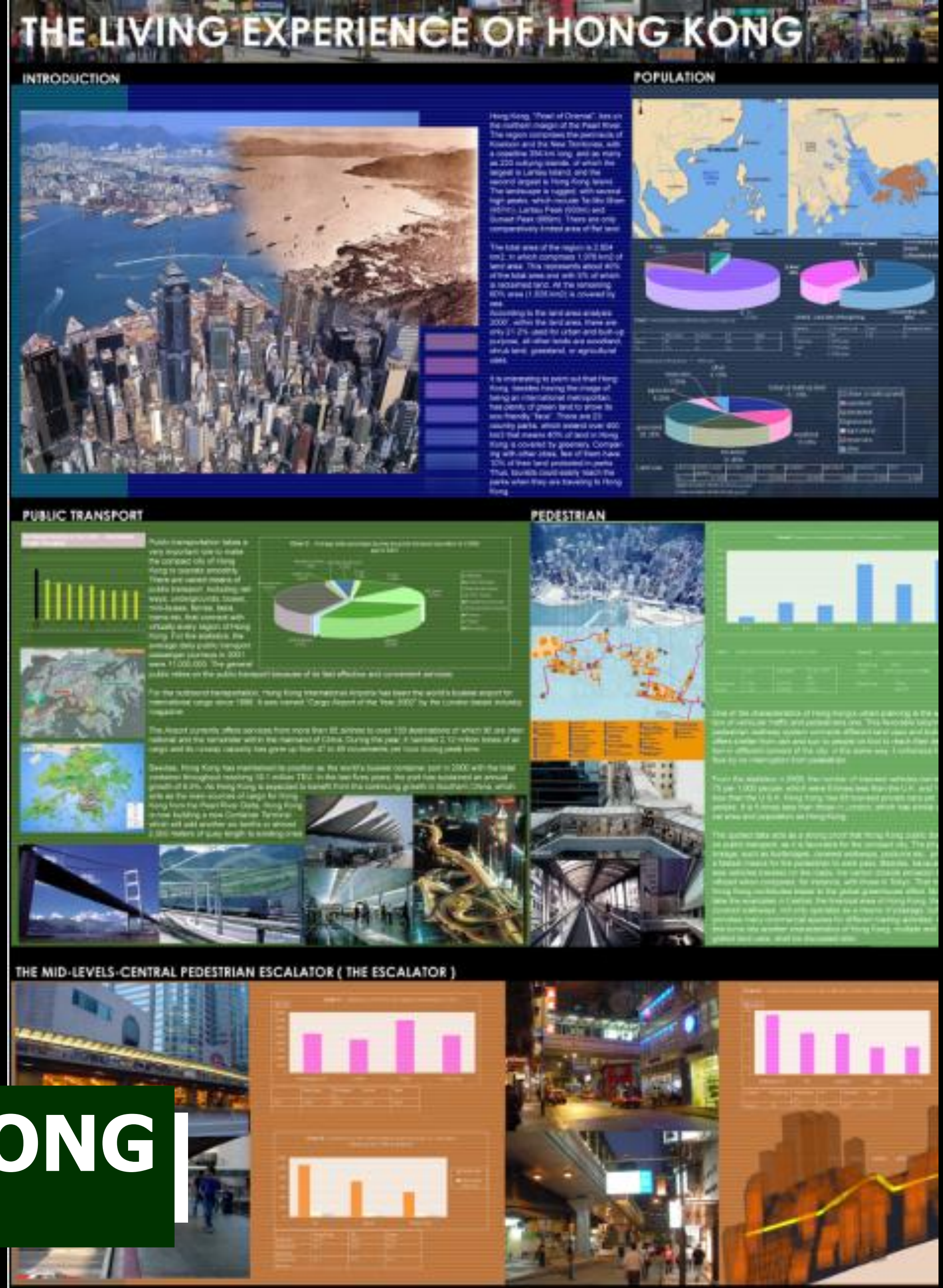


FIRST FLOOR PLAN

AUSTRALIA
UNIVERSITA'

Further Information [illegible]

Green Building Challenge 2002



HONG KONG |

GRATTACIELI

Passivhausanlage Wolfurt

Eichenstraße 37
A-6922 Wolfurt/Vorarlberg

GBC-assessed project

Owner
Errichtergemeinschaft Passivhaus Wolfurt-Oberfeld

Architect
DI Gerhard Zweier

Energy
GMI Gasser & Messner Ingenieure, Dornbirn/A
Ing. Christof Drexel, Bregenz/A

Building type
multi-unit residential building consisting of two identical houses, each of them with 4 apartments and two ateliers

Completed: 1999
Site area: 2,730 m^2
Building land: 501 m^2
Usable area for dwelling units: 1,204 m^2
Share of dwelling units / of ateliers: 91% / 9 %

The passive house Wolfurt is multi-unit residential building in a village in Vorarlberg, the most western province of Austria.
The building was planned and constructed in the course of the CEPHEUS project, supported by the European Commission.

