



Energy Intelligent Retrofitting of Social Housing –The EI-Education Guidebook

Henk Kaan

ECN-Energy research Centre of the Netherlands



Energy Intelligent Retrofitting of Social Housing –The EI-Education Guidebook



Energy Intelligent Retrofitting of Social Housing –The EI-Education Guidebook

- Objectives of the guidebook



Energy Intelligent Retrofitting of Social Housing –The EI-Education Guidebook

- Objectives of the guidebook
- Who may work with the guidebook?



Energy Intelligent Retrofitting of Social Housing –The EI-Education Guidebook

- Objectives of the guidebook
- Who may work with the guidebook?
- Content of the guidebook



Energy Intelligent Retrofitting of Social Housing –The EI-Education Guidebook

- Objectives of the guidebook
- Who may work with the guidebook?
- Content of the guidebook
- Chapters of the guidebook explained in brief



Energy Intelligent Retrofitting of Social Housing –The EI-Education Guidebook and the Internet Platform

<http://ei-education.aarch.dk>



Objectives of the Guidebook



Objectives of the Guidebook

- To get inspired



Objectives of the Guidebook

- To get inspired
- To learn about other ways of approach



Objectives of the Guidebook

- To get inspired
- To learn about other ways of approach
- Checklist for degree of sustainability



Objectives of the Guidebook

- To get inspired
- To learn about other ways of approach
- Checklist for degree of sustainability
- Overview of available techniques and technologies



Who may work with the guidebook?



Who may work with the guidebook?

- **Leading figures in social housing sector, such as:**
 - Housing associations
 - Housing co-operations



Who may work with the guidebook?

- **Leading figures in social housing sector, such as:**
 - Housing associations
 - Housing co-operations
 - Owner-occupiers
 - Home owners associations



Who may work with the guidebook?

- **Leading figures in social housing sector, such as:**
 - Housing associations
 - Housing co-operations
 - Owner-occupiers
 - Home owners associations
 - Institutional investors in housing
 - Real estate agents



Who may work with the guidebook?

- **Leading figures in social housing sector, such as:**
 - Housing associations
 - Housing co-operations
 - Owner-occupiers
 - Home owners associations
 - Institutional investors in housing
 - Real estate agents
 - Municipalities



Who may work with the guidebook?

- **Leading figures in social housing sector, such as:**

- Housing associations
- Housing co-operations
- Owner-occupiers
- Home owners associations
- Institutional investors in housing
- Real estate agents
- Municipalities
- Other owners of social housing



Content of the guidebook



Content of the guidebook

1. State of affairs in the participating countries



Content of the guidebook

1. State of affairs in the participating countries
2. Policy aspects



Content of the guidebook

1. **State of affairs in the participating countries**
2. **Policy aspects**
3. **Examples of most adequate and newest techniques**



Content of the guidebook

- 1. State of affairs in the participating countries**
- 2. Policy aspects**
- 3. Examples of most adequate and newest techniques**
- 4. Checklist and instruments for energy conservation in concrete projects**



Content of the guidebook

1. **State of affairs in the participating countries**
2. **Policy aspects**
3. **Examples of most adequate and newest techniques**
4. **Checklist and instruments for energy conservation in concrete projects**
5. **Inspiring examples from various countries**



Content of the guidebook

1. **State of affairs in the participating countries**
2. **Policy aspects**
3. **Examples of most adequate and newest techniques**
4. **Checklist and instruments for energy conservation in concrete projects**
5. **Inspiring examples from various countries**
6. **Challenges, opportunities and barriers**



Chapters of the guidebook explained in brief



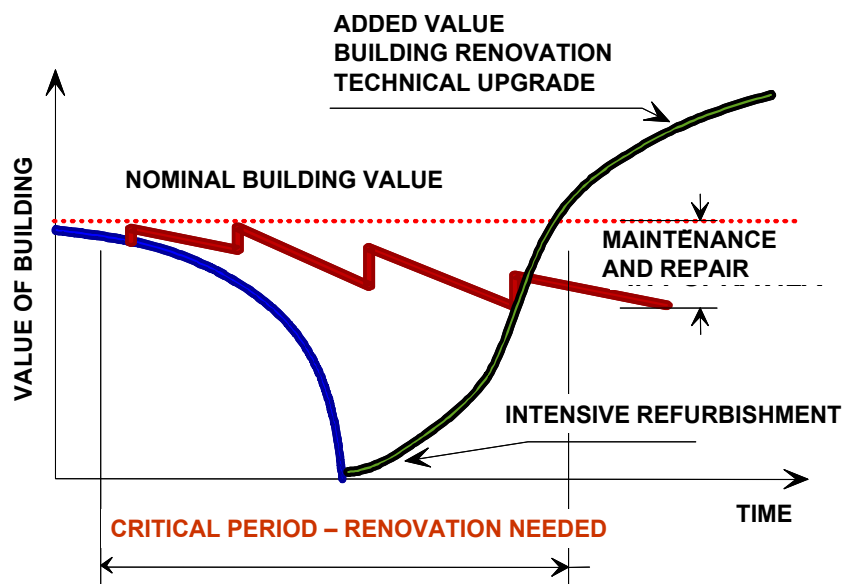
Chapters of the guidebook explained in brief

