

# How actors can implement in practice the General Principles of Sustainability in their buildings and civil engineering projects



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Promoting Policies and Practices for Sustainability



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# How actors can implement in practice the General Principles of Sustainability in their buildings and civil engineering projects

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# Questions

- Has a **generally accepted sustainability understanding** already emerged in the construction and real estate sector? What is the basis?
- How can sustainable development goals and aspects **be implemented in the design and decision-making processes?**
- How can the **actors** be supported in their decision-making?



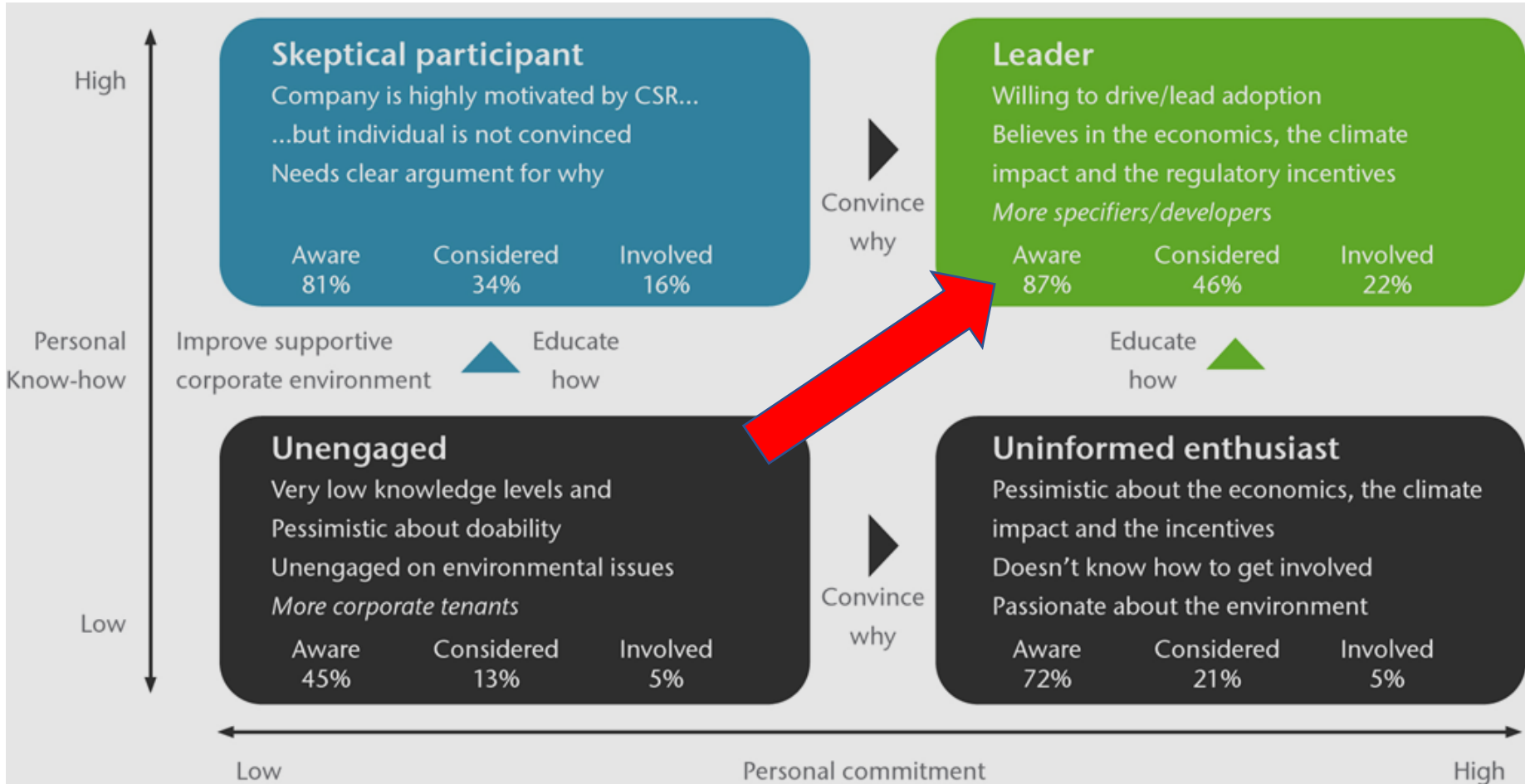
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# Requirement: Commitment & Know how



WBCfSD: Energy Efficiency in Buildings – business realities and opportunities, Summary report, 2007  
<http://www.wbcd.org/Plugins/DocSearch/details.asp?DocTypeId=251&ObjectId=MzMyNDM>



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# Principles !

## What kind of Principles ????



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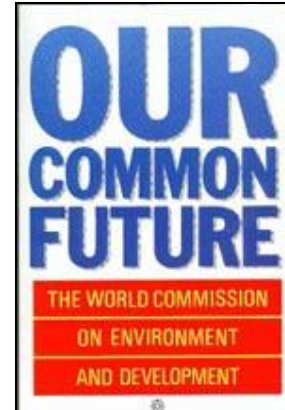


# Sustainable development ?!

*Sustainable development, as defined by the Brundtland Commission is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".*

**The principles of sustainable development have to be "translated" into practical rules for the building industry and made relevant for buildings.**

*„... The predominant factor has been **the absence of a set of common guidelines** that investors can use to assess risks and opportunities fully. The Principles for Responsible Investment respond to this need.“...*

