

Towards Neighborhood Assessment

Nils Larsson
Executive Director, iiSBE,
the International Initiative for a Sustainable Built Environment

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iiSBE at a glance

- An international non-profit organization;
- Focus on guiding the international construction industry towards sustainable building practices;
- Emphasis is on research and policy, with a special emphasis on information dissemination, building performance and its assessment;
- 23 Board members from 16 countries;
- Secretariat is in Ottawa and Paris;
- Local chapters exist in Czech Republic, Israel, Italy, Portugal, Spain and Taiwan, others are being formed in Korea, Canada and Central America;
- Andrea Moro is President, Nils Larsson is XD;
- Volunteer network, very active;
- Current working groups on urban morphology and smart grids.

Summary of SB2010 and SB2011 conferences



as of 10 December 2009

Name	Place	Conference dates	Deadline for abstracts	Theme	Website
Seoul SB10	Seoul, Korea	24-26 February, 2010	Closed	<i>Sustainable Building Technology: thinking Earth for Next Generation</i>	www.sb10seoul.org/
Portugal SB10	Algarve, Portugal	17-19 March, 2010	Closed	<i>Sustainable Building Affordable to All</i>	www.iisbeportugal.org/portugalsb10/
SB10mad	Madrid, Spain	28-30 April, 2010	Closed	<i>Revitalization and refurbishment of districts</i>	www.sb10mad.com
SB10sea	Kuala Lumpur, Malaysia	04-06 May, 2010	Closed	<i>Sustainable Building: beyond energy efficiency</i>	www.mgbc.org.my/sb10sea
SB10	Wellington, New Zealand	26-28 May, 2010	Closed	<i>Innovation and transformation</i>	www.sb10.co.nz
CESB10	Prague, Czech Republic	30 June to 02 July, 2010	Closed	<i>Central Europe Towards Sustainable Building</i>	www.cesb.cz
SB10 Amman	Amman, Jordan	12-14 July, 2010	Closed	<i>Sustainable Architecture and Sustainable Building</i>	www.csaar-center.org/conference/saud2010
SB10 Finland	Espoo, Finland	22-24 September, 2010	15 February, 2010	<i>Sustainable Community BuildingSMART</i>	www.sb10.fi
Euregional SB10	Zuyd, The Netherlands	11-13 October, 2010	31 December 2009	<i>Towards zero impact buildings and environments</i>	www.SB10.nl
SB10Brazil	Sao Paulo, Brazil	25-27 October, 2010	14 December, 2009	<i>Instrumenting change for sustainable building</i>	www.SBinBrazil.org (to check URL availability)
World SB11	Helsinki, Finland	18-21 October, 2011	TBA	TBA	www.sb11.org



Nils Larsson

Nils Larsson is an architect and is a Fellow of the Royal Architectural Institute of Canada. He serves as Executive Director of the *International Initiative for a Sustainable Built Environment* (iiSBE), an international non-profit networking organization that has offices in Ottawa and Paris.

- During the 1990's, while working with the Canadian government, he developed a demonstration program for commercial buildings with energy consumption 50% of current standards;
- As part of this work, developed a formal implementation of the *Integrated Design Process* (IDP), which has been widely emulated around the world;
- He is the lead developer of SBTool, a computerized framework to assess building performance that is adaptable to varying regions and building types;
- On behalf of iiSBE he also led the development of a web-based multi-lingual information system
- He has published many peer-reviewed papers, served as a juror on three architectural competitions in Europe and Montreal, and is Chair of the Regional Committee for the global SB11 Helsinki conference.

Strategic issues

- We face three very major issues: climate change effects, resource depletion and the major recession;
- The built environment sector is being almost ignored in economic kick-start initiatives;
- But the built environment is the largest single sector responsible for energy and emissions;
- It is also of obviously critical importance in supporting our daily working and personal lives;
- So, the functional and performance upgrading of existing neighborhoods and buildings is the single most important initiative we can launch;
- Add to this the labor-intensive nature of renovation and infill activities, and it becomes inevitable;
- We should start with massive training programs.

Assessment, rating, labeling & certification

- **Assessment:** an evaluation
- **Rating:** a score or result relative to a norm or global benchmark. Ratings can be based on self-assessment or carried out by third parties.
- **Certification:** validation of rating or assessment results by a knowledgeable third party that is independent of both the developer / designer and the tool developer.
- ~~**Labeling:** proof of a rating or certification result, issued by the certifier.~~

How do assessments at neighborhood and building scales compare?