All CEPHEUS buildings have to meet very high energy requirements according to the passive house standard - for heating ener-

ÖSTERREICHISCHES ÖKOLOGIE INSTITUT

AUSTRIA
CASE PASSIVE

NEC Tamagawa Renaissance City

Comprehensive Assessment System for Building Environmental Efficiency

Photo by [illegible]

NEC Tamagawa Renaissance City was built as a redevelopment of part of NEC's Tamagawa site, as a project to mark the company's centennial. The South Tower, completed in January 2000, was followed by North Tower and the Hall. The developer went beyond calling for environmental consideration in the building, demanding construction of an "Eco Building", affecting all aspects down to the daily activities of the designers and builders.

■ Building Outline

Building name:	NEC Tamagawa Renaissance City
Building type:	Office and Hall
Location:	Nakahara-ku, Kawasaki city, Kanagawa prefecture
Completion:	March, [illegible]
Owner:	NEC Facilities, Ltd.
Architect:	Nikken Sekkei Ltd, Obayashi Corporation
Contractor:	JV of Obayashi Corporation and Kajima Corporation
Site area:	[illegible] m²
Gross floor area:	[illegible] m²
Structure:	SRC and RC
Number of floors:	-2, +[illegible] (South Tower) -1, +37 (North Tower) +2 (Hall)
Occupancy:	[illegible] persons

■ Measures taken to maximize Environmental Quality

Q-1 Indoor environment

- Provide smoking corners, control the air exhaust volume using occupancy sensors.

Q-2 Quality of Service

- Use of Y-type damper system for earthquake resistance
- Use of dirt resistance tiles for exterior wall for improved cosmetic durability and maintenance
- Secure floor load and elevators at [illegible]-ton load capacity.
- Secure multiple reserved routes, enlarged service for piping, and wide exterior space for equipment installation.

Q-3 Outdoor Environment on Site

- Landscaping of public footpath as a green promenade
- Making public open space ([illegible] of site plan) into a "landscape of

GIAPPONE

CENTRI DIREZIONALI

■ Measures taken to minimize Environmental Loads

LR-1 Energy

- Since the building is oriented in the East-West direction, provide protection from western sunlight and make use of natural light.
- Use of an outdoor air-cooling / free-cooling system and Air-flow windows on north and south facades.
- Use of VAV and VWV control.
- Introduce high-efficiency refrigerator system, a co-generation system and a heat storage system.
- Use of a high-voltage distribution system, and reduction of transformer loss using power-factor-improving high-voltage condensers (extra-high-voltage transformer room) and high-efficiency extra-high-voltage transformers.
- Use of high efficiency lighting fixtures controlled by daylight sensors.
- Improve BEMS, build up a general monitor system and use automatic air-conditioning control systems using BAC-net.

LR-2 Resources & Materials

- Design with consideration of modules
- Use of grey water by means of kitchen drainage treatment, rainwater treatment and cooling tower water treatment facilities.
- Use of blast furnace cement for underground structure
- Reduce excavation and underground structure volume by placing the parking at ground level.

