

Financing Energy Efficient Building Retrofit

EuroPHit Workshop
20th March 2015



Co-funded by the Intelligent Energy Europe
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Introductions

- **Art McCormack**, MosArt
- **Mariana Moreira**, MosArt
- **Fintan Smyth**, Saint Gobain
- **Josephine Maguire**, SEAI
- **Georg Kraft**, KfW



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Welcome

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Aim:

- Explore the financial models and solutions required to drive energy efficient refurbishment

Objectives:

- Share knowledge of EU financial models
- Share lessons from case study projects
- Discuss financial barriers to undertaking retrofits
- Explore new/alternative technical and financial models
- Identify where further industry work is required



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Agenda

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Time	Agenda
09:30	Introduction – EuroPHit project (Art McCormack)
09:45	Case Study 01 – Home for Elderly –Technical challenges (Mariana Moreira)
10:00	Conclusions from Better Energy Financing (Fintan Smyth, Saint Gobain)
10:15	Piloting and Trialling Better Energy Financing Initiatives (Josephine Maguire, SEAI)
10:25	KfW – EU Policy and best practice finance models (Georg Kraft)
11:10	Coffee break
11:20	Break-out session
12:00	Feedback - thoughts from tables and panel of speakers
12:45	Lunch and networking



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About MosArt

EuroPHit

- Formed in 1993
- Architecture, Landscape and Urban Design practice, deeply involved in the Passive House world.
 - Passive House Consultancy
 - Passive House Certifiers
 - BER Assessors
- Involved in European Research projects such as EuroPHit and ZECOS.



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Irish Context of Domestic Refurbishment



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The Irish Housing Stock

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- Housing energy use is responsible for 27% of CO2 emissions
- Government commitment to reduce carbon emissions by 20% by 2020, 80% by 2050
- Old building stock
- Majority of current housing stock will still be standing in 2050
- Annual new-build rate <1% of existing stock
- Rising energy prices
- 350,000 empty homes



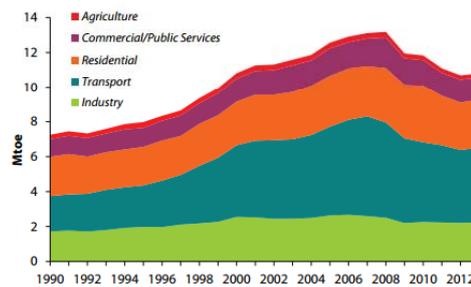
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Energy Consumption

EuroPHit

Total Final Consumption by Sector 1990 – 2013



- Ireland's TFC in 2013 was 10.8 Mtoe, 1.1% higher than in 2012 and 49% above 1990 levels.
- Final energy use in transport grew in 2013 by 2.5% and industry final energy grew by 1.2%. These sectors' energy use is closely coupled with economic growth.
- Residential final energy use grew by 1.3% in 2013 and services final energy fell by 2.4%.

Energy in Ireland, Key Statistics 2014, SEAI



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Retrofit Opportunities

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- Reduce health impacts of poor housing
- Economic impacts of investment, growth and job creation
- Extend the building's useful life
- Alleviate fuel poverty
- Reduce emissions



Joseph Little Architects



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Retrofit Challenges

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- Finance
- Owner/resident fears & attitudes
- Lack of confidence in retrofit technologies
- The performance gap
- Number of skilled professionals
- Listed Buildings/Heritage



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EuroPHit

EuroPHit Project



EnerPHit
Certified
Retrofit
Passive House Institute

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 Passive House Institute

EuroPHit

Reduce consumption!

Low efficiency **High efficiency**

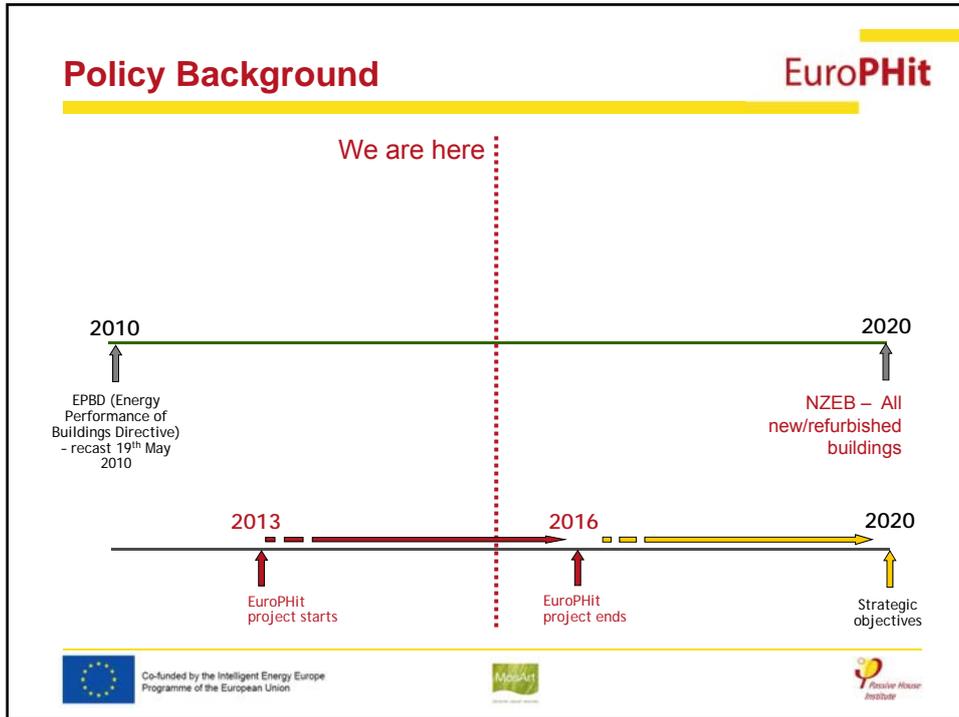
how to get there? →

EU's 2020 objective:
All new/refurbished buildings as NZEBs (Nearly Zero Energy Buildings)

