From Research to a National Standard: SBTool and Protocollo ITACA

Andrea Moro

iiSBE ITALIA

HONG KONG WORLD SBE 2017
WORLD Sustainable Built Environment Conference
Organisers:
CONSTRUCTION INDUSTRY COUNCIL 建造業議會
HKGBC 香港綠色建築議會
SBE SERIES
International Co-owners:
iiSBE
UNEP Sustainable Buildings and Climate Initiative
FIDIC
Global Alliance for Buildings and Construction

Green Building:
a driver for new job opportunities

Environmentally Compatible Jobs project - 1999

Public administrations can generate a demand for green buildings trough incentives, subsidies, performance requirements in building codes, public tenders, urban plans.

The increased demand for green building creates new job opportunities for the actors of the building sector (professionals, construction companies, workers).

Partners: City of Torino, Regione Piemonte and ATC Torino

Need for a building assessment system to improve public policies

An assessment systems provides:

- The possibility to set reliable, measurable and verifiable performance targets for buildings, based on quantitative and objective indicators;
- A reference common framework for stakeholders;
- A clear definition of what is considered a green building.

SET COMMON

CLEAR
RELIABLE
MEASURABLE
VERIFIABLE

OBJECTIVES

POLICIES
REGULATIONS
INCENTIVES
GREEN PUBLIC
PROCUREMENT
URBAN PLANS
AUTHORIZATIONS

IT WAS CLEAR THE NEED TO SET UP A NEW NATIONAL ASSESSMENT SYSTEM TO SUPPORT PUBLIC POLICIES PROMOTING SUSTAINABLE BUILDING IN ITALY.

THE INTERNATIONAL SYSTEMS WERE NOT SUITABLE BECAUSE IT WASN'T POSSIBLE TO CONTEXTUALIZE THEM TO LOCAL CONDITIONS, PRIORITIES, UNIT OF MEASURES, STANDARDS, ETC..

Green Building Challenge

An international research process to define a common generic framework for building assessment.

Launched in 1996

Initially supported by NRC Canada and since 2000 coordinated by iiSBE

Managed by the IFC – International Framework Committee

Harmonization of assessments

- To understand each other talking the same language
- Common understanding about key sustainable built environment issues
- Measurement of the progress towards common sustainability objectives
- Best practice transferring
- Easier to learn from each other
- Facilitated transnational activities and processes

Argentina	University of Buenos Aires	Italy	Environment Park
Austria	Ökologie Institut	Japan	Utsunomiya University
Australia	University of New South Wales	Korea	Korean Institute of Energy Research
Brazil	Unicamp	Netherlands	Novem, DHV
Canada	BCBC	Norway	Norwegian Building Research Institute
Chile	Chilean Chamber of Construction	Poland	NAPE
China	Tsinghua University	South Africa	CSIR
Finland	Motiva	Spain	Ministry of Public Works and Transp.
France	CSTB	Sweden	KTH
Germany		USA	DOE
Greece	University of Thessaloniki	Wales	University of Cardiff
Hong Kong	University of Hong Kong	**IFC 2002**	

U.S. Team Green Building Challenge 2002

The Philip Merrill Environmental Center

Chesapeake Bay Foundation
Annapolis, Maryland

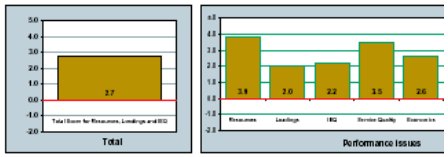
- Building function type: Commercial office building
- Location: Annapolis, Maryland
- Completed: 2000
- Owner: Chesapeake Bay Foundation www.savethebay.cbf.org
- Designers/architects: Smith Group
- Site area: 127,475 m²
- Gross floor area, m² (32,000 ft² = 2,970 m²)
- Typical building population: 100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

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 [illegible] parking [illegible] water ran[illegible] storm-water [illegible] oils and t[illegible] Geotherm[illegible] and cool[illegible]

Selected Environmental Sustainability Indicators for the Design		per m² only
ESI-1	Total net consumption of primary embodied energy, GJ	3.2
ESI-2	Net annualized consumption of primary embodied energy, MJ	65
ESI-3	Net annual consumption of primary energy for building operations, MJ	690
ESI-4	Net annual consumption of primary non-renewable energy for building operations, MJ	684
ESI-5	Net annualized primary embodied energy and annual operating primary energy, MJ	669
ESI-6	Net area of land consumed for building and related works, m²	2.6
ESI-7	Net annual consumption of potable water for building operations, m³	1
ESI-8	Annual use of grey water and rainwater for building operations, m³	0
ESI-9	Net annual GHG emissions from building operations, kg CO_2 equivalent	98
ESI-10	Predicted CFC-11 equivalent leakage per year in gm	0.002140
ESI-11	Total weight of materials re-used in Design from on-site or off-site uses, kg	339
ESI-12	Total weight of new materials used in Design from off-site uses, kg	851



