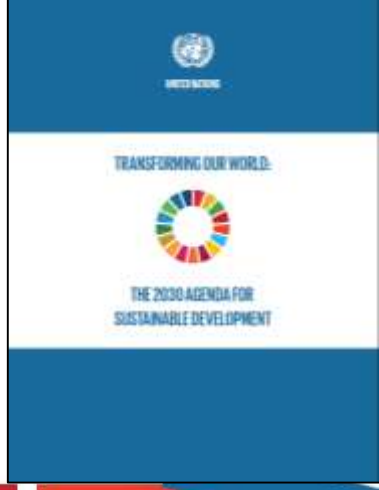
Protocollo ITACA in the European context and the project CESBA MED

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

iiSBE ITALIA

- iiSBE is an international non-profit organization whose overall aim is to actively facilitate and promote the adoption of policies, methods and tools to accelerate the movement towards a global sustainable built environment.
- iiSBE collaborates with governments, regional authorities and cities providing assessment tools to raise the impact of their policies.
- iiSBE is present in all continents trough national chapters.
- iiSBE Italia is the Italian chapter, located at the Energy Center in Torino
- iiSBE Italia collaborates with ITACA and Italian Regions in the development of Protocollo ITACA

UNITED NATIONS
THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT



POLICIES

ACTIONS

SET

CLEAR
RELIABLE
MEASURABLE
VERIFIABLE

OBJECTIVES

If you can’t measure it, you can’t improve it

LORD WILLIAM THOMSON KELVIN

Role of assessment tools

Possibility to set reliable, measurable and verifiable performance targets for urban areas and buildings, based on quantitative indicators.

Provision of objective and reliable information to support decision making processes.

Provision of a reference common framework for the stakeholders

COMMON
CHALLEGES AND POLICIES

COMMON INDICATORS TO ESTABLISH SUSTAINABILITY GOALS

HARMONIZED ASSESSMENT METHODOLOGIES TO MEASURE THE PROGRESS

TO AVOID

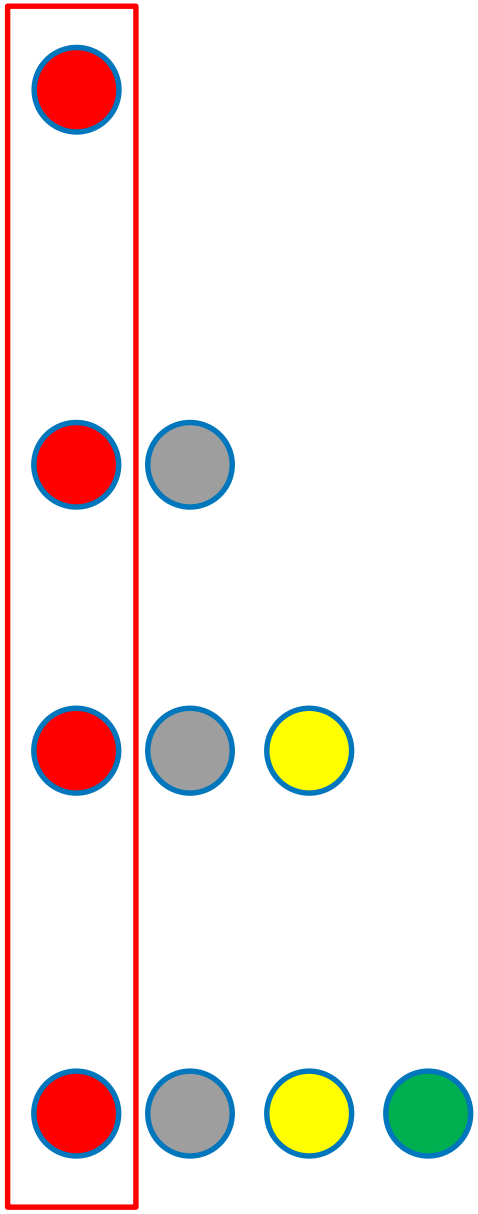
UNCERTAINTY AND CONFUSION

THINK GLOBAL

Governemental Levels

ACT LOCAL

Objectives/Indicators



@Andrea Moro

Why to harmonize

- Common understanding about key sustainable building issues in Europe
- Measurement of the progress towards common objectives
- Best practice transferring
- Easier to learn from each other
- Facilitated transnational activities and processes
- More effective common regulations and directives

ACT LOCALLY

ASSESSMENT TOOLS

MUST REFLECT

LOCAL PRIORITIES AND CONDITIONS

KEEPING THE POSSIBILITY TO

COMPARE/AGGREGATE THE RESULTS AT

TRANSNATIONAL LEVEL

THINK GLOBALLY

A common assessment methodology: Sustainable Building Tool (SBTool)

SBTool is the result of a world level research process launched in 1998 coordinated by iiSBE

OBJECTIVE

Development of a transnational open source assessment methodology for assessing the sustainability of buildings, based on the contextualisation principle.

SBTool
(UNI PdR13 – 0)

25 NATIONAL TEAMS

France	CSTB
U.S.A.	Department of Energy
Canada	NRC
Japan	Utsunomiya University
China	Tsinghua University
Italy	iiSBE IT/ITC-CNR
Korea	Ministry of Environment
Taiwan	Cheng Kung University
Norway	Norwegian Building Research Institute
Sweden	Royal Institute of Technology
Germany	University of Karlsruhe
Netherlands	Novem
Argentina	University of Buenos Aires
South Africa	CSIR
Australia	University of New South Wales
Austria	Ökologie Institut
Finland	Motiva
Greece	Univ. of Thessaloniki
Honk Kong	University of Hong Kong
Poland	University of Warsaw
Great Britain	BRE
Israel	iiSBE Israel
Mexico	GBC Mexico
Brasil	University of San Paolo
Chile	Chamber of Construction

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)

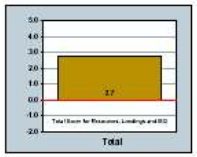
U.S. Team Green Building Challenge 2002

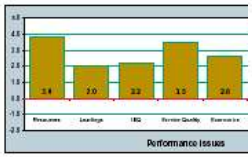
Description: A unique holistic design process produced the Chesapeake Foundation's new building. This award-winning, 33,000 ft² building serves as a global model of energy conservation and sustainable building techniques. The Center's primary purpose is to "Save the Bay" through resource restoration 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.

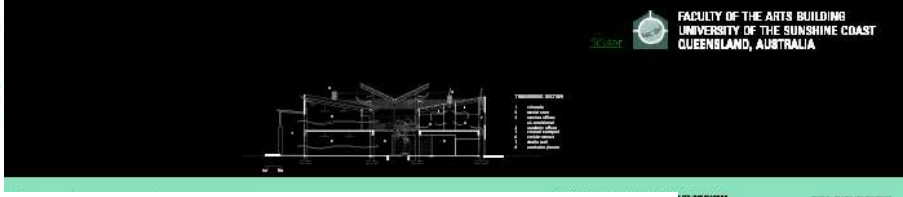
Flushless composting toilets reduce nutrient pollution from human waste and rooftop cisterns capture rainwater for hand-washing and fire suppression. Smart parking design reduces harmful pro[illegible] under the parking o[illegible] water ran[illegible] storm wa[illegible] oils and t[illegible] Geotherm[illegible] and coolin[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	680
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	96
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	320
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



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 conc vegetal species, floor coverings, systems and equipments (including BEMS)

Telecomunication and telematic university school in Baix de LLobregat, SPAIN

and potential for daylighting and natural ventilation use, which are responsible for most energy consumption reduction, if compared against Brazilian common practice (100% artificial conditioning and illumination).

predevelopment condition. The site was previously unbuilt. No significant vegetation was removed and the small earth movement was accommodated within site limits.

