Applicability of Maturity Assessment

for Sustainable Construction

You can‘t manage what you don‘t measure

Peter Drucker
1909 - 2005
Austrian-born American management consultant, educator, and author

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- Application Example
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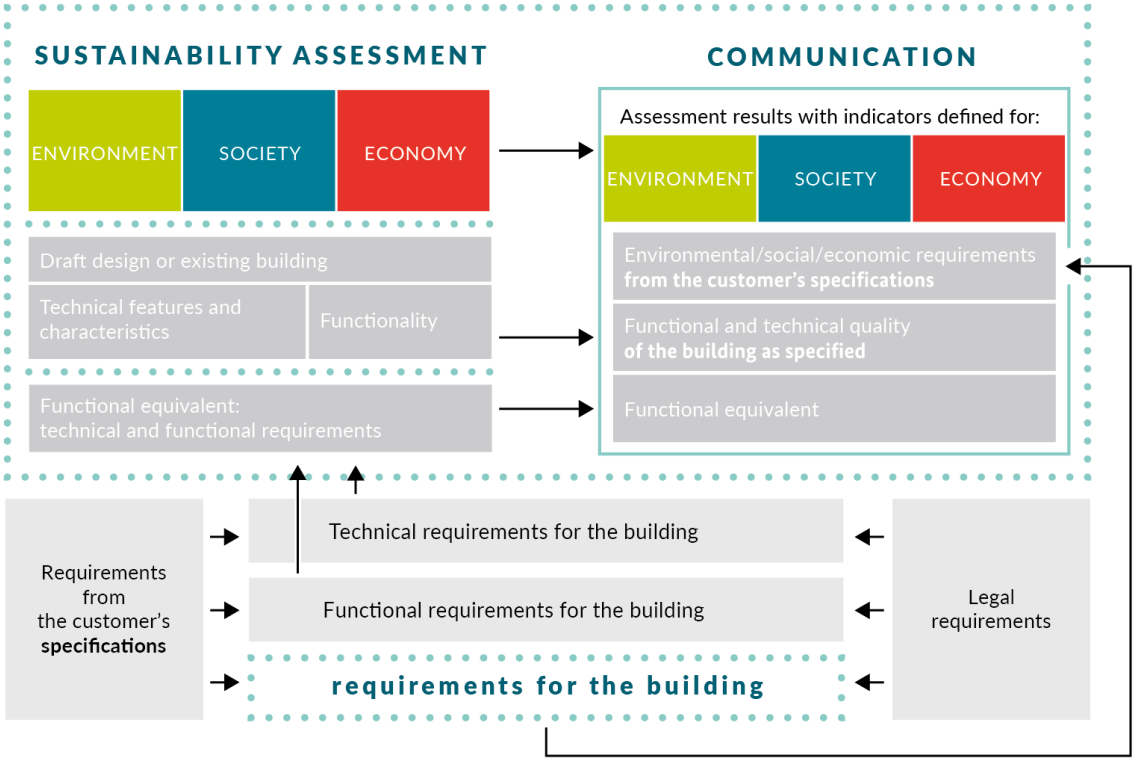
Assessment Concept



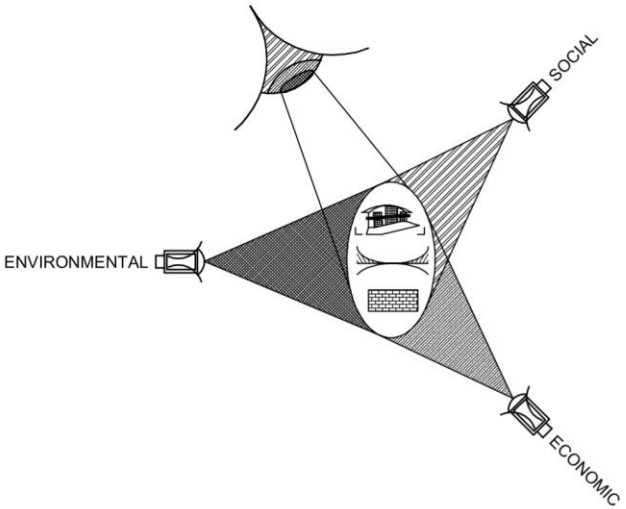
(Quelle: AGNHB according to CEN/TC350

INTERNATIONAL STANDARD **ISO 15392**

First edition
2008-05-01

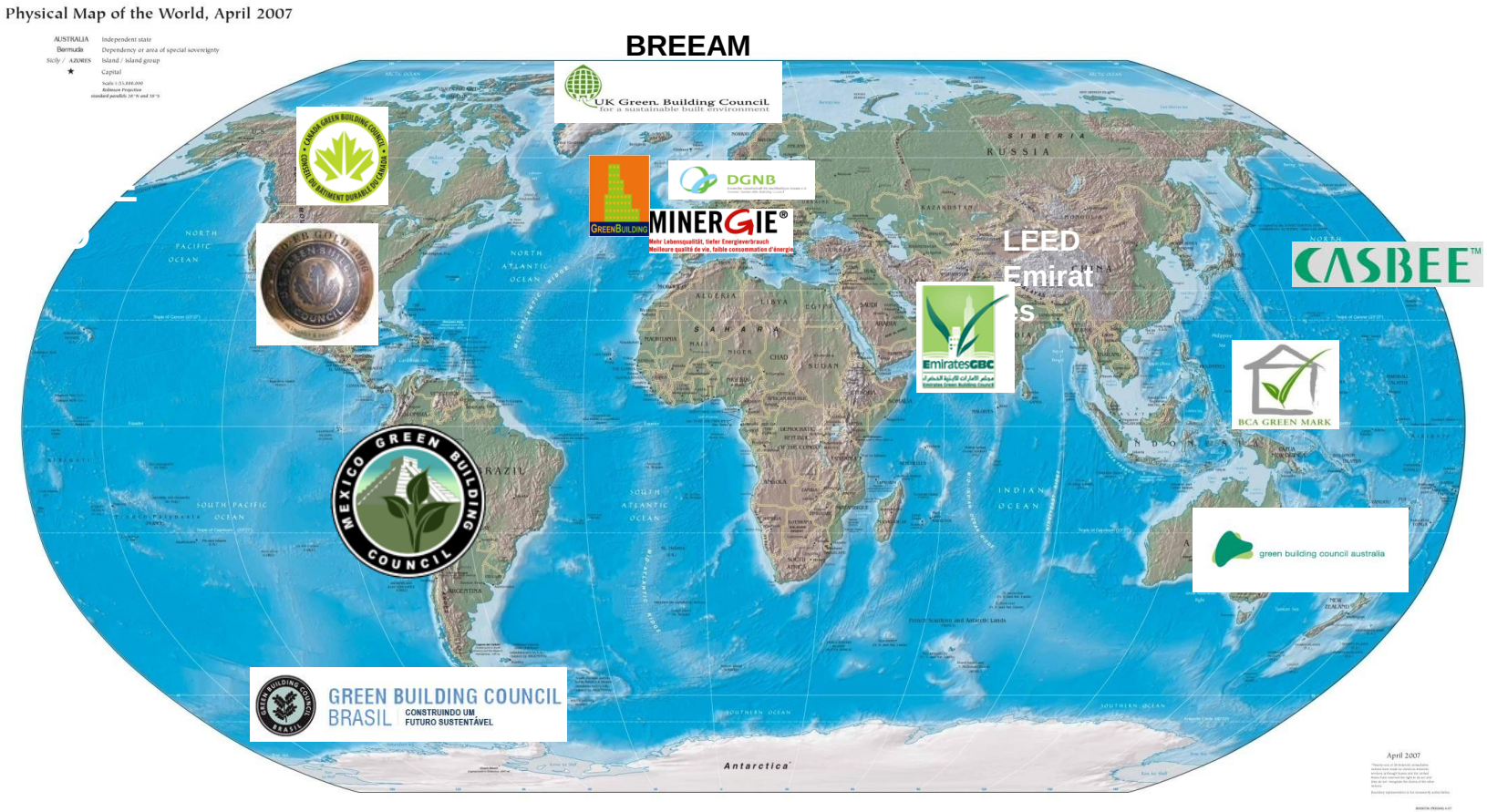
Sustainability in building construction — General principles

