
esam

esam
(Energetic Strategic Asset Management)

a European project for the integration of energetic parameters
into a real estate asset management system
developed within the framework of „Intelligent Energy Europe“

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consolidated data 2007 of Nassauische Heimstätte

- balance sheet total: 2,082.7 Mio. EUR
- fixed assets: 1,825.0 Mio. EUR
- equity capital: 277.9 Mio. EUR
- equity ratio: 13.4%
- annual net profit: 30.2 Mio. EUR
- cashflow from operating activities: 75.4 Mio. EUR
- housing stock: 63,821 accommodation units
- employees: 820
- established in 1922

management of Nassauische Heimstätte

executive board

Bernhard Spiller	managing director (chairman)
Professor Thomas Dilger	managing director
Ernst Hubert von Michaelis	managing director
Dirk Schumacher	managing director

supervisory board

Dr. Alois Rhiel minister of economic affairs of the federal State Hesse	chairman of the board

stakeholders of Nassauische Heimstätte

- Land Hessen (54 %)
- Stadt Frankfurt am Main (31 %)
- Stadt Wiesbaden (8 %)
- Landesversicherungsanstalt Hessen (4 %)
- Stadt Offenbach (3 %)
- Frankfurter Sparkasse
- Stadt Darmstadt
- Stadt Rüsselsheim
- Treuhandverwaltung der IG Metall GmbH
- Hattersheimer Wohnungsbau GmbH
- Stadt Langen
- Stadt Kelsterbach
- Wetzlarer Wohnungsbaugesellschaft mbH
- Stadt Pfungstadt
- Stadt Oberursel/Ts
- Landkreis Offenbach
- Main-Taunus-Kreis
- Hochtaunuskreis
- Wetteraukreis
- Stadt Mörfelden-Walldorf
- Landkreis Limburg-Weilburg
- Gemeinde Erlensee
- Landkreis Groß-Gerau
- Stadt Bad Homburg v.d.H.
- Stadt Bad Vilbel
- Stadt Neu-Isenburg
- Hessische Landesgesellschaft mbH
- Stadt Hofheim/Ts
- Stadt Hadamar

scope of work of Nassauische Heimstätte

- project development
- urban development
- constructing
- revitalization of urban districts
- retrofitting/revitalization of buildings
- housing provision
- tenant services
- facility management
- research projects

esam fact sheet

- objective: to develop methodologies and information systems for integrating energy in the strategic asset management of social housing operators
- benefits: social housing operators will define long-term strategies to upgrade their housing stock
- keywords: strategic asset management, information systems, energy-efficient retrofitting
- duration: 01/2006 – 12/2008
- budget: € 1,342,997 (EU contribution: 48,26%)
- contract number: EIE-05-115

esam fact sheet

- 6 countries covering the range of different institutional backgrounds of social housing in the EU:
  - France, Germany, Austria, Czech Republic, Italy, Estonia
- 6 social housing companies involved
- 3 unions or national associations of housing companies involved
- 6 reaserch institutes, energy agency or consultants involved

esam consortium

- DELPHIS (lead partner), ARMINES, CSTB, Le Val de Loire, Le Toit Angevin (France)
- Nassauische Heimstätte Wohnungs- und Entwicklungsgesellschaft mbH, Institut Wohnen und Umwelt – IWU (Germany)
- ATC Torino, Agencia Energia di Torino (Italy)
- MRA Havirov (Czech Republic)
- GSWB, GBV, Austrian Energy Agency (Austria)
- EKYL (Estonia)

project profile

- the ESAM project is focused on the development and the implementation of strategic asset management (=SAM) methods and tools for SHO's, which will include an energy dimension (=ESAM)
- it is based on the assumption that SHO's face similar problems in different contexts and that some solutions can be developed in common, at least to a certain extent
- the project is focusing on existing housing stocks

project profile

- the project turn the constrains of the energy performance diagnostic on buildings directive into an opportunity
- and integrates the issue of the building directive into the decision making process for real estate investment by establishing efficient, integrated investment strategies
- the project associates all stakeholders (tenants, energy suppliers, public authorities,...) at each step of the asset management by deploying a cooperation management

integration of energy in SAM (=ESAM)

- the energy performance of buildings can be integrated in strategic asset management in different ways which will depend on the situations and objectives of each housing operator:
  - “ESAM in SAM”: energy can be integrated at all steps of the SAM process, the precondition for this case is that a SAM already exists (or will be implemented soon)
  - “Energy after SAM”: energy is taken into account in addition to SAM considerations, through the use of specific tools to maximize the energy efficiency of the refurbishments (this case is suitable if a running SAM system should not be changed)
  - “Energy alone”: the tool can be used on its own to define an investment plan for the energetic retrofitting of the housing stock - especially for (smaller) companies with no existing SAM system

initial framework for esam (in Germany)

- current mainstream in housing associations:
  »running costs are „external entries“ and are not subject of the housing operators responsability«