Green Building Challenge 2002 http://iisbe.org

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

Consalud Headquarters Building, Santiago, Chile

Function:	Office building
Owner:	Isapre Consalud
Architects:	"May & Soler Arquitectos Asociados", Santiago Giancarlo dell'Aquila & Mario Investo, Arq. Architects, Italy
Energy Design:	Prof. Arch. Mario Grosso – Dr. Ing. Paolo Olivero Department Of Environmental Sciences and Technology Politecnico di Torino, Italy
HVAC:	"Gotreau & Zenteno Limited", Santiago
Completed:	February 2001
Site Area:	23.205 m²
Built-up Area:	4.211 m²
Gross Floor Area:	20.557 m²
Basement / Above Grade Floors:	3 / 4
Typical Building Population:	350 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 new 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 density built location to a more open area: the chosen site has 2.8 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

GENERIC FRAMEWORK PRINCIPLE (SBTool)

Generic Framework

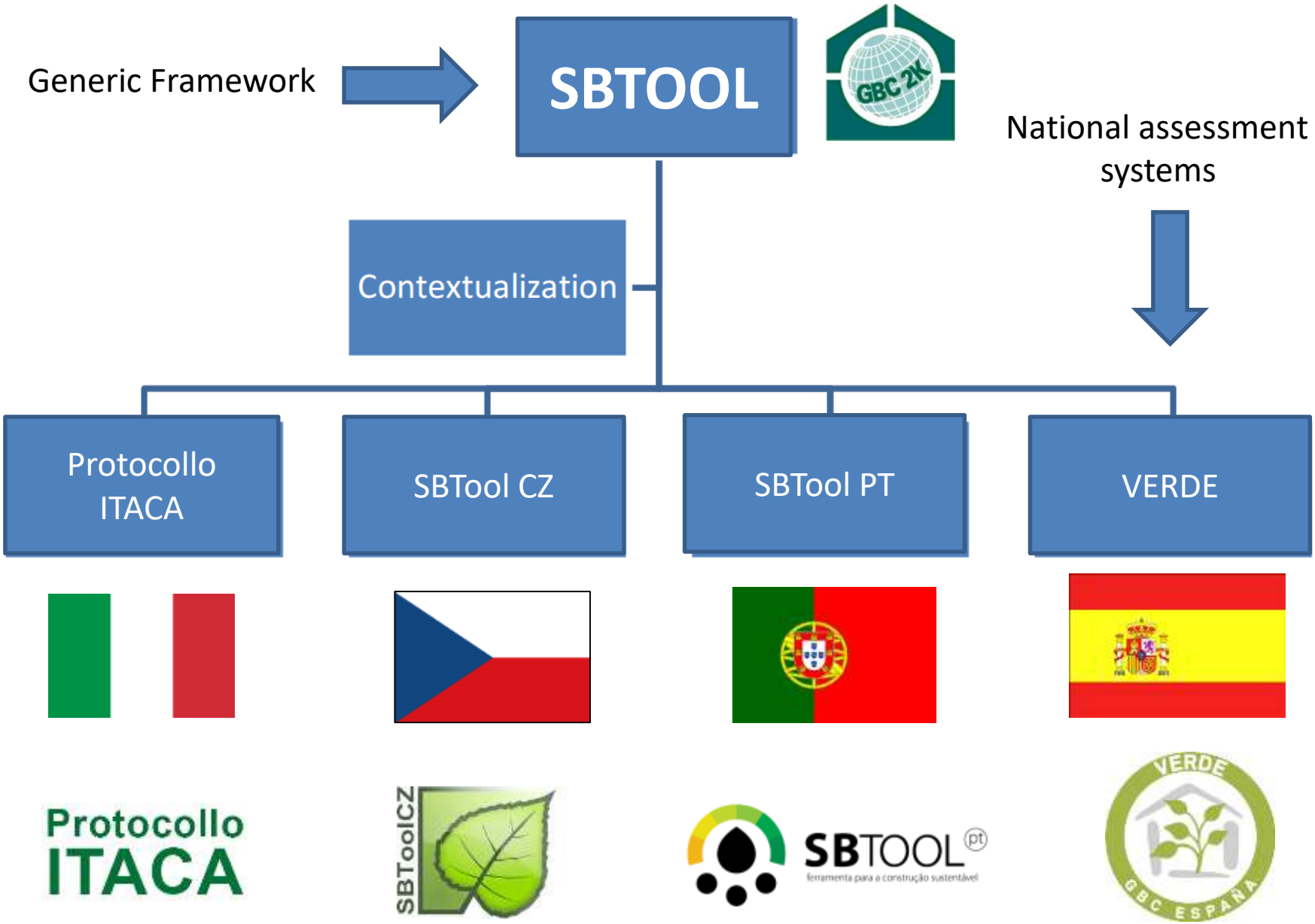
A generic multicriteria assessment system for measuring the sustainability of buildings.

The Generic Framework isn't operational.

It is necessary to contextualise it.

National/Regional assessment systems

Operative assessment systems derived from the Generic Framework trough a contextualisation process.


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

CONTEXTUALIZATION PROCESS

METHODOLOGY

SBTool

CONTEXT

1. CRITERIA SELECTION
2. BENCHMARKS
3. WEIGHTS

PROTOCOLLO ITACA
UNI/PdR13

CESBA

Common European Sustainable Building Assessment

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

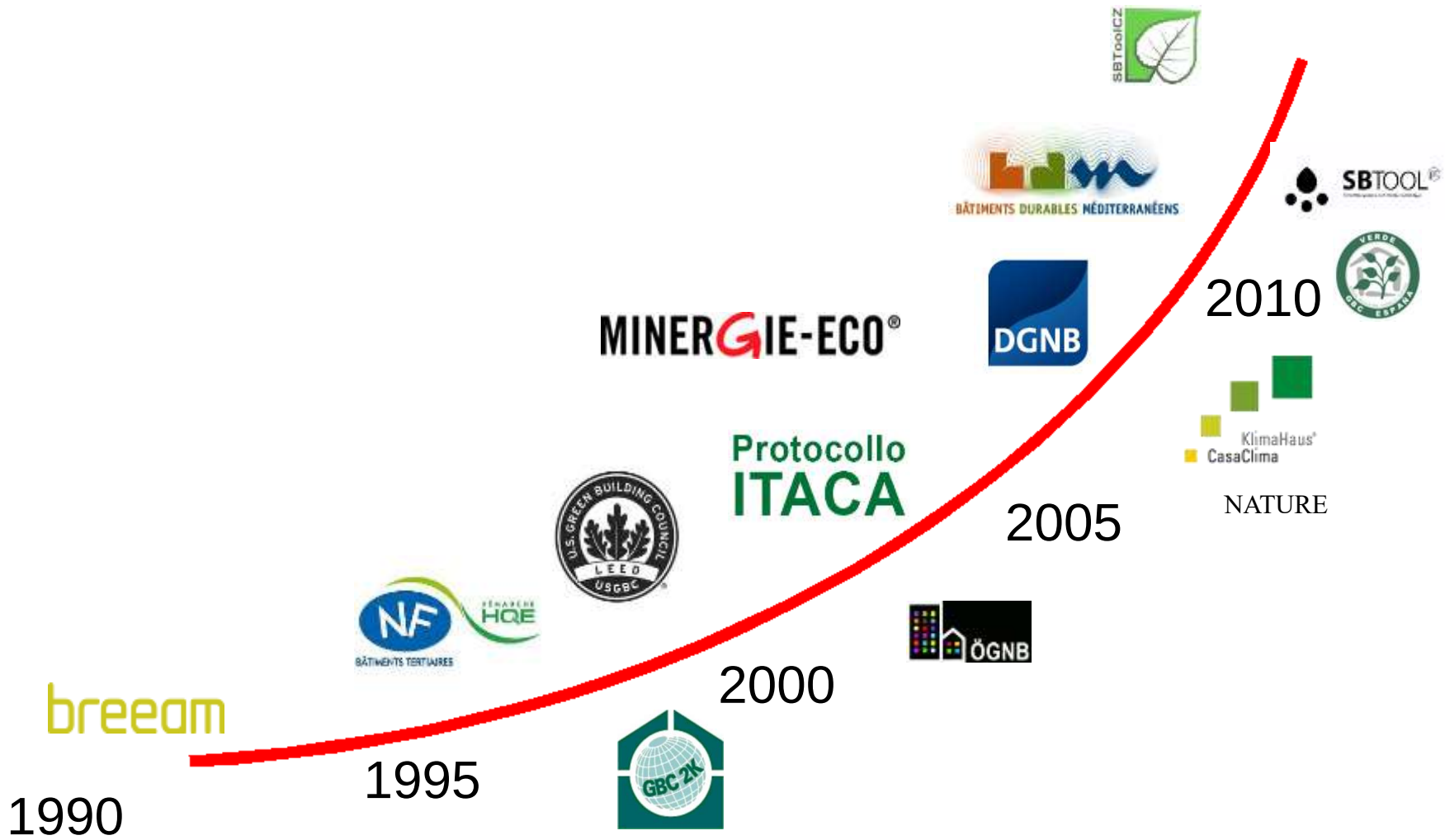
Main Objectives:

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

Focus on public assessment systems.
More than 60 assessment systems used in Europe !

CESBA Principles for Building Assessment

1. User first !
2. Sustainability
3. Regional contextualization
4. Comparability
5. Mass certification
6. Simple to use
7. Open source
8. Co-creation
9. Transparency


SBTool CZ
BÂTIMENTS DURABLES MÉDITERRANÉENS
SBTOOL
2010
DGNB
MINERGIE-ECO®
KlimaHaus CasaClima
NATURE
Protocollo
ITACA
2005
U.S. GREEN BUILDING COUNCIL
LEED
USGBC
NF
HQE
BÂTIMENTS TERTIAIRES
ÖGNB
2000
breeam
GBC 2K
1995
1990

@Andrea Moro

CESBA PASSPORT: COMPARABILITY OF ASSESSMENT RESULTS

KPIs

COMMON INDICATORS

Projects

ENERBUILD
CABEE
VISIBLE
CEC5
OPEN HOUSE
SUPERBUILDNGS

CESBA PASSPORT: COMPARABILITY OF ASSESSMENT RESULTS

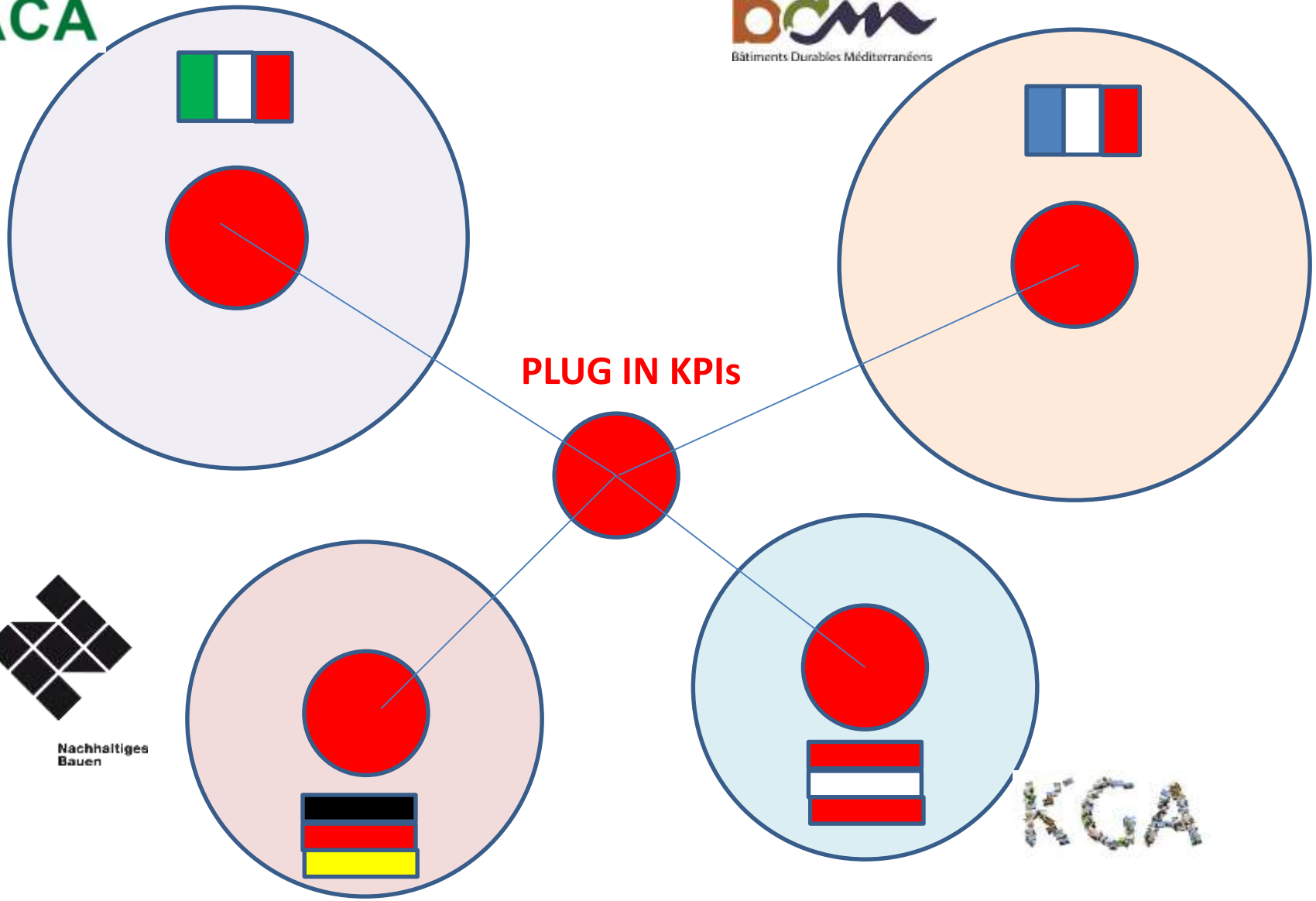
KPIs

- Energy
- Water
- Emissions
- Waste
- Materials
- Comfort
- Economic aspects

→ COMMON METRICS = COMPARABLE RESULTS

Protocollo
ITACA

bdm
Bâtiments Durables Méditerranéens



Nachhaltiges
Bauen

KGA

CESBA PASSPORT

CESBA

PERFORMANCE PASSPORT

SUSTAINABILITY KEY PERFORMANCE INDICATORS

CODE	CRITERION	INDICATOR	VALUE	UNIT	PERFORMANCE
A 1.7	Conservation of land	Area of non-developed land with ecological or agricultural value / area of the neighbourhood		%	
B 1.2	Use stage energy cost for public buildings	Aggregated annual operating energy cost per aggregated heated useful floor area		Euro/m²/year	
C 1.1	Total final thermal energy consumption for building operations	Aggregated annual total final thermal energy consumption per aggregated heated useful floor area		kWh/m²/year	
C 1.4	Total final electric energy consumption for building operations	Aggregated annual total final electric energy consumption per aggregated heated useful floor area		kWh/m²/year	
C 1.7	Total primary energy demand for building operations	Aggregated annual total primary energy consumption per aggregated heated useful floor area		kWh/m²/year	
C 2.1	Share of renewable energy on-site (photovoltaic and final thermal energy consumption for building operations	Annual total thermal energy from on-site renewable / total final thermal energy		%	
C 2.2	Share of renewable energy on-site, on final electric energy consumptions	Share of renewable energy in the electric		%	
D 1.2	Total GHG Emissions from primary energy used in building operations	CO_2 equivalent / heated floor area		kg CO_2 eq./m²/yr	
E 1.6	Consumption of potable water for residential population	Annual potable water consumption per occupant		m³/occupant/year	
E 1.7	Consumption of potable water for public non-residential building centers	Annual water consumption per m²		m³/m²	
F 1.3	Recharge of groundwater through permeable paving or landscaping	Area of permeable surfaces on total neighbourhood area		%	
F 2.2	Ambient air quality with respect to particulates <10 micrograms/m³ every per period	Number of days exceeding the daily limits in a year		Days/year	
G 2.1	Public transport services	Percentage of inhabitants that are within 400 meters walking distance of at least one public transportation service stop		%	
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	
G 4.2	Availability and proximity of key services	Percentage of inhabitants that are within 400 meters walking distance of at least 3 key services.		%	
G 6.3	Community involvement in urban planning activities	Level of involvement of users in urban planning		LEVEL (score)	

