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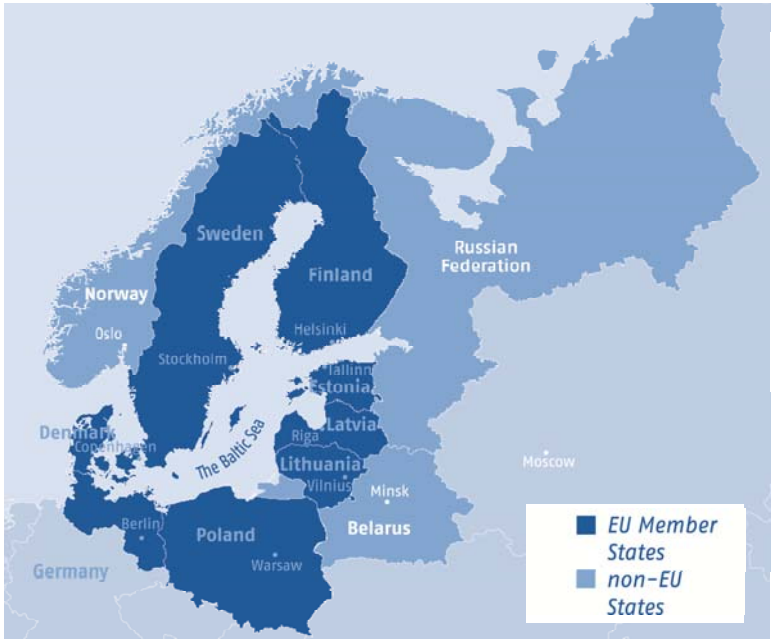
Sustainable, energy efficient residential buildings in regard to European requirements and innovative technologies in the Baltic Sea Region



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Design of sustainable, energy efficient and resource saving residential buildings

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Planung von nachhaltigen, energieeffizienten, Ressourcen schonenden Wohngebäuden

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Introduction

- Climate changes
- EU – resolution: reducing energy consumption **20% till 2020**
- Transnational **cooperation** in countries of the Baltic Sea Region

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- **Energy and Resource saving**
- **Consideration of life cycle of building**
- **Harmonization of standards**
- **Guidelines**

- **Prototype building**
- **Longlife Performance Pass©**

- **Sharing knowledge and technology**
- **International cooperation**

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Structure of project

TEAMS		regional team	regional team	regional team	regional team	regional team
		GERMANY	POLAND	LITHUANIA	RUSSIA	DENMARK
specialist	TEAM 1 technology, energy, planning	Berlin Institute of Technology	Gdansk University of Technology	Vilnius Gediminas Technical University	St. Petersburg State University of Architecture and Civil Engineering	Cenergia
specialist	TEAM 2 administation procedures	Center of Competence for Major Housing Estates	Municipality of Gdynia	Housing and Urban Development Agency	Joint-stock company „Hypothecary Agency of Leningrad oblast"	Municipality Roskilde Kommune
specialist	TEAM 3 industry, costs, quality	ProPotsdam GmbH	Municipality of Gdynia	Building Planning Systematics Centre	North-West-Inter-Regional Center AVOK	Building Association of Zealand

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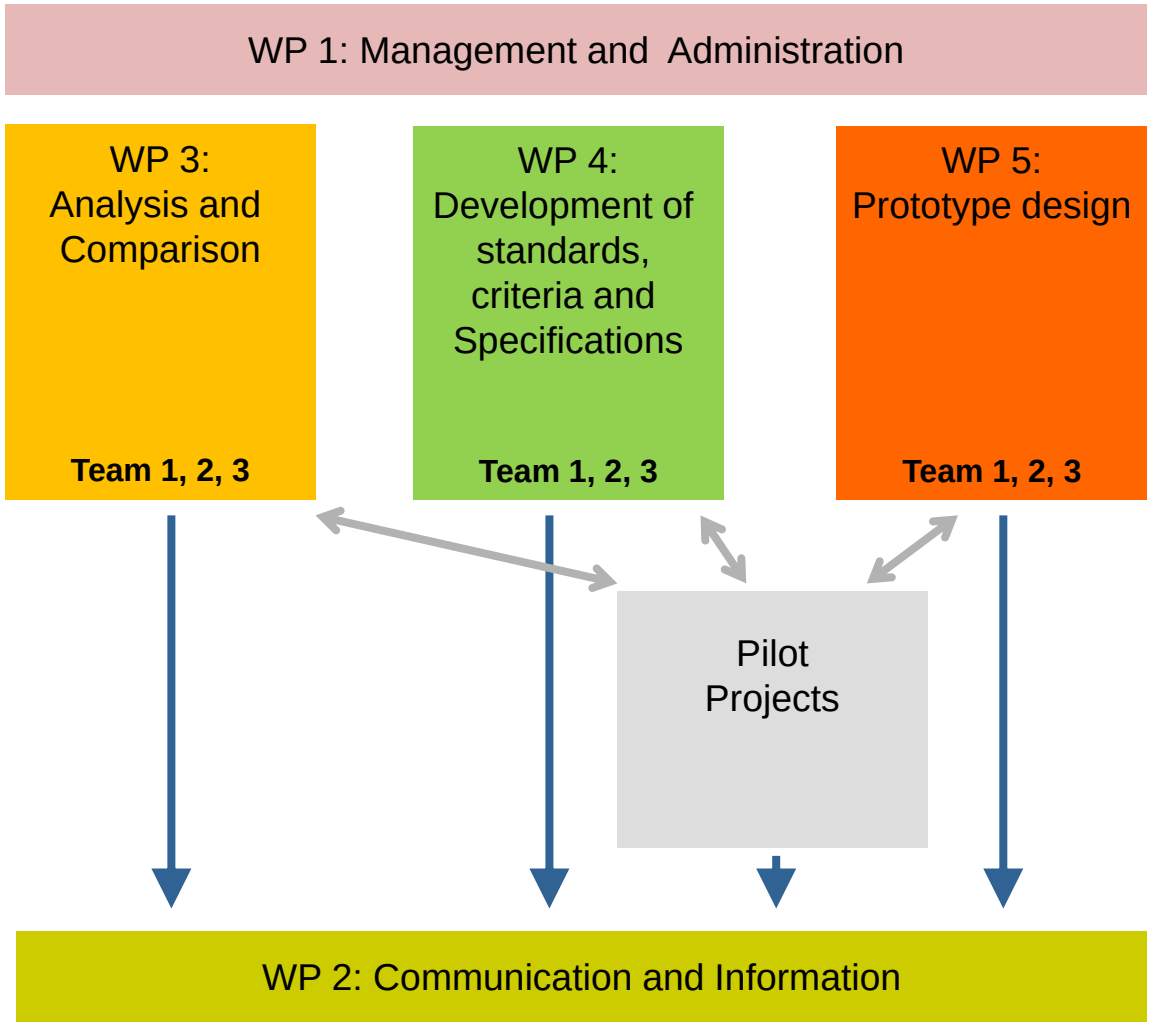