- running costs are increasingly important for the „Warmmiete“ (i.e.: total monthly costs for renting a flat, including maintenance costs and heating)

- the „Warmmiete“ will be increasingly crucial for the competitiveness of a flat and for the competitiveness of the housing operator

initial framework for esam (in Germany)

- a paradigm change in housing industry seems to be necessary:
  - housing associations have to accept, that they are responsible for the total price („Warmmiete“) of their product
  - housing associations have to integrate all factors, influencing the total price of their product, into their strategic considerations concerning the development of their housing stock (= strategic asset management)
  - energy costs (of the tenant) are a relevant component of market success for housing operators, which has to be managed systematically by the housing operator

initial framework for esam (in Germany)

- a paradigm change in housing industry seems to be necessary:
  - affordable energy costs have to be guaranteed by adequate investment in good time – in terms of energetic items as well as in terms of social items
  - financial resources have to optimized in the framework of a long-term strategic assset management strategy including economical, social and ecological needs
  - „energy awareness systems“ have to be implemented to assist the tenants in their individual energy saving efforts (e.g.: save@work4homes project)

fundamental components of esam

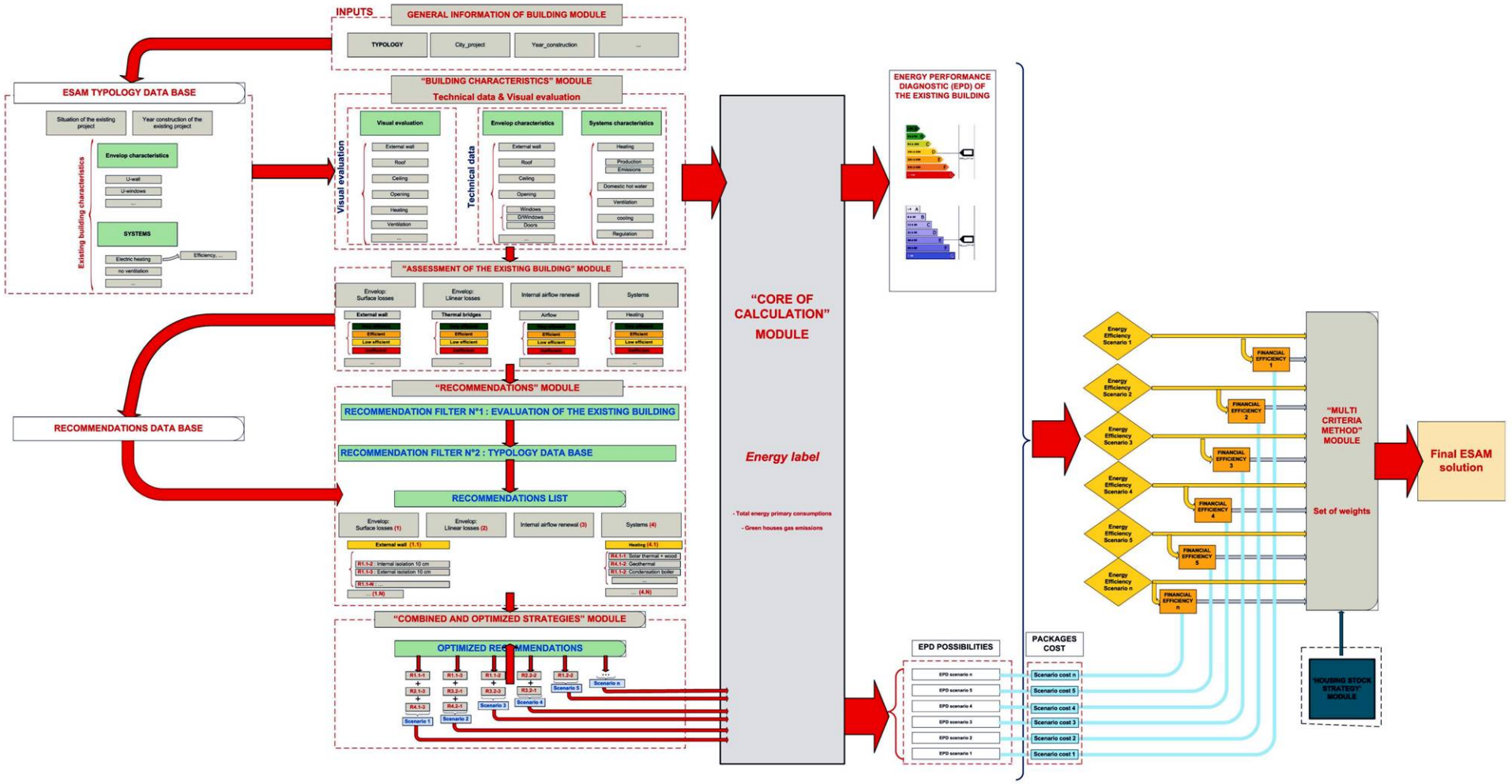
- the energetic information is based on the „simplified method“ of IWU for the generation of demand-oriented energy certificates
- this method was adapted and customized for the special needs of NH
- specific - alredy existing - databases of NH and a NH-adapted building typology deliver relevant data to the „simplified method“ calculation tool
- (consumtion-based energy certificates do not contain relevant information that could be used for the definition of modernisation measures and related investment strategies)

fundamental components of esam

- the assessment of cost effectiveness of the energetic measures is conducted by the “Calculation Model” of IWU (dynamic calculation / net present value method)
  - Tool I: calculation of profitability on the basis of saved energy
  - Tool II: calculation of profitability on the basis of the estimated rent after the end of the retrofitting measure