LR-3 Off-site Environment

- Use of water permeable interlocking pavement

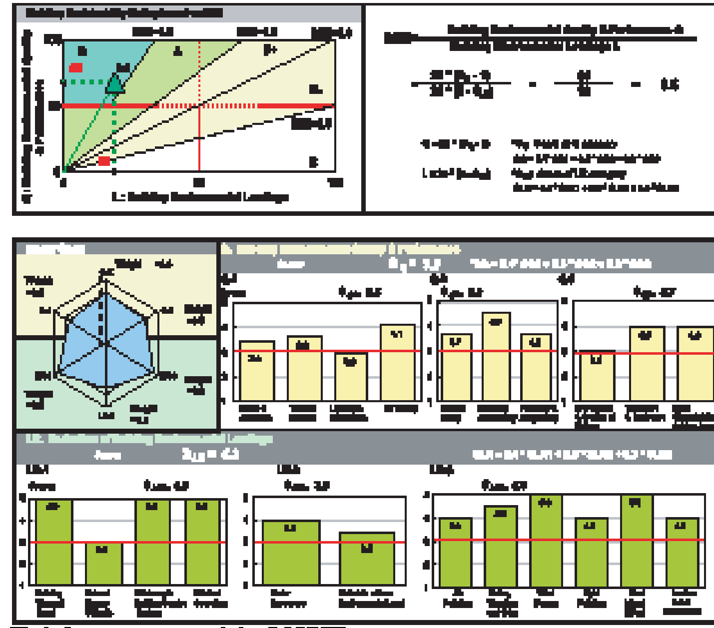


Fig1. Assessment result by CASBEE

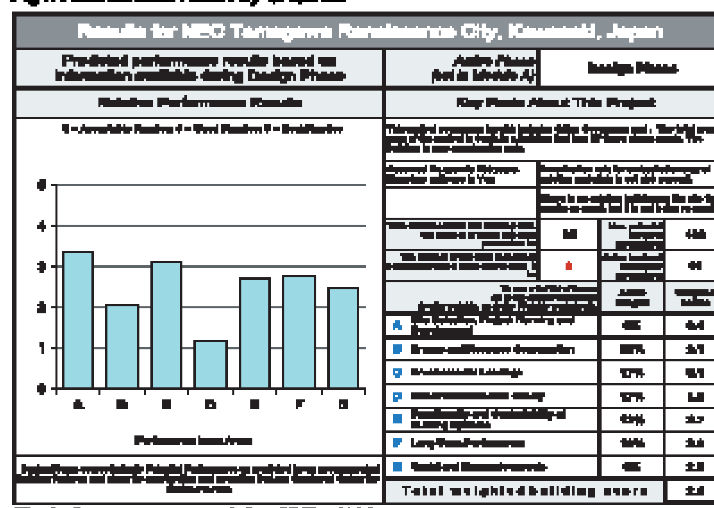
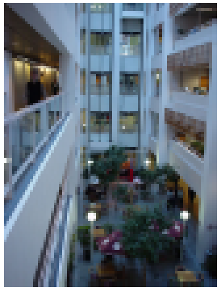
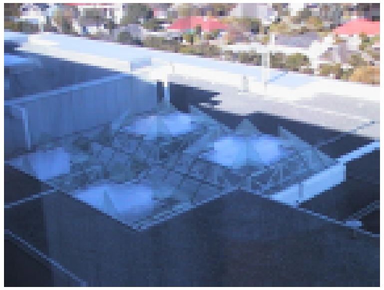


Fig 2. Assessment result by GBTool2005

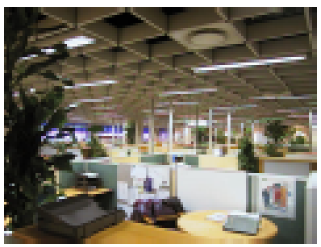
Architectural presentation of Mutualpark

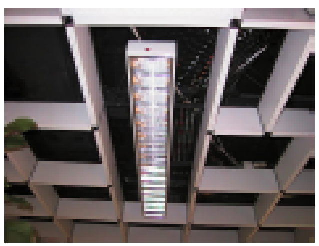
Only the four buildings; Mutual-81, Mutual-89, Mutual-91 and Mutual-94 were assessed. These buildings are independent and are only connected via hallways, except for Mutual-89 and Mutual-91. These two buildings are connected to each other by an atrium.





All the buildings are mainly of the open plan office layout. The ceilings are a suspended wooden grid, about 0.75 m from the next floor. All the supply and return air ducting, electric and networking cabling are routed in this "plenum". The floor is a pre-cast concrete waffle structure finished off with screed and carpet. The overall U_0-value of all the floors are 2.26 W/m^2.K.