Développement durable dans la construction — Principes généraux



Reference number
ISO 15392:2008(E)

Building Certification Systems



(Quelle/Visualisierung: IMBT, 2011)

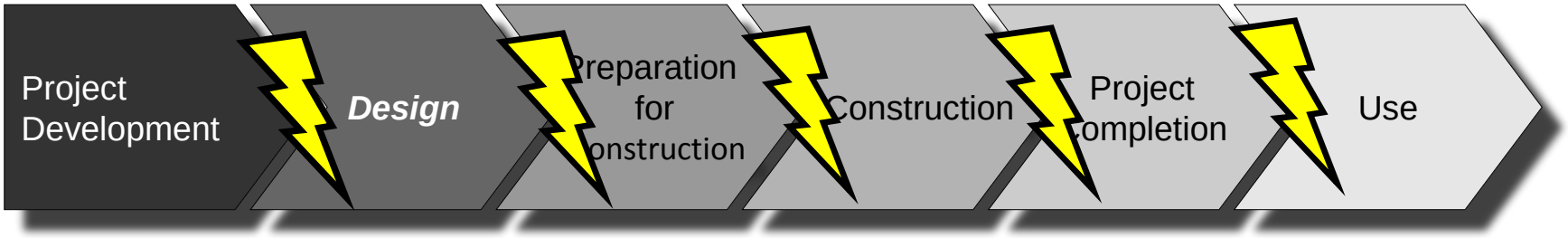
Applied Certification System

DGNB
Deutsche Gesellschaft für Nachhaltiges Bauen
German Sustainable Building Council

Weighting:

- **Environmental Quality** **22,5%**
- **Economical Quality** **22,5%**
- **Social & Functional Quality** **22,5%**
- **Technical Quality** **22,5%**
- **Process Quality** **10,0%**

Current Situation



Ideal timing

Good starting point

Hard to integrate
Cost-intensive

Not any more reasonable

Status-Quo

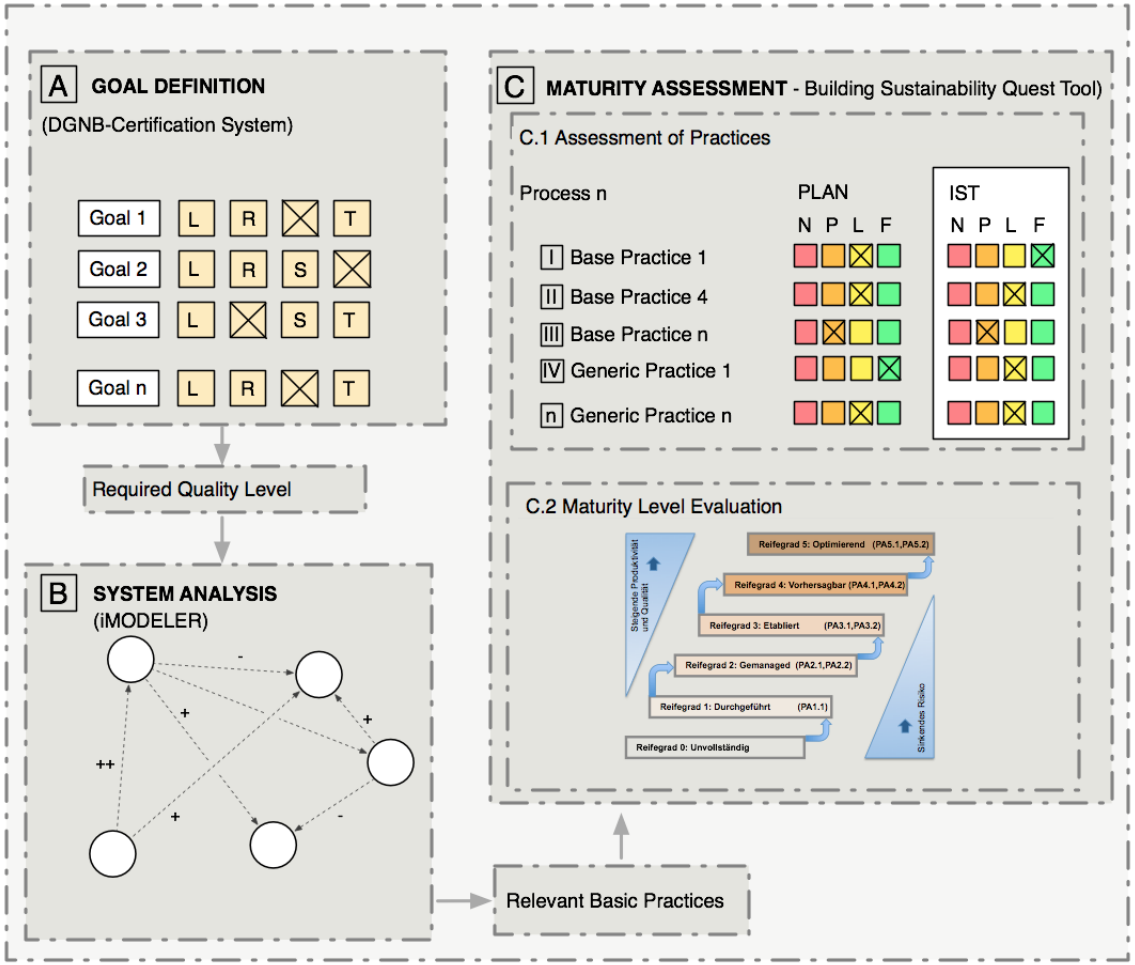
Certification of building stock

Holistic Maturity Assessment and Monitoring Tools

- Stakeholder Goals
- Sustainability Criteria Interaction
- Identification of relevant Processes
- Quality of Process Implementation