- the results of tool I & II are incorporated in the strategic asset management system of NH (portfolio management) and define the base material for real estate investment decisions of NH

esam flowchart

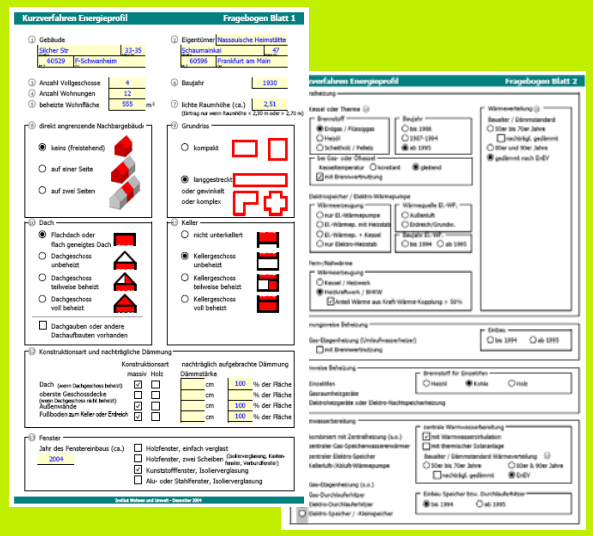


data collection & data generation process

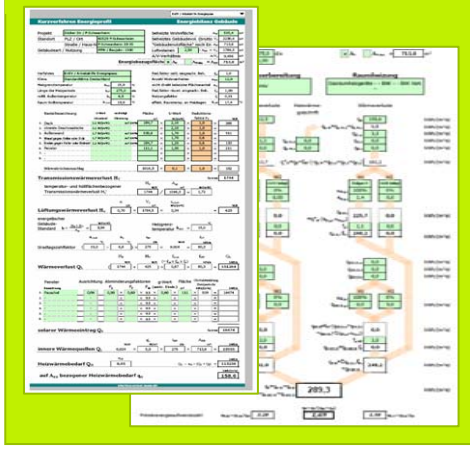
NH database
(e.g.: building typology, technical database, retrofittting measures, cost database, etc.)

data collection

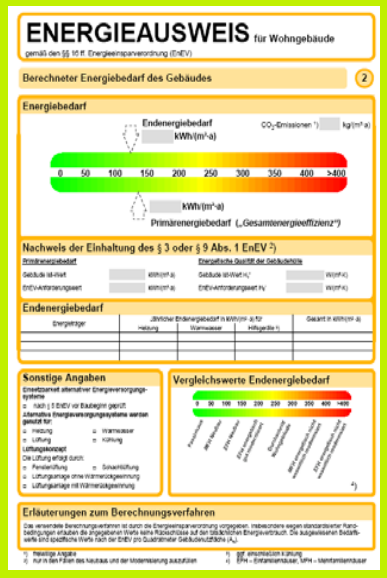
(IWU- short profile)