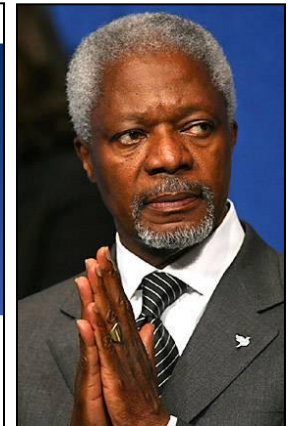
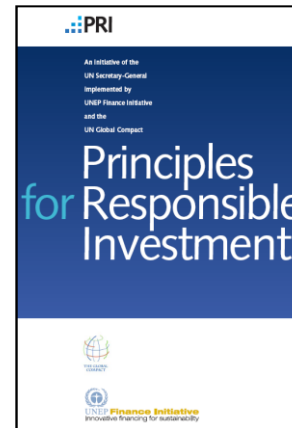


1987



Norwegian Prime-Minister  
Gro Harlem Brundtland

2006



Kofi A. Annan



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# Existing examples: Management rules – I

- 1) **Each generation must solve its own problems and not burden the next generations with them ....**
- (2) Renewable natural goods (e.g. wood or fish populations) should, on a long term basis, be used only within the bounds of their ability to regenerate. Equally, non-renewable natural goods (e.g. minerals or fossil energy sources) should only be used to the extent that their functions can be replaced by other materials or energy sources.
- (3) The release of materials into the environment should, in the long run, not exceed the adaptability of the eco-system – e.g. the climate, forests and oceans.
- (4) Dangers and unjustifiable risks to human health should be avoided.
- (5) Structural change triggered by technical developments and international competition should be shaped in a way that is economically successful as well as ecologically and socially sustainable ....

<https://www.bundesregierung.de/Content/EN/StatischeSeiten/Schwerpunkte/Nachhaltigkeit/nachhaltigkeit-2007-04-13-die-10-managementregeln-der-nachhaltigkeit.html;jsessionid=65147FF1D9BE89B74543CB3F20BAEDB2.s3t2?nn=393722>



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# Existing examples: Management rules – II

- (6) **Energy and natural resource consumption and the provision of transport services should be decoupled from economic growth.** At the same time, we should aim for growth-related increases in demand for energy, resources and transport to be more than offset by efficiency gains ...
- (7) Public budgets are to take account of intergenerational equity ....
- (8) Sustainable agriculture needs to be compatible with nature and the environment and take into account the requirements of livestock farming in a way that is fair to the animals and provides consumer protection, particularly concerning health matters.
- (9) In order to strengthen social cohesion poverty and social exclusion should be prevented as far as possible, opportunities for participating in economic development should be open to all sections of society ...
- (10) General international conditions should be shaped jointly in a manner which ensures that people in all countries can lead a life worthy of a human being and according to their ideas and in unison with their regional environment while at the same time profiting from economic developments. Environment and development form a unit ....

<https://www.bundesregierung.de/Content/EN/StatischeSeiten/Schwerpunkte/Nachhaltigkeit/nachhaltigkeit-2007-04-13-die-10-managementregeln-der-nachhaltigkeit.html;jsessionid=65147FF1D9BE89B74543CB3F20BAEDB2.s3t2?nn=393722>



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# Existing examples: PRI – responsible investment

## PRINCIPLE 1

WE WILL INCORPORATE ESG ISSUES INTO INVESTMENT ANALYSIS AND DECISION-MAKING PROCESSES.

## PRINCIPLE 3

WE WILL SEEK APPROPRIATE DISCLOSURE ON ESG ISSUES BY THE ENTITIES IN WHICH WE INVEST.

## PRINCIPLE 5

WE WILL WORK TOGETHER TO ENHANCE OUR EFFECTIVENESS IN IMPLEMENTING THE PRINCIPLES.

## PRINCIPLE 2

WE WILL BE ACTIVE OWNERS AND INCORPORATE ESG ISSUES INTO OUR OWNERSHIP POLICIES AND PRACTICES.

## PRINCIPLE 4

WE WILL PROMOTE ACCEPTANCE AND IMPLEMENTATION OF THE PRINCIPLES WITHIN THE INVESTMENT INDUSTRY.

## PRINCIPLE 6

WE WILL EACH REPORT ON OUR ACTIVITIES AND PROGRESS TOWARDS IMPLEMENTING THE PRINCIPLES.



## PRINCIPLES FOR RESPONSIBLE INVESTMENT

An investor initiative in partnership with UNEP Finance Initiative and the UN Global Compact

"The PRI works with its international network of signatories to put the six Principles for Responsible Investment into practice. Its goals are to understand the investment implications of environmental, social and governance issues and to support signatories in integrating these issues into investment and ownership decisions."



The PRI principles **developed for the financial sector** can also be used in the field of investment in real estate.