- Both can be new or existing, but the emphasis on neighborhoods is much more on existing;
- Neighborhood assessment must deal with similar issues as buildings, such as energy, emissions, water and resource consumption;
- But there are some physical issues that are more meaningful at the neighborhood scale, such as shading by other buildings, population density and the importance of mixed uses;
- Carbon neutral does not mean so much at the neighborhood scale because of the dominance of embodied emissions from infrastructure;
- And many more social and economic issues that are operative at the community scale;
- And also some entirely different concerns, such as local infrastructure, transportation and ecosystems.

Impact indicators for buildings, based on CEN TC350

Ecological systems

Climate change

Destruction of the stratospheric ozone layer

Acidification of land and water resources

Eutrophication of water bodies

Photo-chemical ozone creation (POCP)

Changes in biodiversity and other ecological systems

Resources

Depletion of non-renewable primary energy

Depletion of non-renewable resources other than primary energy

Depletion of non-renewable freshwater resources

Depletion of land resources with ecological or agricultural value

Exhaustion of solid waste sites suitable for non-hazardous waste

Waste

Pollution of water bodies by wastewater, other than eutrophication

Hazards from disposal of non-radioactive hazardous waste

Hazards from disposal or storage of radioactive waste

Impact indicators for buildings

Health, society and culture

Ability of users with functional impairments to use the facility

Personal safety and security of users

Health, well-being and productivity for users of facility

Health, security and well-being of off-site population

Changes to social or cultural systems

Economy

Financial risk or benefits for investors

Housing affordability or commercial retail viability

Changes in economic system (employment, economic stimulus)

Caofeidian, China (Sweco)

Indicators

Indicators

- Density – efficient land use
- Functional mix
- Affordable housing
- Local accessibility to service functions distance
- Per capita floor area for cultural facilities
- Share of land used for higher education & research including research & science parks
- Walking distance from all entrances to local public transportation system
- Walking distance from entrances to urban nodes
- Share of travel by private cars in relation to all local transport
- Share of travel by foot and bicycle in relation to all local transport
- Share of urban public space
- Per capita public space
- Accessibility to public space
- Tree coverage in green spaces
- Share of yearly storm water that is stored

Target level

- 3-400 people/ha (plot net) (work + residents)
- 80% of all blocks to be mixed-use (80/20 to 20/80)
- > 5-10%
- 100% ratio of basic services within 400 m walking
- 0.5 sq m.
- 20%
- 90% within 300 m to bus stops
- 100% within 800 m to bus stops
- <10%
- >50%
- 35% of city area
- 20 sq. m.
- 100% within 500 m.
- >50%
- >75%

Caofeidian, China (Sweco)

Indicators

Indicators

- Total energy demand (inc. transport, excl. industry)
- Heat and electricity in residential buildings
- Share of renewable energy inc. off-site energy sources
- Average household water consumption
- Reservoir water for drinking water
- Treatment of wastewater
(Including separated treatment of black and grey water.)
- Reuse of treated wastewater for agriculture
- Waste to recycling (recycling of material and recycling of biodegradable food waste nutrients) and energy recovery
- Share of generated food waste to biological treatment , for nutrient and energy recovery
- Direct landfill of municipal solid waste

Target level

- 10,000 kWh per person per year
- 70 kWh / sq. m., of which 25 kWh for electricity)
- >95%
- 120 Lpp per day
- >90%
- 100% (all black water is digested for biogas)
- >95%
- >80% (based on 100% collection & separation)
- >80%
- <10%

Indicators of neighborhood performance

- Gross imports of electric power generated from non-renewable sources per capita;
- Annual fossil fuels consumed per year per capita;
- Gross imports of potable water;
- Annual diminution of local non-renewable water resources;
- Annual GHG emissions per capita;
- Annual emissions leading to low-level ozone;
- Annual emissions leading to acidification;
- Annual emissions leading to eutrophication of water bodies;
- Contribution to urban heat island effect;
- Net exports of storm and sewer waste water;
- Gross exports of solid wastes;
- Changes in agricultural value of land used;
- Changes in ecological value of land used;
- Changes in physical condition of buildings;