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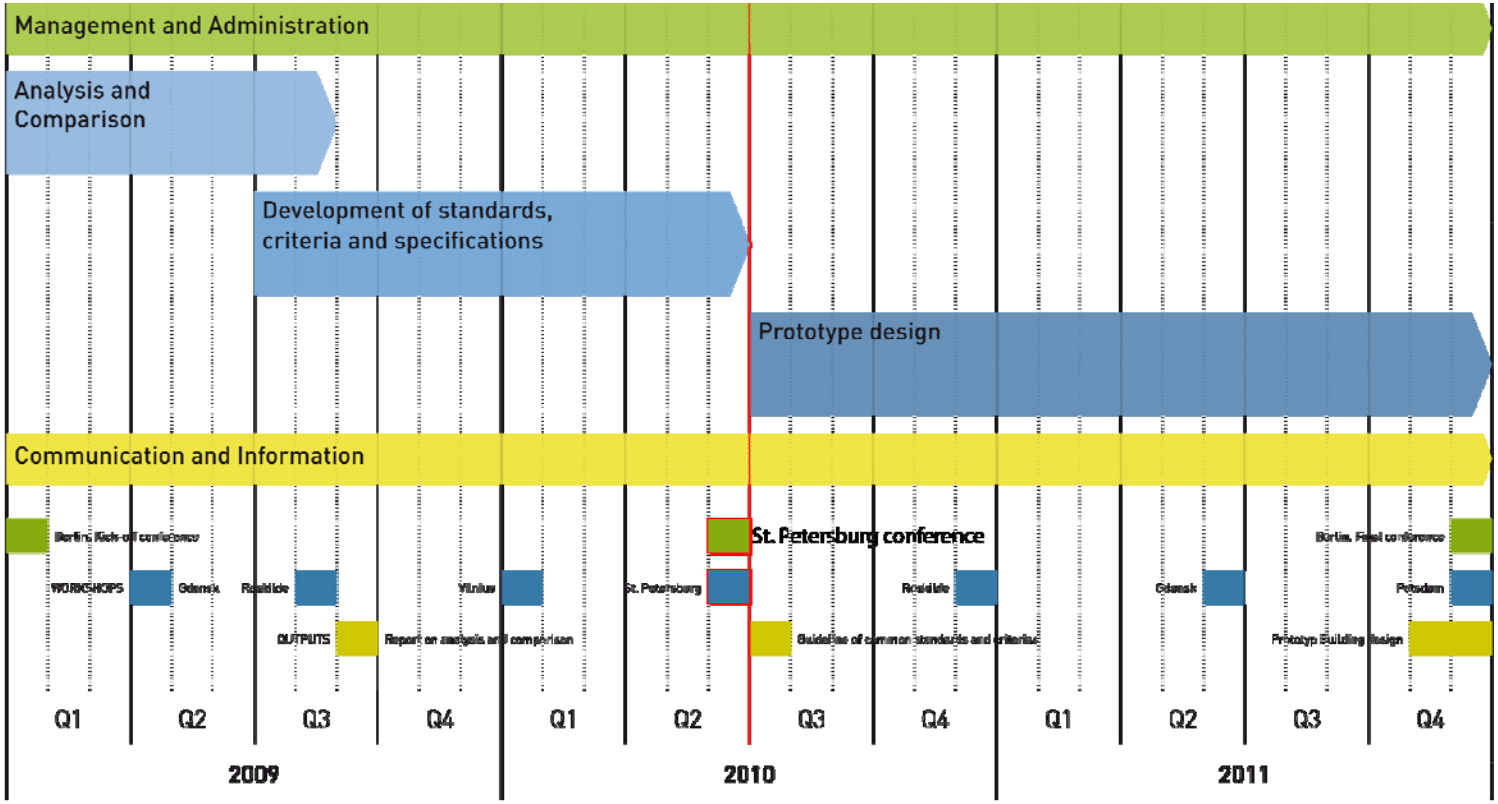