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About EnerPHit - Methodology EuroPHit

- Based on Passive House methodology, with 20 years of experience
- Detailed planning and modelling, using PHPP software
- Airtight construction, ventilation with heat recovery, avoidance of thermal bridging
- High quality building components
- Low and predictable energy usage (80-90% reductions possible)
- “Quality-approved energy retrofit with Passive House components”

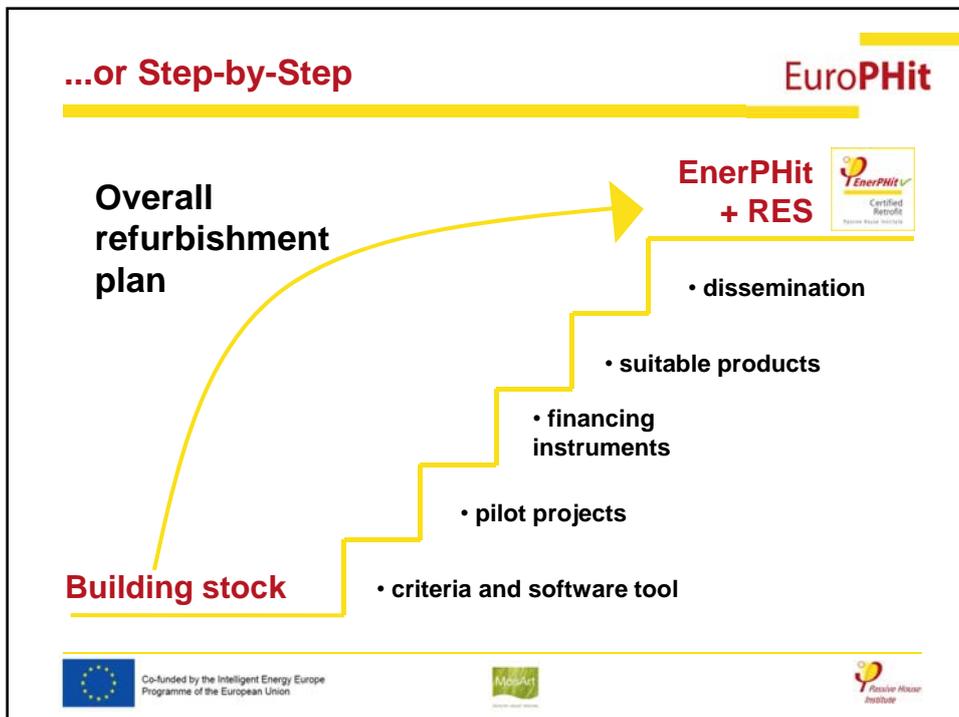
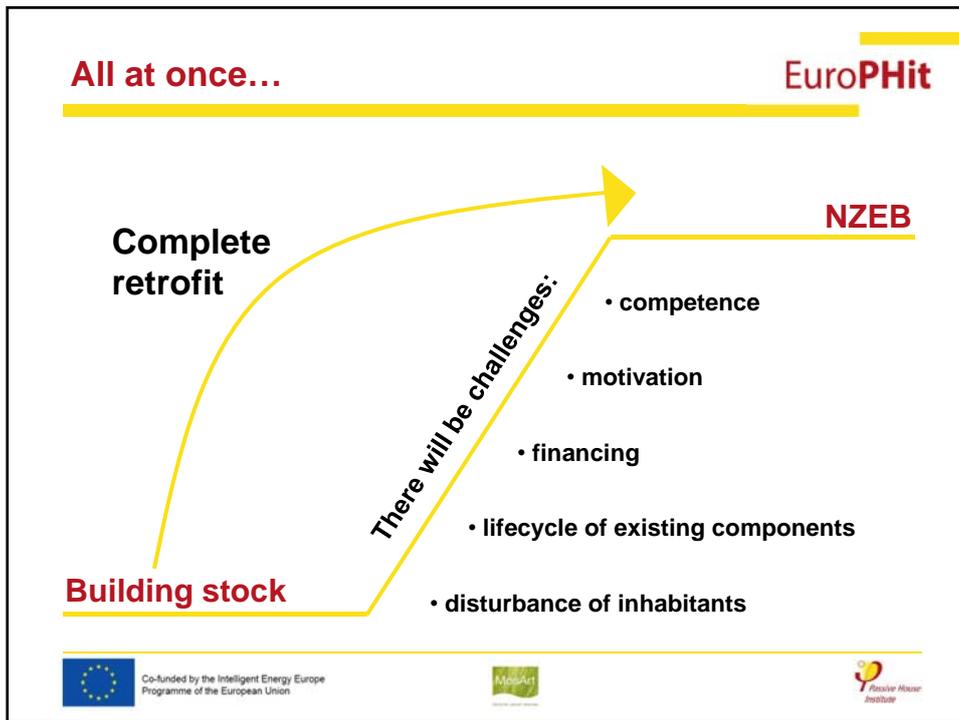
Criteria	Passive House	EnerPHit
Specific Heat Demand	≤ 15 kWh/m ² .yr	≤ 25 kWh/m ² .yr
Primary Energy Demand	≤ 120 kWh/m ² .yr	≤ 120 kWh/m ² .yr *
Limiting Value	n ₅₀ ≤ 0.6 ⁻¹	n ₅₀ ≤ 1.0 ⁻¹