Produced for the U.S. Department of Energy by the National Renewable Energy Laboratory

Telecomunication and telematic university school in Baix de LLobregat, SPAIN

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

OVERVIEW

Owner:	Universitat Politecnica de Catalunya
Location:	Baix de Llobregat
Architects:	Josep Benedito / Agusti Mataca
Colaboration:	Manuel Arguijo / Oriol Cuadó
Clerks of work:	Josep Molero
Engineers:	C.O.T. Lluis J.Duart, S.L.
Main contractor:	NECSO, S.A.
Year of completion:	2001
Gross Floor Area:	11273 m²
Construction cost:	10.700.000 €


NORTH ELEVATION


SITE AERIAL VIEW

DESCRIPTION

[illegible] programatic needs, bringing about [illegible] ity and its location in the site, sums [illegible] , allow thermic differentials, [illegible] lectors connected with the toilet [illegible] sanitary water supply system. [illegible] the tanks. The water table supplies [illegible] otaic cells, installed in southern [illegible] the roofs. These produce hot water [illegible] r from the heating system. [illegible] ampipes pipes under flooring. The [illegible] 2, equivalent to the basic unit of floor [illegible] accumulators in the boiler's room, [illegible] anels in the roof.


VIEW OF A COURTYARD

[illegible] ndition. The site was [illegible] No significant vegetation [illegible] the small earth movement [illegible] d within site limits.

[illegible] s
[illegible] a Gomes & Maristela Silva
[illegible] ovana 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 m³/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

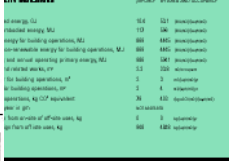
Structure, products and materials
- Choice of durable, and easy-to-repair and easy-to-clean materials
- Choice of materials with low impact on human health

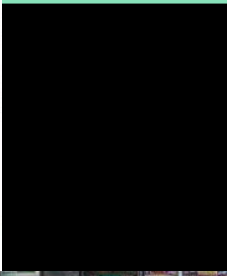
Energy consumption
- Ventilation system with heat recovery
- Low NOx emissions gas boilers
- Building Energy Management System (in accordance with the outside temperature and the occupation)

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

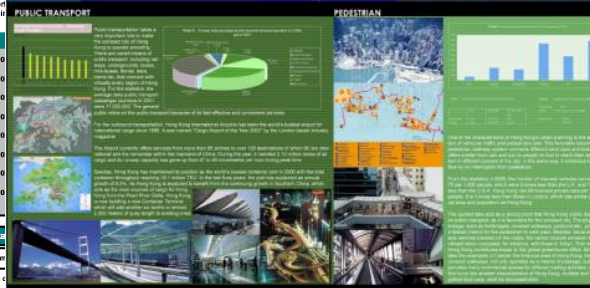
onmental management
- Involvement of the maintenance staff in the studies and choices conce vegetal species, floor coverings, systems and equipments (including t BEMS)


Layout plan





THE LIVING EXPERIENCE OF HONG KONG



Consalud Headquarters Building, Santiago, Chile

Function:	Office building
Owner:	Isapre Consalud
Architects:	"May & Soler Arquitectos Asociados", Santiago Giancarlo dell'Aquila & Mario Voercio, 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 and that, in addition to their offices, the building should support and recreational facilities. To achieve these objectives they moved from their former central densely built location to a more open area; the chosen site has 2.5 ha. located out of downtown, on the beltway that surrounds Santiago. Another objective was a building with lower operational costs, with a geo-climatic design.

Green Building Challenge 2002 http://iisbe.org

2.- Relevant Architectural an Building As

2.1 Architecture

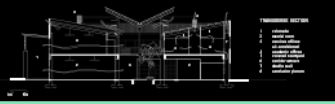
a) SOLAR ORIENTATION
The main façade is exposed to the nort[illegible] the exposure in winter. The main buildi[illegible]

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.

