



Green
Building
Council
Italia

EUROPE REGIONAL
NETWORK



Report

Level(s)

|

Un linguaggio
europeo comune
per la sostenibilità
in edilizia

27 novembre 2017
Roma, Spazio Europa

I risultati delle discussioni ai tavoli di lavoro

Una delle priorità chiave dell'Unione Europea è il passaggio a un sistema economico circolare con il raggiungimento di obiettivi ambientali ambiziosi, garantendo nel contempo una costante crescita economica.

Level(s) è un nuovo schema lanciato dalla Commissione Europea che rappresenterà uno strumento rilevante per supportare il raggiungimento degli obiettivi ambientali e indirizzare la domanda di edifici performanti. Utilizzando questi indicatori basati su standard e protocolli già esistenti, gli utilizzatori dello strumento Level(s) saranno in grado di rendicontare nell'ambito del ciclo di vita di un edificio su energia, materiali, acqua, salute e comfort, emissioni, costo e valore dell'edificio.

Level(s) è uno strumento chiave del pacchetto Europeo sull'economica circolare ed è stato sviluppato dalla Commissione Europea in collaborazione con un ampio panel di stakeholder compresi i Green Building Council europei.

L'Italia è stato il primo paese in Europa ad adottare un decreto nazionale sul Green Public Procurement, (Legge 221/2015, art. 18) allo scopo di incorporare i Criteri Ambientali Minimi dapprima per gli acquisti e successivamente anche per gli edifici della Pubblica Amministrazione. Con la pubblicazione del nuovo Codice Appalti, D.lgs 50/2016 e con le modifiche del D.lgs. 56/2017 è stata resa obbligatoria l'applicazione dei CAM per l'edilizia da parte di tutte le stazioni appaltanti.

Green Building Council Italia ha curato la redazione delle linee guida per l'utilizzo dei protocolli di certificazione a marchio LEED e a marchio GBC Italia a supporto dei CAM per l'edilizia.

Dalla sua fondazione, GBC Italia sviluppa protocolli di valutazione della sostenibilità

degli edifici e delle aree urbane per promuovere sul mercato buone pratiche in materia di sostenibilità, e monitora la crescita del mercato degli edifici green a scala nazionale.

GBC Italia coinvolge una rete di stakeholder che intervengono nelle diverse fasi dello sviluppo edilizio: progettazione e pianificazione, costruzione, riqualificazione e gestione dell'edificio. A scala nazionale, GBC Italia si impegna a trasformare il mercato e a promuovere la filiera degli edifici green attraverso i protocolli di certificazione, le attività di divulgazione e formazione, progetti di ricerca internazionali, attività di advocacy e networking e favorendo il coinvolgimento dei suoi soci e del pubblico attraverso le attività di comunicazione e l'organizzazione di eventi.

GBC Italia è inoltre parte di un network internazionale la Europe Regional Network di World Green Building Council che riunisce 24 associazioni nazionali votate alla trasformazione del settore delle costruzioni.

Obiettivo della ERN è trasformare e fare crescere il settore delle costruzioni verso lo sviluppo di un mercato forte per l'edilizia sostenibile. La strategia d'azione prevede di agire su più fronti per superare le barriere alla trasformazione: essere leader in una rete di attori per guidare la trasformazione del mercato, proporre e promuovere gli strumenti di valutazione e certificazione per creare la domanda di mercato, rafforzare la consapevolezza della necessità di vivere in edifici sostenibili, sviluppare le competenze tecniche per soddisfare i requisiti di sostenibilità, supportare la trasformazione del mercato attraverso iniziative finanziarie ed economiche, integrare i principi all'interno delle politiche e dei regolamenti nazionali ed europee.

Il lavoro di advocacy della Europe Regional Network sul tema degli edifici sostenibili è

iniziato nel 2013. Nel 2014 la ERN ha svolto una consultazione pubblica tra gli stakeholder del mercato a cui hanno preso parte 10 filiere di mercato europee e sono stati consultati circa 350 stakeholder attraverso alcuni workshop e un rapporto finale pubblicato dalla Commissione Europea.