Roof construction

	Mutual-89 & Mutual-91	Mutual-81 & Mutual-94
Outer layer:	Stones and Durby gum of 20 mm	Zinc metal of 1.5 mm
Inner layers:	Screed of 35 mm	Cellulose fill in foil of 50 mm
		Air space of 300 mm
		Screed of 35 mm
Interior:	Waffle concrete structure of average 260 mm	Waffle concrete structure average 260 mm
Atrium to roof ratio:	8%	0%
Atrium window U-value	5.8 W/m^2.K	
Overall U_0-value	2.3 W/m^2.K	0.18 W/m^2.K

SUD AFRICA
EDIFICIO PER UFFICI

CA

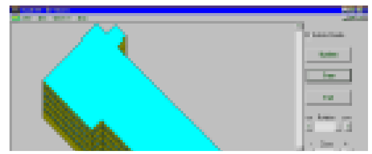
Mutualpark, South Africa

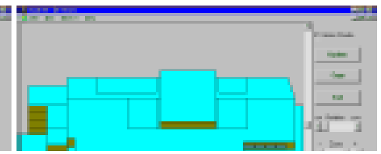
Wall construction:

	Mutual-89	Mutual-89 & Mutual-91	Mutual-94
Outer layer:	Glass curtain of 6 mm	Granite slab of 30 mm	Granite slab of 30 mm
Inner layer:	Framework for glass curtain of 30 mm	Aluminium substructure of 110 mm	Aluminium substructure of 110 mm
	Cement bricks of 230 mm	Common brick of 110 mm	Common brick of 110 mm
Interior:	Plaster of 25 mm	Plaster of 30 mm	Plaster of 30 mm
	Paint	Strip wood covering of 3 mm	Strip wood covering of 3 mm
Window-wall area ratio	16.9%	34.9%	23.8%
Window U_0 value	5.8 W/m^2.K	5.8 W/m^2.K	5.8 W/m^2.K
Overall U_0-value	1.47 W/m^2.K	1.97 W/m^2.K	1.42 W/m^2.K

Building models:

Shown below are the building models used during the SAEDES Evaluation of the buildings' energy consumption (the scale of the figures is not the same).



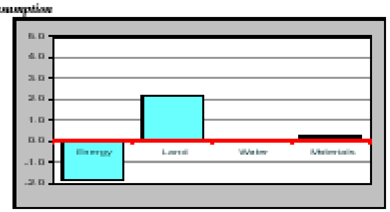


GBC Assessment results and conclusions

The following results were obtained from the assessment:

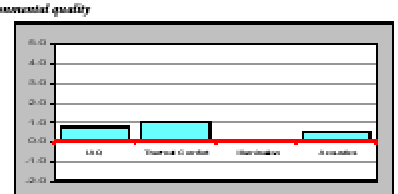
Environmental Sustainability Indicators for Design	by area only	area & occup.
Net annual consumption of primary energy for building operations in MJ, normalised for net area and occupancy	2745	172
Net area of land consumed for building and related works, normalised for net area and occupancy	0.18	2.58
Net annual consumption of potable water for building operations, normalised for net area and occupancy	5.8	2.5
Net annual GHG emissions from building operations, kg. CO_2 equiv., normalised for net area and occupancy	1241	78

Resource Consumption



Mutualpark has to improve their energy consumption by roughly 20% before meeting the standard. Facilities management has developed strategies to improve and maybe even excel the standard for energy consumption. Land consumption excels the standard whereas water and materials consumption is basically on standard.

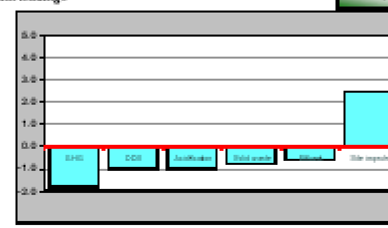
Indoor environmental quality



Mutualpark evaluates fairly well in this section. Roughly 75% of the occupants are satisfied with the indoor environmental quality (IEQ). This is very good considering the great cultural and racial diversity of the occupants that makes the choice of a certain level of IEQ very difficult.

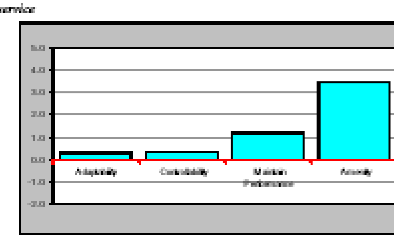
Mutualpark, South Africa

Environmental loadings



Most of the evaluation proofs Mutualpark to be below standard. This is mainly due to the low evaluation of the energy consumption. Improving the energy consumption should improve the environmental loading evaluation.