Selected Environmenta[illegible]	
ESI-1	Total net consumption of prim[illegible]
ESI-2	Net annualized consumption [illegible]
ESI-3	Net annual consumption of pr[illegible]
ESI-4	Net annual consumption of pr[illegible]
ESI-5	Net annualized primary embod[illegible]
ESI-6	Net area of land consumed fo[illegible]
ESI-7	Net annual consumption of po[illegible]
ESI-8	Annual use of grey water and [illegible]
ESI-9	Net annual GHG emissions fro[illegible]
ESI-10	Predicted CFC-11 equivalent l[illegible]
ESI-11	Total weight of materials re-un[illegible]
ESI-12	Total weight of new materials [illegible]

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



THE LIVING EXPERIENCE OF HONG KONG

INTRODUCTION

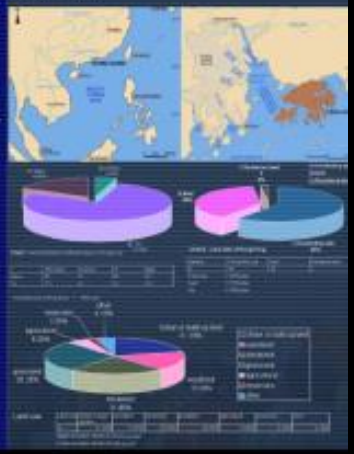
Hong Kong, "Pearl of Oriental", lies on the southern margin of the Pearl River. The region comprises the peninsula of Kowloon and the New Territories, with a coastline 356 km long, and as many as 235 outlying islands, of which the largest is Lantau Island, and the second largest is Hong Kong Island. The landscape is rugged, with several high peaks, which include Tai Mo Shan (957m), Lantau Peak (934m) and Sunset Peak (869m). There are only comparatively limited area of flat land.

The total area of the region is 2,834 km2, in which comprises 1,076 km2 of land area. This represents about 40% of the total area and with 5% of which is reclaimed land. All the remaining, 60% area (1,828 km2) is covered by sea.

According to the land area analysis 2000', within the land area, there are only 21.2% used for urban and built-up purpose, all other lands are woodland, shrub land, grassland, or agricultural uses.

It is interesting to point out that Hong Kong, besides having the image of being an international metropolitan, has plenty of green land to prove its eco-friendly "face". There are 23 country parks, almost covered over 400 km2 that means 40% of land in Hong Kong is covered by greenery. Comparing with other cities, few of them have 30% of their land protected in parks. Thus, tourists could easily reach the parks when they are traveling to Hong Kong.

POPULATION



PUBLIC TRANSPORT

Public transportation takes a very important role to make the compact city of Hong Kong to operate smoothly. There are varied means of public transport, including rail ways, underground, buses, mini-buses, ferries, taxis, trams etc. that connect with virtually every region of Hong Kong. For the statistics, the average daily public transport passenger journeys in 2001 were 11,000,000. The general public relies on the public transport because of its fast effective and convenient services.

For the outbound transportation, Hong Kong International Airport is has been the world's busiest airport for international cargo since 1996. It was named "Cargo Airport of the Year 2002" by the London based industry magazine.

The Airport currently offers services from more than 80 airlines to over 120 destinations of which 90 are inter-national and the remainder within the mainland of China. During the year, it handled 2.12 million tonnes of air cargo and its runway capacity has gone up from 47 to 68 movements per hour during peak time.