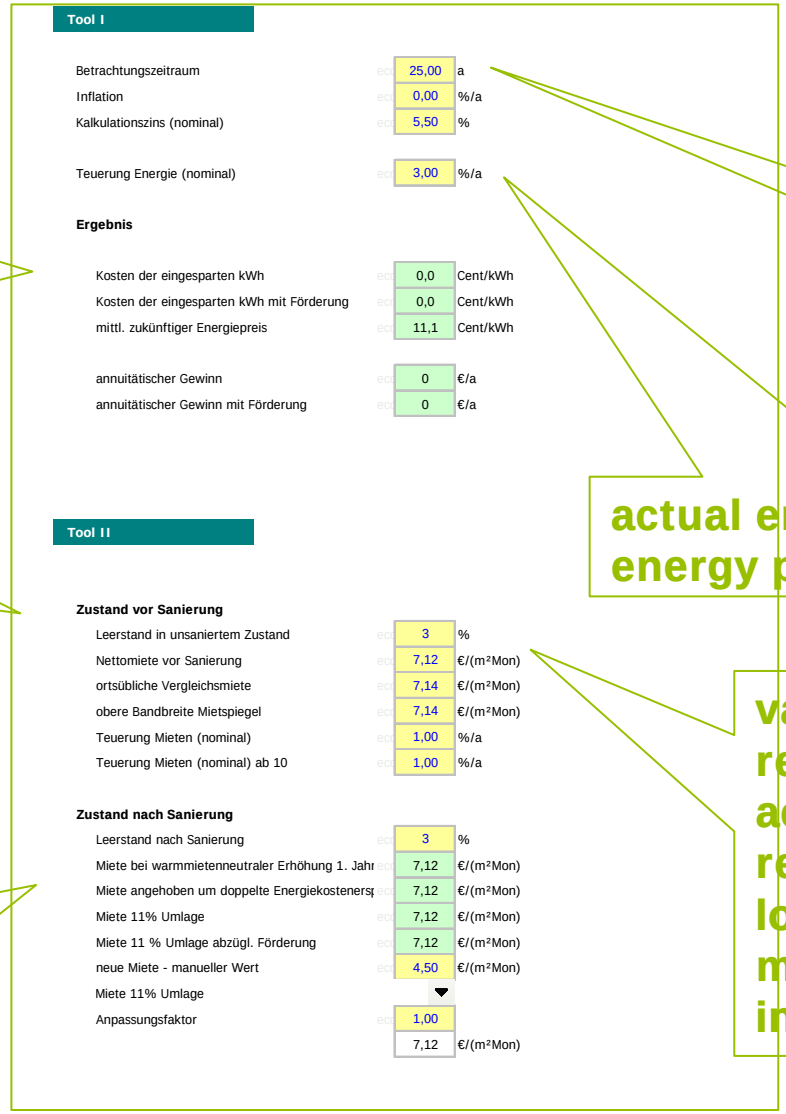
energy profile



energy certificate
based on NH-typology



economical assessment form



Tool I

Betrachtungszeitraum	25,00	a
Inflation	0,00	%/a
Kalkulationszins (nominal)	5,50	%
Teuerung Energie (nominal)	3,00	%/a

Ergebnis

Kosten der eingesparten kWh	0,0	Cent/kWh
Kosten der eingesparten kWh mit Förderung	0,0	Cent/kWh
mittl. zukünftiger Energiepreis	11,1	Cent/kWh
annuitätischer Gewinn	0	€/a
annuitätischer Gewinn mit Förderung	0	€/a

Tool II

Zustand vor Sanierung

Leerstand in unsaniertem Zustand	3	%
Nettomiete vor Sanierung	7,12	€/(m²Mon)
ortsübliche Vergleichsmiete	7,14	€/(m²Mon)
obere Bandbreite Mietspiegel	7,14	€/(m²Mon)
Teuerung Mieten (nominal)	1,00	%/a
Teuerung Mieten (nominal) ab 10	1,00	%/a

Zustand nach Sanierung

Leerstand nach Sanierung	3	%
Miete bei warmmietenneutraler Erhöhung 1. Jahr	7,12	€/(m²Mon)
Miete angehoben um doppelte Energiekostenersp	7,12	€/(m²Mon)
Miete 11% Umlage	7,12	€/(m²Mon)
Miete 11 % Umlage abzügl. Förderung	7,12	€/(m²Mon)
neue Miete - manueller Wert	4,50	€/(m²Mon)
Miete 11% Umlage		
Anpassungsfaktor	1,00	
	7,12	€/(m²Mon)