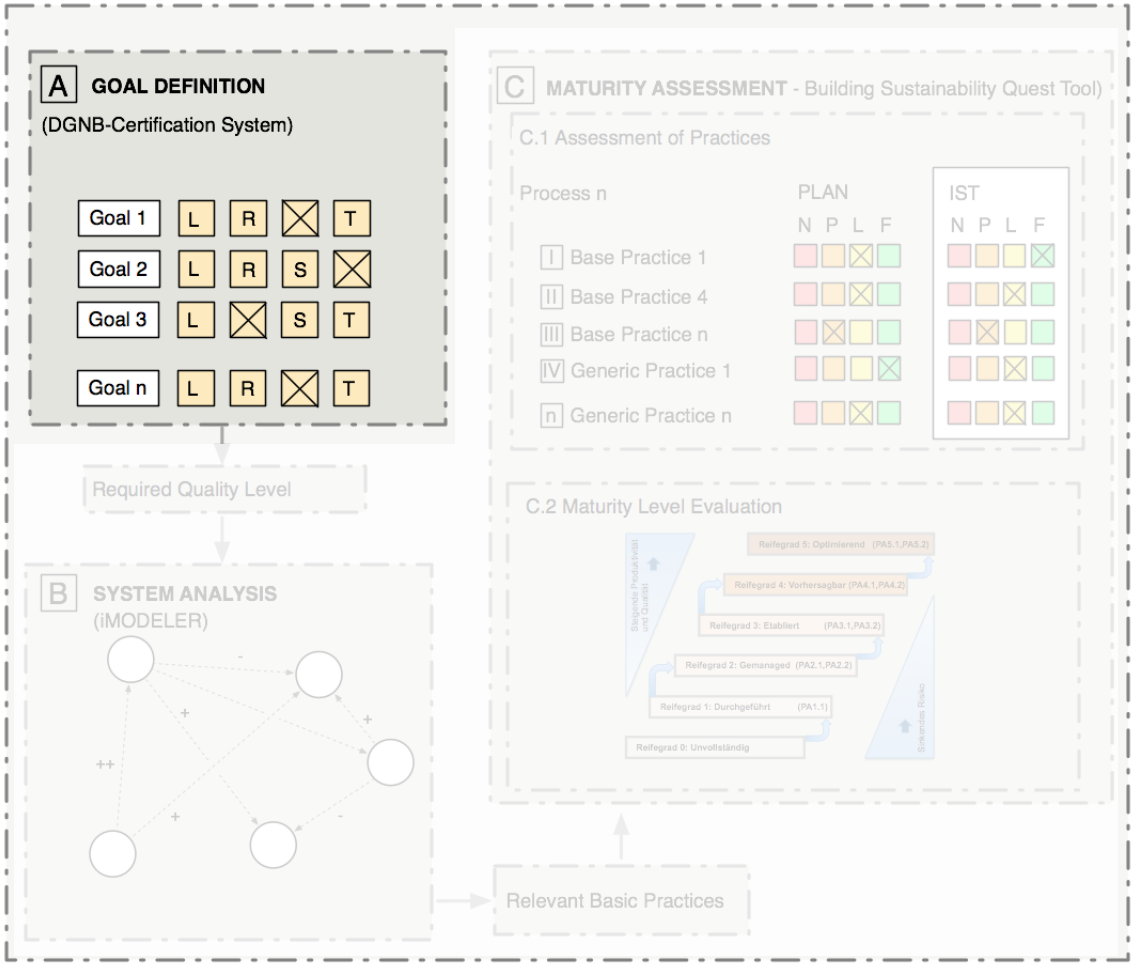
Process Model

- A – Goal Definition
- B – System Analysis
- C1 – Assessment of Practices
- C2 – Maturity Level Evaluation