* PE ≤ 120 kWh/m².yr + ((SHD - 15 kWh/m².yr) x 1.2)

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Key project outcomes

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- Strategic approach and certification scheme for retrofits aiming for the EnerPHit Standard over an extended period
- Financing models and market incentive programmes tailored to step-by-step retrofits
- Design concepts and sound guidelines for the development of suitable, high performance building retrofits + associated components
- Training material / courses and workshops focusing on the specific needs of step-by-step refurbishment
- Building case studies indicating the way towards an increasingly high quality, energy efficient building stock.

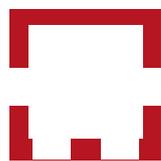


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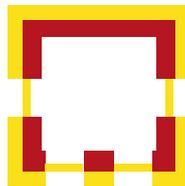


Example of step-by-step retrofit?

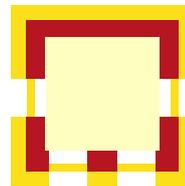
EuroPHit



Building stock



Insulation windows, airtightness & ventilation

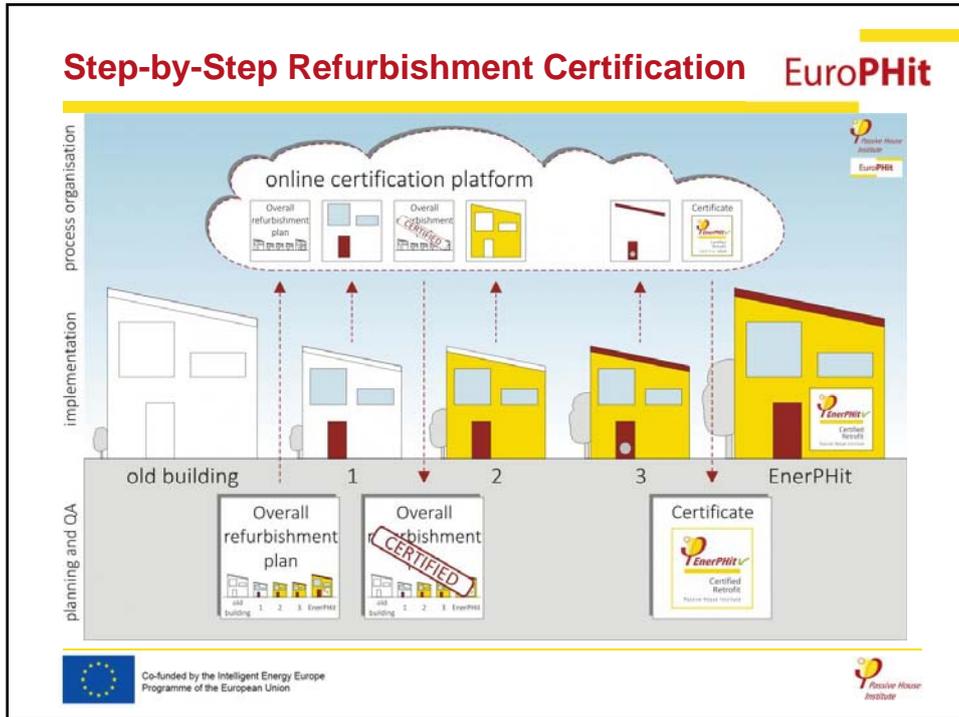


RES & heating system



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Thank you

Any questions at this stage?

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CS01 Home for Elderly in Dun Laoghaire EuroPHit



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Site Photos (before retrofit works) EuroPHit



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Site Photos (current retrofit works)

EuroPHit

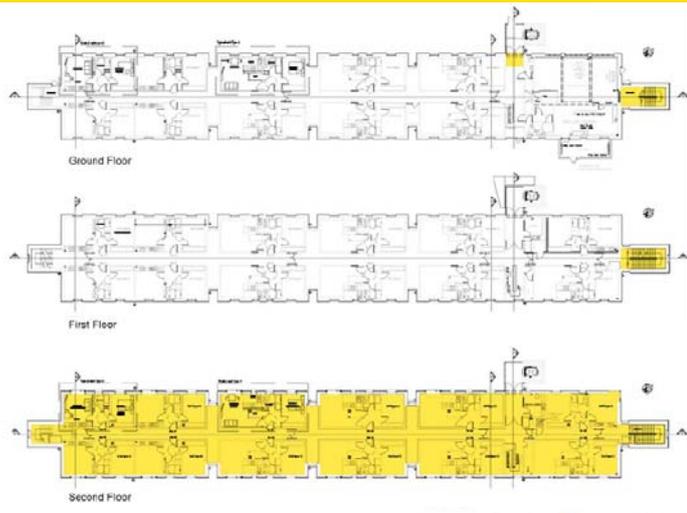


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Floor Plans

EuroPHit

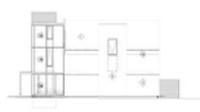
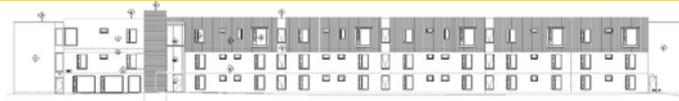