GBC Italia mira ad assumere un ruolo centrale nell'implementazione dello schema LEVEL(s) livello nazionale favorendo l'interazione tra il Ministero dell'Ambiente, la Commissione Europea e il proprio network di stakeholder della filiera dell'edilizia sostenibile.

Il workshop si è sviluppato in due parti: nella prima parte si è parlato dello schema LEVEL(s), del suo inquadramento rispetto al contesto normativo nazionale, della capacità attuale del mercato di recepire LEVEL(s); nella seconda parte i partecipanti suddivisi in quattro tavoli hanno analizzato i macro-obiettivi che caratterizzano lo schema. Guidati da tutor esperti in materia, i partecipanti hanno analizzato lo stato di sviluppo del mercato nazionale rispetto a ciascun macro-obiettivo, le barriere all'applicazione dello stesso e le potenziali soluzioni per superarle.

I temi analizzati nei tavoli di lavoro:

- **Gruppo A:** GHG Emissions / Lifecycle Costing, Tutor: Manuela Ojan (Italcementi)
- **Gruppo B:** Resource Efficiency / Water Efficiency, Tutor Andrea Fornasiero (Manens-Tifs)
- **Gruppo C:** Health & Comfort, Tutor: Marco Filippi (Politecnico di Torino)
- **Gruppo D:** Resilience, Tutor: Remigio Rancan (Remigio Rancan.com)

I risultati delle discussioni dei tavoli di lavoro sono presentate nelle schede riassuntive riportate nel documento e condivise con la Commissione Europea come input per le fasi di miglioramento e implementazione dello schema a scala internazionale.

L'iniziativa è stata organizzata con il supporto di ICMQ, MEHITS, RINA, SAINT GOBAIN Italia

Macro objective GHG emissions

ENERGY PERFORMANCE DURING THE USE

Market Readiness:

market is ready, in particular in terms of professionals and skilled technicians. Also quite widespread awareness of customers who at least understand the value of the Energy Performance Certificates (EPC) due for new building or apartment rental

An inventory of buildings energy efficiency level is available in a few regions, showing the registered EPCs values and the type of authorised heating equipment/boilers (they need to be checked regularly by authorised experts). Information is available on aggregated form by region

Energy audit standard tools are available

Barriers:

- Networking Leaders: still needed to further promote the topic
- Certification & Assessment: the level of quality of energy audits and EPC should be further enhanced
- Awareness Raising Skills & Capacity Building: to be continued to increase the coverage and understanding, as to promote further existing building refurbishment. The energy bills should be easier to read and understandable
- Financial & Economic Incentives Policy & Regulation: public incentives to refurbishment should be maintained but also additional support is needed (e.g. mortgages EEMAP project). Difficulty in fast development of technology and new solution available on the market
- Organisational and Administration: for cities/ twns it is difficult to get budget spending approved because it is linked with preliminary energy assessment and there is a non-alignment in timing, due to heavy procedures

REDUCTION IN USE PHASE AND EMBODIED GWP

Market Readiness:

market is not ready, concepts and rational behind reduction are not know, not even at professional level.

No perceived value of reduction (global impact and not directly affecting costs)

Main construction materials producers can already supply information on embedded carbon (but not the small ones) and are already engaged to reduce it through their R&D

Barriers:

- Networking Leaders are still missing; they need to give example.
- Certification & Assessment: GWP concepts are too complex to be explained and understood by the broad audience; furthermore there is no direct impact on economic
- Awareness Raising Skills & Capacity Building: still insufficient engagement in schools, to educate children and made them responsible. Poor knowledge of indirect impacts of climate change at local level (extreme conditions, floods and drought both frequent recently in Italy). Construction materials associations are not yet engaged in raising awareness of their members on their responsibilities
- Policy & Regulation: building carbon footprint cannot be applied without any mandatory policy or regulation
- Organisational and Administration: almost no action yet on GWP; focus is only energy without a clear link to GWP impacts

POTENTIAL SOLUTIONS

To increase energy performance, a broader mapping of the existing building park should be made available, even not so detailed as to require for a full energy audit of the building.