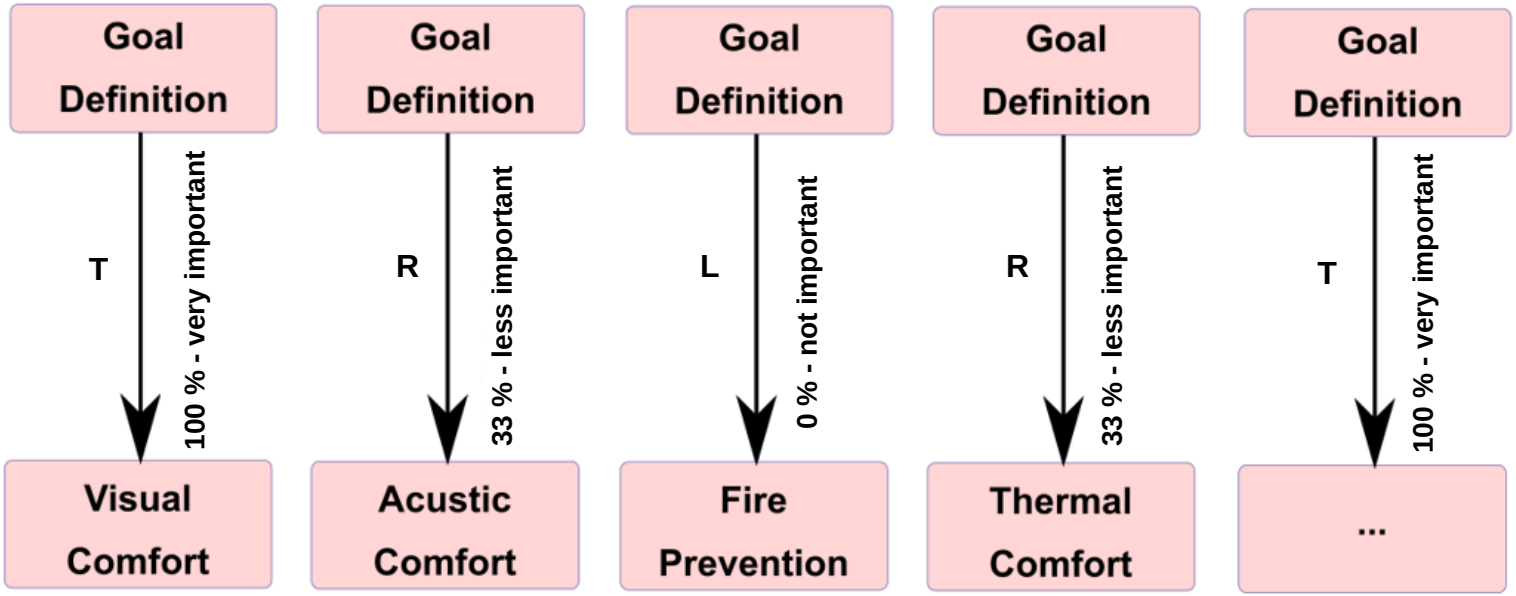
A – Goal Definition

- Stakeholder Requirements
- 4 Quality Levels



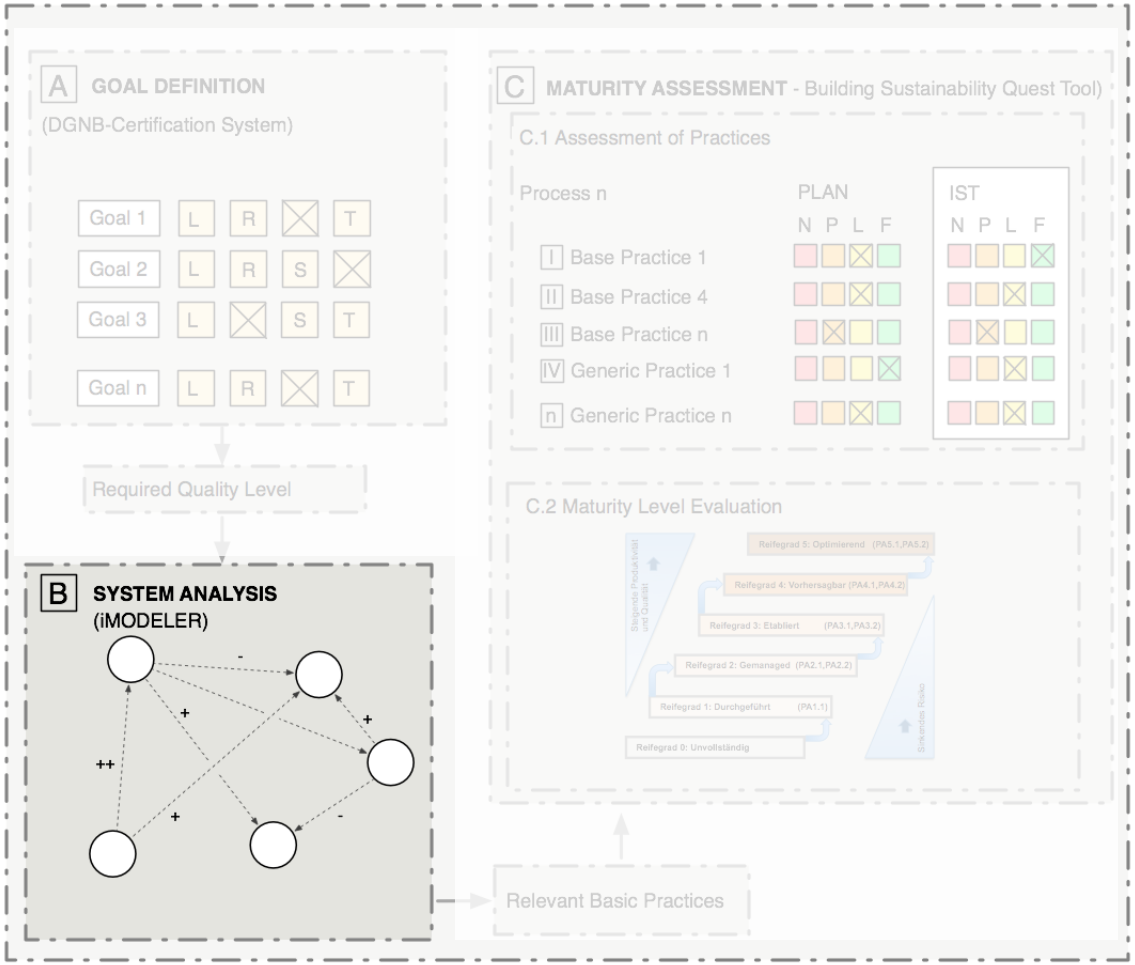
A – Goal Definition

Result: Stakeholder Requirements



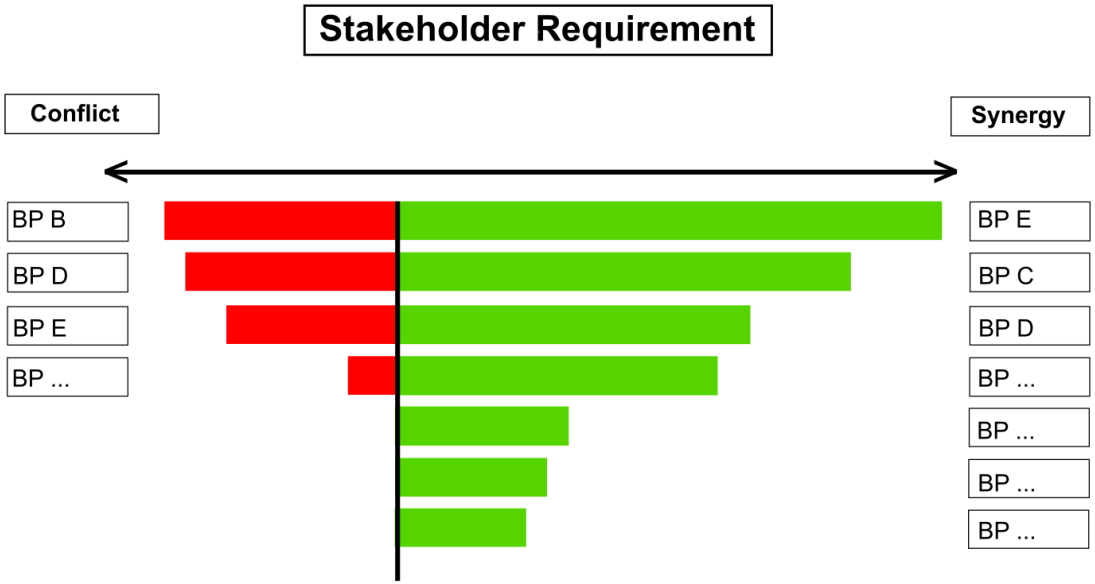
B – System Analysis

- Systemic Approach
- Causal Loop Investigation



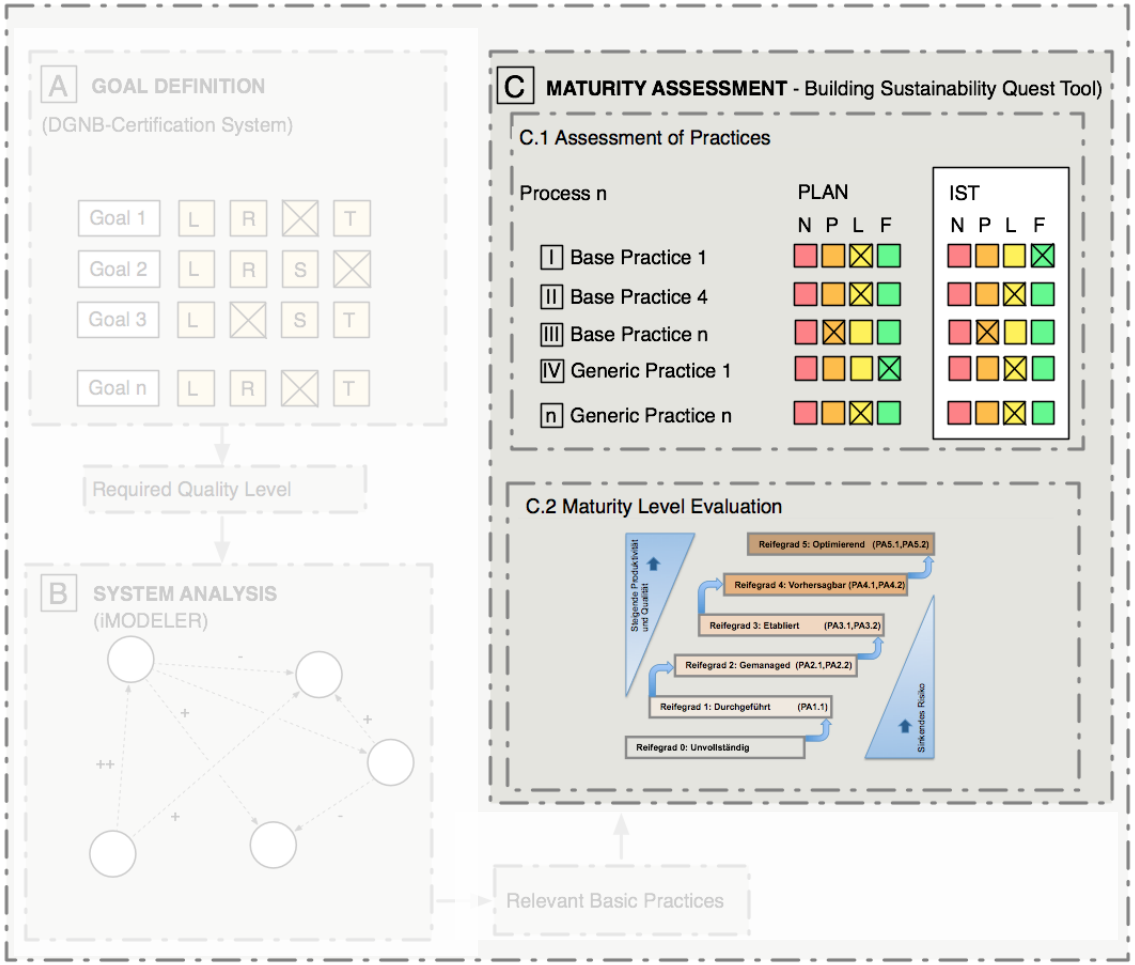
B – System Analysis

Result: Relevant Practices



C – Maturity Assessment