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Analysis and comparison

WP 3: Analysis and comparison

3.1
Engineering and building technology standards – Team 1

→ analysis and comparison of engineering and technology standards in partner countries

3.2
Administration procedures, licensing rules, tendering rules, laws – Team 2

→ comparisons and investigations of administration procedures, building permit rules, tendering rules and laws in the participating countries

3.3
Economical and financial basis – Team 3

→ provide a general and a specific overview about economical and financial issues; sustainability and quality aspects in the participating countries

3.4
Virtual project room

→ provide an access to the project's work results and documents for all project partners

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Glossary

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Cost Efficient Architecture

Is a term that refers to the economical approach to design techniques in the field of architecture. It seeks to minimize construction and operation costs by enhancing efficiency and moderation in the use of material, energy and development space, yet it ensures high quality architecture.

DE	Kostengünstiges Bauen
DK	Totaløkonomisk projektering
LT	Ekonomiškai efektyvi architektūra
PL	Architektura opłacalna ekonomicznie
RU	Экономически эффективная застройка (архитектура)

Life cycle of a building

Is the life span of a building, which involves the construction process, the utilization phase, the tearing down and the recycling of the building.

DE	Gebäude-Lebenszyklus
DK	Bygningslivscyklus
LT	Pastato gyvavimo trukmė
PL	Okres użytkowania budynku
RU	Жизненный цикл здания

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Questionnaire

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3.3 Economical energy supply							
Question	Denmark	Germany	Lithuania	Poland	Russia	Summary	Benchmarks
3.3.2 How was the development of energy costs for private household (incl. TAX) within the last few years?	The energy consumption for heating has fallen 28,6% from 1980 to 2007. Prices per energy unit have been quite stable the last couple of years.	The energy prices rose in the last years. If in 1998 a kWh of electricity costs 15.48 Cent, then in 2008 the amount was on average 21.43 Cent.	Average heating cost in 2008 y. was 51,47 €/MWh, but heating net cost 60,65 €/MWh. Average cost of central heating in 2000 - 0,03 €/kWh, in 2008 - 0,05 €/kWh.	The energy prices increased in the last years. Average cost of heating in 1998 - 0,04€/kWh , in 2007 - 0,07€/kWh	Average heating cost in 2007 y. was 0.27 €/ m². Average cost of central heating in 2009- 0,31€/ m².	While the development of energy prices was quite stable in Denmark, prices rose remarkably in Germany (40% in 10 years) and in Lithuania (66% in 8 years).	Because of the rising prices it is necessary to save energy: on one hand by changing our consumer attitude and on the other hand by building houses with less energy requirement.

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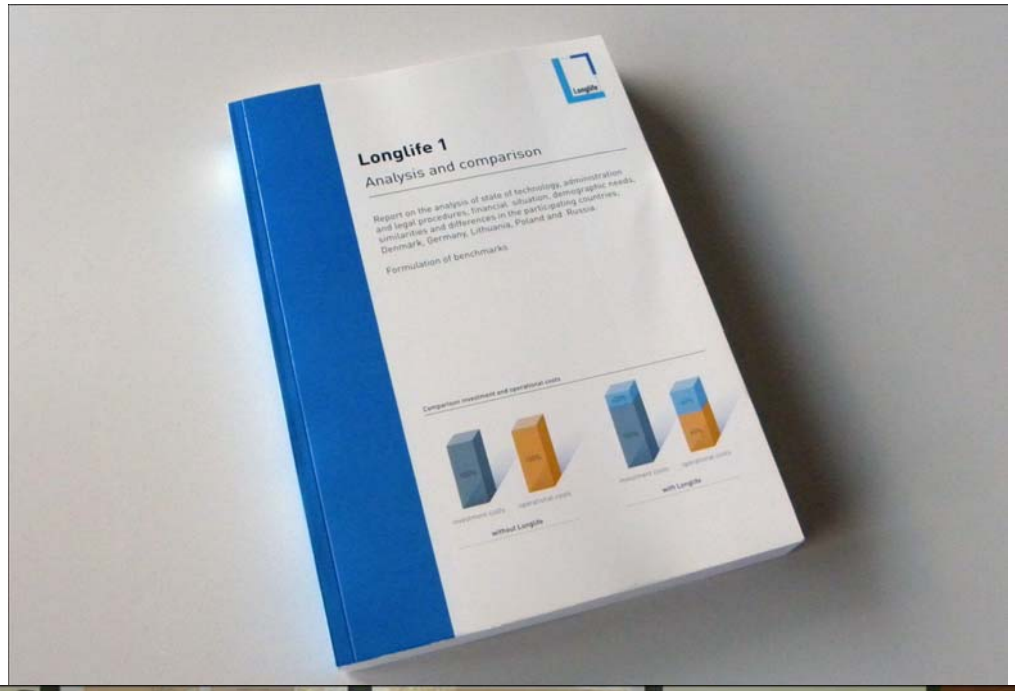