[https://www.google.de/search?q=principles+responsible+investment+PDF&ie=utf-8&oe=utf-8&client=firefox-b&gfe\\_rd=cr&ei=a18mWYXjF87b8Af6\\_rKgCg](https://www.google.de/search?q=principles+responsible+investment+PDF&ie=utf-8&oe=utf-8&client=firefox-b&gfe_rd=cr&ei=a18mWYXjF87b8Af6_rKgCg)



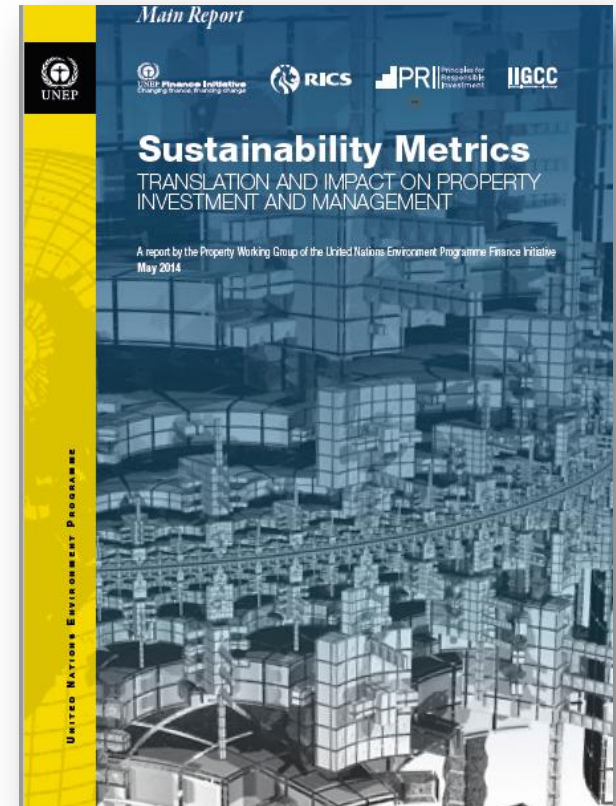
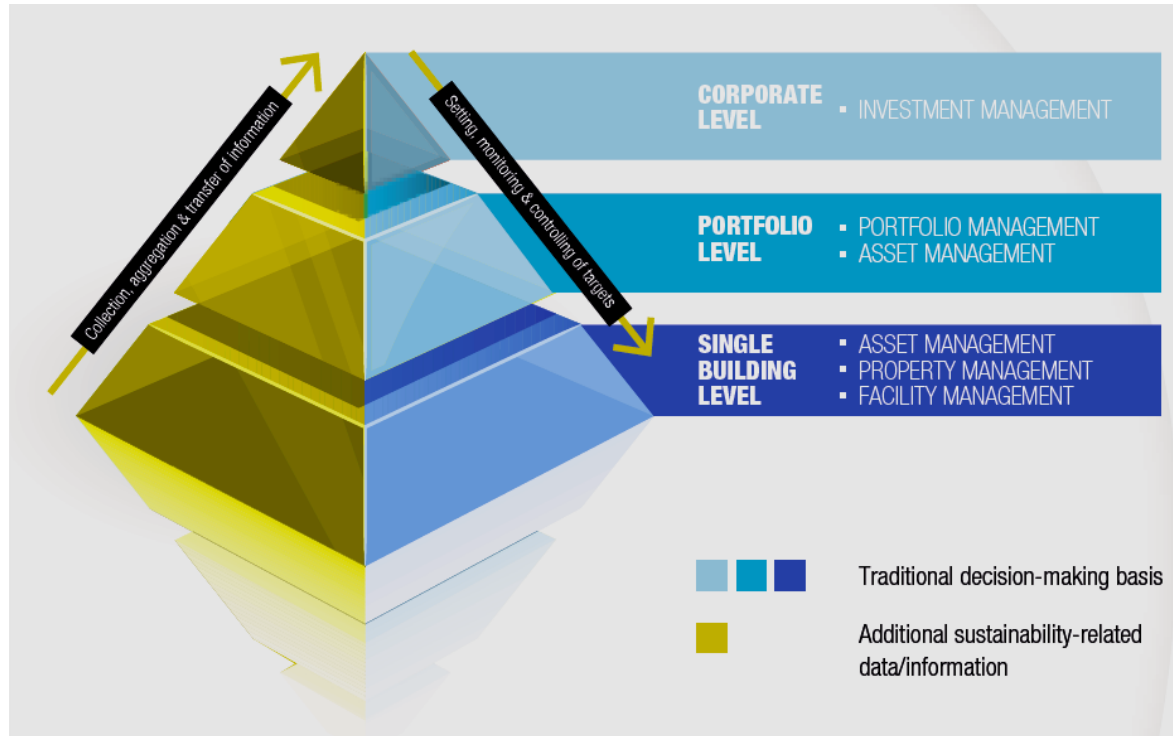
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# Existing examples: UNEP-FI Sustainability Metrics



For companies in the real estate sector there are guidelines for taking sustainability aspects into account at their **various levels of action**.

[http://www.unepfi.org/fileadmin/documents/UNEPFI\\_SustainabilityMetrics\\_Web.pdf](http://www.unepfi.org/fileadmin/documents/UNEPFI_SustainabilityMetrics_Web.pdf)



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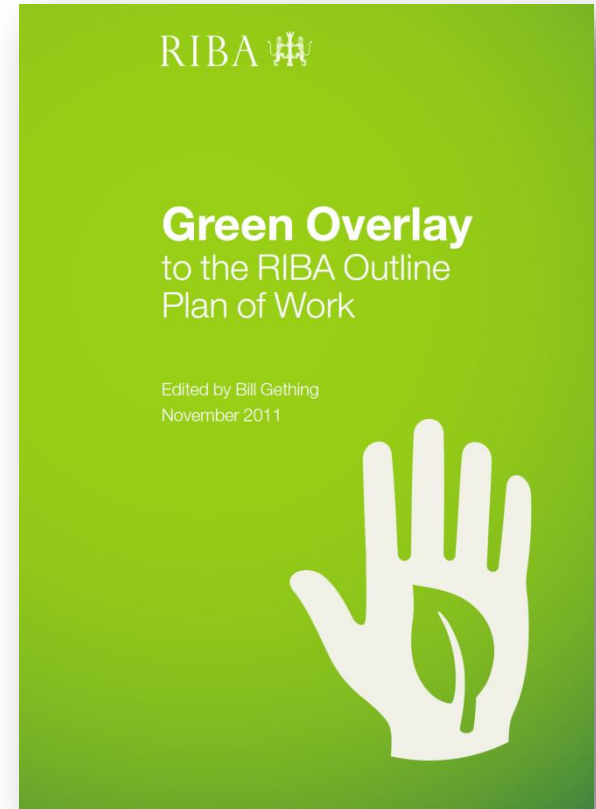