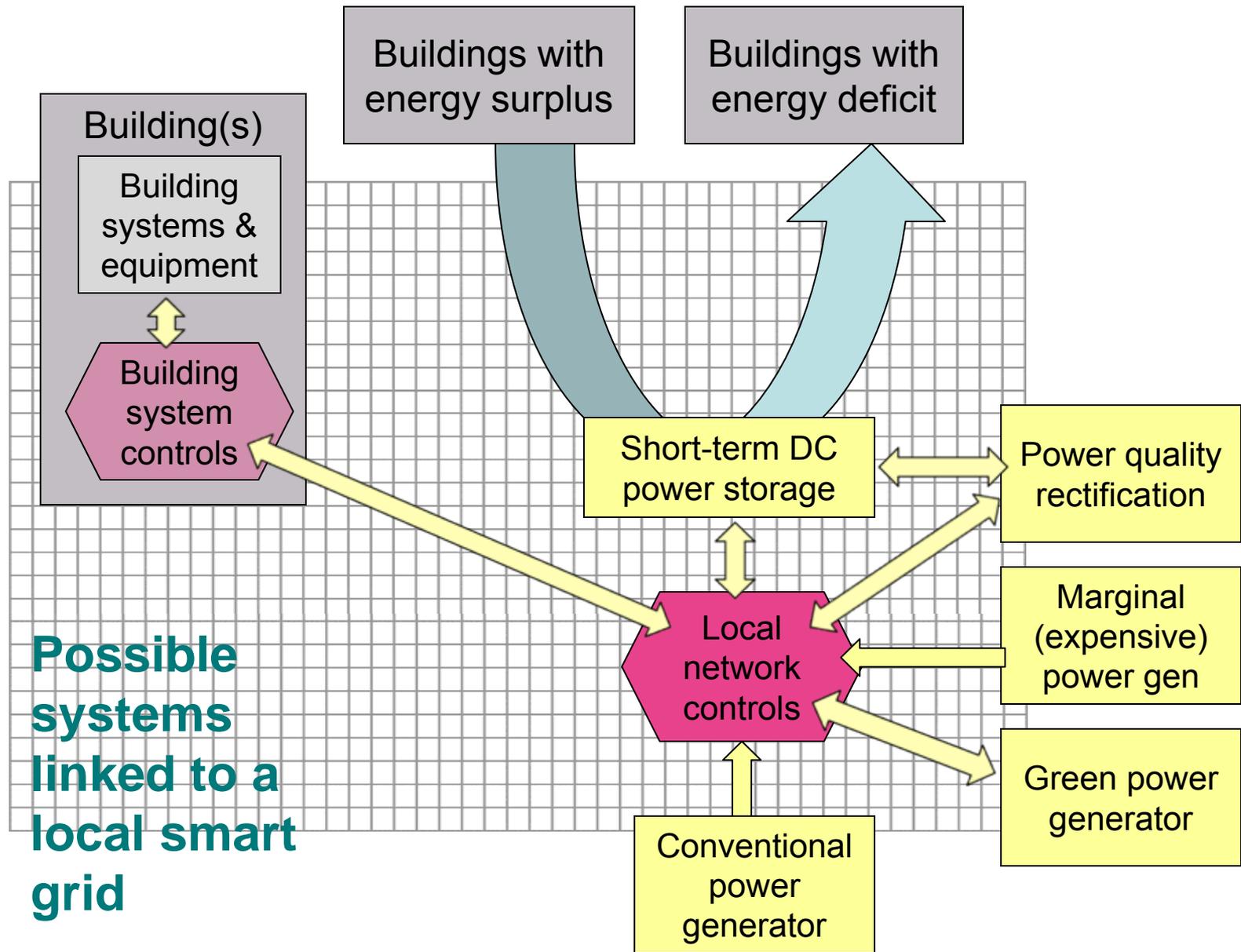
Indicators of neighborhood performance

- Changes in biodiversity (bird population);
- Public green space per capita;
- Density of trees more than 5 m. in height;
- Overall floor area ratio;
- Building occupancy diversity;
- Private vehicles per capita;
- Presence of easily accessible public transport;
- Presence of good-quality bicycle paths;
- Social diversity;
- Unemployment ratio of 24-64 age group;
- Local vandalism and crime;
- Wealth and income diversity per capita;
- Changes in land values;
- Changes in value of landscape aesthetics;
- Changes in value of streetscape aesthetics;