PASSPORT

TRANSNATIONAL

REPORTING DOCUMENT

CERTIFICATE +

PASSPORT

Protocollo ITACA

+

bdm

Bâtiments Durables Méditerranéens

RECONNU EN PHASE

bdm OR

80 POINTS / 100

+

Level(s)

Level(s): a Common EU framework of core sustainability indicators

Protocollo
ITACA

bdm
Bâtiments Durables Méditerranéens

Nachhaltiges Bauen

KGA

Collaboration established with the City Unit of UN Environment.

SDGs and CESBA Passport.

Meeting at UN Environment – Paris – January 2018

A NEW CHALLENGE….

THE URBAN SCALE

URBAN SCALE vs BUILDING SCALE

- Energy efficient and sustainability measures and their implementation at district level allow to reach significant and cost-effective improvements with regards to a building scale approach
- Urban scale approach is frequently the most efficient one: synergies among buildings, wasted energy exploitation, efficient use of renewable energy sources, cogeneration systems, economy scale factor.

CESBA MED: SUSTAINABLE CITIES

Start: November 2016
End: October 2019

Total budget: 3.190.375 euro

12 Partners
7 Countries

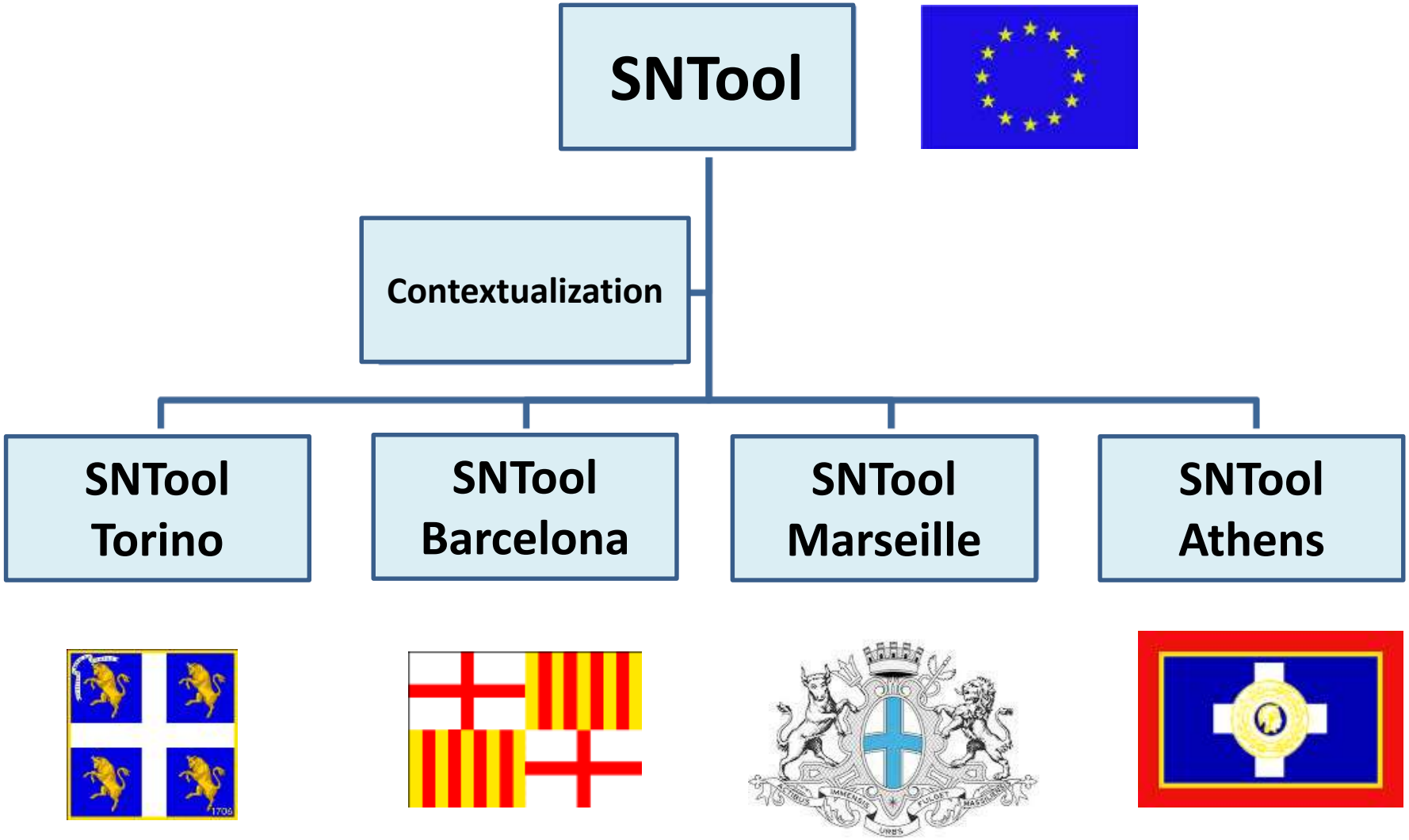
Assessment systems and Passport at urban and building scale. 9 Cities involved.