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# Existing examples: RIBA – “green” Plan of Work

RIBA Work Stage		Description of key tasks	Sustainability Checkpoints
Preparation	A Appraisal	Identification of client’s needs and objectives, business case, <b>sustainability aspirations</b> and possible constraints on development. Preparation of feasibility studies and assessment of options to enable the client to decide whether to proceed.	Strategic sustainability review of client needs and potential sites, including re-use of existing facilities, building components or materials.
	B Design Brief	Development of initial statement of requirements into the Design Brief by or on behalf of the client confirming key requirements and constraints. Identification of procurement method, <b>project and sustainability</b> procedures, <b>building design lifetime</b> , organisational structure and range of consultants and others to be engaged for the project.	Internal environmental conditions and formal sustainability targets stated. Building lifespan and future climate parameters stated. Early stage consultation, surveys or monitoring undertaken as necessary to meet sustainability criteria or assessment procedures. Involvement of design team after Practical Completion defined. Site Waste Management Plan (SWMP) started.
Design	C Concept	Implementation of Design Brief and preparation of additional data. Preparation of Concept Design including outline proposals for structural and <b>environmental strategies and systems</b> , <b>site landscape and ecology</b> , outline specifications, preliminary cost and <b>energy plans</b> . Review of procurement route.	Key design team members appointed. Formal sustainability pre-assessment and identification of key areas of design focus. Deviation from aspirations reported. Initial Part L assessment. Plain English description of internal environmental conditions, seasonal control strategy and systems prepared. Environmental impact of key materials and construction strategy checked. Resilience to future changes in climate considered.
	D Design Development	Development of concept design to include structural and <b>environmental strategies and services systems</b> , <b>site landscape and ecology</b> , updated outline specifications and cost and <b>energy plans</b> . Completion of Project Brief. <i>Application for detailed planning permission.</i>	Full formal sustainability assessment. Interim Part L assessment and design stage carbon/energy declaration (e.g. Carbon Buzz). Design reviewed to identify opportunities to reduce resource use and waste and recorded in SWMP.
	E Technical Design	Preparation of technical design(s) and specifications, sufficient to co-ordinate components and elements of the project and <b>information for statutory standards, sustainability assessment and construction safety.</b>	Formal sustainability assessment substantially complete – minor technical and contractor items only outstanding. Principles of handover process and post completion service agreed. Details audited for airtightness, continuity of insulation and subcontractor package coordination.



There are already experiences and **checklists** for the **integration of sustainability aspects into the design tasks** per work stage.

<https://www.architecture.com/Files/RIBA/ProfessionalServices/Practice/General/GreenOverlaytotheRIBAOOutlinePlanofWork2007.pdf>




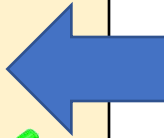

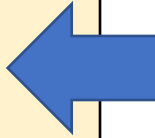
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# Principles – what kind of principles ?

<p><u>Principles</u> for sustainable development</p>	<p><b>PRINCIPLES</b> <b>Management Rules</b></p> 
<p><u>Principles</u> for sustainability assessment of construction works</p>	<p><b>RULES</b> <b>Assessment Rules</b></p> 
<p><u>Principles</u> for responsible investment</p>	<p><b>TARGETS</b> <b>Commitment</b></p> 
<p><u>Principles</u> for integration of sustainability aspects into design and decision making</p>	<p><b>RECOMMENDATIONS</b> <b>Guideline</b></p> 



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# Principles !

## The contribution of ISO TC59 SC 17

ISO 15392  
ISO/TS 12720



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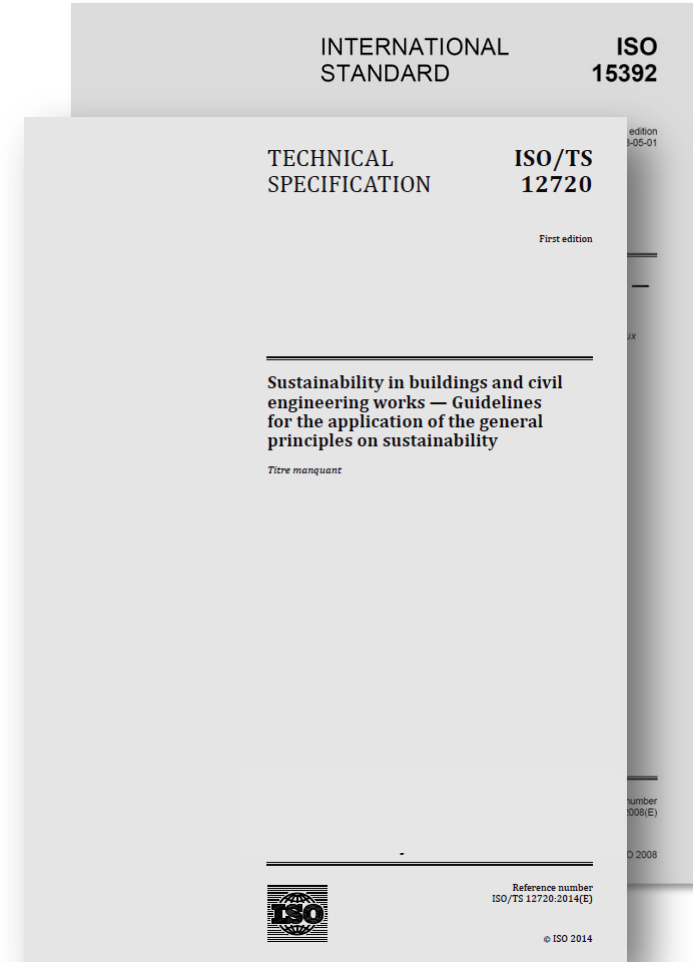