Smart Grids

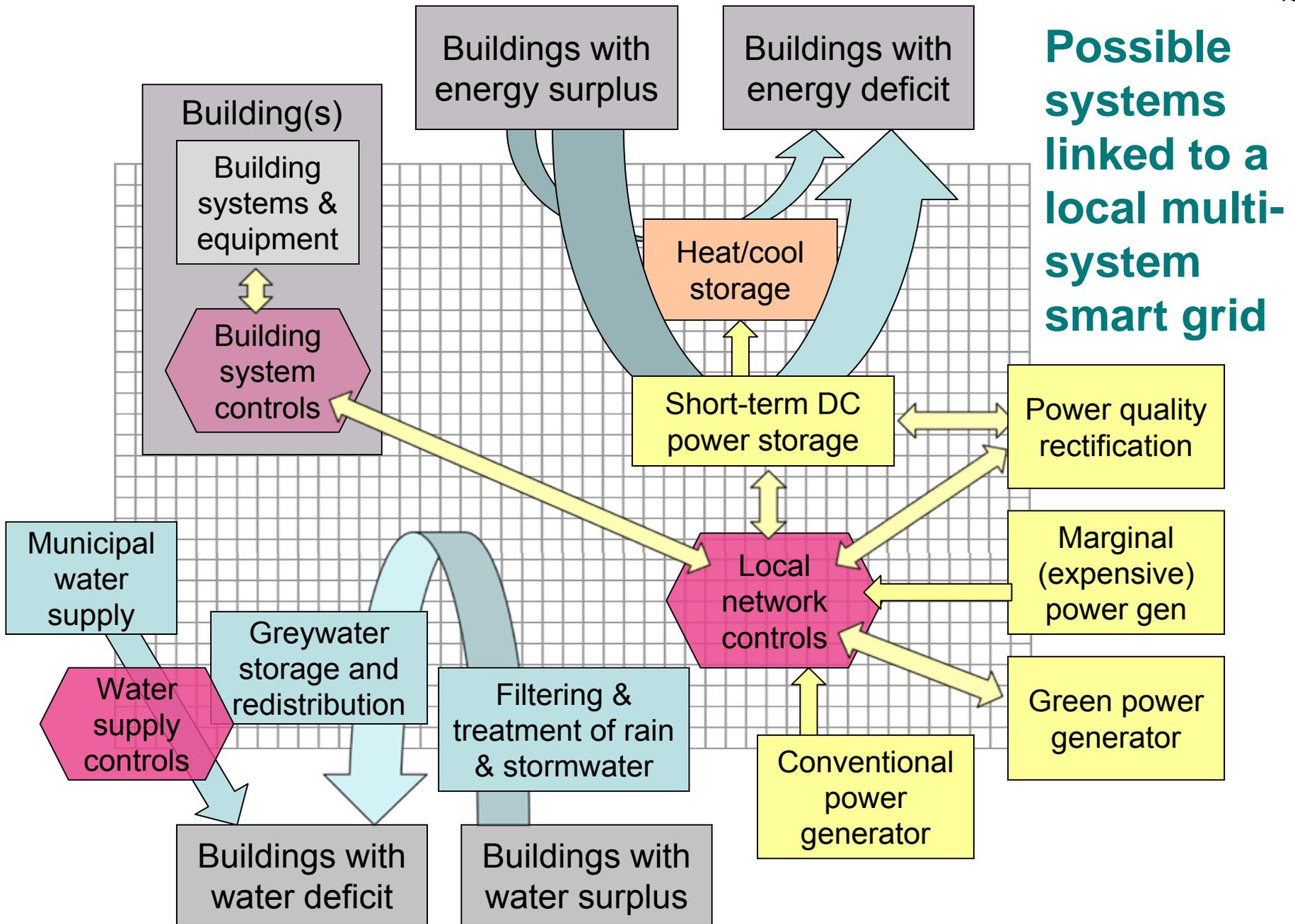
What is a Smart Grid? – a Wikipedia definition

- A Smart Grid is an electric power network that links generators and users of electric power in a new way, by adding intelligent electronic controls and software to the system.
- The smart grid can collect the optimal amount of information necessary for customers, distributors and generators to change their human and equipment behavior in a way that reduces system demands and costs, increases energy efficiency, optimally allocates and matches demand and resources to meet that demand, and increases the reliability of the grid.
- The social benefits of a smart grid are reduced emissions, lower costs, increased reliability, greater security and flexibility to accommodate new energy technologies, including renewable, intermittent and distributed sources.