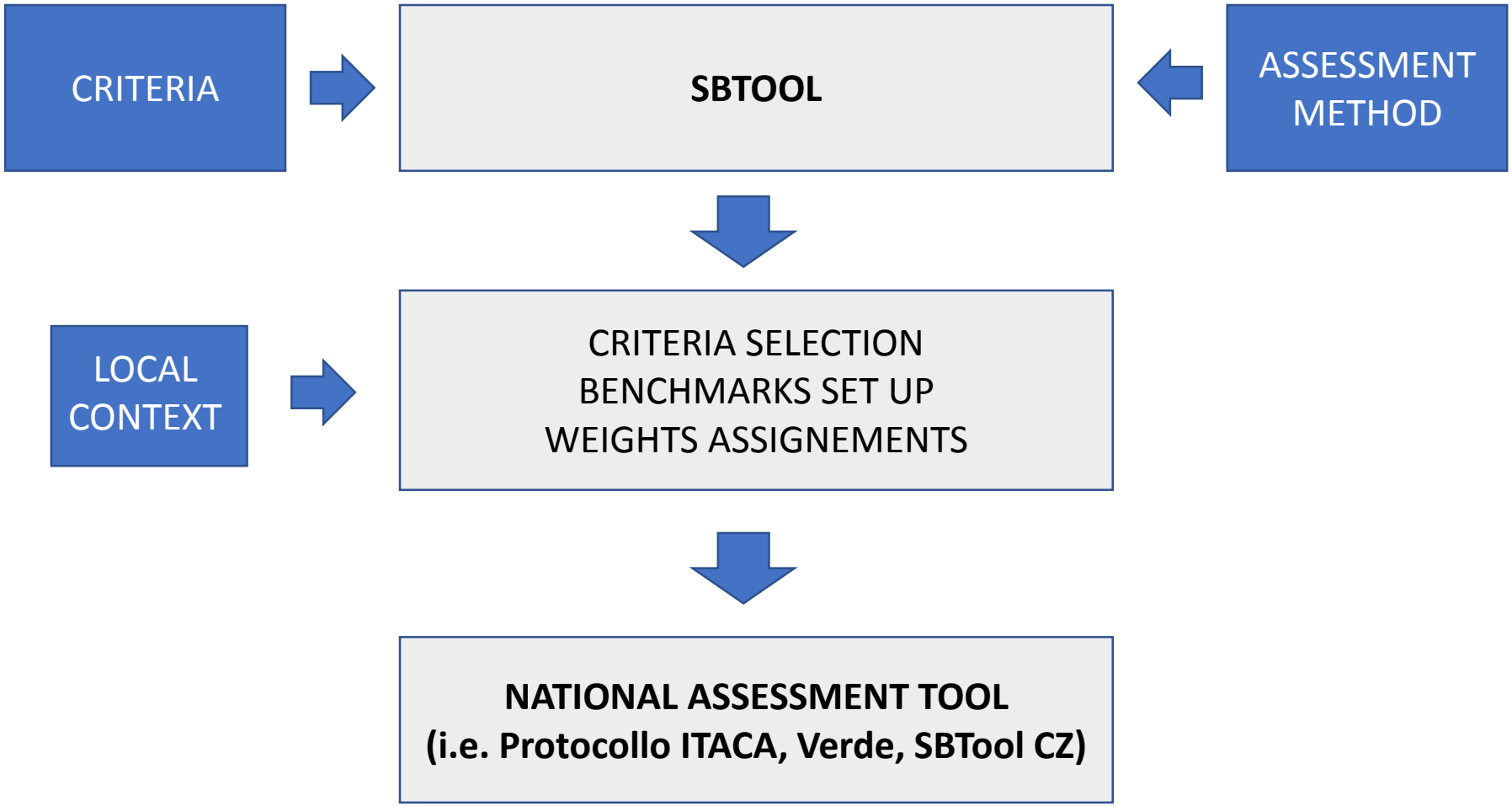
Besides, Hong Kong has maintained its position as the world's busiest container port in 2000 with the total container throughput reaching 18.1 million TEU. In the last five years, the port has sustained an annual growth of 8.3%. As Hong Kong is expected to benefit from the continuing growth in southern China, which acts as the main sources of cargo for Hong Kong from the Pearl River Delta, Hong Kong is now building a new Container Terminal which will add another six berths or almost 2,300 meters of quay length to existing area.

PEDESTRIAN

THE MID-LEVELS-CENTRAL PEDESTRIAN ESCALATOR (THE ESCALATOR)

SBTool: the Generic Framework principle

- A generic framework allows to combine the need for contextualized tools with the possibility to transnationally compare the assessment results.
- It is a «generic» multicriteria assessment tool that needs a contextualization process to be appied.
- It is the common root for harmonized national and regional systems. It makes possible to speak the same language.
- The Generic Framework is composed by a set of assessment criteria, a weighting system, a normalization system and an aggregation procedure.


CRITERIA
SBTOOL
ASSESSMENT METHOD
LOCAL CONTEXT
CRITERIA SELECTION
BENCHMARKS SET UP
WEIGHTS ASSIGNEMENTS
NATIONAL ASSESSMENT TOOL
(i.e. Protocollo ITACA, Verde, SBTool CZ)

ITALIAN TEAM IN GBC

The Italian GBC National Team was set up and presented in 2000 at SB Maastricht. Key members were Environment Park, the Italian National Research Council, Politecnico of Torino and Politecnico of Milan.

Between 2000-2002 the first Italian version of GBTool was developed and tested.

The Italian GBTool was used as Guideline for the Sustainability of the Olympic Villages – XX Winter Olympic Games Torino.