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# ISO TC 59 SC 17 Sustainability in building ....

- One basis for the transfer of the principles of sustainable development into the construction and real estate industry is the international standard series resulted from the work of ISO TC 59 SC17.
- The authors of this paper have been and are involved in the development and refinement of these standards.
- *The contributions from Germany are supported by the Federal Institute for Research on Building, Urban Affairs and Spatial Planning*



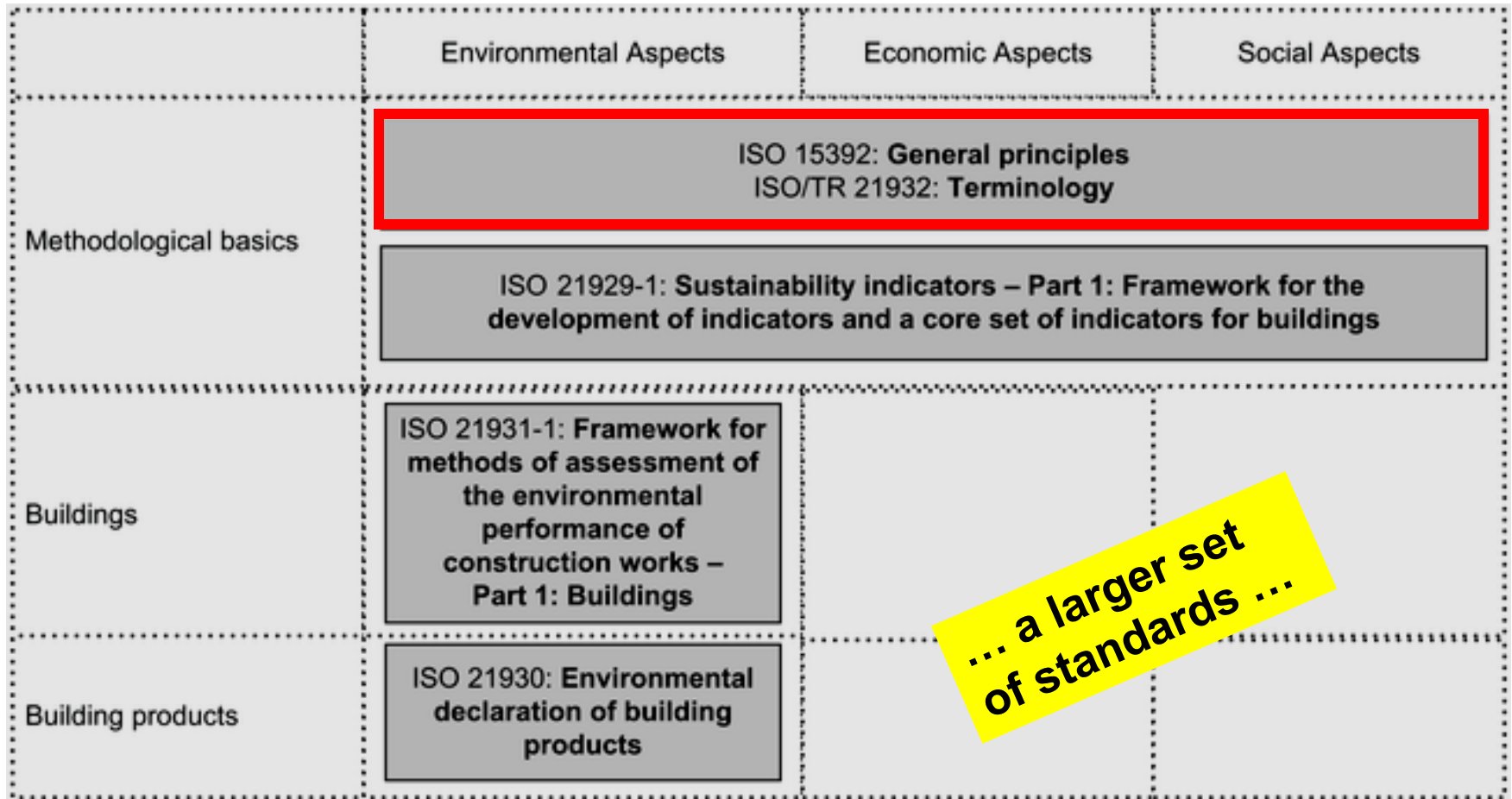
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# ISO TC59 SC17 Sustainability in buildings ...



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# ISO 15392:2008 General Principles

- The aim of this International Standard is to set out the **objectives for sustainability in building construction** and from these derives general principles.
- It forms the basis for deriving evaluation **criteria and indicators** for the assessment of the contribution of buildings to sustainable development, and it enables **decision makers** to apply the principles in their **decision making**.