Application of the concept to other needs

- The concept can also be designed to include:
 - Bio-mass and waste combined heat and power (CHP) generation;
 - District heating and cooling systems;
 - Thermal long-term storage and re-distribution for low-temperature heating systems;
 - Rain- and grey water storage and re-distribution;
 - Local treatment of grey and black-water;
 - Local re-use of materials or solid waste recycling;
 - Local transport systems and storage/parking;
 - Allocation and re-distribution of floor area bonuses in return for high performance;
 - Local standards for appropriate occupancy mixes and social housing ratios;
 - Wide-area networks to link local internet users without using the full internet network.

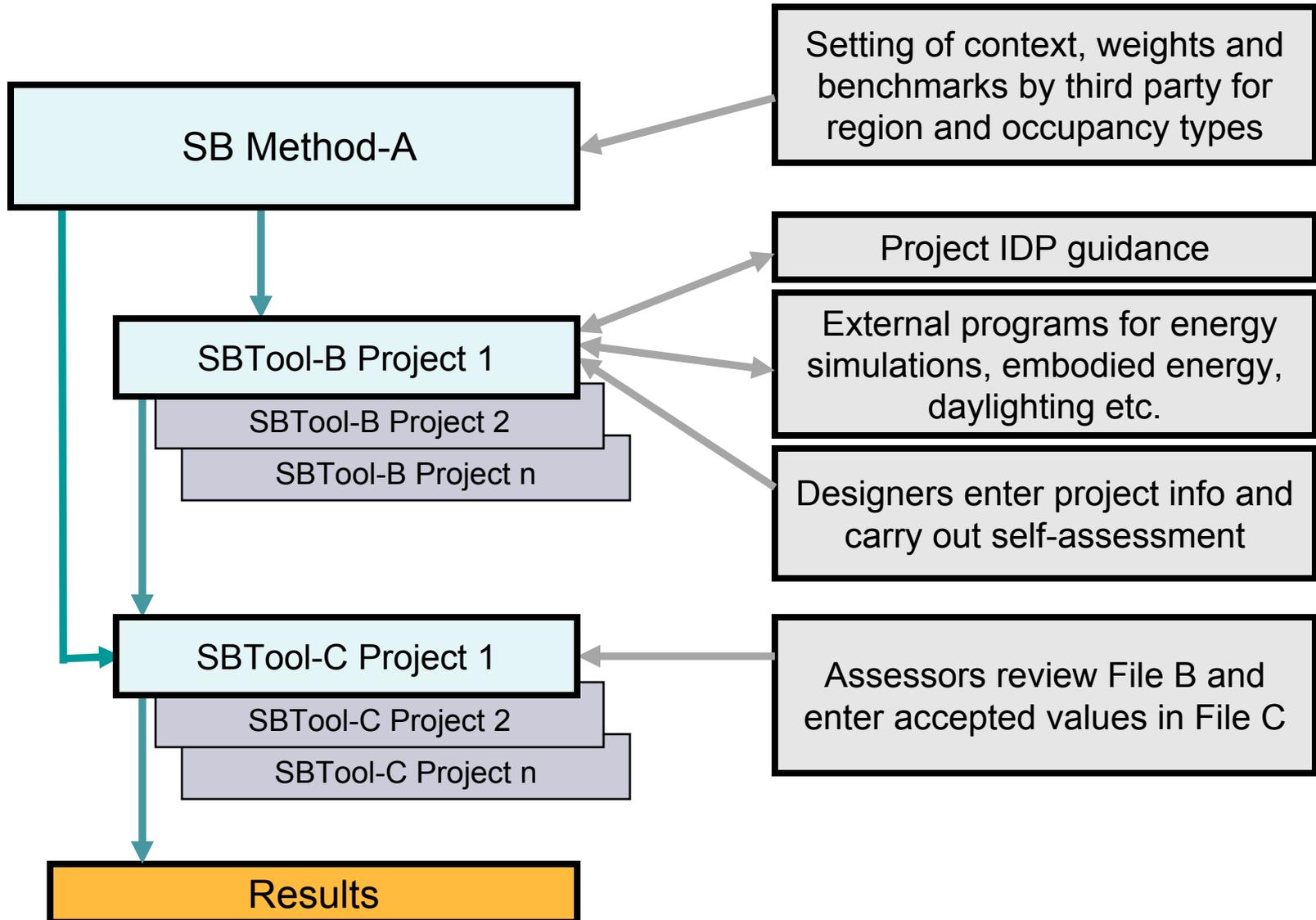


**SBTool used for
large development
competition**

SB Method - Basics

- The SB Method is a generic framework for rating the sustainable performance of buildings and projects. It may also be thought of as a toolkit that assists local organizations to develop SBTool rating systems;
- The system covers a wide range of sustainable building issues, not just green building concerns, but the scope of the system can be modified to be as narrow or as broad as desired, ranging from 100+ criteria to half a dozen;
- SB Method takes into account region-specific and site-specific context factors, and these are used to switch off or reduce certain weights, as well as providing background information for all parties;
- Weighting is at one level and can be partly modified by authorized third parties;
- The system is set up to allow easy insertion of local criteria and/or language;
- It includes IDP process steps;
- It handles all four major phases;
 - ... new and renovation projects or a mix;
 - ... up to five occupancy types in a single project;
 - ... handles buildings up to 100 floors in height;
 - ... provides relative and absolute outputs;