1. State of affairs in the participating countries



Chapters of the guidebook explained in brief

2. Policy aspects





Chapters of the guidebook explained in brief

2. Policy aspects

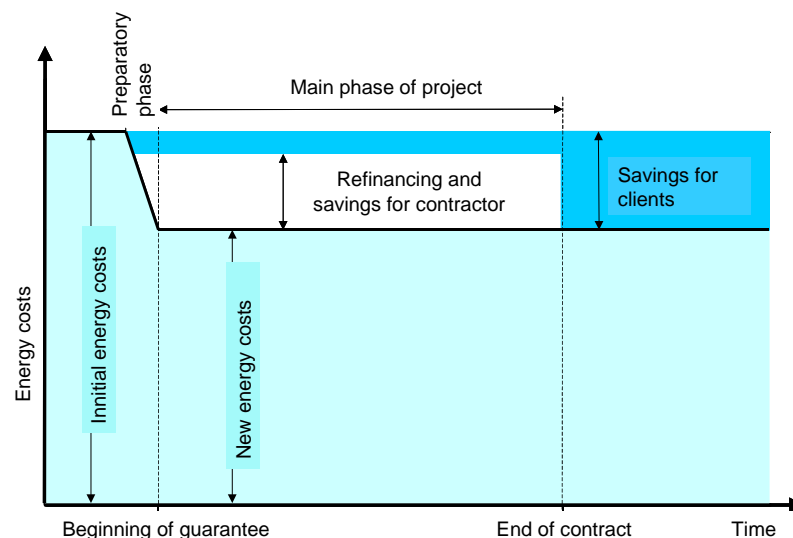


Fig. 2.3 Energy performance contracting – scheme of financial flows
(Source: Energieeinspar-Contracting, Ein Leitfaden für Kommunen, ZREU)



Chapters of the guidebook explained in brief

3. Examples of most adequate and newest techniques



Chapters of the guidebook explained in brief

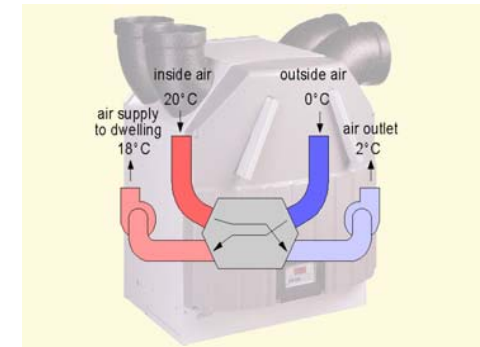
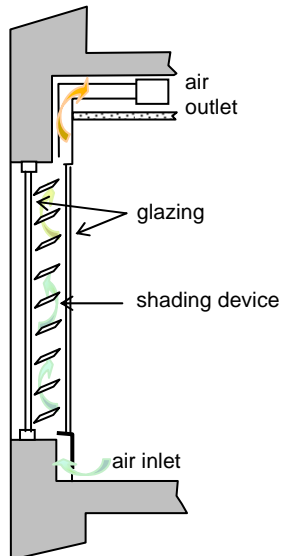
3. Examples of most adequate and newest techniques





Chapters of the guidebook explained in brief

3. Examples of most adequate and newest techniques





Chapters of the guidebook explained in brief

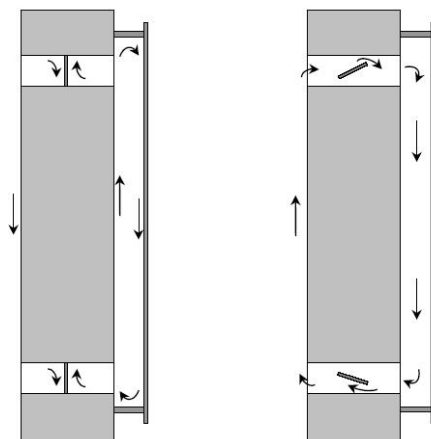
3. Examples of most adequate and newest techniques