profitability related to saving of energy costs

profitability related to additional rent

vacancy rate after refurbishment, legal rent, warm rent after refurbishment

period under review, inflation rate, interest rate

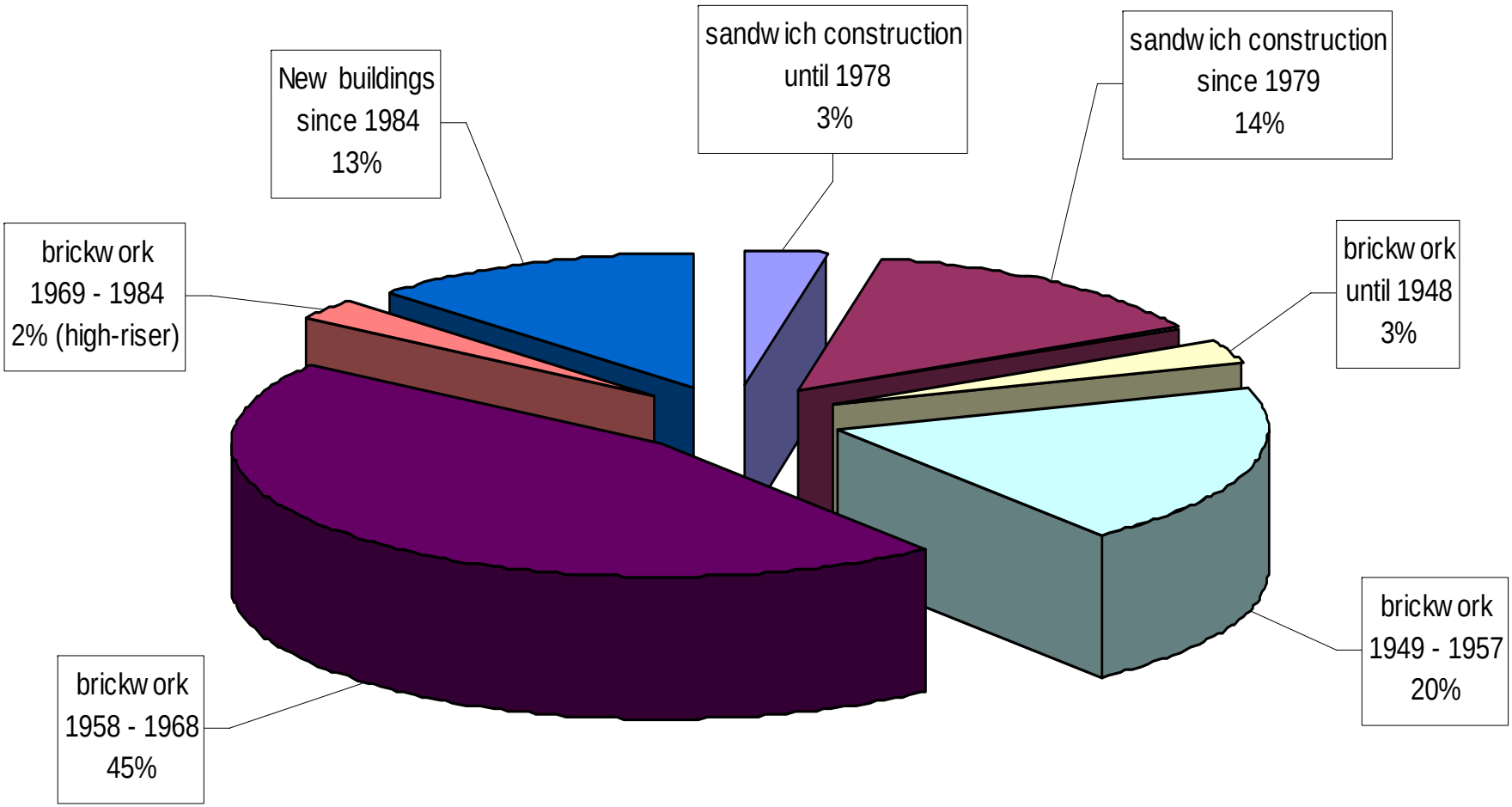
actual energy price, future energy price increase

vacancy rate before refurbishment, actual rent before refurbishment, local rent level („rent mirror“), future rent increase

building typology of NH

I	**sandwich construction** Holzmann-Coignet Zur Frankenfurt 199-205, FFM multiple-family dwelling - 32 units year of construction 1966	
II	**sandwich construction** Holzmann-Coignet Am Waldgraben 10-12, FFM multiple-family dwelling - 16 units year of construction 1981	
III	**brickwork** until 1948 Silcherstraße 33-35, FFM multiple-family dwelling - 12 units year of construction 1930	
IV	**brickwork** from 1949 to 1957, Rheinlandstraße 52-54, FFM multiple-family dwelling - 24 units year of construction 1952	
V	**brickwork** from 1958 to 1968, Heinrich Seliger Straße 85-89, FFM multiple-family dwelling - 45 units year of construction 1958	
VI	**high-riser** Henriette-Fürth-Straße 14, FFM multiple-family dwelling - 48 units year of construction 1968	