Reminder: SB Method and Tool System Structure



Application of the SBTool framework to an invited competition for a large development in Monaco



Monaco background

- The use of SBTool as a rating system for certification of buildings requires calibration of weights and benchmarks to suit local conditions, and this involves considerable time and effort;
- But the system can also be used by a client to identify its specific performance requirements for competitions or long-term portfolio development;
- We followed this approach in a major invited competition in Monaco which involves an extension of 11 hectares into the sea in the middle of the urban area;
- This approach allowed the client to be very specific and also provides clarity for the competing teams.
- Invited competition for five teams.

A5 Projet marin et développement du site.

- A5.1 Paysage marin.
- A5.2 Prise en compte de l'impact des activités sous-marine.
- A5.3 Exploitation patrimoniale du milieu marin.
- A5.4 Plan de gestion du milieu marin.
- A5.5 Qualité et importance des espaces extérieurs privés (balcons, terrasses, jardins, É)
- A5.6 Vues sur la mer.
- A5.7 Impacts sonores sur les quartiers existants.

Excerpts of the lowest level of parameters (Criteria)

C4 Impacts sur le site.

- C4.1 Impacts sonores du nouveau Quartier le jour.
- C4.2 Impacts sonores du nouveau Quartier la nuit.
- C4.3 Impact lumineux du nouveau Quartier la nuit.

C5 Impacts sur l'Écosystème marin.

- C5.1 Impacts de l'Extension sur le site marin (taux de renouvellement des eaux).
- C5.2 Impacts de l'Extension sur le site marin (qualité des fonds).
- C5.3 Impacts de l'Extension sur le site marin (turbidité de l'eau).
- C5.4 Impacts de la permanence des matériaux utilisés.
- C5.5 Impact de l'Extension sur la sur le phytoplancton.
- C5.6 Impact de l'Extension sur la sur le zooplancton.
- C5.7 Impacts sur la biodiversité marine des fonds.