<https://www.iso.org/obp/ui/#iso:std:iso:15392:ed-1:v1:en>



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# The meaning of “sustainable development ...”

- Sustainable development of buildings and other construction works brings about the **required performance and functionality with minimum adverse environmental impact**, while **encouraging improvements in economic and social (and cultural) aspects at local, regional and global levels.**
- The **contribution of buildings and construction works to sustainable development** can be considered on **several levels**, including a whole industrial **sector**, an **enterprise**, a **community**, a **building stock**, a **group of buildings**, or an individual building or construction works.



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# The meaning of “sustainability assessment ...”

- Addressing sustainability in buildings and other construction works includes the interpretation and consideration of sustainable development in terms of its three primary aspects – **economic, environmental, and social aspects** – while **meeting the requirements for technical and functional performance** of the construction works.
- These aspects are **inextricably linked to each other** and interdependent, and a **dynamic balance** exists between them, .... They have no particular precedence and this International Standard gives them **equal importance**.



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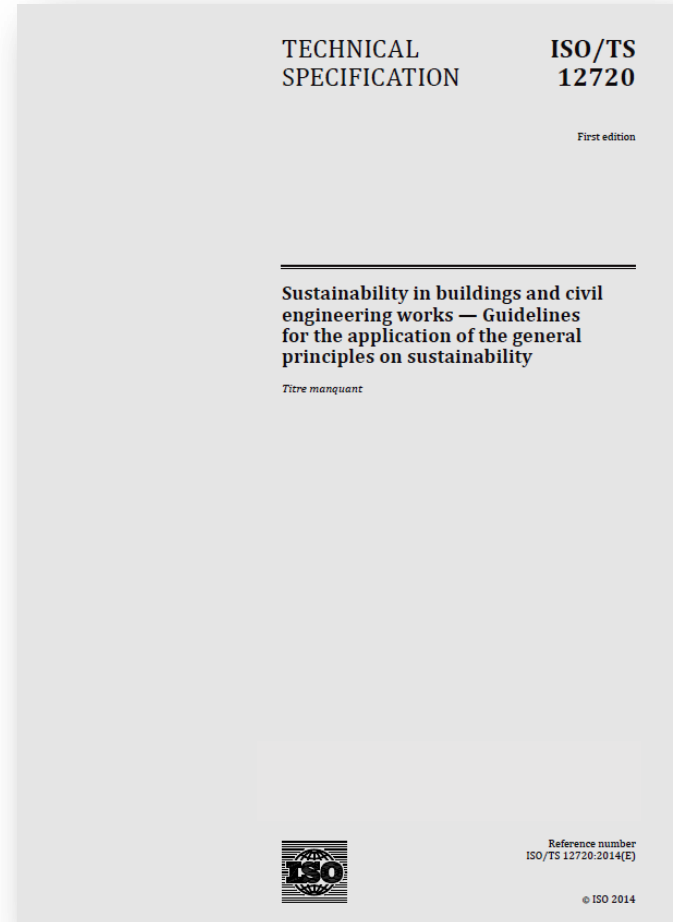
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# ISO/TS 12720:2014 Guideline for the application

- ISO/TS 12720:2014 provides guidance for the **application of the general principles** of sustainability in buildings and civil engineering works elaborated in ISO 15392.
- It provides a **step-by-step approach** for: encouraging the application of the general principles **by all stakeholders** at **each stage of the project** and its use, helping interested parties to consider and/or incorporate **sustainability thinking in all phases of the building's or civil engineering works' life cycle ...**

<https://www.iso.org/obp/ui/#iso:std:iso:ts:12720:ed-1:v1:en>  
<https://www.iso.org/standard/51654.html>