PPAA should act first on public buildings, financing best practices, and sharing afterwards results on energy performance and comfort improvement.

Relevant Stakeholders/ Partners

Local PPAA, supported by professional orders (engineers, architects) are the key players for further promoting building refurbishment and better energy performance of new buildings

Supporting Activities

Awareness raising not only focusing on cost saving but also on comfort enhancement

Keep working on EEMAP project

Value Proposition

For energy performance: cost savings and comfort improvement

Next Step

- Keep working with PPAA/ Min. Environment to include GHG topics in GPP/CAM
- EEMAP continued
- Include GHG emission topics, as from LEVELs, in GBC protocols (Condomini first)

Macro objective

Life Cycle Costing

LIFE CYCLE COSTING

Market Readiness:

Market is not ready.

Rational behind cost estimation, further that the initial investment and sometimes main maintenance, are not know, not even at professional level. There are no agreed upon methodologies and standard tools for calculation

Barriers:

- Networking Leaders: not disclosing or sharing information on the topic; about LCA/ EPD there is a reactive approach to market request
- Certification & Assessment: methodologies not available for LCC, just for LCA
- Awareness Raising Skills & Capacity Building: highly needed, especially towards building administration and private owners
- Financial & Economic Incentives Policy & Regulation: topic not dealt with, except on application to public sector in more advanced regions/ cities
- Organisational and Administration: almost no action yet on Life Cycle Approach; rules and tools missing or not widespread

VALUE CREATION AND RISK FACTORS

Market Readiness:

Market is not ready. Concepts and rational behind a qualitative or qualitative approach to these topics are not know.

Insurance companies and banks are starting approaching those concepts, at least on residual value of the building and perceived value of comfort for more expensive/ higher quality buildings

Barriers:

- Networking Leaders are still missing; they need to give example.
- Certification & Assessment: lack of disclosure of reliable data and information, based on agreed upon calculation methodologies
- Awareness Raising Skills & Capacity Building: still insufficient engagement of administrators, real estate, construction companies also because of lack of data and information
- Policy & Regulation: life cycle cost cannot be applied systematically (including refurbishment) without any mandatory policy or regulation
- Organisational and Administration: missing reference standards and also no reward/ benefit foreseen for sustainable buildings

POTENTIAL SOLUTIONS

To increase energy performance, a broader mapping of the existing building park should be made available, even not so detailed as to require for a full energy audit of the building.

PPAA should act first on public buildings, financing best practices, and sharing afterwards results on energy performance and comfort improvement.

Tax discount should be foreseen for sustainable buildings (e.g. annual ownership tax of buildings or waste tax) or tax on demolition costs depending on the quantity of non-recovered CDW produced. Share databases are needed to set benchmarks.

Introduce a "Building owner -end-of -life responsibility" for new buildings based on end-of-life scenarios as set at the design stage, for example linked with insurance costs.

Relevant Stakeholders/Partners

- Insurance companies and banks
- Building administrators (associations) to understand concepts and explain to owners/ occupants
- Local PPAA, supported by professional orders (engineers, architects) are the key players for further promoting building refurbishment and better energy performance of new buildings based on LCC and evidence of increase of value
- University/ Academia to develop research and knowledge on LCC, also in relation with BIM

Supporting Activities

Awareness raising not only focusing on cost saving but also on comfort enhancement

Aggregate interested parties to promote building LCA and LCC tools to be the reference standards at national level (avoid fragmentation and unilateral initiatives)

Value Proposition

Cost savings in a whole life cycle approach, including residual value

Enhanced value of the building in case of sale or rental

Next Step

- Keep working with PPAA/ Min. Environment to include LCC topics in GPP/CAM
- EEMAP continued
- Include Life Cycle Costing topics, as from LEVELs, in GBC protocols (GBC Condomini first)
- GBC to promote building LCA and LCC tools to be the reference standard at national level, based on the experience of ERN and other GBCs

Macro objective

Materials and water

WATER AND RESOURCE EFFICIENCY

Market Readiness:

Water efficiency

Market is substantially ready, on both demand and offer viewpoint; technical solution are available with affordable costs and are commonly understood by consumers. Most of times technical solution are already transposed into building specification (e.g. low-flow mixer, double-flush toilet, with low flush, ...)