Chapters of the guidebook explained in brief

3. Examples of most adequate and newest techniques





Chapters of the guidebook explained in brief

4. **Checklist and instruments for energy conservation
in concrete projects**



Chapters of the guidebook explained in brief

4. Checklist and instruments for energy conservation in concrete projects

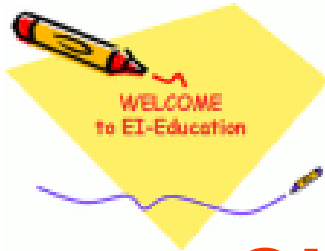
PROJECT	DECISION MAKING INDICATORS OF RENOVATION PROJECT	Ranking				
<i>Indicator</i>	Value	-2	-1	0	+1	+2
<i>r</i>						
1	Environmental performance				1	
2	Investment costs of renovation project		-1	0		
3	Economic evaluation of energy efficiency investment (PB, NPV, LCC)				+1	
4	Additional living space			0		
5	Improved quality of life in a renovated house and/or neighbourhood				+1	
6	Other criteria, like: easy maintenance, social acceptance etc					2
Σ	4	0	-1	0	3	2



Chapters of the guidebook explained in brief

4. Checklist and instruments for energy conservation in concrete projects

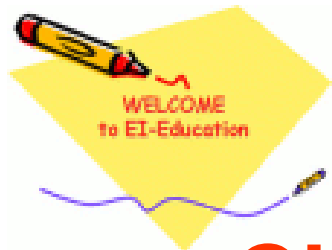
221113	Energy efficiency of building refurbishment					
1	implementation of architectural principles in EE renovation: principles of passive solar architecture, bioclimatic buildings, zoning of rooms ...		-1			
2	renovation design takes into account insolation and shading benefits resulting from urban planning concept			0		
3	high level of thermal insulation of building envelope, energy efficient windows and doors, systematic prevention of thermal bridges, calculation and proofs, certificates (passive house principles, optionally)				1	
4	energy efficient windows, parameters (passive house standard, optionally), shading integrated			0		
5	RES implemented, (heating, domestic hot water...)			0		
6	other issues, technologies relevant for energy efficient renovation (also energy certificate available...)			0		
□	0	0	-1	0	1	0



Chapters of the guidebook explained in brief

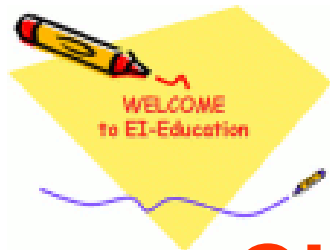
4. Checklist and instruments for energy conservation in concrete projects





Chapters of the guidebook explained in brief

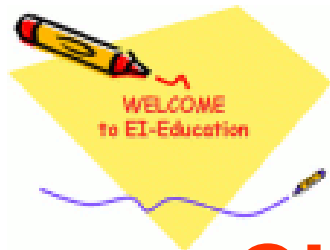
5. Inspiring examples from various countries:



Chapters of the guidebook explained in brief

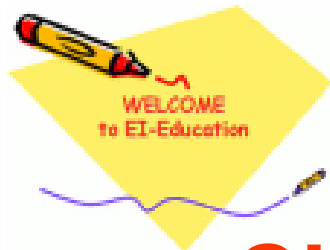
5. Inspiring examples from various countries:

- Austria
- Bulgaria
- Denmark
- France
- Germany
- Latvia
- Netherlands
- Slovenia
- Sweden
- Switzerland



Chapters of the guidebook explained in brief

5. Inspiring examples from various countries, classified in:



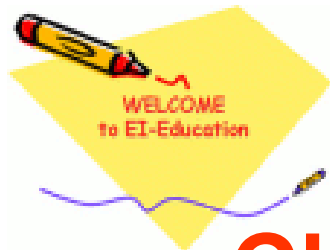
Chapters of the guidebook explained in brief

5. Inspiring examples from various countries, classified in:
 - Technology and environmental aspects



Chapters of the guidebook explained in brief

5. Inspiring examples from various countries, classified in:
- Technology and environmental aspects
 - Policy and strategy



Chapters of the guidebook explained in brief

5. Inspiring examples from various countries, classified in:
- Technology and environmental aspects
 - Policy and strategy
 - Organisation and financing



Chapters of the guidebook explained in brief

5. Inspiring examples from various countries

Per example:

- Projecttitle, achieved energy savings, most important measures
- Photo of the project



Chapters of the guidebook explained in brief

5. Inspiring examples from various countries

Per example:

- Projecttitle, achieved energy savings, most important measures
- Photo of the project



Chapters of the guidebook explained in brief

5. Inspiring examples from various countries

Per example:

- Projecttitle, achieved energy savings, most important measures
- Photo of the project
- Short description



Chapters of the guidebook explained in brief

5. Inspiring examples from various countries

Per example:

- Projecttitle, achieved energy savings, most important measures
- Photo of the project
- Short description
- Summary in the form of a table



Chapters of the guidebook explained in brief

5. Inspiring examples from various countries

Per example:

- Projecttitle, achieved energy savings, most important measures
- Photo of the project
- Short description
- Summary in the form of a table
- Web-page for more information



Chapters of the guidebook explained in brief

6. Challenges, opportunities and barriers



Questions /discussion