Quality of service



Mutualpark are really trying to improve their service to their workers as well as improving the working environment. This effort is reflected in the positive evaluation of the quality of service.

Overall evaluation.

The evaluation showed that the energy consumption and environmental loadings are below standard. However, from a facilities management point of view, it could be argued that the indoor environmental quality is over-performing and this is the reason the why the energy consumption is too high

If the indoor environmental quality is reduced according to practice, the energy consumption should become closer to the levels required by the standards. Along with the lowered energy consumption an improvement in environmental loading should also be experienced.

SBTool – Italia (2002)

ITC-CNR
ENEA
Regione Piemonte
Politecnico di Torino
Politecnico di Milano
Università di Genova
Environment Park
APAT
Città di Torino

Nel 2002 ITACA adotta SBTool
come base per lo sviluppo del Protocollo ITACA

SBE 2020
Urban Challenge

Sustainable Neighborhood Tool - SNTool

CESBA
Common European Sustainable Built Environment Assessment

A Collective Initiative for a New Culture of Built Environment in Europe

Obiettivi principali

- Armonizzazione dei protocolli di valutazione
- Promuovere l’impiego dei protocolli da parte delle autorità pubbliche
- Aumentare il numero di edifici certificati
- Regione Piemonte, Veneto e Lombardia

PRINCIPI

1. L’utente prima di tutto !
2. Sostenibilità
3. Contestualizzazione
4. Certificazione diffusa
5. Semolicità d’uso
6. Open source
7. Co-creazione
8. Transparenza