The GBC in Torino

In 2002 the meeting of the IFC was hosted in Torino, Italy, at the Environment Park.

On that occasion, the first conference in Italy on building assessment tools and methodologies was organized with 25 participating countries,

A key organization was attending the conference: ITACA, the Federal Association of the Italian Regions. In Italy, energy and environment fall into the competence of regions.

ITACA and iiSBE

ITACA asked iiSBE to collaborate in the process for the development of the new Italian national public assessment tools.

ITACA chose to base the new tool on the GBTool because:

- Its scientific value, coming from the cooperation of 25 teams
- The possibility to adapt the framework to local contexts: 20 regions with different climates and building practices
- It is open source, transparent and simple to use: suitable for mass certification

PROTOCOLLO ITACA

January 2004: the Conference of the Presidents of Italian Regions officially approved the first version of Protocollo ITACA.

The Italian Regions started to adopt Protocollo ITACA to raise the impact of their policies.

First used in incentive based programs.

Rating system composed by 5 issues and 74 criteria. Provides a score ranging from -1 to +5 to a building depending on its performance.

REGIONAL POLICIES

- 10.000 Apartments by 2012
  - +10.000 euro per apartment, minimum score 2.5
- Housing Plan
  - +35 % building volume, minimum score 2.5
- Green Public Procurement
  - Energy Centre Torino, 5% penalty if a minimum score is not reached
- Shopping Centers
  - Commercial authorization: score 3 minimum
- Funding programs for public buildings

iiSBE Italia: the first chapter

Considering the increasing need for support expressed by the Italian Regions, iiSBE decides to set up its first local chapter, iiSBE Italia in 2005.

A MOU is signed between iiSBE Italia and ITACA where iiSBE Italia takes the official role of technical control body for the Protocollo ITACA assessment system:

- Update of national versions
- New assessment protocols development (i.e. urban scale)
- Support provided to regions (local versions, training, certification)

PROTOCOLLO ITACA Update

2004: first National version (74 criteria)

2007: short version for an easier application (15 criteria)

2009, 2011, 2015: updates of the National version

. Changes in energy regulations

. New technical standards (UNI)

Protocollo ITACA and the market

2011: the private sector request ITACA to provide an assessment systems also suitable for the market.

Appreciated: affordability, operability and limited cost

15 regional systems with different certification processes

. 99% of 1500 buildings certified because incentives or regulations

. Certification non always accessible by private organizations

A new strategy for a national system

The private sector was asking an assessment system operational and accessible in the whole country based on a unique standard.

To answer this need, the strategy of ITACA and iiSBE Italia has been developed in two directions:

- Transformation of the national version of Protocollo ITACA in a national standard (UNI)
- Implementation of a certification process under national accreditation

UNI PdR13 – a new standard

UNI is the Italian National Standardization body

2014 - Agreement between ITACA and UNI

2015 - publication of the new UNI PdR 13 standard:
“Environmental sustainability of construction works - Operational tools for sustainability assessment”

Section 0- Methodology (SBTool description)

Section 1- Criteria for residential buildings

Section 2- Criteria for non residential buildings

UNI PdR13

The document is downloadable form the UNI website for free because it is a public assessment tool.

Now a common national assessment tool is available in the whole country.

The value of Protocollo ITACA has been strengthen. Today it isn’t anymore only the public assessment system of the Italian regions but instead it is the official technical assessment tool for Italy.

A new national certification process

- A second agreement was signed between ITACA and Accredia.
- Accredia is the national Italian accreditation body. It is the organization that accredits certification bodies to can carry out inspections and audit activities with regards to UNI standards.
- ITACA and Accredia, with the support of iiSBE Italia, defined the Technical Regulation 33 (RT33) for the accreditation of organizations with respect to UNI PdR 13 – Protocollo ITACA.
- Set up of a National registry
- Two level process: audit carried out by certification bodies that are validated by the national registry. The national registry issues the certificate

CESBA

Common European
Sustainable Built
Environment Assessment

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

Main Objectives:

- Harmonization of public assessment systems in Europe
- Facilitate the adoption of assessment tools in policies
- Increase the number of certified buildings

Conclusions

The establishment of the new standard UNI PdR13 not only made available a fully operational national certification system to the private sector. It is also encouraging the adoption and use of Protocollo ITACA by public organizations.

This approaches combines the public and private needs in one open and transparent systems that is expected will encourage the mass diffusion of sustainability certification in Italy.

Thank you