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WP4 – Development of standards and requirements

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WP 4: Development of standards, criteria and specifications

4.1
Engineering and building technology standards – Team 1

→ **development of normative rules, codes and requirements for planning and building new residential buildings**

4.2
Administration procedures, licensing rules, tendering rules, laws – Team 2

→ **common development of methods and rules for administrative procedures and laws, tenders and licensing in an ideal common planning situation which can be used with no or at least only small changes in all partner countries (and eventually in all EU countries)**

4.3
Economical and financial basis – Team 3

→ **formulation of normative requirements for sustain-ability and energy-efficiency aspects with impact on currentbuilding practice; quality aspects in building material selection and economical energy supply under the aspects of influence on costs**

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Longlife Decision Tool

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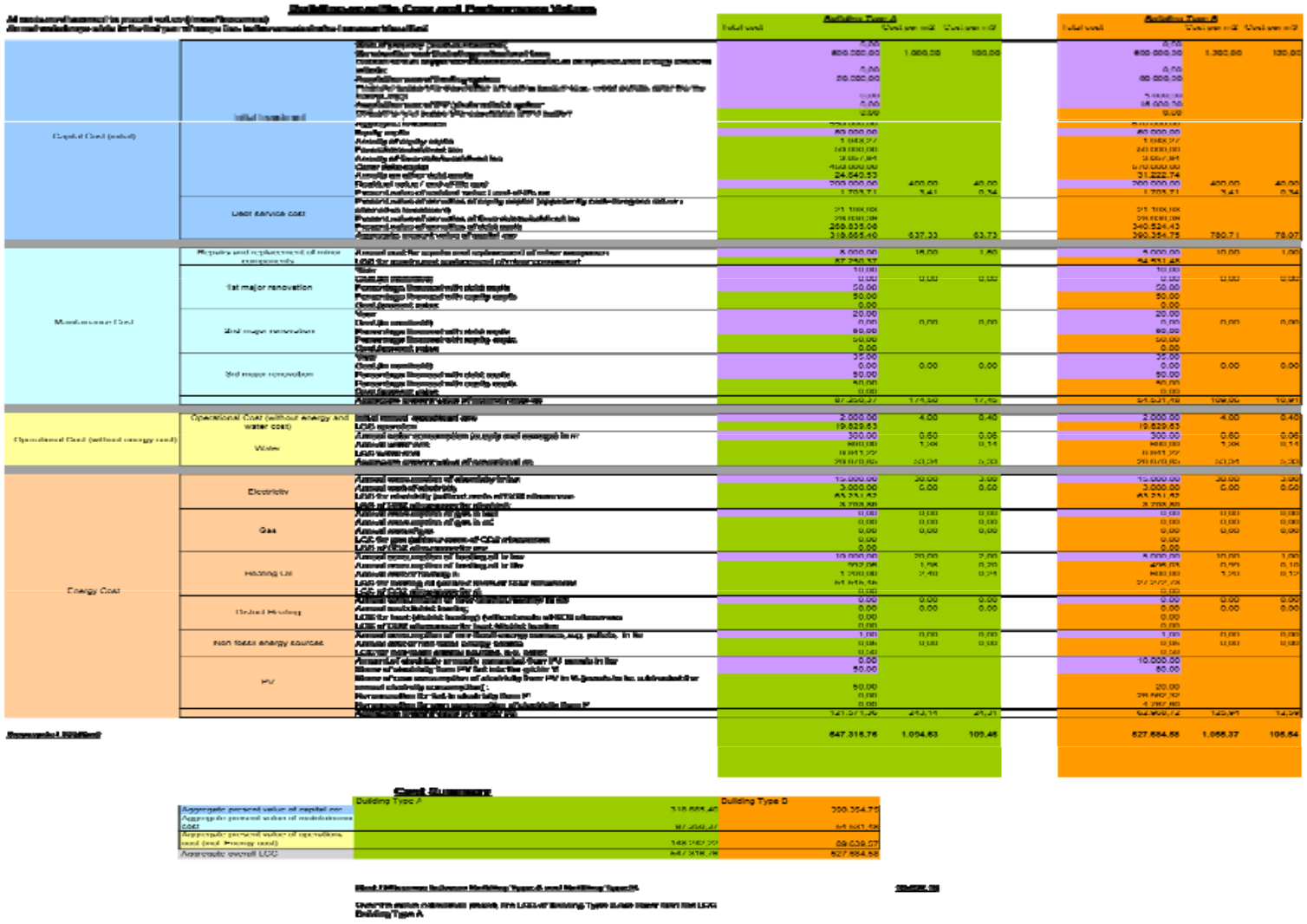