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Elevations

EuroPHit

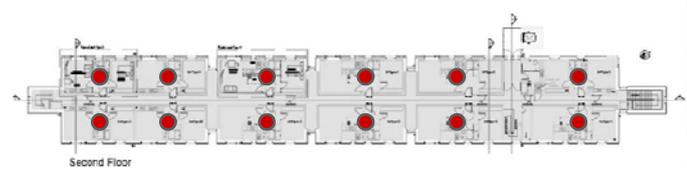
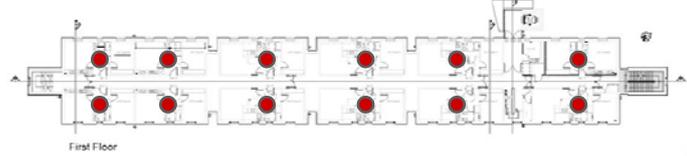
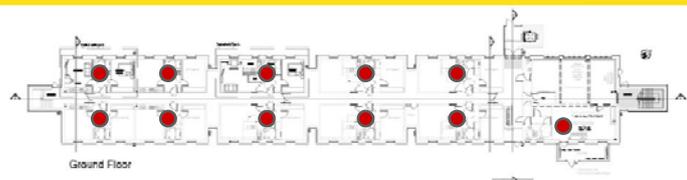


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Ventilation Option 1

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Ventilation Option 2

EuroPHit

Ground Floor

First Floor

Second Floor

Centralised ventilation system

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Ventilation Option 3

EuroPHit

Ground Floor

First Floor

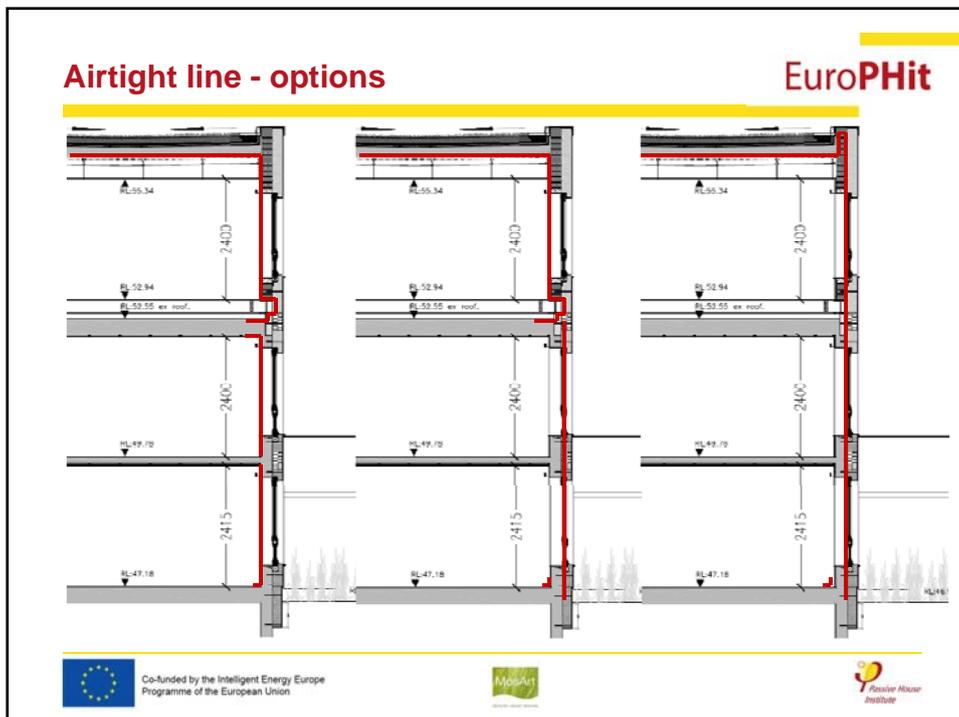
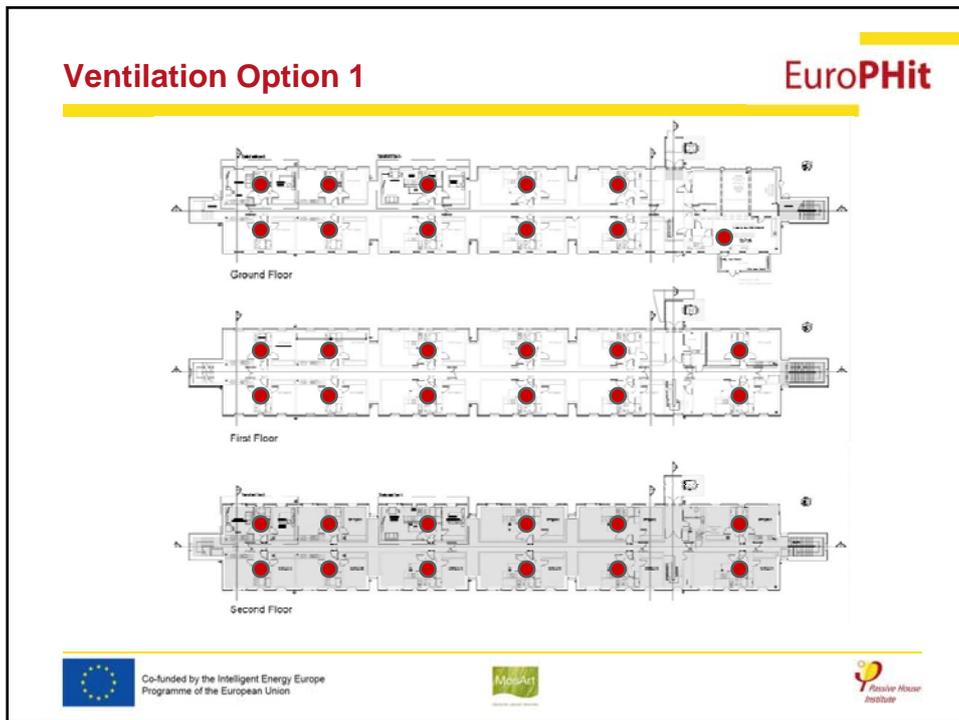
Second Floor