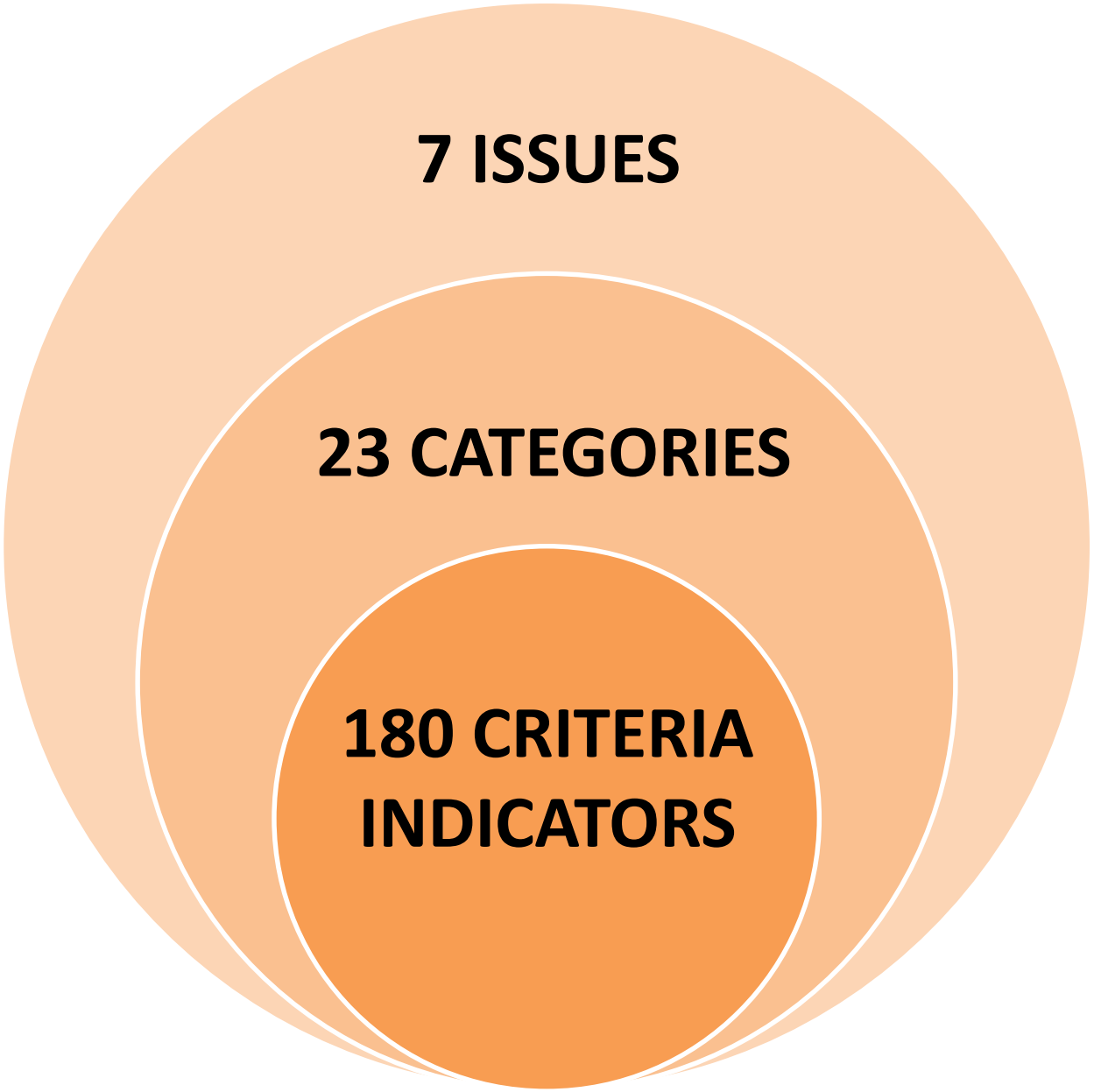
City of Torino - Italy
iiSBE Italia R&D - Italy
City of Udine – Italy
EnvirobatBDM - France
AURA-EE- France
Métropole d' Aix-Provence-Marseille – France
Government of Catalonia - Catalonia
Municipality of Sant Cugat del Vallés - Catalonia
University of Malta – Malta
National Observatory of Athens – Greece
Energy Institute Hrvoje Požar – Croatia
CESBA – Austria

Assessment System for Neighbourhoods

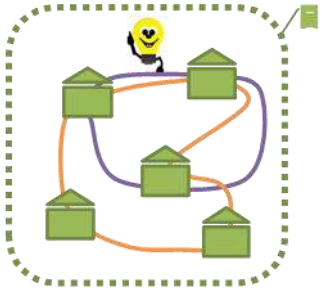
CESBA MED produced the first transnational multicriteria assessment system for rating the sustainability of neighbourhoods.

The assessment system is associated to a model of decision making process for the selection of the best sustainability retrofitting strategies to increase the quality of neighbourhoods and public buildings.


SNTool
Contextualization
SNTool Torino
SNTool Barcelona
SNTool Marseille
SNTool Athens


7 ISSUES
23 CATEGORIES
180 CRITERIA
INDICATORS

MACRO - THEMES



A – BUILT URBAN SYSTEMS

B – ECONOMY

C – ENERGY

D – ATMOSHERIC EMIS.

E – NON RENEW. SOURCES

F – ENVIRONMENT

G – SOCIAL ASPECTS

A Built Urban Systems	B Economy	C Energy	D Atmosheric Emissions	E Non renew. sources	F Environment	G Social aspects
A1 Urban structure and form	B1 Economic Structure and Value	C1 Non renewable energy	D1 Atmospheric emissions	E1 Potable water, stormwater and greywater	F1 Environmental aspects	G1 Acessibility and Safety
A2 Transportation infrastructure	B2 Economic activity	C2 Nuclear, renewable and Clean energy		E2 Solid and liquid waste	F2 Outdoor environmental quality	G2 Traffic and Mobility Services
	B3 Cost and investement	C3 Energy recycling and storage		E3 Resource consumption, retention and maintenance	F3 Ecosystems and landscapes	G3 Communication services
						G4 Public and private facilities and services
						G5 Local food
						G6 Management and community involvment
						G7 Society, culture and Heritage
						G8 Perceptual

GENERIC FRAMEWORK – URBAN SCALE

7 ISSUES
23 CATEGORIES
176 CRITERIA – MAX SIZE

SET UP OF AN ASSESSMENT SYSTEM

ASSESSMENT METHOD

CESBA MED SN GENERIC FRAMEWORK

CONTEXT

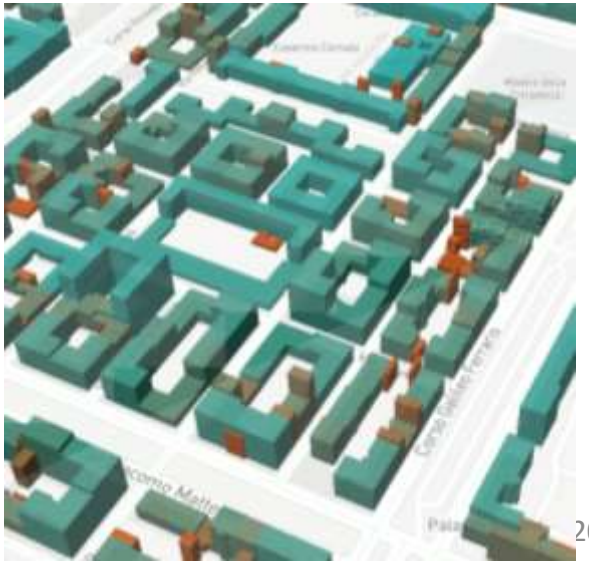
1. CRITERIA SELECTION
2. PERFORMANCE SCALE
3. WEIGHTS

ASSESSMENT SYSTEM CITY OF TORINO

Harmonized Assessment Tools

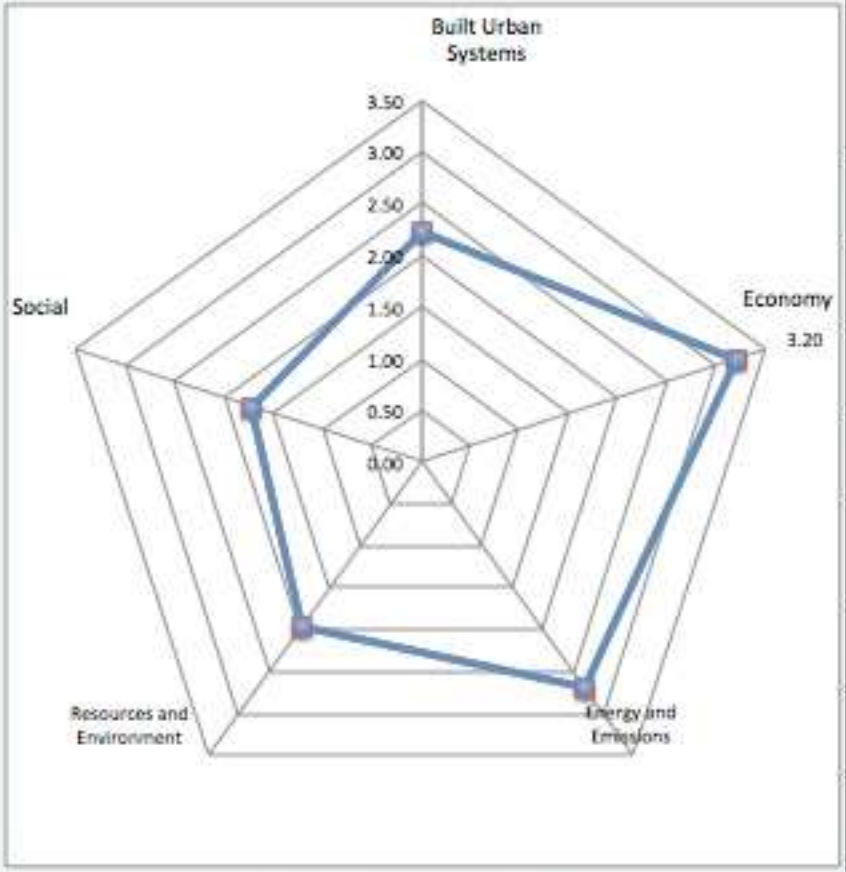
9 assessment tools under test on neighbourhoods in:

- Torino
- Barcelona
- Marseille
- Lyon
- Athens
- Zagreb
- Sant Cugat del Vallés
- Udine
- Malta

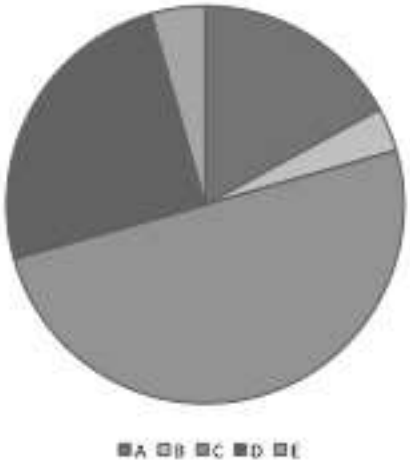


Performance results for an urban area performance assessment in SW quarter, a neighbourhood of Torino

CESBA MED SNTool	Min	10Nov17

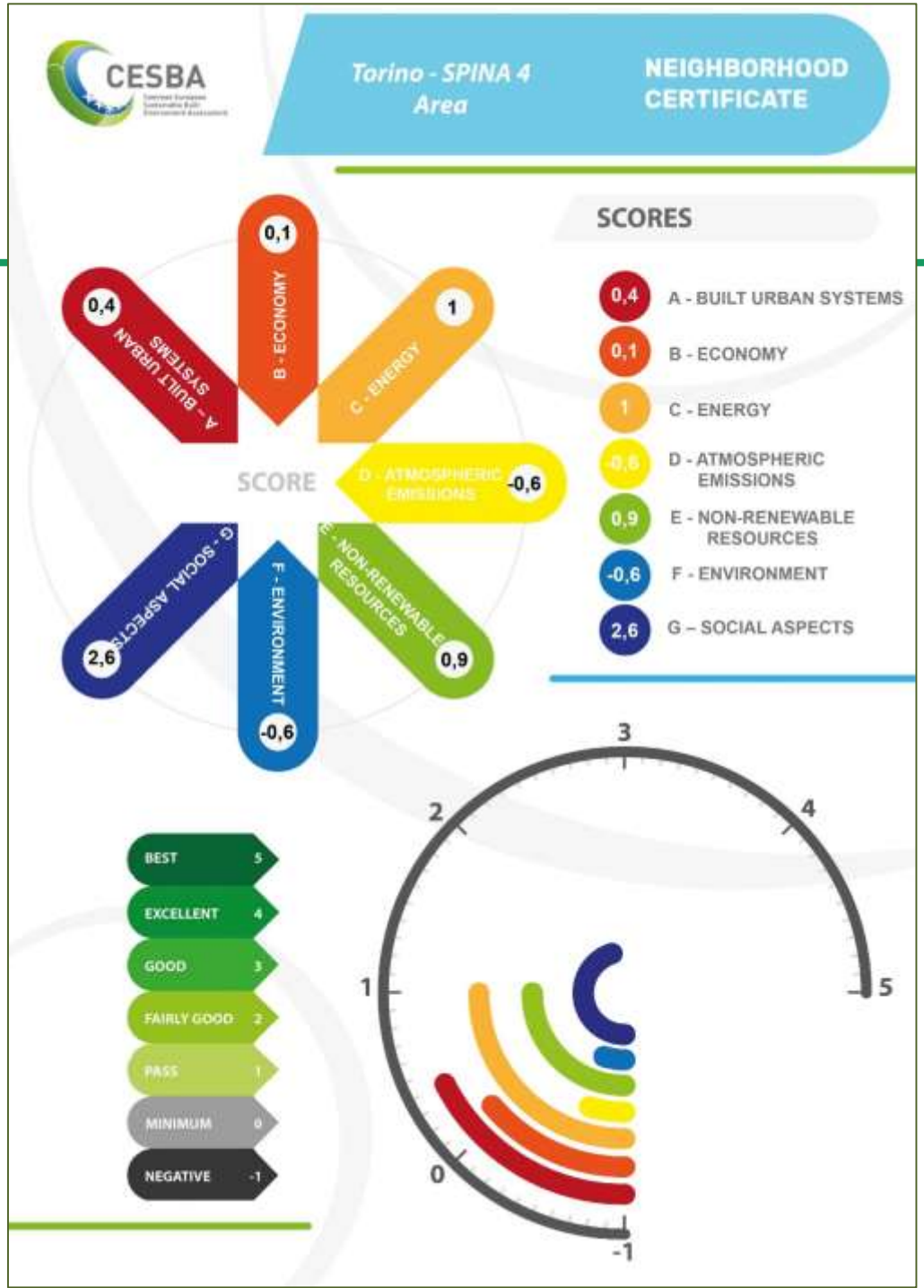


0 = Acceptable Practice; 3 = Good Practice; 5 = Best Practice

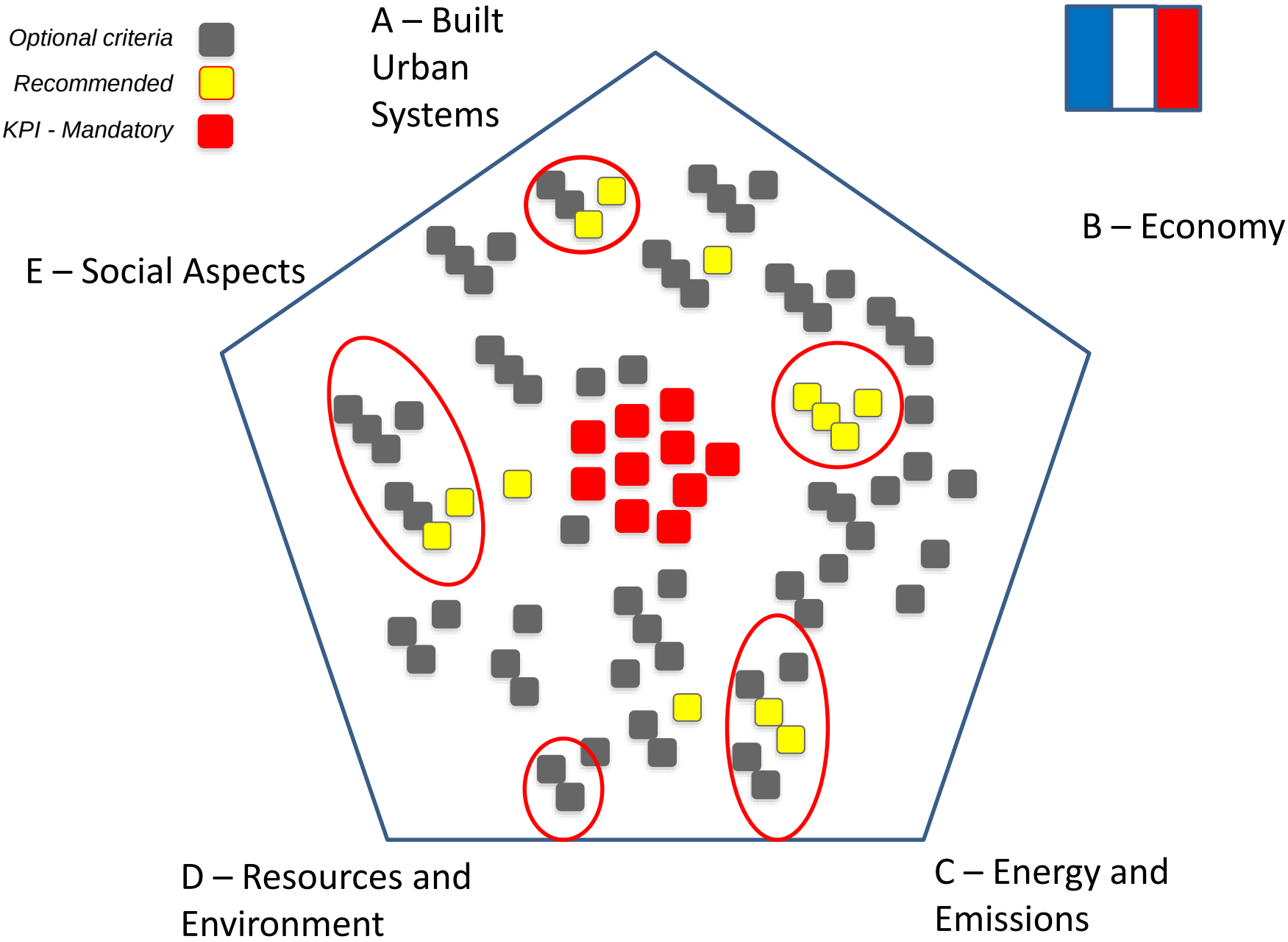


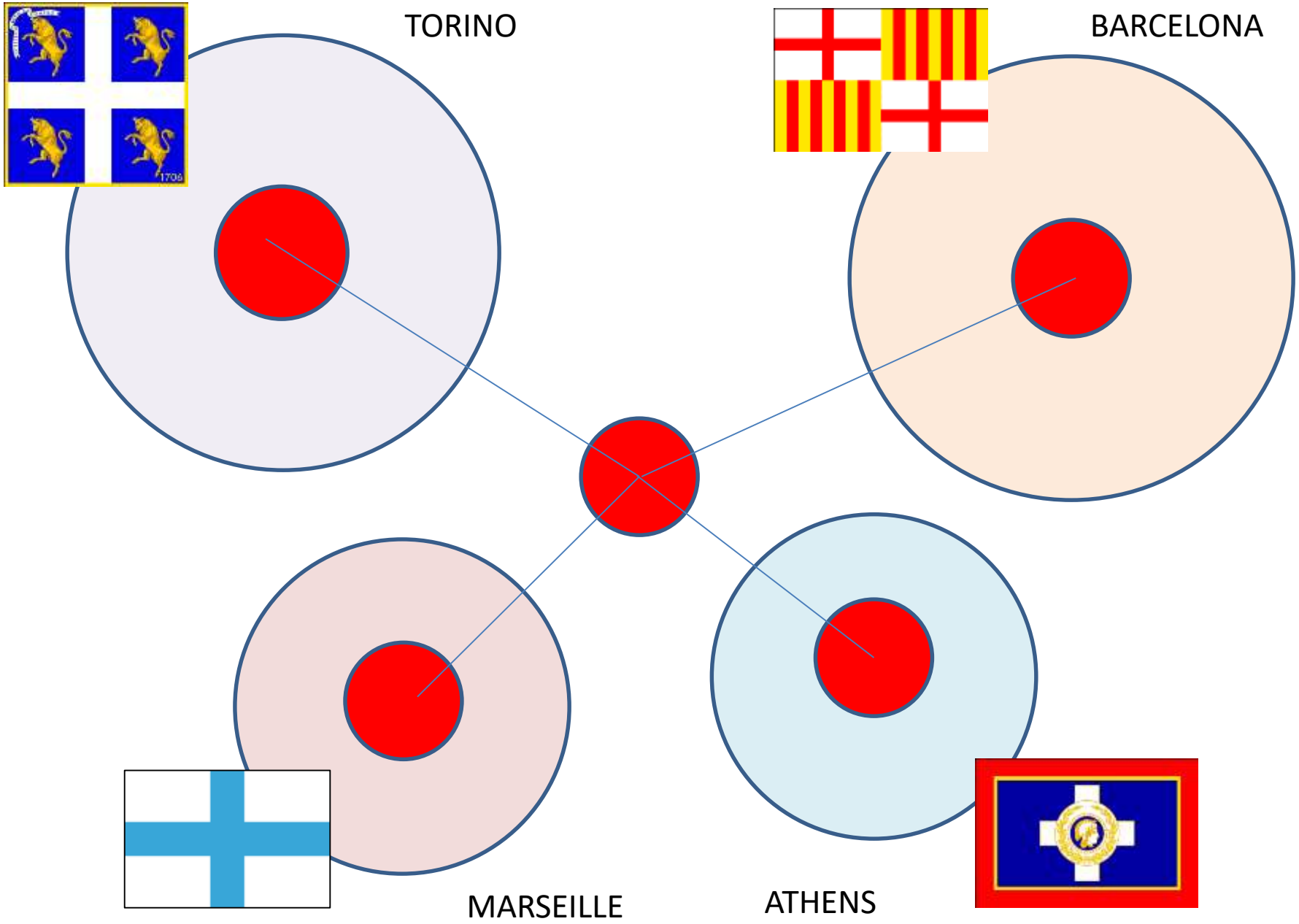
The number available criteria is:	42	The number active criteria is:	38
The number of active mandatory criteria with a score of less than 3 is:	3	Active low-level mandatory parameters:	0

	Issue	Active Weights	Weighted scores
A	Built Urban Systems	17.0%	2.23
B	Economy	3.6%	3.20
C	Energy and Emissions	50.0%	2.69
D	Resources and Environment	24.9%	1.96
E	Social Aspects	4.4%	1.73
	Weighted total score		2.41



iiSBE Italia R&D


Optional criteria
Recommended
KPI - Mandatory
A – Built Urban Systems
B – Economy
C – Energy and Emissions
D – Resources and Environment