Resource efficiency (materials)

There are already a lot of technical solution toward eco-friendly material use, growing inside the market, also if there are a lot of difficulties due to knowledge convergence and lack of common LCA database.

It is noted that there are reticence by contractors to use eco-friendly materials, with reference with recycled contents, due to possible issues with performance and sanction risk.

The following aspect of readiness are noted in the market:

- EPD certificated products are growing in number;
- Standards are in development (e.g. UNI EN 15978, 15804)
- CAM (Criteri Ambientali Minimi = Minimal environmental Criteria) on national regulation for public contracts
- GPP practice from EU
- Some softwares are already available and usable (e.g. GABI, Simapro)
- BIM (Building Information Modeling) can be helpful for both LCA analysis and Bill of Quantities/Materials
- Other initiative are ongoing (e.g. HISER, FISSAC)

Barriers:

Networking Leaders

- Green is an opportunities for bigger actors in the market, but an excessive cost for smaller.
- Inertia for public, long term for market transformation, education difficulties.

Awareness Raising Skills & Capacity Building

- Standards and database definition.
- Higher cost impact for smaller building (expecially for green certification)
- Market confusion due to too much green labels
- Lack of incentives and rewarding for green

Awareness Raising

- Performance rating simplification lackness for public understanding (see for example dishwasher or electric appliance classification)

Skills & Capacity Building

- Insufficient information and marketing on the market
- Greenwashing

Financial & Economic Incentives

- Lack of rewarding and incentives for public
- Policy & Regulation
- acks of PEF (Product Environmental Footprint)

Organisational and Administration

- Lack of regulation understanding and sensitiveness on environmental issues by local government technician

POTENTIAL SOLUTIONS

1. Incentives + Marketing + Training
2. Incentives + Marketing + Training
3. Incentives + Marketing + Training
4. ...

It is necessary to increase public awareness and understanding to increment economic incentives (expecially aimed to smaller actors in the market), paired with education and training, with capillary marketing actions on final building users, local administration technicians and professionals.

Relevant Stakeholders/Partners

- Association (fund on greenbuilding and environment), such as GBC Italia
- Central government (ministry, ...) and local administration (to incentivate smaller market actors: manufacturer, developer, design professional)
- Real estate and real estate appraiser (if they understand the value of green, wider market will be involved)
- Market leaders

Supporting Activities

- Training & education at both higher (government, local administration, administration technician, professionals) and lower level (final building user and investors)
- Technical groups with discounts based on company size
- Incentives, based on size of the market actors (the smaller, the higher incentives)
- Rating system performance simplification (more immediate and understandable for all)
- Real estate, investors and RE appraiser awareness raising

Value Proposition

Less impact on non-renewable resource consumption and use

Next Step

- Keep working with government (main and local) for education, marketing, awareness at all levels.
- Keep working with standard setters and market leaders.

Macro objective
**Health and
comfortable
spaces**

HEALTH & COMFORT

Market Readiness:

Indicators:

- 4.1 Indoor air quality
 - 4.1.1 Good quality indoor air: parameters for ventilation, CO2 and humidity
 - 4.1.2 Target list of pollutants: emissions from construction products and external air intake
- 4.2 Time outside of thermal comfort range

4.1 Indoor air quality

Market is ready, in terms of professionals, skilled technicians and labs for detecting air pollutants. At point 2.3.5 of the MECs (Minimum Environmental Criteria), devoted to public procurement in the building sector, the objective of indoor air quality is considered and the specific topics are daylight, ventilation (with reference to air change rates), solar shading, electromagnetic pollution, emissions from materials (very detailed), acoustical comfort, thermal comfort and radon. A quite widespread awareness of investors and customers is due to consciousness of rating systems (e.g LEED EBOM, WELL), company programs (e.g Multicomfort by Saint Gobain), energy or environment management systems (e.g ISO 14000, 16000, 50000 or OHSAS 18000) and labor laws (Legge 626/98, D.lgs.81/08).