INDICATORI COMUNI (KPIs)
RISULTATI DIRETTAMENTE COMPARABILI
ATTRAVERSO UN PASSAPORTO

KPIs

SUSTAINABLE DEVELOPMENT GOALS

Passaporto CESBA

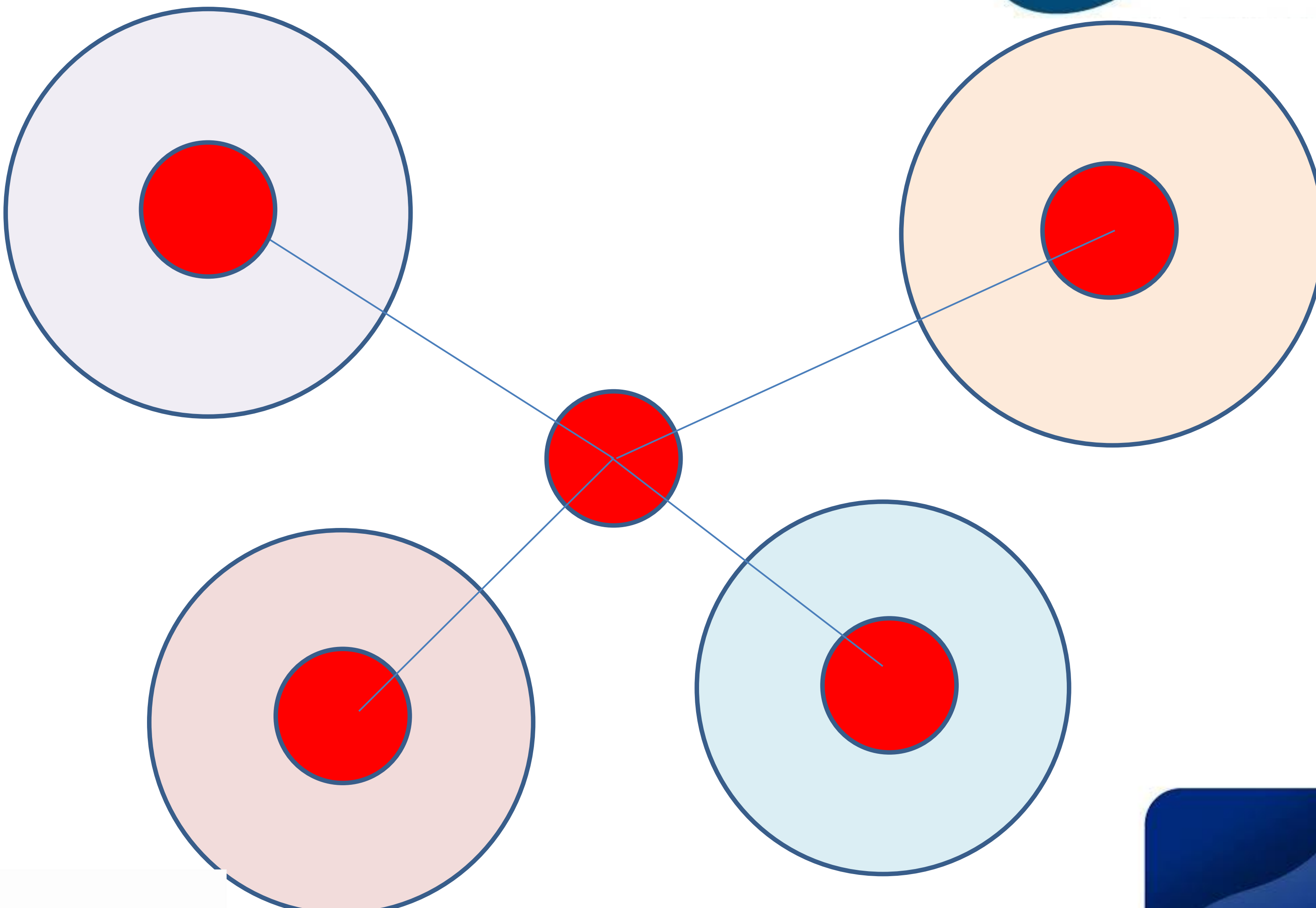
KPIs

ENERGIA
ACQUA
EMISSIONI
RIFIUTI
MATERIALI
ASPETTI SOCIALI
ASPETTI ECONOMICI

METRICHE COMUNI = COMPARAZIONE E AGGREGAZIONE RISULTATI

UNI/PdR 13.

NF HQE



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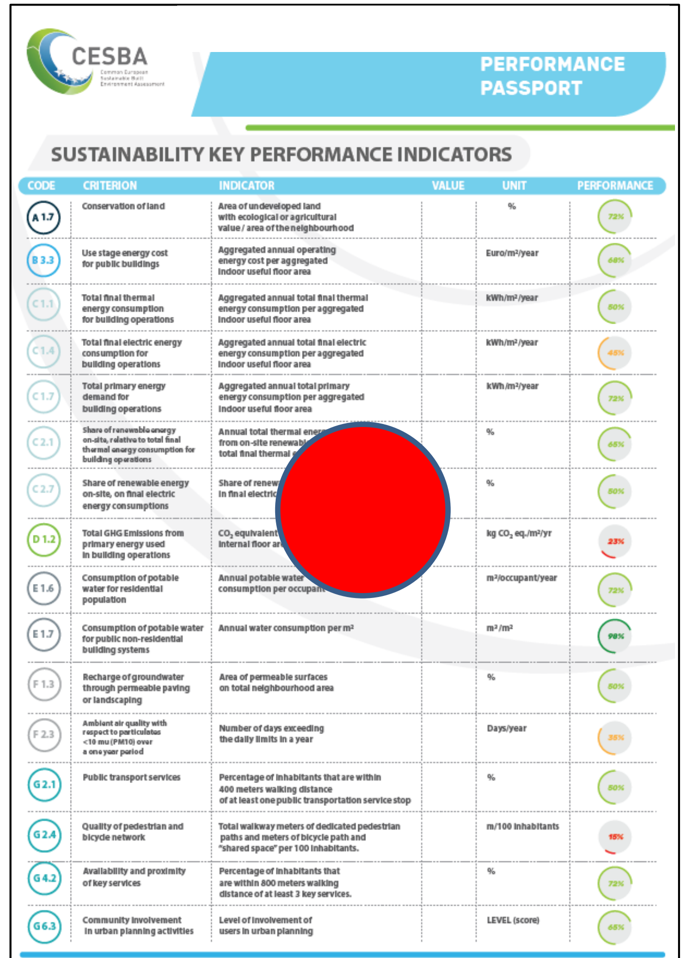
Passaporto per gli edifici



CESBA
Common European Sustainable Built Environment Assessment

PERFORMANCE PASSPORT

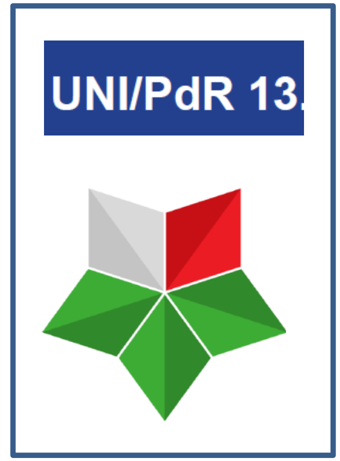
SUSTAINABILITY KEY PERFORMANCE INDICATORS