5 Centralised ventilation system

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Thank you

Any questions at this stage?



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Fintan Smyth

Conclusions from Better Energy Financing



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A vision for quality buildings

20th March 2015

EuroPHit

Retrofitting for the energy revolution, one step at a time

Valuing
~~Financing~~ Energy Efficiency

Fintan M. Smyth
Building Physics Manager,
Gyproc and Isover Ireland

SAINT-GOBAIN

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Saint-Gobain, a responsible leader

- Leadership based on best behaviour & actions in sustainable development ...
- inspired by common values

Sustainable Habitat

Sustainable Development

Principles of Conduct and Action

Saint-Gobain, a solutions provider
The benchmark of Sustainable Habitat



3

Better Energy Financing Project

BETTER ENERGY
The National Upgrade Programme

‘DEEP’ RETROFIT

A Government initiative forming part of the National Upgrade Programme & is key element in the Government's strategy for Jobs

Scale (& depth)

Public Acceptance

Secure and Loans

- Government-aided solutions
- Appropriate financial repayment
- Focus on quality assurance relating to:
 - assessments, installations, products & workmanship

Design process in consultation with a wide group of stakeholders. Q3, 2013.

Assessment & Quotation

Financing

Installation

Payment

Cost & Value

Measure	BER	Cost (each)	Running Total	Monthly Cost over	
				15 Years	
				Total	After Energy Savings
New efficient lightbulbs	E1	€75	€75	€1	-€1
Upgrade Attic Insulation	D2	€450	€525	€4	-€1
Insulated all Walls	D1	€7,300	€7,825	€58	€35
Replace 4 worst windows	C3	€2,800	€10,625	€79	€52
New Boiler & Controls	B2	€2,400	€13,025	€97	€44
New Stove to Sitting Room	B2	€2,000	€15,025	€111	€56
Solar panels: Electricity	A3	€3,400	€20,425	€151	€31

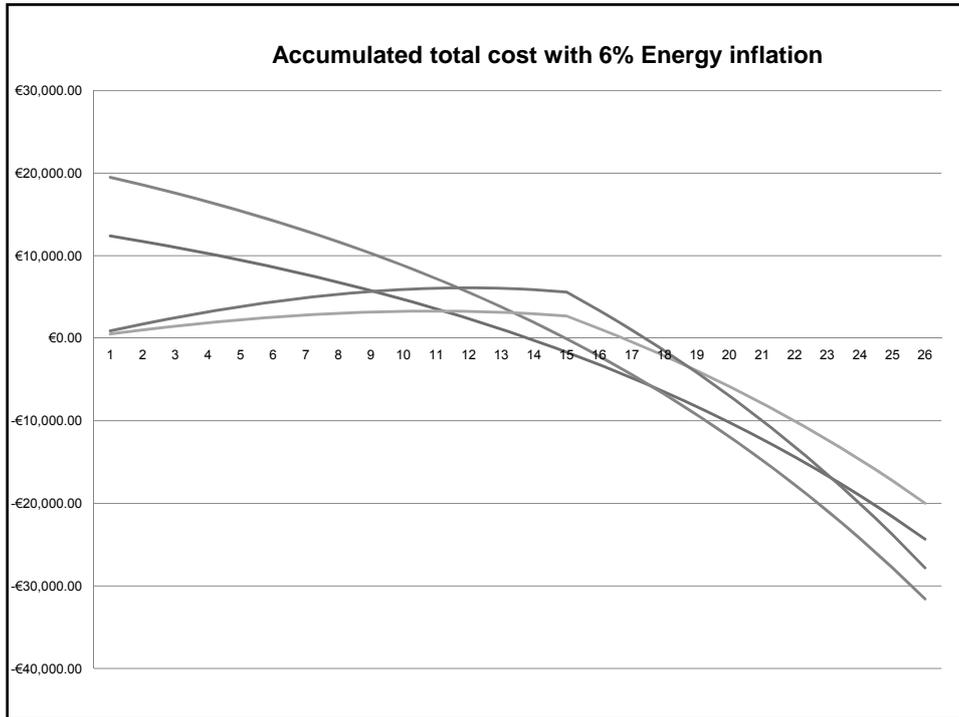
€300,000 + €48,000

Energy Inflation 2.00%

€5,594

Net Cost

Property value



Deep (DEAP) vs Passive Efficiency

Good Standards (Theoretical target)

- Efficiency principles
- Insulation / Airtightness
- Efficient services
- Renewables
- Building Control

No joined up thinking

■ Thermal bypass	■ Condensation Risk
■ Leaky components	■ Air Quality
■ Performance Gap	■ Thermal shock
■ Draughts	