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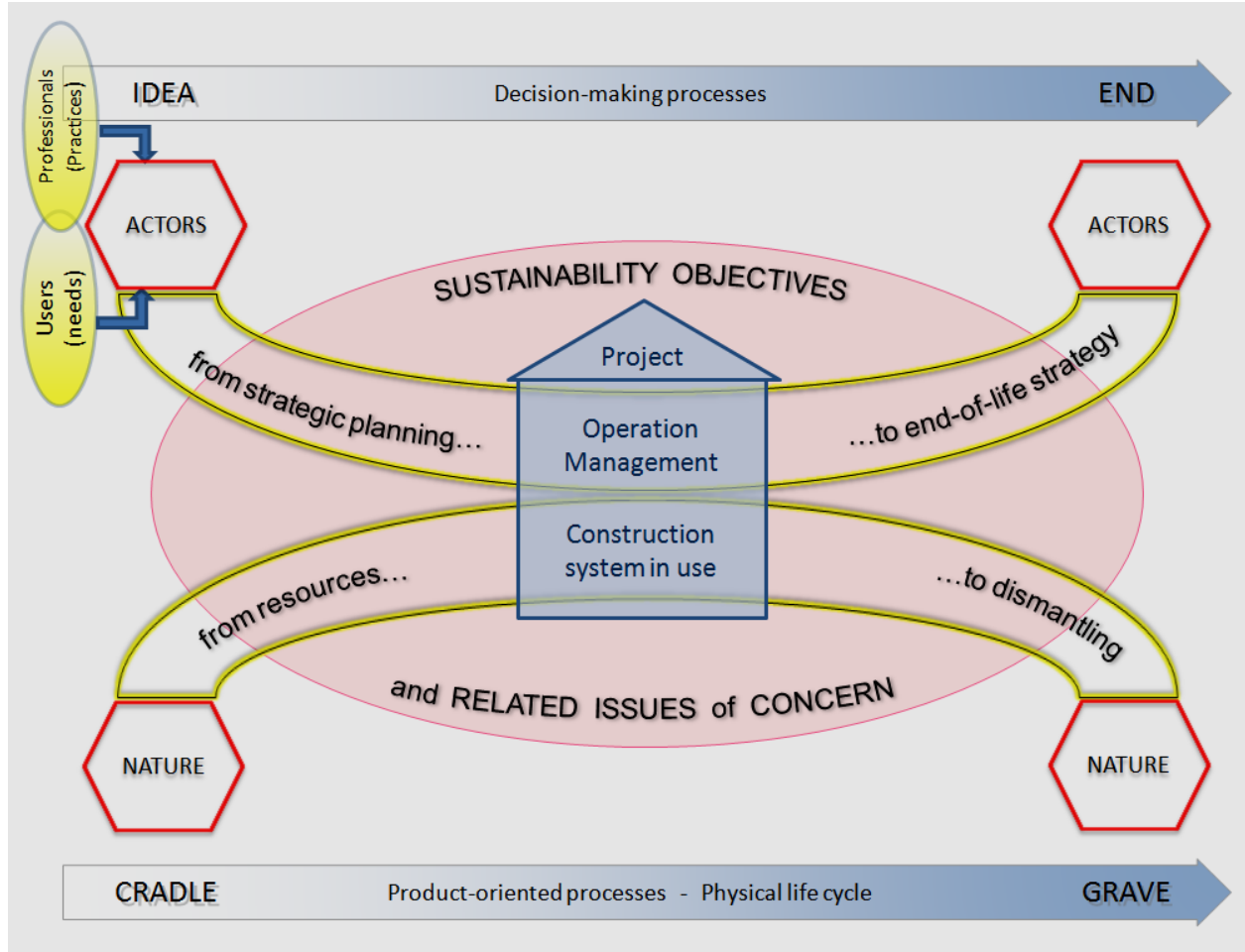


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# Decision making along the physical life cycle



Parallel to the **physical life cycle** forming the basis for energy and mass flows (and cash flow), **project management** takes place dealing with the flow of information, the fulfillment of responsibility towards the environment and society as well as the consideration of current and future effects of decisions.



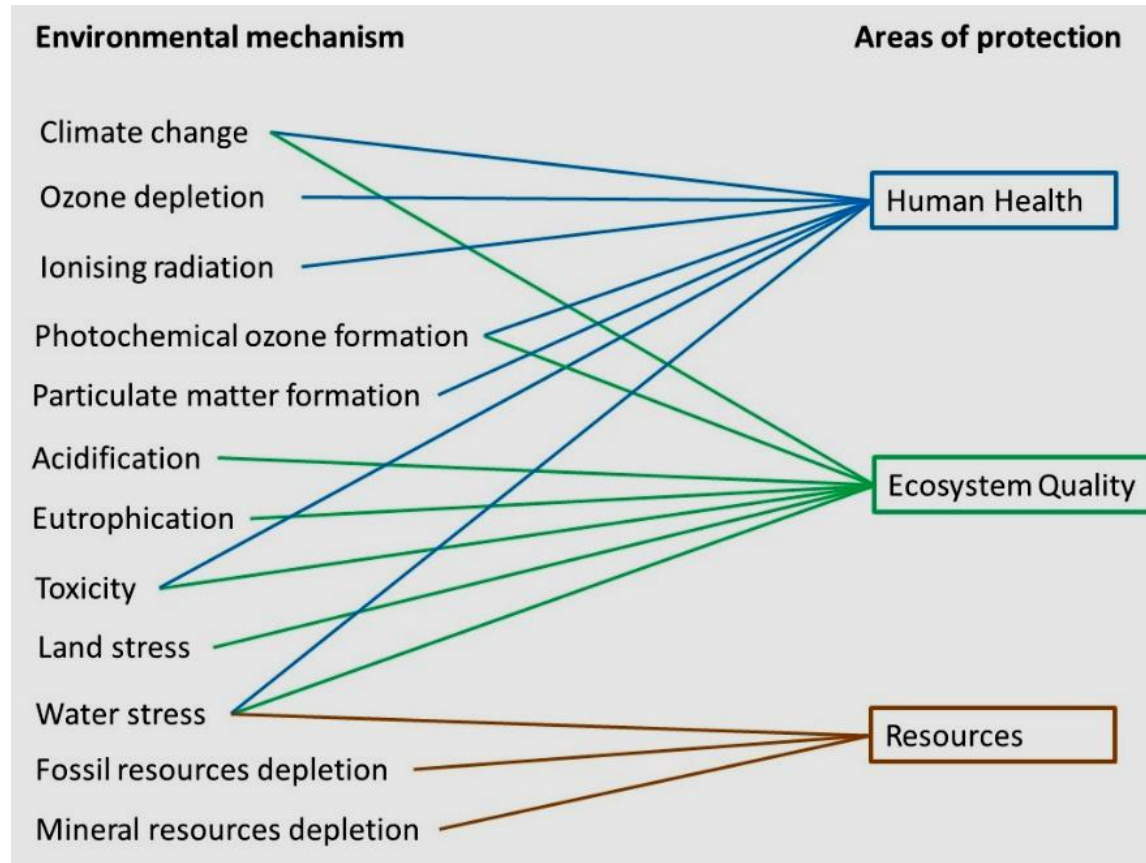
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# Areas of protection as starting points



The “areas of protection” / “areas of concern” can be used a **basis for deriving objectives and assessment criteria** for sustainable development in the construction sector. They can also be used for **deriving related social and economic aspects**.