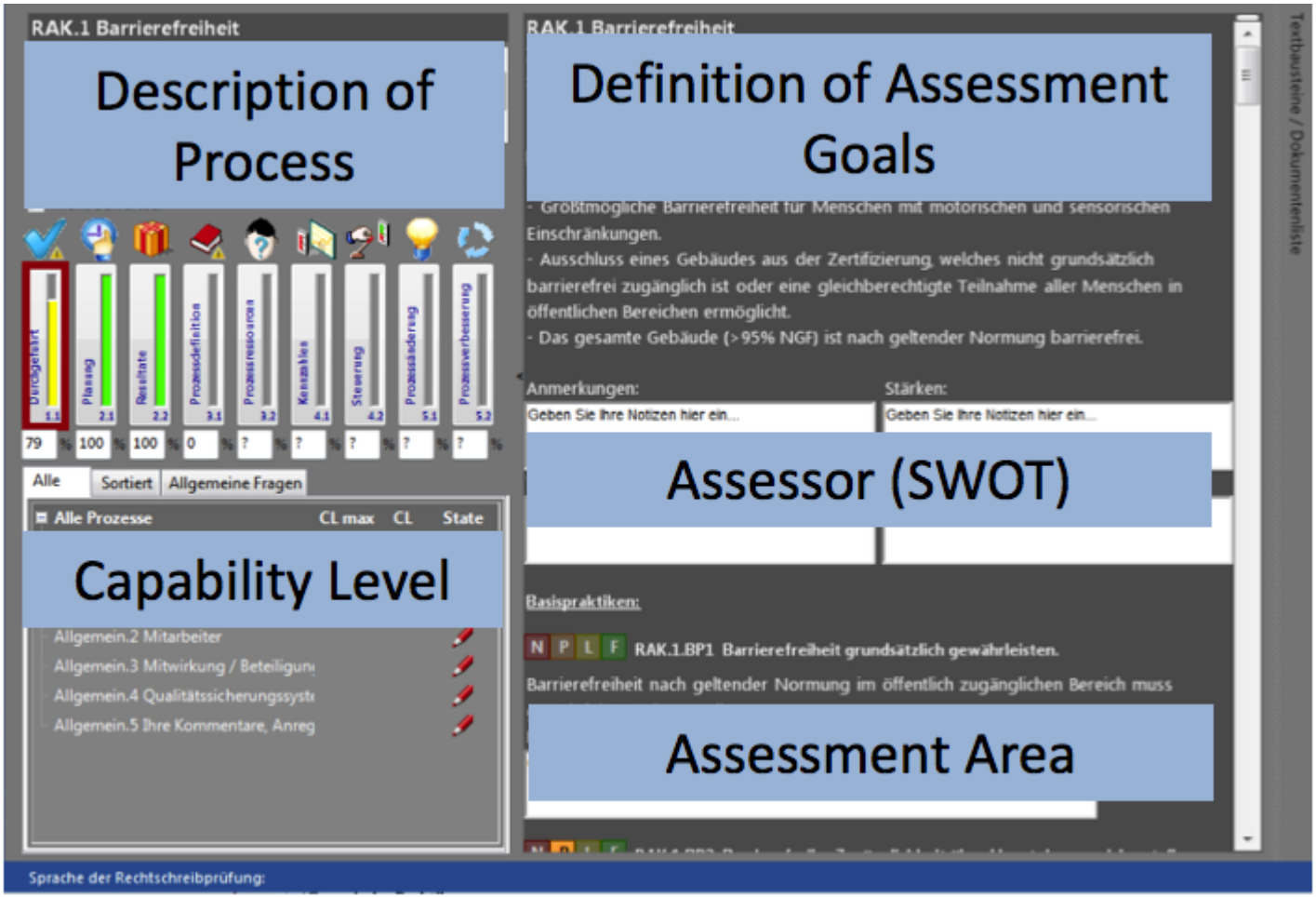
- Assessment of Practices
- Maturity Level Evaluation



C – Maturity Assessment

- SPiCE (**ISO/IEC 15504-5)** - ***S****oftware* ***P****rocess* ***I****mprovement and* ***C****apability D****e****termination*
- Development of Process Assessment Model
  - Definition of Processes
  - Process Attributes
    - Base Practices
    - Generic practices
  - N-P-L-F – scale
- Definition of Maturity Assessment Scale (Maturity Levels)