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Alignment : The Real Value of the Principles

- Ownership of the knowledge chain
- Engagement
- Understanding
- Building Science
- Quality**
- Rigour



"Tell me and I forget. Teach me and I remember. Involve me and I learn"

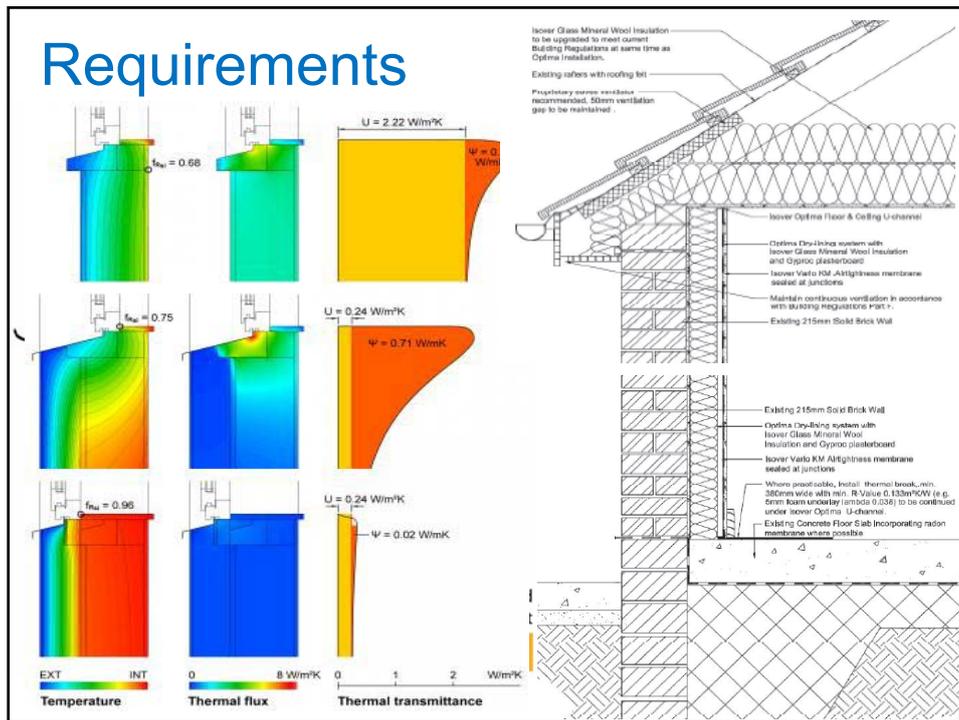
Benjamin Franklin 1750.



Cost vs Value : New Build

- 'Hung up on payback'
- The middle option
- 'near passive'





Cost vs Value : Passive Retrofit Challenge

- | | |
|--------------------------------|-------------------------------|
| 1. Light bulbs | 1. Focus on Interdependencies |
| 2. Lagging Jacket | 2. Advanced building science |
| 3. Draught proofing | 3. Higher performance |
| 4. Attic Insulation * | 4. Airtightness/Bridging |
| 5. Wall Insulation * | a) Intermediate floors/walls |
| 6. Boiler & Heating Controls * | b) Party walls |
| 7. Stove ** | 5. Advanced ventilation |
| 8. Solar Panels – Electricity | 6. All windows/doors |
| 9. Windows ** | 7. New floor (insulation) |
| | a) New finishes / Kitchen |
| | b) Removals / Accommodation |

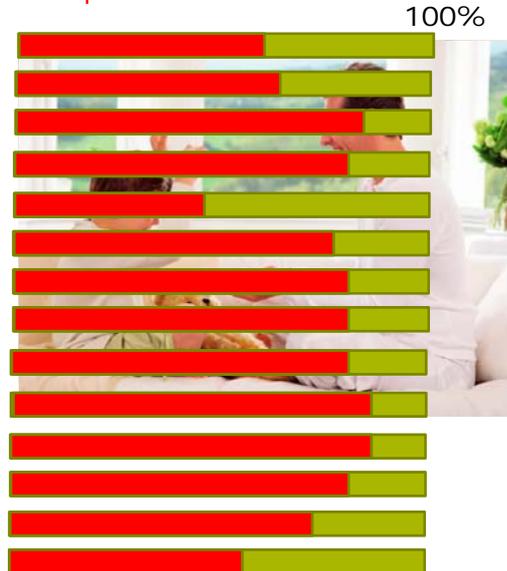
What is the *EuroPhit Rationale* ?

NEXT STEPS : Quantify against 'Deep' retrofit

Investing in a better home!

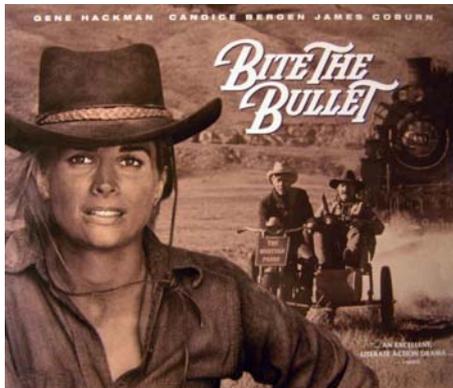
- Improved Comfort
- Reduced maintenance
- Convenience
- Enhanced air quality
- Energy Efficient
- Reduced Energy Bills
- Future carbon taxes
- Environmentally better
- Facelift to home
- Property value
- Reduced Stress
- Healthy Family

Investing for a better life!