[http://www.lc-impact.eu/downloads/documents/LC-impact\\_methodology.jpg](http://www.lc-impact.eu/downloads/documents/LC-impact_methodology.jpg)

# Dimensions of sustainability & Areas of concern

<i>Dimension</i>	<i>Areas of concern</i>
Economic Dimension	<b>Economic resources / LCC Asset / property value</b>
Environmental Dimension	<b>Environment / Ecosystem (natural) Resources</b>
Social Dimension	<b>Social infrastructure Cultural heritage / cultural value Human health and comfort</b>



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# Process-related principles (Recommendations)

- Continual improvement
- Equity
- Global thinking and local action
- Holistic approach
- Involvement of interested parties
- Long-term consideration
- Precaution and risk management
- Responsibility
- Transparency



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# Principles !

## The details .....



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# Recommendations (principles) in detail - I

The concept of sustainability implies the **equal consideration of all three pillars** of sustainability. This is vital **to reflect the entire impacts** of building and construction works rather than focusing on a single criterion (e.g. GWP).

**Holistic approach**

Global aims and concerns with respect to sustainable development need to be aligned with needs, requirements and constraints with respect to **functionality** and efficiency (e.g. cost-benefit ratio).



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# Recommendations (principles) in detail - II

To benefit from sustainable development concepts, **long-term considerations** are an important factor during inception and design of a project.

**Long-term  
consideration**

**All life cycle stages** have to be taken into account to assess the **implications of a decision taken on other life cycle stages.**



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# Recommendations (principles) in detail - III

Management strategies need to be set up and communicated to **identify, analyze and control any potential risks**.

**Risk  
management**

Risks may be avoided by using methods, techniques and products that are proven to be safe and healthy (**precautionary principle**).



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# Life cycle stages (ISO TS 12720)

Decision-making process	Questions raised	Main stakeholders (or actors)	Result/deliverables
Strategic planning	<ul style="list-style-type: none"> <li>— What is the demand?</li> <li>— What are the needs?</li> <li>— What are the sustainability objectives?</li> <li>— What are the opportunities and constraints of the site?</li> </ul>	Clients, users, community interest groups	<ul style="list-style-type: none"> <li>— Preliminary objectives</li> <li>— Decision to proceed or not</li> </ul>
Project definition	<ul style="list-style-type: none"> <li>— What are the technical and functional requirements?</li> <li>— What are the environmental, economic, and social performance requirements?</li> </ul>	Clients, users, community interest groups	<ul style="list-style-type: none"> <li>— Project detailed objectives</li> <li>— Creation of the project/client brief<sup>a</sup></li> </ul>
Design	How is the demand expressed into a project, first schematically and then in detail?	Designers, engineers, clients, users, regulatory authorities, community interest groups	A sustainable construction project, with detailed drawings and specifications
Construction and handover	How is the design realized and the works handed over to users?	Contractors, suppliers, manufacturers, clients, users	A sustainable construction process, a sustainable works/asset, a user guide, specifications for use
Operation and maintenance	How to operate and maintain the built environment in an effective, sustainable way?	Clients, users, facility managers, suppliers, community interest groups	A sustainable service life, including continuous improvement
End-of-life strategy	Once full obsolescence is reached, how to deal with the end-of-life, without creating damage to the environment or the community?	Clients, suppliers, contractors, community interest groups	A sustainable exit strategy and its realization, a clean site

**Strategic planning**

**Project definition**

**Design**

**Construction**

**Handover**

**Operation / maintenance**

**End of life**

**Questions**

**Actors**

**Results**



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# Objectives – aspects (dimensions) - principles

Sustainability objectives and related issues of concern	Aspects			General principles of sustainability						
	Environmental	Economic	Social	Continual improvement	Equity	Global thinking and local action	Holistic approach	Involvement of interested parties	Long-term consideration	Precaution and risk management
A1 — Establishment of the sustainability policy of the client or main decision-maker and communication of the vision	●	●	●			●				
A2 — Availability of resources (e.g. financial, technical, human, etc.)		●	●						●	
A3 — Implementation of an integrated multidisciplinary approach throughout the process	●	●	●				●			
A4 — Adoption of an iterative process and validation of the choices at each key stage	●	●	●	●			●	●		
A5 — Management of risks	●	●	●			●	●		●	●

In ISO TR 12720 both sustainability dimensions (aspects) and principles (recommendations) are assigned to the different sustainability objectives.



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# Principles!

## Outlook and conclusions



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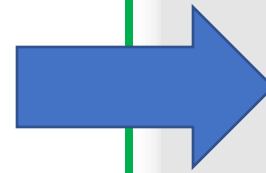
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# Revisions under consideration

The inclusion and consideration of additional topics is currently under discussion

- Sustainable development goals (SDG's)
- Handling of multiple impacts
- Impact chains
- Resilience
- Integrated design
- Smart buildings
- Building information modelling (BIM)
- Regenerative sustainability



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# Conclusions

- All aspects of sustainable development have to be **adapted to the concrete object of assessment** (buildings, construction sites, neighborhoods, cities) and the specific work task.
- **Local and cultural characteristics** shall be taken into account.
- All aspects must be integrated into the **design and decision-making processes** as well as the work and responsibilities of relevant actors.
- It is no longer appropriate to distinguish between traditional work tasks and additional tasks concerned with sustainability issues.



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# Thank you



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