C – Maturity Assessment



C – Maturity Assessment

Process Attributes

Base Practices

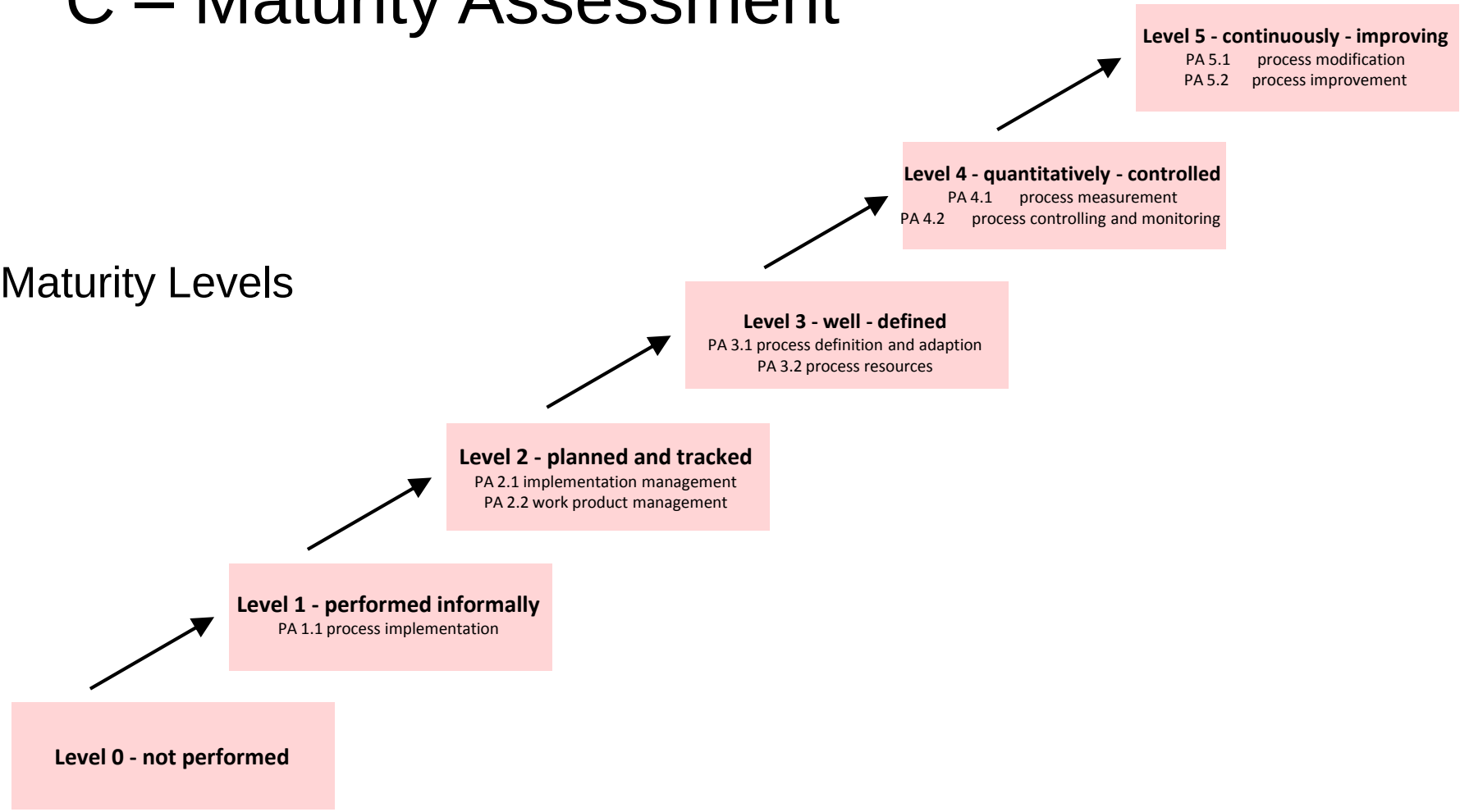
Generic Practices

N – P – L – F Scale

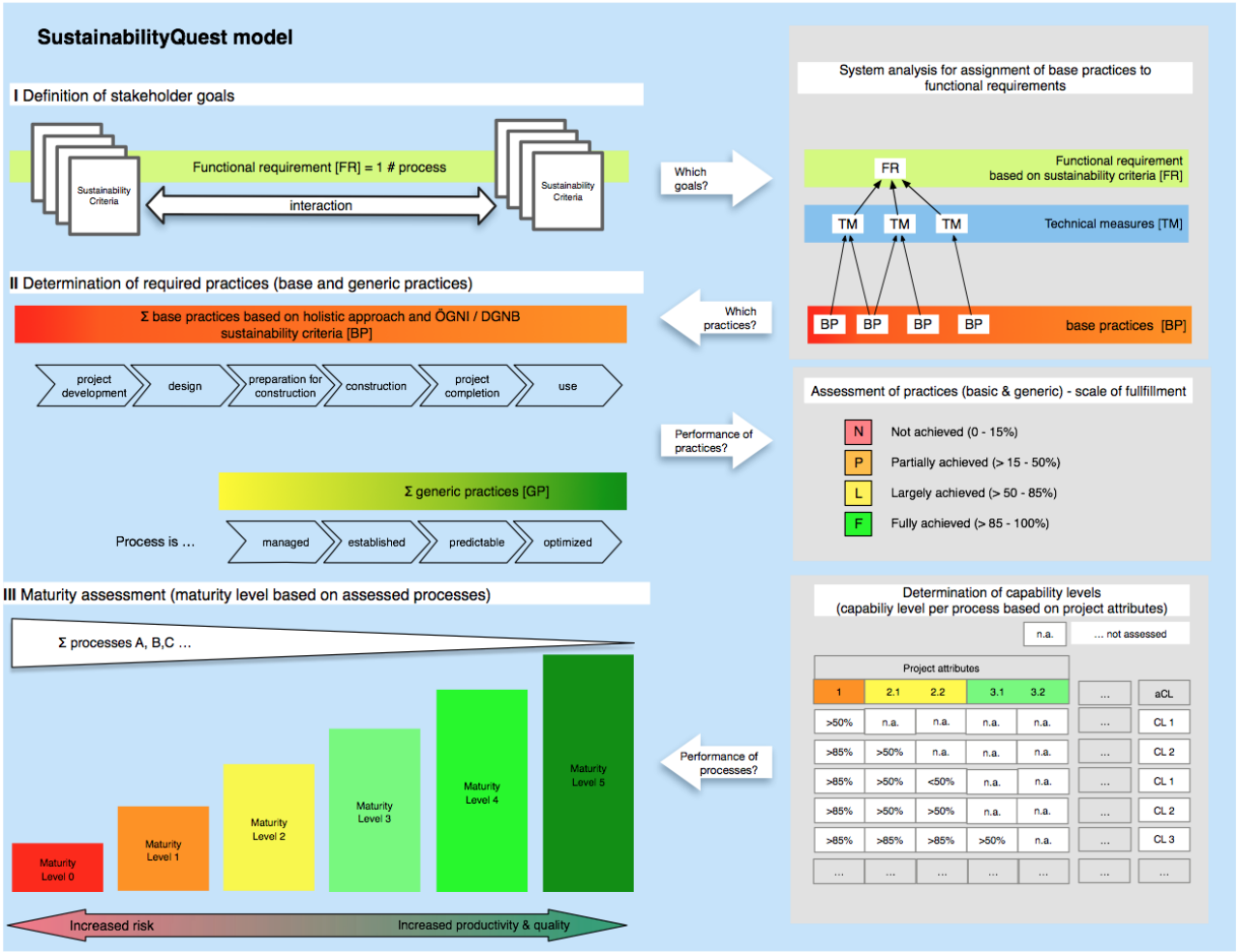
N	Not achieved (0 - 15%)
P	Partially achieved (> 15 - 50%)
L	Largely achieved (> 50 - 85%)
F	Fully achieved (> 85 - 100%)