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WP4 – Development of standards and requirements

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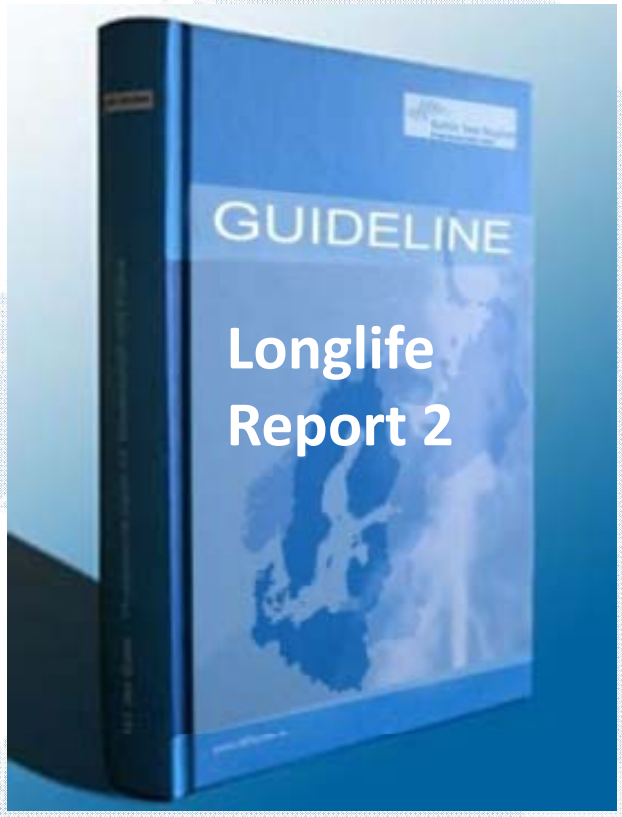

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WP 5

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WP 5:
Prototype design

O 5.1 approval technical design documents for prototype in consideration of defined standards, criteria and specifications from WP 4.

O 5.2 complete administrative, permit and tender documents for the prototype project

O 5.3 financing, maintenance and operation models which can be used by authorities, banks, investors and owners

O 5.4 concept for territorial development and financial instruments to develop regions and specific projects

O 5.5 models for operating and monitoring the pilot and subsequent real projects

O 5.6 concept for a "building pass / certificate of sustainability" to describe the properties of a building

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Longlife Design Class

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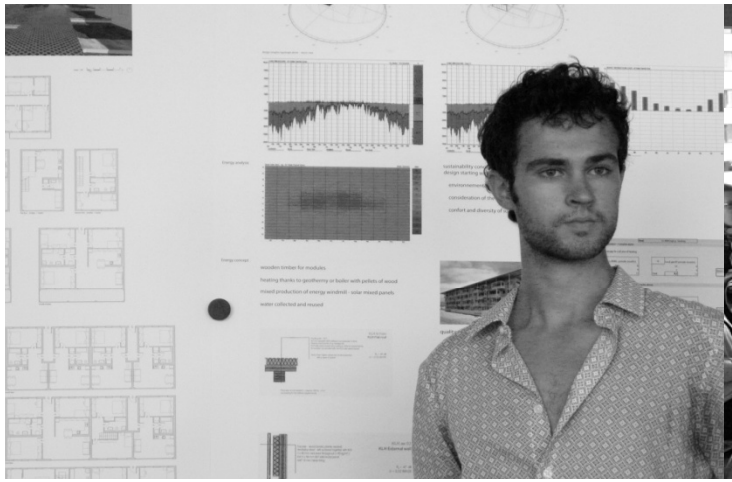
- Number of floor levels 4
- Number of apartments 12 – 16
- Benchmark: < 40 kWh/m2/a
- Size of the apartments
- 2-room, approx. 45 - 60 m²
- 3-room, approx. 75 - 80 m²
- 4-room, approx. 85 - 100 m²