We know how to get there

Patricia Kochaniuk, Green Extension
Architects, 76 Mountain View park, Dublin 14
086 269 2874
info@greenextension.eu
www.greenextension.eu
& Liam Desmond Project Manager & Home-owner



91%

Energy Savings



Energy Usage	
Total Heating/Cooling	48 Wh/m ² [was 535]
Energy Demand Heating Cooling	25 Wh/m ² [was 451]
Airtightness	1.24 ach [was 10]
BER	A2

ISOVER
SAINT-GOBAIN



SAINT-GOBAIN

EuroPHit

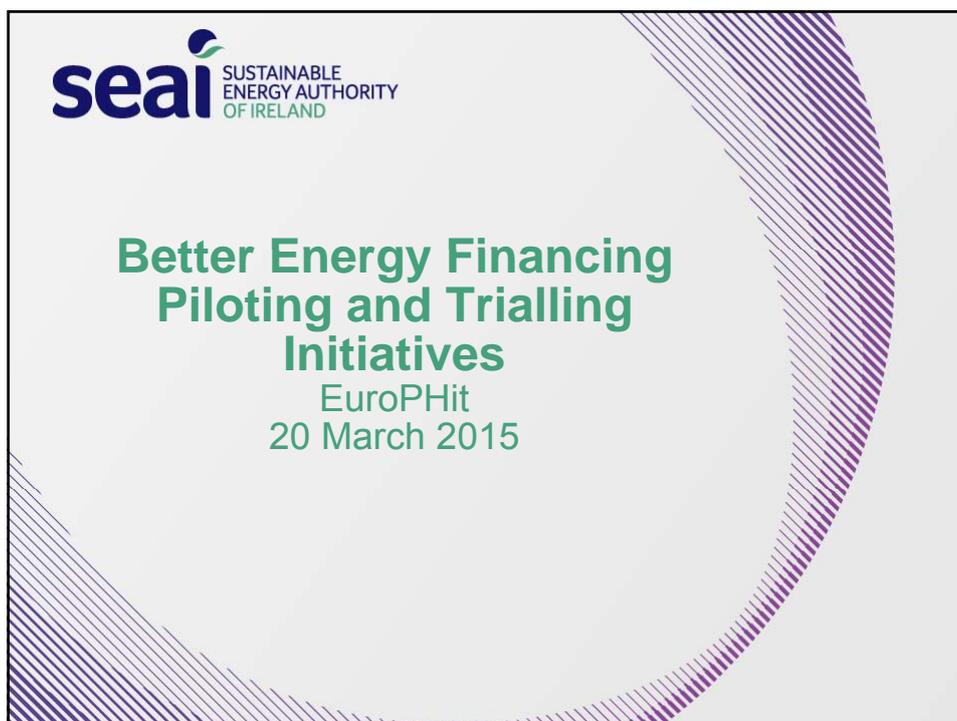
Josephine Maguire

Piloting and Trialling Better Energy Financing Initiatives



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Genesis of Better Energy Financing Programme

- Programme for Government
- ...to transition from Exchequer funded grants for energy efficiency measures to a market orientated approach to delivering energy efficiency savings.
- 2012 - Better Energy Financing Project in DCENR
- 2013 -Better Energy Financing Working Group established with stakeholders from across Industry and banking
- Objective : develop a design for the proposed national retrofit scheme incorporating competitive and accessible finance in conjunction with a compelling consumer proposition

Development of BEF through 2014

- Better Energy Financing Memo to Gov't June 2014
- Intention:
 - BEF scheme to form an element of the energy efficiency framework and complement schemes under the Better Energy Programme

BEF Memo Requirements

- SEAI tasked to draw up a detailed implementation plan
- Core elements of the Scheme to consider:
 - Accredited over-the-counter loan products
 - Q/A code of practice and warranty scheme
 - Framework and procedures for accreditation
 - BEF Scheme brand, marketing and quality mark
 - Scheme assessment and quotation process
 - Establishment of Scheme governance arrangements
 - Supporting policies and measures for success

SEAI Work Programme Actions in 2014

- Piloting financing options
 - Credit Union Trials (lower interest rates, unsecured)
 - Suppliers pilot projects(finance & energy poverty)
 - Consult on Employer Trials
 - Banks ...consultation and seeking options through IBF and banks

Other Pillars

- i. Quality Assurance –contractor star, codes/standards Information – Test advisory reports, energy roadshow, energy poverty mapping, marketing working group
- ii. Policy supports –DCENR construction sector strategy

Planned SEAI Actions 2015

Memo	Action
Over the counter loan products	Trials with banks and credit unions Build on relationships to encourage new products
Q/A Code of Practice and Warranty Scheme	Build on existing codes & standards Discussions on Industry Warranty Scheme
Framework and procedures for accreditation	Build on current contractor registration system, HARP database and Triple E listing Integrate SR54 to SEAI BEH specification Develop NSAI relationship on materials and systems
Scheme brand, marketing strategy and quality mark	Awareness building programme Develop Communications & PR working group Long term strategy once final design is clear
Assessment and quotation process and software tool	Review existing assessment tools and develop plan for integration and development Discuss options with Contractors for quotation tool
Supporting policies and measures	Trials on Salary Sacrifice Supporting Regulations Review any options regarding Tax Incentive Policies

Trials and Pilots 2015

- €1 million for trials:
 - -Salary Incentive Schemes
 - -Energy Supplier Financing
 - -Banks and Credit Union Trials
- €2 million for Financing in Communities
 - -innovation through Better Energy Communities

The Matrix Effect...