C – Maturity Assessment

Maturity Levels



Wrap Up

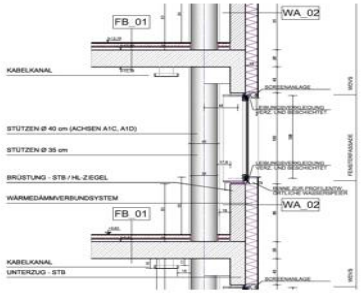


Application

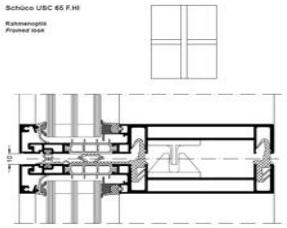
Case Study

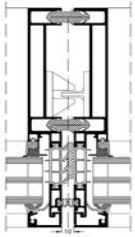
- Comparison of different Façade Types

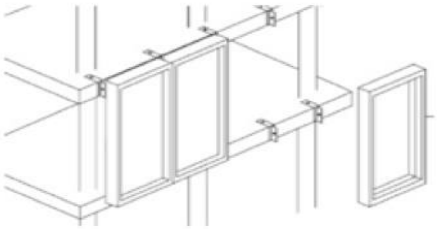
WDVS - Karmeliterhof



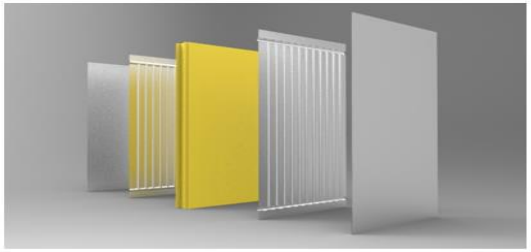
Pfosten-Riegen Fassade







UNAB - Paneel



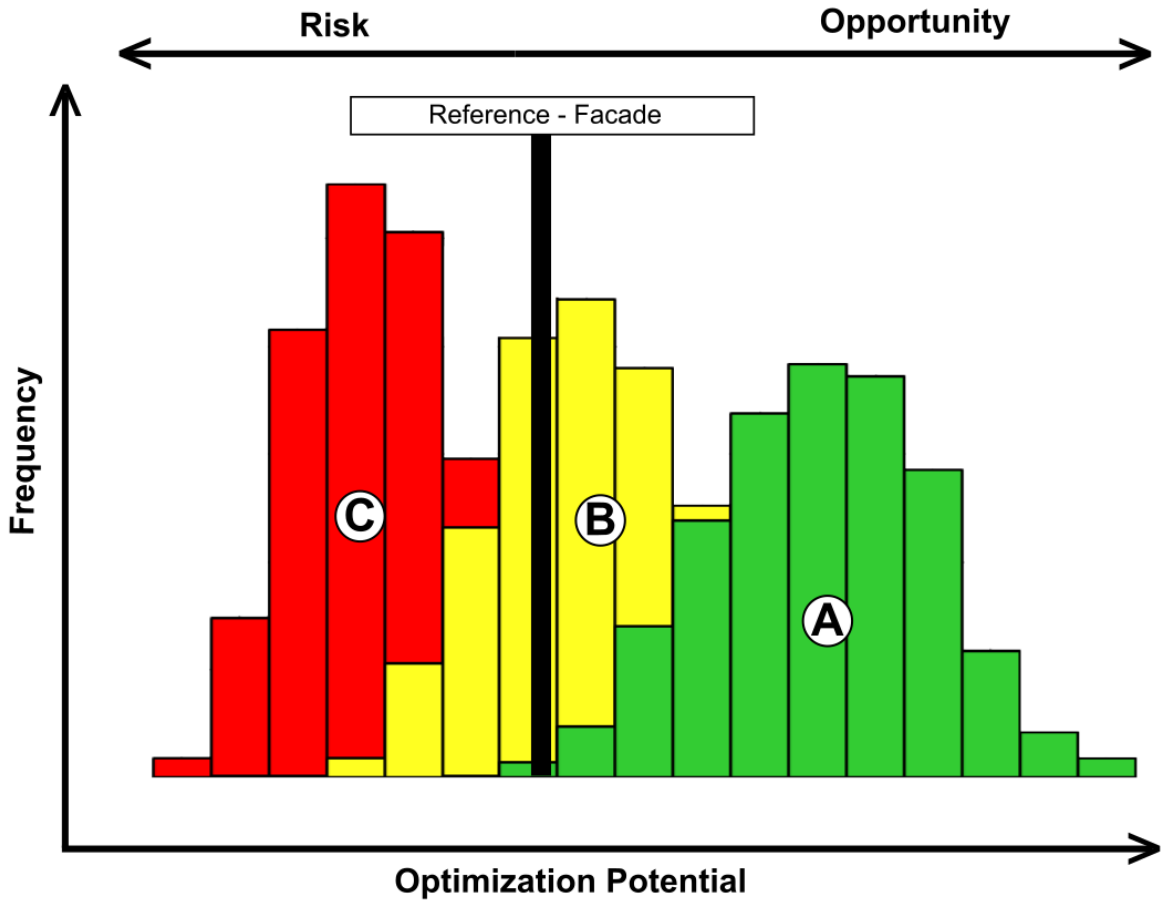
Application

Stakeholder Requirements

- Visual Comfort
- Thermal Comfort
- Sound Insulation
- ....

Criteria	Description	Weighting
LCA[6]	Life Cycle Assessment	13,5%
C6	Risks to the local environment	3,4%
C8	Sustainable use of resources / wood	1,1%
C14	Drinking water demand and volume of waste water	2,3%
C15	Space demand	2,3%
LCCA	Building related life-cycle costs	13,5%
C17	Suitability for third-party use	9,0%
C18	Thermal comfort in the winter	1,6%
C19	Thermal comfort in the summer	2,4%
C20	Interior air hygiene	2,4%
C21	Acoustic comfort	0,8%
C22	Visual comfort	2,4%
C23	User control possibilities	1,6%
C24	Quality of outdoor spaces	0,8%
C25	Safety and risk of hazardous incidents	0,8%
C26	Handicapped accessibility	1,6%
C27	Space efficiency	0,8%
C28	Suitability for conversion	1,6%
C29	Public access	1,6%
C30	Bicycling convenience	0,8%
C31	Assurance of design and urban development quality in a competition	2,4%
C32	Percent for art	0,8%
C33	Fire prevention	4,5%
C34	Sound insulation	4,5%
C35	Quality of building envelope with regard to heat and humidity	4,5%
C40	Ease of cleaning and maintenance	4,5%
C42	Ease of dismantling and recycling	4,5%
C43	Quality of project preparation	1,3%
C44	Integral planning	1,3%
C45	Optimization and complexity of planning method	1,3%
C46	Evidence of sustainable aspects in call for and awarding of tenders	0,9%
C47	Creation of conditions for optimal use and management	0,9%
C48	Construction site / construction process	0,9%
C49	Quality of contractors / prequalification	0,9%
C50	Quality assurance for construction	1,3%
C51	Commissioning	1,3%
	Sum	***100%***