building typology of NH



definition and calculation of scenarios

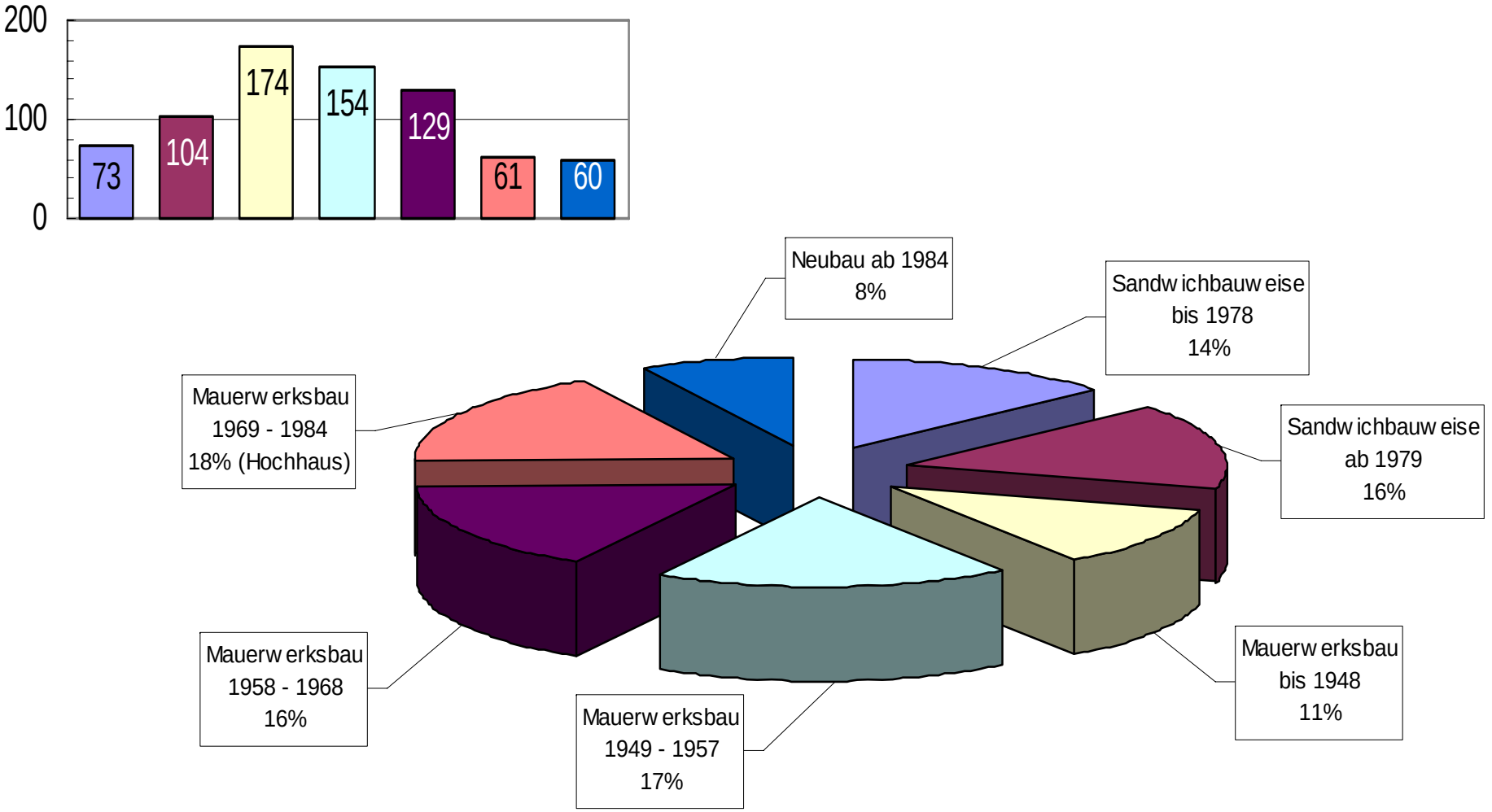
- definition of retrofitting projects differentiated by multiple energetic retrofitting measures
- interconnection of retrofitting measures and typical costs (drawn primarily from procurement databases of NH)
- calculation of energy saving potentials
- extrapolation of energy saving potentials for the pilot site as a whole

definition and calculation of scenarios

- calculation of energy costs and energy cost savings
- calculation of the actual „Warmmiete“ and of the future development of „Warmmiete“
- calculation of the cost-effectiveness of different types of rent adaptions/increases based on the legal framework in Germany („warmmietenneutral“, § 558 and § 559 BGB)
- extrapolation of total investment needs for the pilot site as a whole

pilot site Frankfurt am Main
Schwanheim – Goldstein - Niederrad

heating energy demand based on the building typology of NH



heating and primary energy demand at the Frankfurt a. M. pilot site

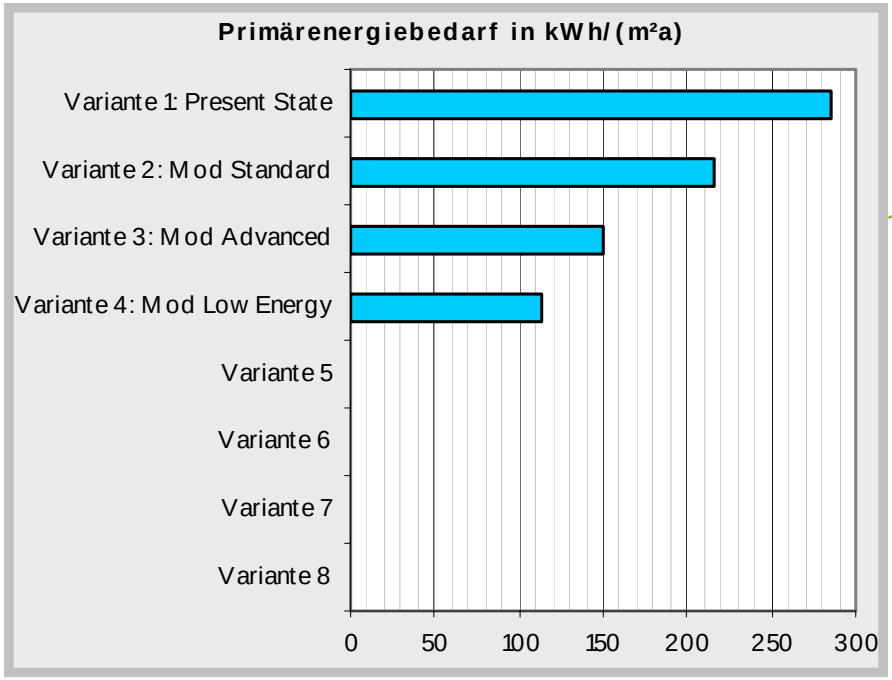
heating energy demand at the Frankfurt a. M. pilot site