There is no widespread experience in long term monitoring and post occupancy evaluation (POE) of environmental parameters in buildings.

The experts attending the round table underline that filling a target list of air pollutants (see above 4.1.2) requires: expensive measurements by third-party laboratories; definitions of threshold values for different pollutants concentrations related to the duration of exposure.

4.2 Time outside of thermal comfort range

There is no widespread experience in long term monitoring and post occupancy evaluation (POE) of thermal comfort parameters in buildings.

There are skills and experiences in calculating thermal comfort parameters in building design driven by energy simulation software. The experts attending the round table report the difficulty of identifying benchmarks for the proposed indicator.

Barriers:

Networking Leaders: networking leaders are required to promote the theme (with the only exception of the topics related to emissions from construction products for which there is a widespread action by the manufacturers).

Certification & Assessment: certification and assessment procedures are required to implement the Level(s) proposal.

Awareness Raising: a widespread awareness on health and comfort indicators is required for investors, designers and general contractors (with the exception of public procurement which is supported by the new MECs)

Skills & Capacity Building: public officers need intensive training to make operational the MECs procedure; specific education programs on health and comfort (and, in general, on sustainability) indicators have to be promoted in Italian university

Financial & Economic Incentives: financial and economic incentives are required in order to reduce the costs of the indoor environment analysis and evaluation in existing buildings diagnosis;

Policy & Regulation: -

Organisational and Administration: -

POTENTIAL SOLUTIONS

- a. Stronger and widespread promotion of the health and comfort topics in building sector (professionals and construction enterprises) and university (architecture and engineering).
- b. Post Occupancy Evaluation (POE), by monitoring of environmental parameters and satisfaction questionnaires, as part of a life cycle assessment in all existing building (in analogy with energy diagnosis).
- c. Health and Comfort Performance Contracts (HCPC) alongside the Energy Performance Contracts (EPC).
- d. Ecobonus related to health and comfort improvement alongside the ecobonus related to energy saving.
- e. Financial and economic incentives to reduce the costs of the additional services (accredited professionals, documentation, lab test.....) for health and comfort assessment (in analogy with energy diagnosis).

Relevant Stakeholders/Partners

Investors in residential sector and companies, supported by manufacturers (new measurement instrumentations) and professionals, are the key players for promoting health and comfort indicators in new and existing buildings

Supporting Activities

Awareness raising not only focusing on energy saving but also on health and comfort enhancement

Value Proposition

Decrease of medical costs, improvement of productivity in office, enhancement of the market value of the building

Next Step

- Keep working with PPAA/ Min. Environment/Companies to enhance the awareness on health and comfort topics and to underline the importance of the post occupancy monitoring.

Macro objective

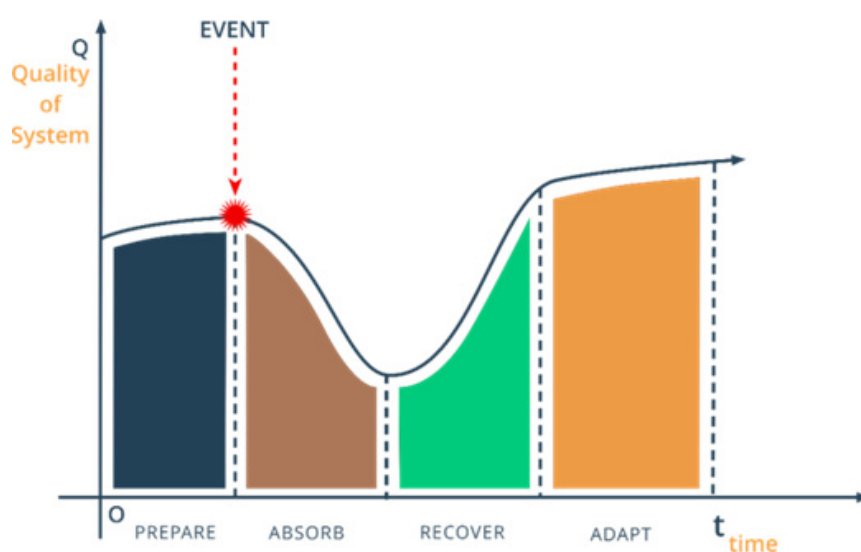
Adaptation and Resilience to climate change