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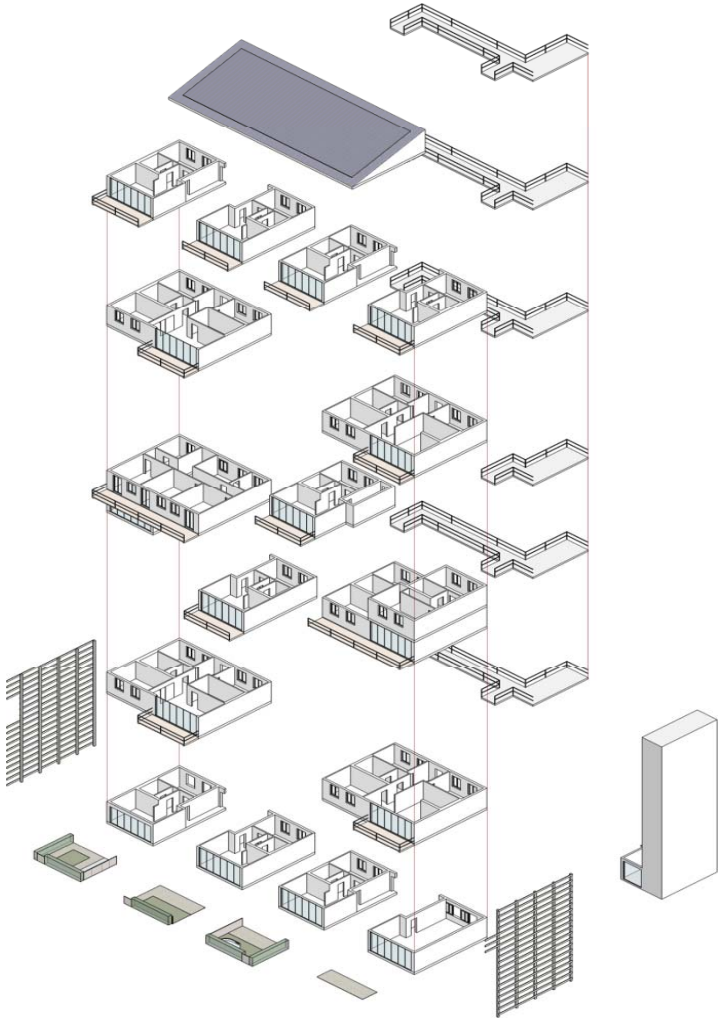
Longlife Design Class - 1. Price

Design for sustainable residential buildings



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Measurement

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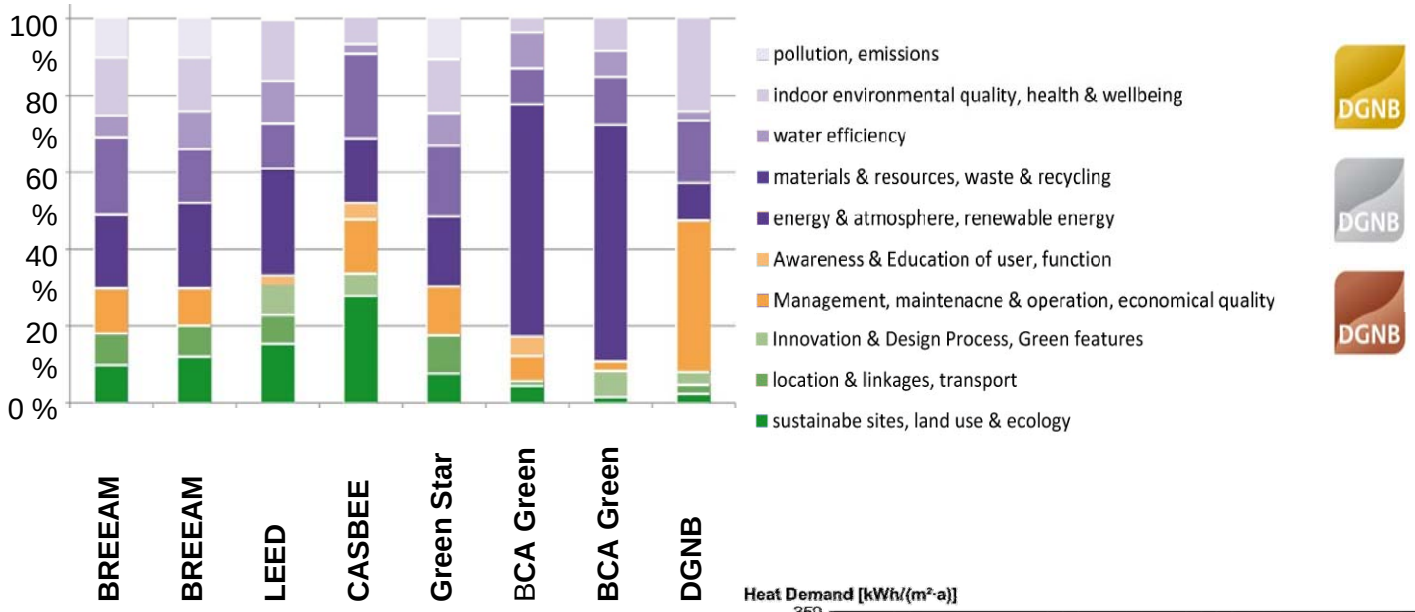

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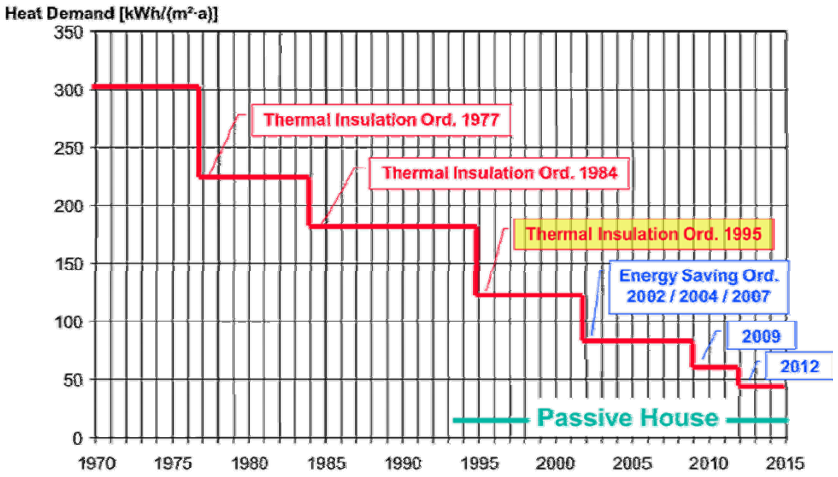