CODE	CRITERION	INDICATOR	VALUE	UNIT	PERFORMANCE
A 1.7	Conservation of land	Area of undeveloped land with ecological or agricultural value / area of the neighbourhood		%	72%
B 3.3	Use stage energy cost for public buildings	Aggregated annual operating energy cost per aggregated indoor useful floor area		Euro/m²/year	68%
C 1.1	Total final thermal energy consumption for building operations	Aggregated annual total final thermal energy consumption per aggregated indoor useful floor area		kWh/m²/year	50%
C 1.4	Total final electric energy consumption for building operations	Aggregated annual total final electric energy consumption per aggregated indoor useful floor area		kWh/m²/year	45%
C 1.7	Total primary energy demand for building operations	Aggregated annual total primary energy consumption per aggregated indoor useful floor area		kWh/m²/year	72%
C 2.1	Share of renewable energy on-site, relative to total final thermal energy consumption for building operations	Annual total thermal ener… from on-site renewabl… total final thermal …		%	65%
C 2.7	Share of renewable energy on-site, on final electric energy consumptions	Share of renew… in final electric…		%	50%
D 1.2	Total GHG Emissions from primary energy used in building operations	CO_2 equivalent… internal floor ar…		kg CO_2 eq./m²/yr	23%
E 1.6	Consumption of potable water for residential population	Annual potable water consumption per occupant		m³/occupant/year	72%
E 1.7	Consumption of potable water for public non-residential building systems	Annual water consumption per m²		m³/m²	98%
F 1.3	Recharge of groundwater through permeable paving or landscaping	Area of permeable surfaces on total neighbourhood area		%	50%
F 2.3	Ambient air quality with respect to particulates <10 mu (PM10) over a one year period	Number of days exceeding the daily limits in a year		Days/year	35%
G 2.1	Public transport services	Percentage of inhabitants that are within 400 meters walking distance of at least one public transportation service stop		%	50%
G 2.4	Quality of pedestrian and bicycle network	Total walkway meters of dedicated pedestrian paths and meters of bicycle path and "shared space" per 100 inhabitants.		m/100 inhabitants	15%
G 4.2	Availability and proximity of key services	Percentage of inhabitants that are within 800 meters walking distance of at least 3 key services.		%	72%
G 6.3	Community involvement in urban planning activities	Level of involvement of users in urban planning		LEVEL (score)	65%

Passaporto CESBA

DOCUMENTO TRANSNAZIONALE

EMESSIONE DI UN CERTIFICATO + PASSAPORTO



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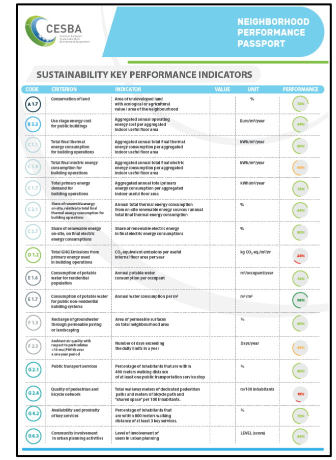