Introduction

Because of the fact that in this M-O 5 the indicators on resilience are not so evident and the term resilience itself is probably used as robustness, it was explained a possible meaning of resilience, useful also for the people participating in the workshop. We must certainly define the system and its boundaries, to which resilience refers. Our system is the “built environment system” or “urban system” at different scales, from the whole city, to the neighborhood, to the building blocks, to a single building or house. In particular, referring to LEVEL (s), our system is the “system building”, considering the building as shaped by its structure, its envelope and its equipment, but also by people who live and work in it. We could refer to the initiative of 100 resilient cities of the Rockefeller Foundation “Urban resilience is the ability of individuals, communities, institutions, businesses and systems within

a city to survive, adapt and grow regardless of the type of chronic stress and from acute shocks that experience “and to the US National Academy of Science (NAS)” Disaster Resilience ... the ability to prepare and plan, absorb, renew and adapt more successfully to adverse events.” So we can talk about the cycle of resilience and its temporal steps: -before, during and after an event that hits our system. It was showed to the participants an image of a diagram of the stages of resilience, elaborated from the literature, to facilitate the work in the next sessions.

So the capacity to adapt or adaptation to an event, in our case adaptation to climate change is one of the phases of resilience. All together agree on it and as a consequence the title of Macro-objective n.5 could be changed simply in : “Resilience to the affects of climate change”.



ADAPTATION AND RESILIENCE TO CLIMATE CHANGE

Market Readiness:

Known initiatives that already support assessment in adaptation and resilience to climate change.

1. National adaptation plan;
2. Municipality of Bologna. Local Urban Environment Adaptation Plan for a Resilient City. BLUE AP (Bologna Local Urban Environment Adaptation Plan for a Resilient City) is a LIFE+ project for the implementation of an Adaptation Plan to Climate Change for the Municipality of Bologna);
3. Municipality of Ancona. Project ACT - Adapting to Climate Change in Time."...to take into consideration the environmental, social and economic impacts of climate change to increase the resilience of cities dealing with the phenomenon. The methodology has been implemented by the three local partners of the project – the Municipalities of Ancona (Italy), Bullas (Spain) and Patras (Greece)) a LIFE project.
4. Green building Council Italia voluntary rating system protocol. In particular : - " Condomini" about the "Renovation, operation and management of residential mid rise multi family existing buildings". (Developed with the LEED process approach, the protocol define a new area of analysis called " Durability and Resilience" providing a preliminar building comprehensive assessment to find hazards, vulnerabilities and expositions to which the existing building's infrastructures, structures, envelops, equipments and people are or could be affected to.)
5. Green Building Council Italia voluntary rating system protocol: - " Quartieri" about the "Neighborhood development".
6. GAIA. GAIA is a project financed by the Life+09 European Fund, coordinated by the Municipality of Bologna, and that involves 4 Partners: IBIMET CNR (Institute of Biometeorology), Impronta Etica, Cittalia and Unindustria. The main objective of the project is to contribute to the reduction of greenhouse gas emissions at the local level through the creation of a partnership between Municipality and companies to plant trees throughout the municipal area.
7. Build Upon; The discussion develops through the same approach and process of session 1. The focus is on key barriers to wider adoption of resilience cycle initiatives. The short-list developed is as follow:
8. Sisma bonus. Sisma bonus is an Italian government initiative that gives tax incentives to get seismic classification of residential and office, industrial buildings situated on the three major seismic prone zone in a scale of four and to improve existing seismic category, by structural seismic renovation.
9. Sharing cities. The Sharing Cities 'lighthouse' programme is a proving ground for a better, common approach to making smart cities a reality. By fostering international collaboration between industry and cities, the project seeks to develop affordable, integrated, commercial-scale smart city solutions with a high market potential.
10. Trento province initiative
11. Covenant of Mayors for Climate & Energy. the Covenant of Mayors for Climate & Energy brings together thousands of local and regional authorities voluntarily committed to implementing EU climate and energy objectives on their territory. New signatories now pledge to reduce CO2 emissions by at least 40% by 2030 and to adopt an integrated approach to tackling mitigation and adaptation to climate change.
12. " Piano periferie". Italian government programme of supporting for urban renewal and security of peripheries. DPCM 25 May 2016.