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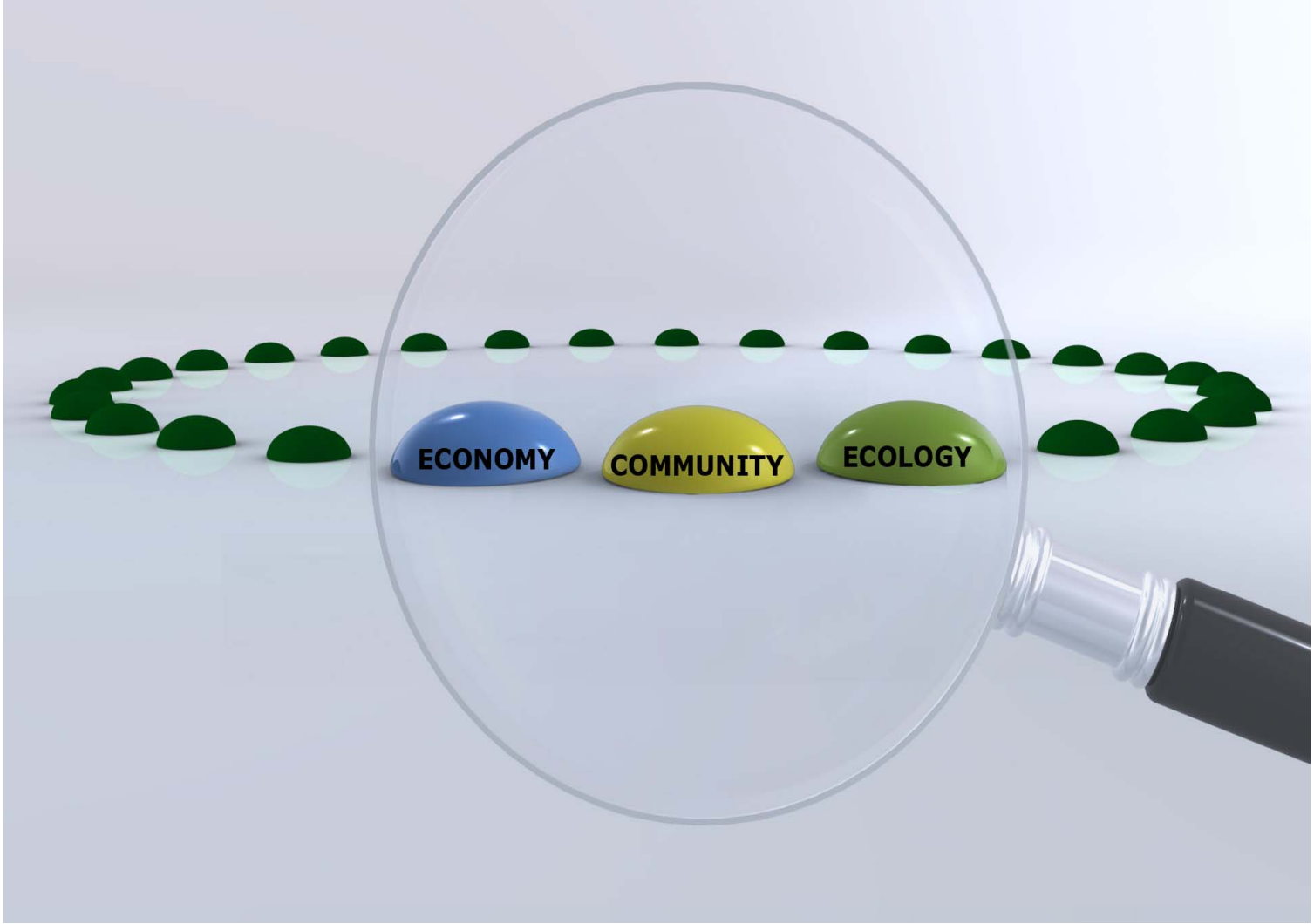
Longlife's focus