- the heating energy demand reaches from 32 to 180 kWh/m²a
- this is caused by:
  - different insulation levels at different years of construction
  - different modernisation standards at different years of modernisation (partial modernisations: windows, flat roof refurbishment, exchange of heating systems, etc. – often depending from available funding programms)

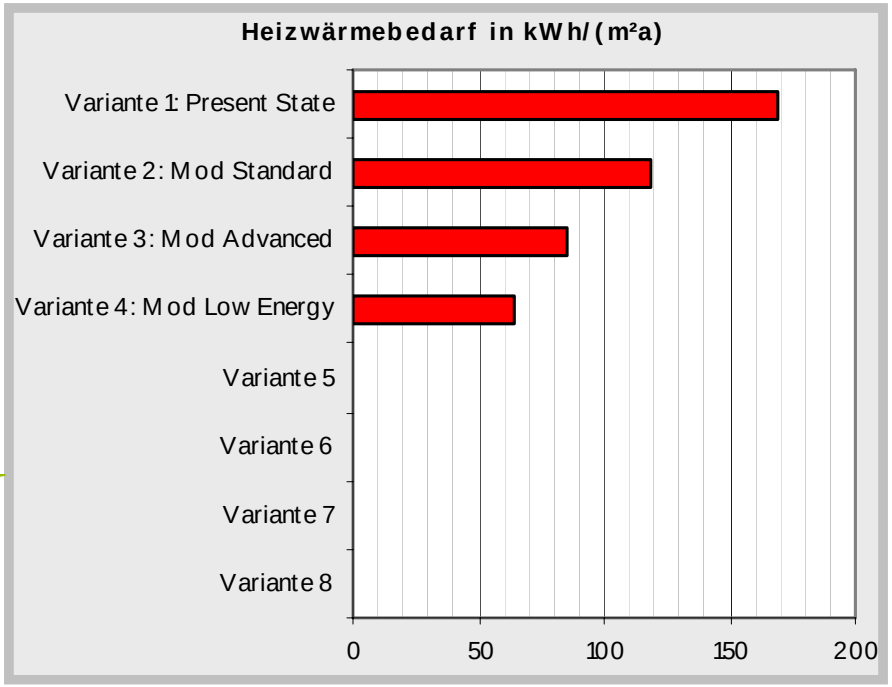
primary energy demand at the Frankfurt a. M. pilot site

- reaches from 52 to 280 kWh/m²a.
- partially district heating by Heizkraftwerk Niederrad (congeneration of heat and power – good performance figures)
- at Niederrad sporadic gas and oil boiler plants
- 855 of 2099 flats have „classical“ central heating systems
- more than one third of the flats (37 %) have horizontal appartment gas heating systems

results pilot site (building type I)



e.g. primary energy

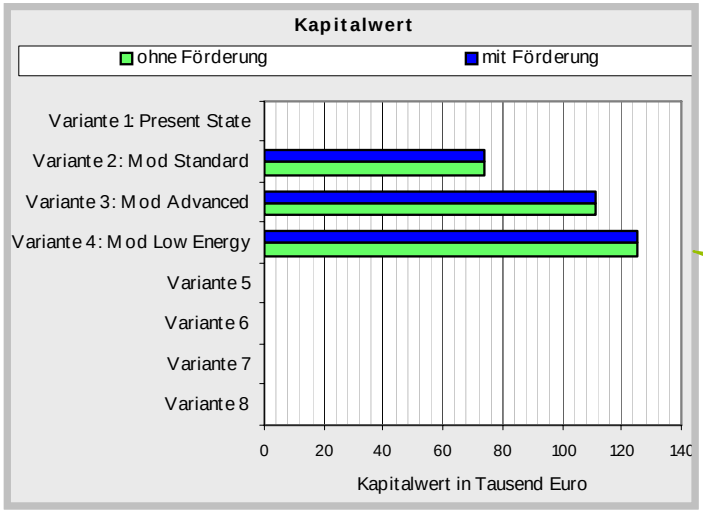


e.g. heat energy

predefined sets of energy saving measures

- Mod. Standard:
  - insulation of wall and upper ceiling/roof (14 cm)
- Mod. Advanced:
  - insulation of wall (14 cm) and upper ceiling/roof (14 cm), insulation of cellar ceiling (8 cm), new windows (double glazing)
- Mod Low Energy:
  - insulation of wall (20 cm) and upper ceiling/roof (24 cm), insulation of cellar ceiling (8 cm), new windows (double glazing), solar DHW system

results pilot site (building type I)