Barriers:

The discussion develops through the same approach and process of session 1. The focus is on key barriers to wider adoption of resilience cycle initiatives. The short-list developed is as follows:

- a. Lack of correct awareness on risks affecting new and existing system buildings, among all stakeholders involved in urban transformation process.
- b. Lack of mutual communication.
- c. Skills scarcity.
- d. Economic barriers to wider diffusion of resilience theme (How can be valued resilience measure in order to be taken into account by market?)
- e. Lack of common recognized indicators.
- f. No mandatory adaptation measures by law.
- g. No capacity of existing municipal urban plan to cope with effects of climate change.

Areas of market transformation	Number of barriers
Networking leaders	
Certification & Assessment	
Awareness raising	
Skills and Capacity building	
Financial and economic Incentives	
Policy and Regulation	
Organizational and Administration	

>=3	2	1	No one

SOLUTIONS

The discussion focused on type of solutions, referring to specific barriers found in session n.2. This is the resume :

Discussion and thoughts focused on the fact that resilience must be correctly understood by stakeholders involved in the process of urban transformation. Italian market is not so well readiness for a comprehensive resilience thinking approach, but cities administrations should develop a resilience strategy plan at all different scale as a prerequisite to have a sustainable city. So the LEVEL(s) framework, with the target to be a common sustainability approach in construction, renovation and management of existing buildings or new ones, should embrace a comprehensive resilience assessment as a prerequisite of all Macro-Objectives, and not only as an area of investigation for effects due to climate change.

Possible solutions	Type of barriers (to see Session 2)
Effective and active communication and information to stakeholders	A. B.
Training by public administrations, professional organizations and Green Building Councils	C.
Standards upgrading	F.
Due diligence by law	H.
New financial instruments	D.
New codes for urban planning	H.
Resilience indicators guide	E.

Relevant Stakeholders/Partners

- Local PPAA, supported by qualified professional consultants and consulting companies and international organizations (es. Rockefeller Foundation 100 Resilience cities) to develop resilience strategy plan.
- Building administrators (associations) to understand concepts and explain to owners/ occupants
- University/ Academia to develop research and knowledge on building resilience assessment.
- Eu Commission to develop guide for resilience assessment

Based on conclusions of qualified EU co-founded projects (like Improver, Resilens, Resistand, Smartresilience, Epicuro, Resccue,...)

Supporting Activities

Awareness raising not only focusing on adaptation to affects of climate change, but also on adaptation and vulnerability reduction to other well knowed risks (es. Earthquake for many EU countries not only Italy) or knowed after preliminar assessment.

To consider inside LCA analisys the environmental impacts of risks assessed, coming from climate change but also from other country or local issues.

Value Proposition

Cost savings in a whole life cycle approach, in particular for existing buildings, by promoting a comprehensive approach on renovation:

- Energy retrofit not allowed without structural retrofit in high risk zone;
- Energy retrofit and structural retrofit at the same time...

Enhanced value of the building in case of sale or rental

An existing renovated safe building by structural and energy performace based design to overcome the lack of mandatory laws at the age of construction.

Next Step

- Keep working with PPAA/ Min. Environment to include resilience assessment of buildings in particular in public design and construction tenders.
- Include Life Cycle Costing topics, as from LEVELs, in GBC protocols (GBC Condomini first)
- GBC to promote resilience assessment as a prerequisite to develop a correct building LCA and LCC



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