E – Social Aspects


TORINO
BARCELONA
MARSEILLE
ATHENS

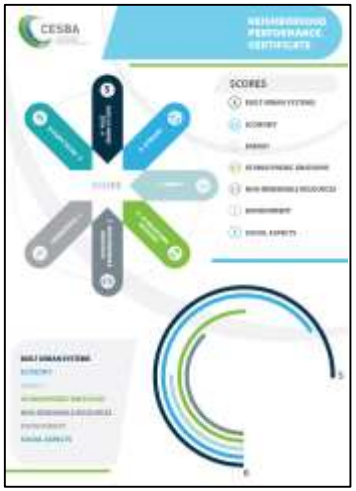
CESBA Passport Neighbourhoods

KPIs

TRANSNATIONAL DOCUMENT

+

ASSOCIATED WITH THE LOCAL PERFORMANCE CERTIFICATE



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SCORE
TURIN

SCORE
BARCELONA

SAME
MEANING,
COMPATIBLE

DIRECTLY
COMPARABLE

CESBA

Torino - SPINA 4 Area

NEIGHBORHOOD PASSPORT

Name	Spina 4 Area
Surface (Km²)	1,07 km²
City	Turin
General location	northern part of the city
Historical origin of the area	mixed use area – pre 1950

Urban area description

Flat urban area, characterized by a high population density, modest incomes.

In recent years the pilot area has undergone a major urban transformation: construction of a new underground railway, new junction of two parts of the city that were divided by the railway since the nineteenth century, new roads with low circulation

Demography

Residential population in the area	12.607
Urban residential density	118 persons/ha
Daytime population working in the area	n.a.