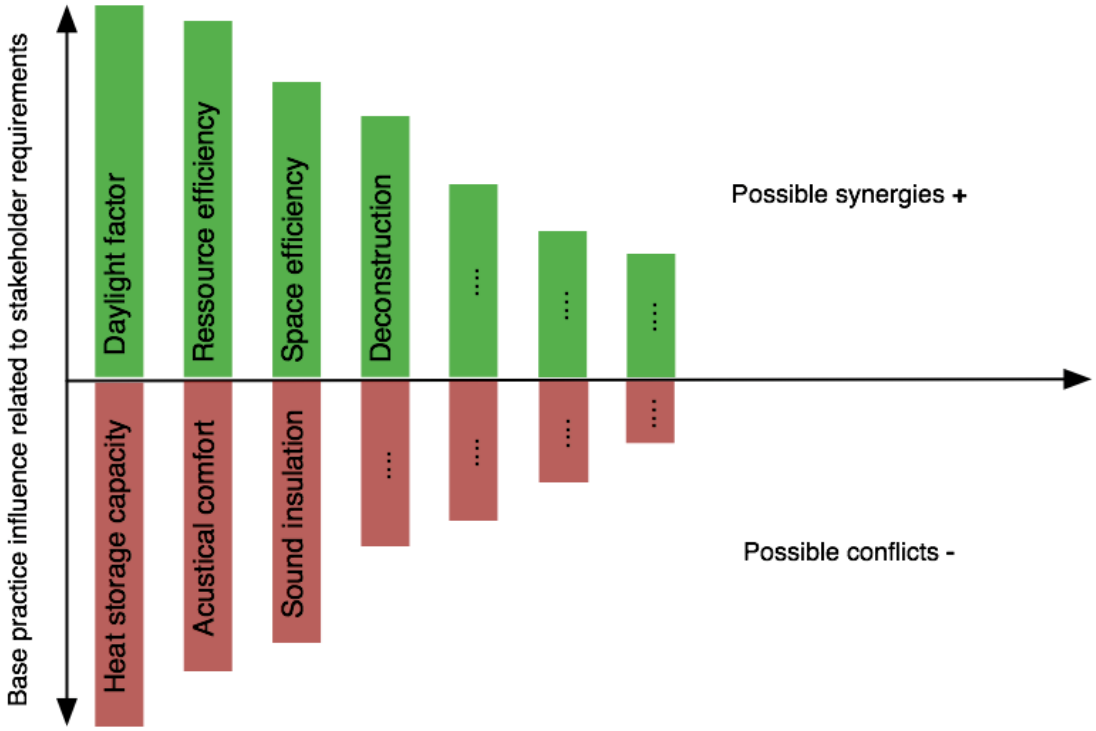
Optimization Potential



Application

System Analysis

- Slendering the Building Envelope



Application

Assessment of Practices

- N – P – L - F
- Compared to the Reference Scenario

Base Practices

Basispraktik (BP) / Basispraktik-Prozess (BPP)

N P L F **THE.1.BP.1 Endenergiebedarf reduzieren**

Mögliches Synergiepotenzial mit:
- VIS.2 - Sonnenschutz
- VIS.3 - Kunstlichtverteilung
- THE.3 - Oberflächentemperature
- THE.4 - Zugluft
- EFN.1 - Einflussnahme Temperat
- WFQ.1 - Energieeffizienz TGA
- WFQ.2 - Energieeffizienz Konstru
- WFQ.3 - Thermische Gebäudehü
- WFQ.4 - U - Werte
- WFQ.5 - Dichtheit Gebäudehülle

Mögliches Zielkonfliktpotential
- VIS.1 - Tageslichtquotient

Der U-Wert des UNAB-Paneels lieg
HWB.
Zusätzlich kommt es zu eine
Solarmodule.

Hinweis:
Sommer- und Winterfall werden o
Hinweis:
niedrigere Systemtemperaturen d

Generic Practices

Generische Praktiken

N P L F **GP 3.1.1 Standardisiertes institutionsspezifisches Ablaufschemata (d.h. projektübergreifend und eventuell prozessgebietsübergreifend anwendbar) für die Berücksichtigung von Nachhaltigkeitsaspekten zur Definition eines Standardprozesses liegt vor**
Es liegt kein standardisiertes Ablaufschema vor.

N P L F **GP 3.1.2 Dieser definierte Standardprozess wird umgesetzt**
Da kein standardisiertes Ablaufschema vorliegt, kann der Prozess nicht nach diesem umgesetzt werden.

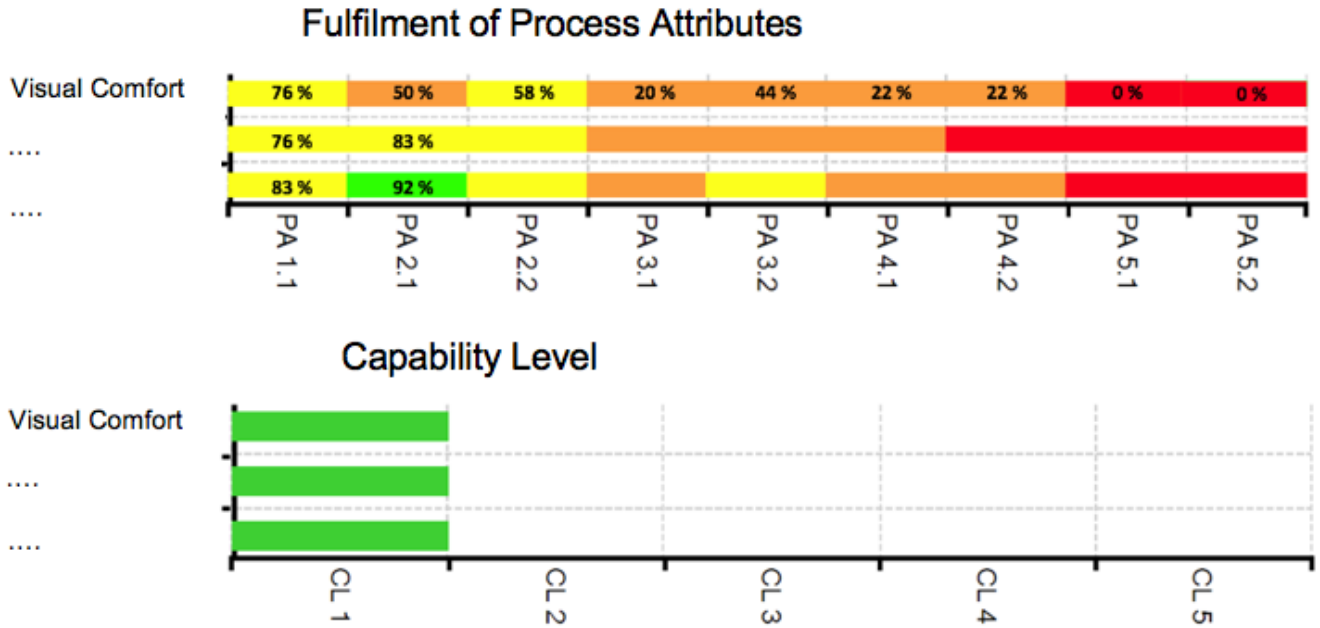
N P L F **GP 3.1.3 Prozessleistungsdaten werden gesammelt (z.B. Erhebnung von Prozessdauer, Ressourcenbedarf, mögliche Risiken)**
Es ist geplant die Durchführung des Prozesses zu dokumentieren und zu überwachen. Ein derartiges Konzept befindet sich noch in Ausarbeitung.

N P L F **GP 3.1.4 Der Standardprozess wird durch kontinuierliches Einpflegen der erhobenen Prozessleistungsdaten verfeinert**
Es liegen noch keine Prozessleistungsdaten vor.

N P L F **GP 3.1.5 Ein Risikomanagement wird vorbereitet nach dem Schema: Risiken erkennen, Risiken analysieren, Risiken abschwächen**
Neben der Dokumentation und Überwachung des Prozesses wird auch ein Konzept zur Risikominimierung erstellt.

Application

Assessment of Practices



∑ Capability Levels = Maturity Level

Summary

- Identifying relevant Practices for the Fulfilment of Stakeholder Requirements
- Knowledge about Coherences between Practices and Functional Requirements
- Highlighting Synergies and Conflicts
- Detection of Optimization Potential of Scenarios
- Knowledge about a Maturity Level of a Sustainability Process

Thank you

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