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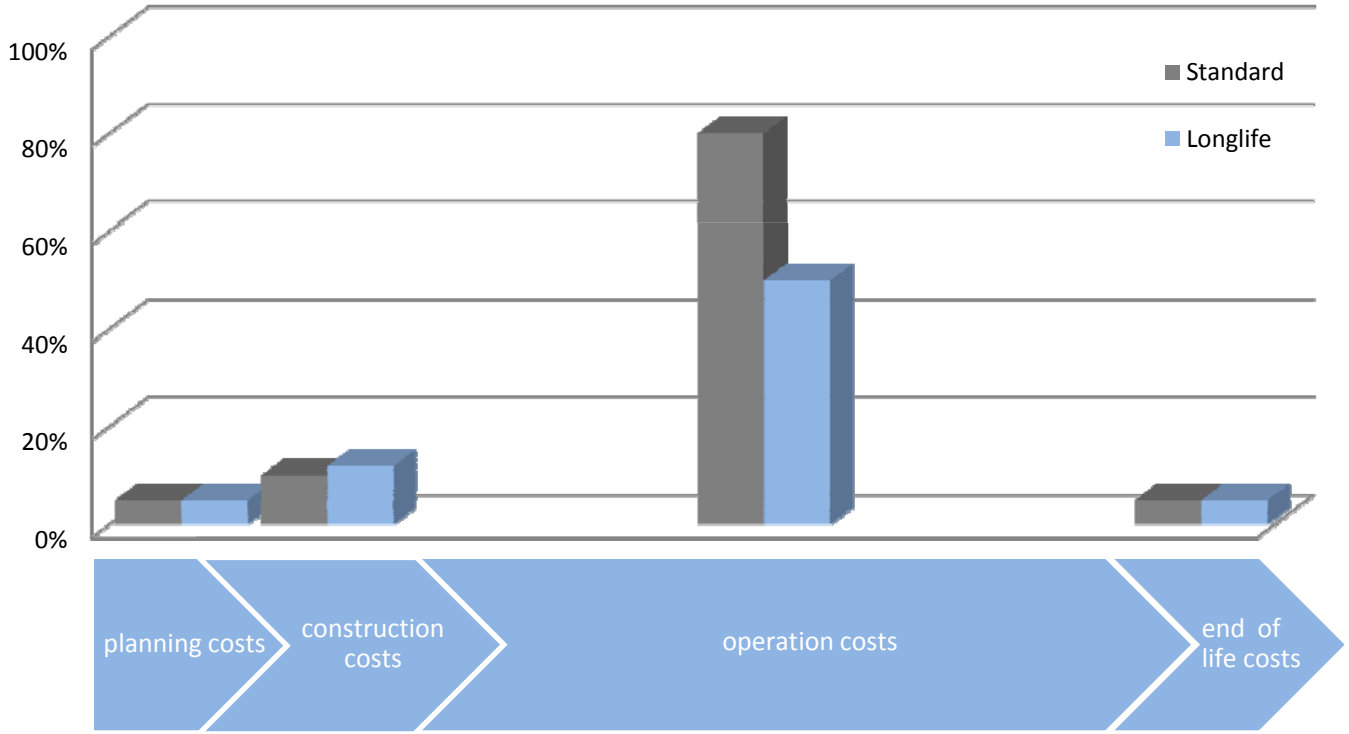
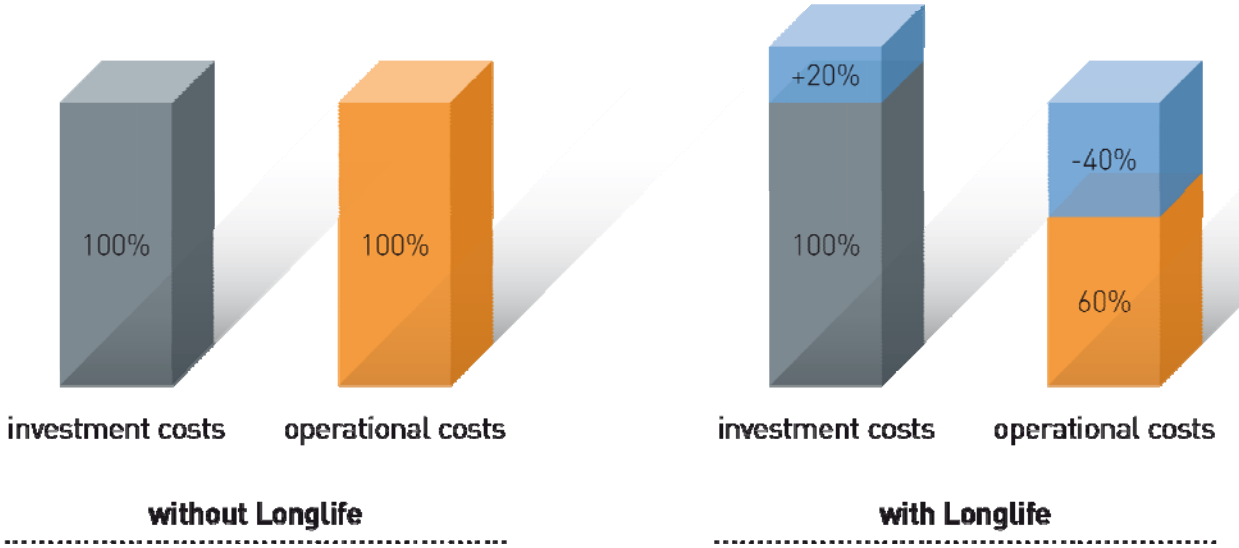
Efficiency of life-cycle-cost

- Energy Efficiency
- Life Cycle Costs of Building



Comparison investment and operational costs



Longlife Performance Pass

BASHDA- Baltic Sea Housing Development Association

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