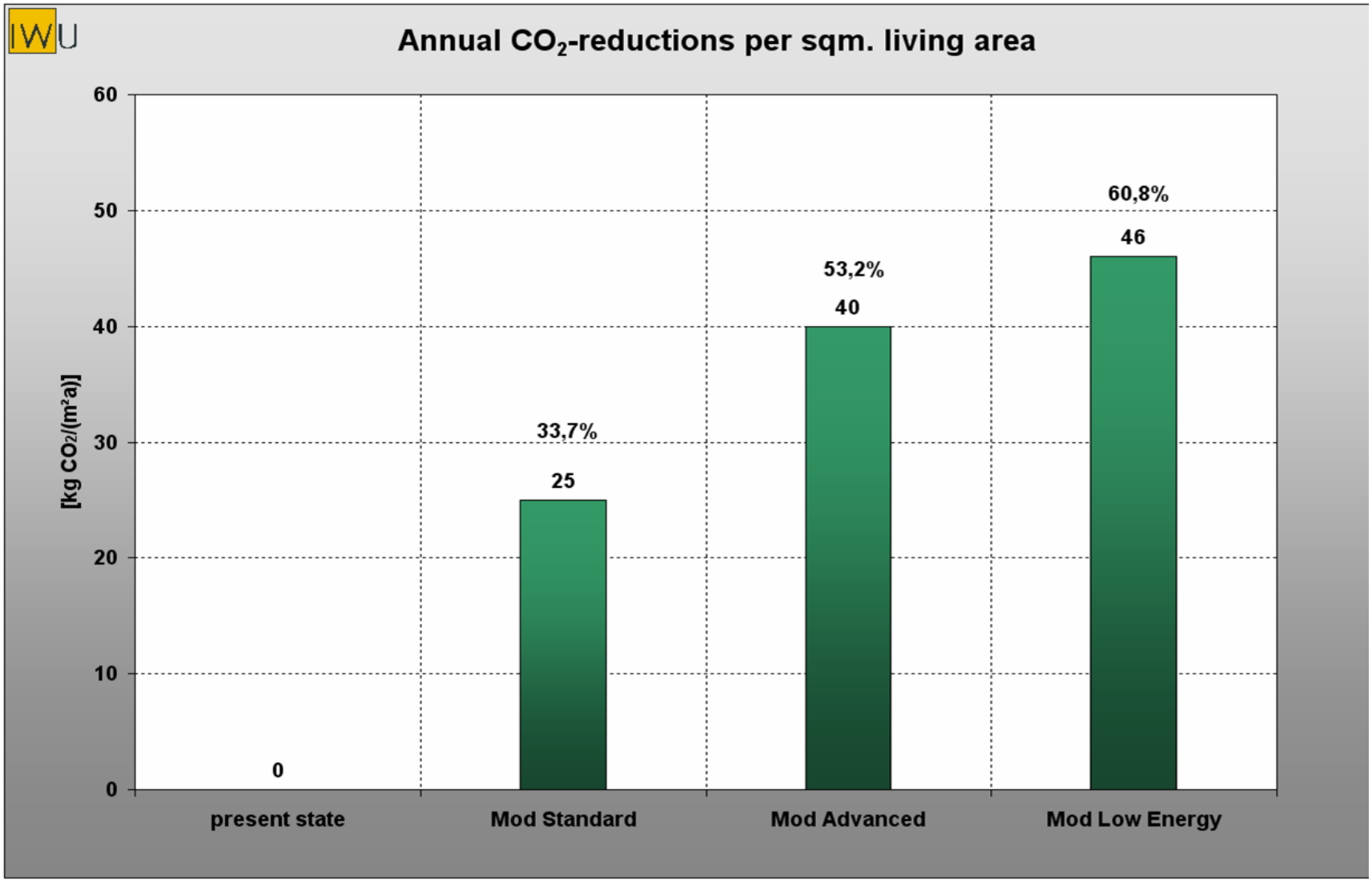


Profitability related to additional rent:

e.g. new rent II = legal rent

general data					
project		ESAM			
adress		Schwanheim			
name		MFH - building type I: Zur Frankenfurt S1230			
year of construction		1958-68			
Variantenbezeichnung	[-]	present state	Mod Standard	Mod Advanced	Mod Low Energy
living area	[m²]	2263	2263	2263	2263
net rent before refurbishment	[€/(m²Mon)]	5,32	5,32	5,32	5,32
local rent level	[€/(m²Mon)]	7,14	7,14	7,14	7,14
new rent I (warm rent neutrality)	[€/(m²Mon)]	5,32	5,67	5,89	6,12
new rent II (legal rent)	[€/(m²Mon)]	5,32	5,84	6,09	6,21
new rent III (break-even-rent)	[€/(m²Mon)]	5,32	5,66	5,82	5,89

overall results pilot site (all building types)



Intelligent Energy Europe

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