Climate

Annual precipitation	850 mm
Solar irradiance on horizontal surface	1.411 kWh/m²year
Winter design temperature	-8.°C
Summer design temperature	30,5°C

Building stock

Number of buildings in the area	613
Aggregate gross area in m² of housing units	101.109 m²
Aggregate gross area in m² of other buildings	93.099 m²
Total gross area of all buildings	194.208 m²
Total gross area of buildings constructed before 1975	154.939 m²
Average building density (total m² / land surface in m²)	0,18

Use of land and morphology

Percentage of consumed land area	82,8 %
Aggregate length of urban streets with sidewalks	20 km
Density of street intersections	57 intersection/km²

CESBA

Torino - SPINA 4 Area

NEIGHBORHOOD PASSPORT

SUSTAINABILITY KEY PERFORMANCE INDICATORS

CODE	CRITERION	INDICATOR	VALUE	UNIT
A1.7	Conservation of land	Area of undeveloped land with ecological or agricultural value / area of the neighbourhood	0,5	%
B3.3	Use stage energy cost for public buildings	Aggregated annual operating energy cost per aggregated indoor useful floor area	8,2	Euro/m²/year
C1.1	Total final thermal energy consumption for building operations	Aggregated annual total final thermal energy consumption per aggregated indoor useful floor area	235	kWh/m²/year
C1.4	Total final electric energy consumption for building operations	Aggregated annual total final electric energy consumption per aggregated indoor useful floor area	78,2	kWh/m²/year
C1.7	Total primary energy demand for building operations	Aggregated annual total primary energy consumption per aggregated indoor useful floor area	403	kWh/m²/year
C2.1	Share of renewable energy on-site, relative to total final thermal energy consumption for building operations	Annual total thermal energy consumption from on-site renewable energy sources / annual total final thermal energy consumption	0,00003	%
C2.7	Share of renewable energy on-site, on final electric energy consumptions	Share of renewable electric energy in final electric energy consumptions	1,23	%
D1.2	Total GHG Emissions from primary energy used in building operations	CO_2 equivalent emissions per useful internal floor area per year	86	kgCO2 eq./m²/yr
E1.6	Consumption of potable water for residential population	Annual potable water consumption per occupant	63,5	m³/occupant/year
E1.7	Consumption of potable water for public non-residential building systems	Annual water consumption per m²	0,8	m³/m²
F1.3	Recharge of groundwater through permeable paving or landscaping	Area of permeable surfaces on total neighbourhood area	17,19	%
F2.3	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	118	Days/year
G2.1	Public transport service	Percentage of inhabitants that are within 400 meters walking distance of at least one public transportation service stop	100	%
G2.4	Quality of pedestrian and bicycle network	Total walkway meters of dedicated pedestrian paths and meters of bicycle path and shared space per 100 inhabitants	12,07	m/100inhabitants
G4.2	Availability and proximity of key services	Percentage of inhabitants that are within 800 meters walking distance of at least 3 key services	100	%
G6.3	Community involvement in urban planning activities	Level of involvement of users in urban planning	0	LEVEL (score)

Decision Making Process

The model of decision making process is intended to support public administrations in the definition of:

- ✓ the best retrofit concept for sustainable **urban areas retrofitting**;
- ✓ the best retrofit/design concept for **public buildings** in the context of their urban area;
- ✓ the best planning concept for **new urban developments**

Decision Making Process

Decision Making Process is articulated in **6 phases**:

1. **Initiation**
2. **Preparation**
3. **Diagnosis**
4. **Strategic definition**
5. **Decision making**
6. **Retrofit/New development concept**

SBE 2020
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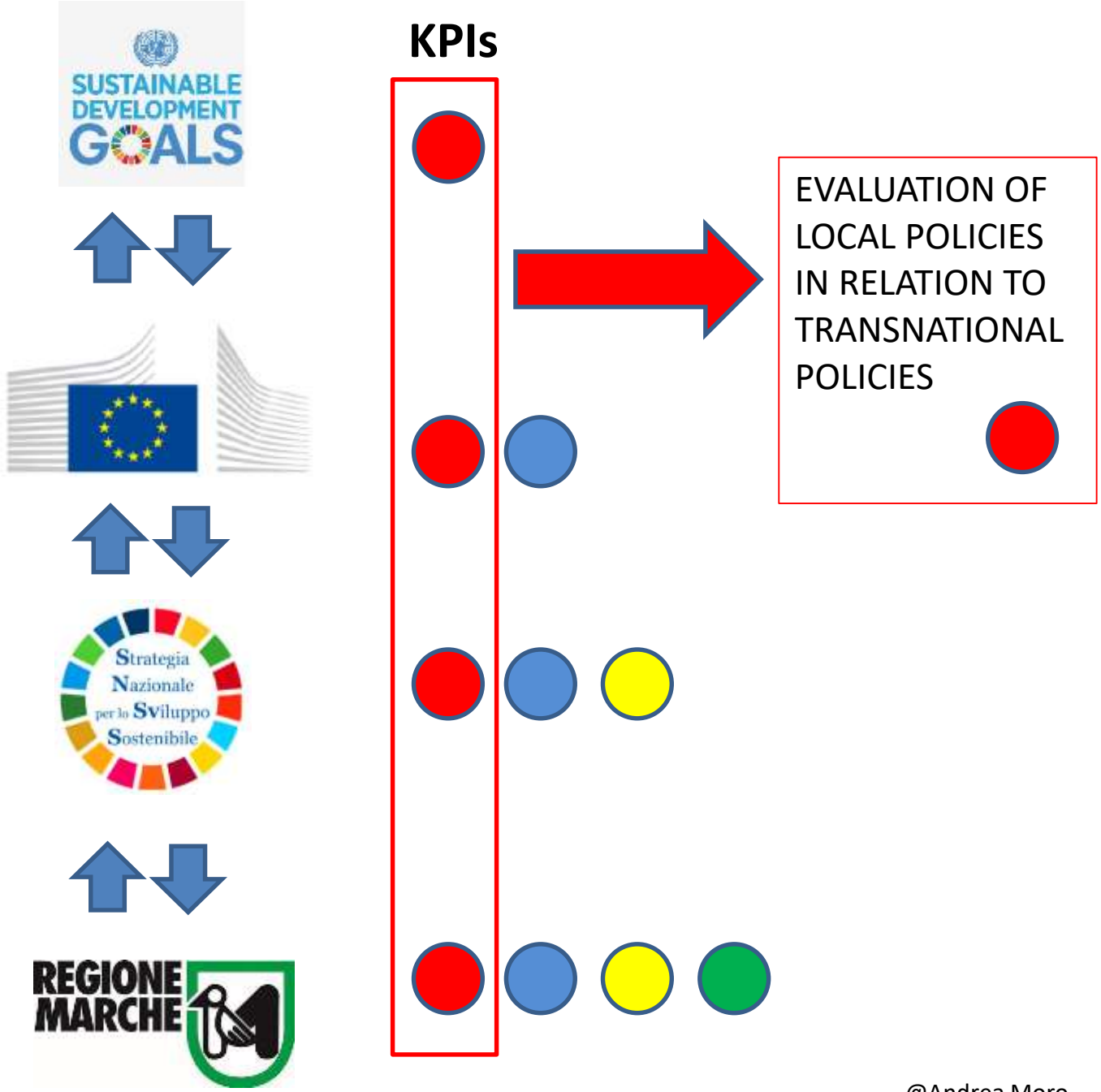
WORLD SUSTAINABLE BUILT ENVIRONMENT CONFERENCE

THINK GLOBAL



ACT LOCAL

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SBTool

Protocollo ITACA

UNI PdR 13

SNTool

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Conclusions

The origin of Protocollo ITACA is international. Protocollo ITACA is part of a family of assessment systems derived from SBTool.

Protocollo ITACA is part of the CESBA initiative. Collaboration with European scheme operators for the implementation of the CESBA Passport at building and urban scale.

Protocollo ITACA is contributing via iiSBE to the Level(s) initiative. Protocollo ITACA will integrate the Level(s) indicators in the next vesion.

Thank you for your attention !

andrea.moro@iisbeitalia.org

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