Results page

Résultats pour l'équipe XXX

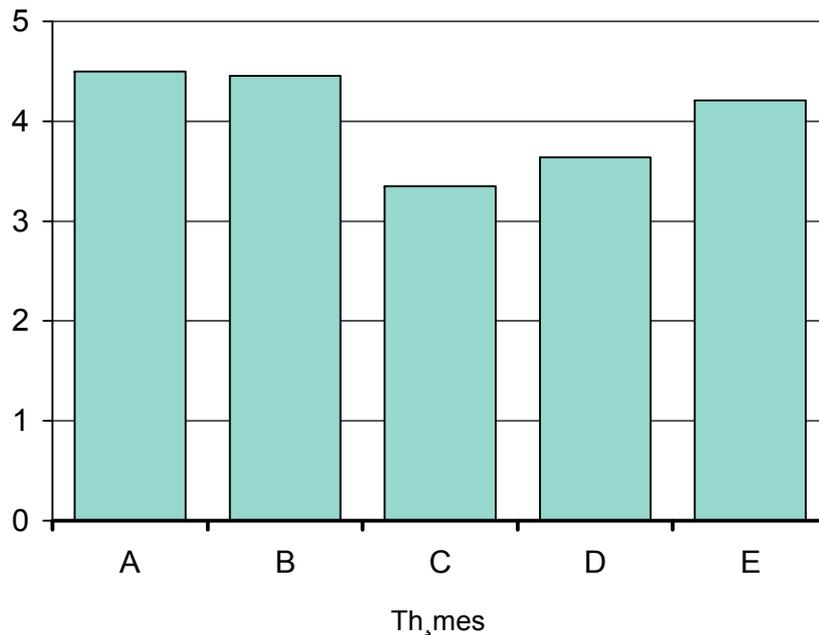
Equipe:

Phase de conception

Resultats relatifs

Monaco

0 = Passable; 3 = Bon; 5 = Excellent



Durée de vie imaginée = 60 ans

Paramètres actifs

89

A	Site, implantation, développement urbain et marin	30%	4.5
B	Consommations d'énergie et de ressources	24%	4.5
C	Impacts environnementaux	24%	3.3
D	Qualité des ambiances intérieures	11%	3.6
E	Qualité de service ou d'usage	11%	4.2
Total			4.1

avril 2008

Equipe A

Equipe B

Equipe C

Equipe D

Equipe E

PRINCIPAUTÉ
DE MONACOBilan comparatifs
de l'ensemble de projetsObservations
générale

SBTool - score autoeval

3,6

3,8

4,1

3,7

4,5

SBTool - score finale

3,2

3,5

2,8

3,3

3,9

Observations sur
l'utilisation de SBTool

Le dossier "r"alis" de version des textes de SBTool est dans la soumission, et inclut l'information supplémentaire d'attente jusqu'à C1.2.

Ils ont utilis" l'outil correctement et ont "galemment fourni des informations supplémentaires tr,s "tendues et d'taill'es pour chaque crit,re.

Il y a seulement une version imprim"e du dossier "r"alis" de SBTool dans la soumission. Plusieurs points "taient plus hauts que 5.0 et ceux-ci ont "t" donc r"duits.

SBTool a "t" employ" comme pr"vu..

SBTool a "t" employ" comme pr"vu.

Surface de l'emprise totale de l'extension, m2		180,000		208,337		238,864		220,645		1,021,150
Surface mer pacifi"e	28%	50,000	20%	41,674	27%	65,304	26%	57,000	78%	800,000
Surface projet d"velopp"e sur le littoral et en mer	81%	145,000	80%	166,663	73%	173,580	74%	163,645	22%	221,150
Surface nouveau territoire d"v. en mer (partie "m"erg"e		130,000		153,941		160,454		161,193		221,150
Emprise du b"ati	32%	42,231	27%	42,200	20%	32,188	30%	48,012	42%	92,310
Emprises non b"aties	68%	87,769	73%	111,741	80%	128,265	70%	113,181	58%	128,840
Emprise du bati projet"e		42,231		58,358		55,575		48,012		92,310
Emprise du bati projet"e / Surface nouveau territoire		32%		38%		35%		30%		42%
Programme immobilier, m2										
Surfaces commerciales	6%	15,840	10%	23,468	9%	22,040	6%	15,004	8%	20,062
Surfaces tertiaires	8%	21,000	11%	25,012	9%	23,185	4%	9,824	10%	24,855
Surfaces activit"s touristiques	10%	23,934	11%	26,500	7%	16,655	9%	21,290	12%	30,000
H"tel		22,760		26,500		16,655		21,290		25,000
Equipements autres		1,174		0		0		0		5,000
Surfaces logement (min 40%)	76%	189,413	68%	162,506	76%	193,565	82%	204,032	70%	174,673
Logements domaniaux		15,037		15,964		17,565		25,000		17,962
Logements priv"s		174,376		146,542		176,000		179,032		156,711
Total programme immobilier		250,187		237,486		255,445		250,150		249,590

Contacts & Info

- Nils Larsson, larsson@iisbe.org
- www.iisbe.org