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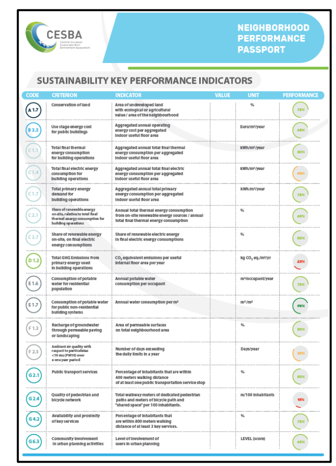
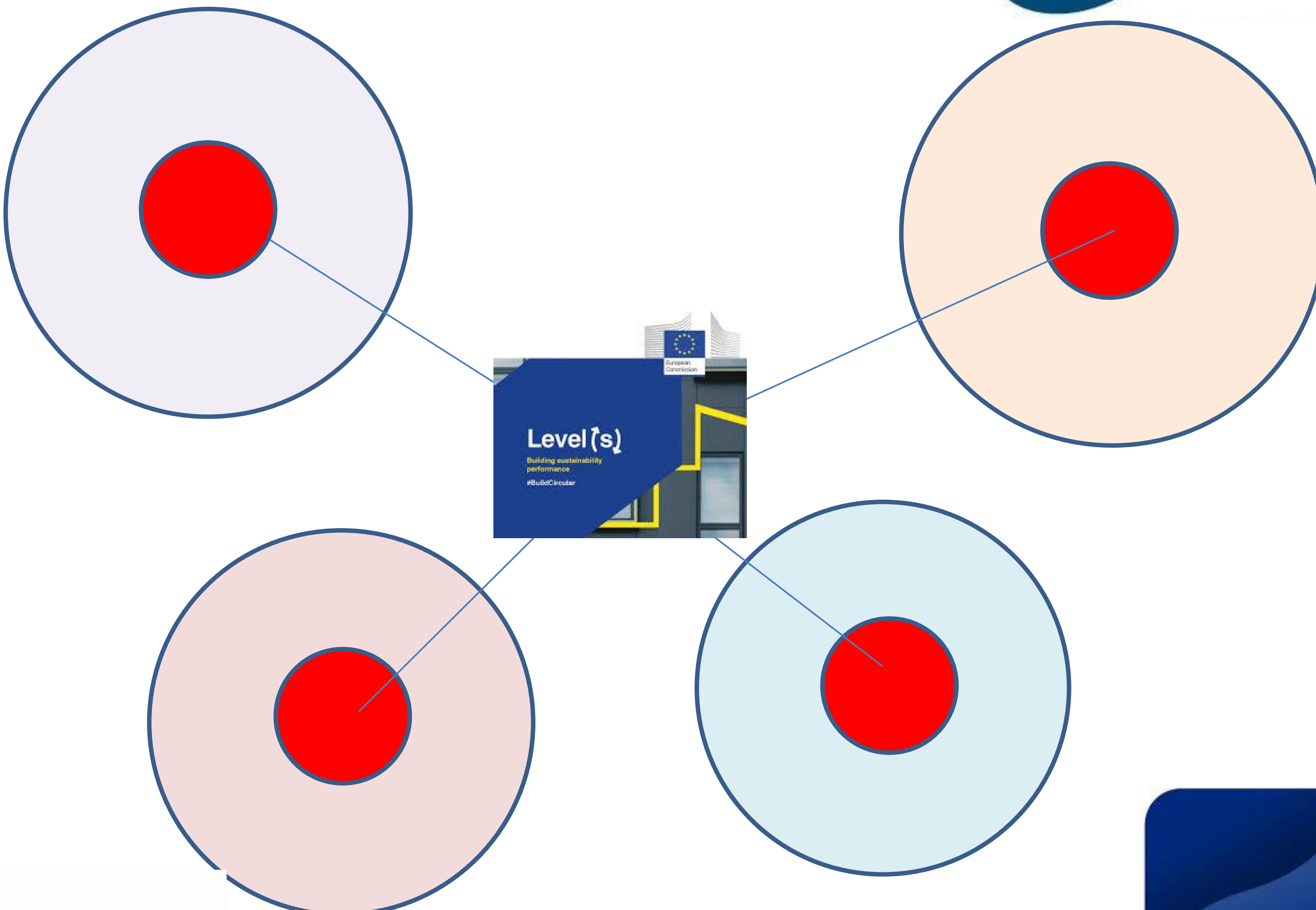


DG Ambiente e Level(s)

Level(s): gli indicatori comuni della Commissione Europea per l’armonizzazione dei Protocolli

UNI/PdR 13.

CERTIFIÉ PAR CERTIVEA NF HQE



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UN environment

Presentazione del Passaporto alla City Unit di UN Environment.

Collegamento Passaporto agli SDGs.

Meeting at UN Environment – Paris – January 2018

Conclusioni

L'origine del Protocollo ITACA e quindi della UNI/PdR 13 è internazionale

La PdR13 è parte dell'iniziativa CESBA e collabora con altri sistemi di valutazione europei di livello istituzionale

La PdR 13 sarà parte del sistema Level(s) integrando gli indicatori della Commissione Europea e generando certificati compatibili con quelli di tutti I principali sistemi europei (DGNB, HQE, BREEAM, ecc.)

La PdR 13 è integrata nel consesso internazionale dei sistemi di valutazione e contribuisce alle iniziative di armonizzazione a livello Europeo e mondiale.

Grazie per la vostra attenzione

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