- No silver bullet: ...it doesn't work
- A suite of solutions to fit consumer circumstances
 - - match circumstances to solution
- Develop a matrix of homeowner circumstances and potential routes to upgrade
- These will include mortgage top ups, equity release, unsecured lending, supplier credit, purchase options, community schemes, personal savings

Financing Energy Efficiency in Non Residential Sector

- Sectors
 - Commercial Companies
 - Industry
 - Public Sector
- Mechanisms
 - Energy Efficiency Fund
 - Banking Products (e.g. AIB, BOI)
 - SBCI (new SME fund)
 - ISIF (newly established – Debt and Investment)

Thank you

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Coffee - Break

Resume in 10 minutes



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Georg Kraft

EU Policy and best practice finance models



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Financing of Sustainable Housing Retrofit

Guidelines for Financial Institutions
Workshop Dublin 20. March 2015

Friedrichsdorfer Institut zur Nachhaltigkeit IzN e.V
Georg Kraft



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1. EU Promotion of Energy Efficient Buildings
2. The EuroPhit Project
3. The German Case
4. Ireland
5. Financial Instruments
6. Discussion and questions



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Part 1

Promotion of Energy Efficient Buildings in the EU



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EU Directive 2002/91/EC on Energy Performance of Buildings EuroPHit

- Application of minimum requirements for new buildings and existing buildings for primary energy consumption and energy losses
- Energy certification of buildings
- Member States shall have regulations and administrative provisions to comply
- Member States: Energy Saving Ordinances



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EU Funding for Energy Efficiency in Buildings

<http://www.buildup.eu/financing-schemes/>




energy solutions for better buildings

THE EUROPEAN PORTAL FOR ENERGY EFFICIENCY IN BUILDINGS

Home > Financing Schemes > Browse all

Financing Schemes

In this section of BUILD UP you can find information involving financing schemes for investments in energy efficiency and renewable energy measures in buildings.

Within each scheme you will find a description of the scheme but also useful information relevant to the scheme such as best practice guidelines, links to finance providers, case studies, updates/amendments to schemes, application procedures etc.

You can contribute to the financing schemes section by providing relevant content to the general BUILD UP sections (events, publications, cases etc). Selecting the theme "Financing, socio-economics" and relevant tags (keywords) for the material that you upload, will help the Financing Schemes section maintainers identify this content and link it to a financing scheme if deemed relevant.

[Hide this description](#)

▶ **Advanced Search**

search:

Sort by: Most Recent | in: DESC | order | Show 10 | results per page

Search

Highlighted Schemes Info

European wide funds

In this category you will find a list of the existing European funding mechanisms that are aimed at promoting, improving and supporting energy efficiency and renewable...

Tags: EU financing instruments | EU funded projects | EU Funding | Financing energy efficiency

Financing Schemes

Click concepts below to obtain a list

5	32	193
Schemes	Countries	Publications
82	188	4
News	Links	Events

Latest | Most Visited

Highlighted Cases

Life Cycle House One Building

Local water authority in Sorque

[View all](#)



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EU Funding for Energy Efficiency in Buildings

<http://www.buildup.eu/financing-schemes/>

- [European wide funds](#)
- [National/Regional schemes for Individuals \(homeowners & tenants\)](#)
- [National/Regional schemes for Municipalities, Social Housing, Companies, Enterprises](#)
- [National/Regional schemes for Residential Buildings](#)
- [National/Regional schemes for Non-Residential Buildings and other Facilities](#)



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ELENA - European Local ENergy Assistance



EIB ELENA
Big investment projects
> 50 million €



KfW ELENA
investment projects
< 50 Mio. €

Several facilities



CEB ELENA
Social investment projects
< 50 Mio. €



EBRD ELENA
Focus on municipalities
< 50 Mio. €



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Specific aspects of KfW ELENA Facility

Global loans to local financial intermediaries

Global loan for the Investment Programme [+ ELENA Grant]

[Larger part of the ELENA grant for in house capacity building in the municipality/region and/or consultancy services]

Final Beneficiaries:
Municipalities, Regions, ESCOs

Private Investors:
Housing Assoc., Healthcare Org., ESCOs

KfW

→

Partnering financial intermediary

→

[Smaller part of the EU grant for system building in the banks through technical assistance]

Individual loans for the Investment Projects



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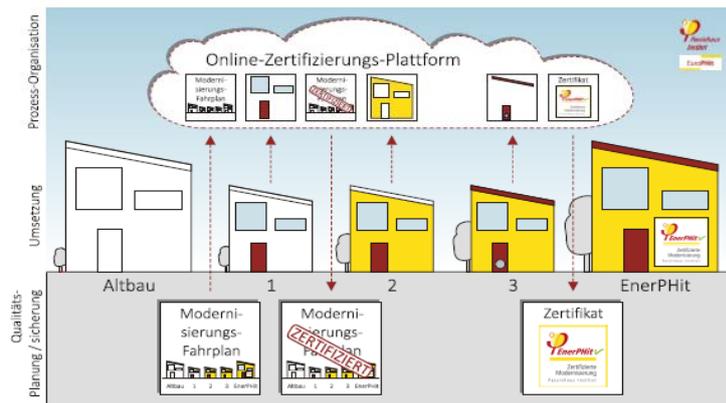
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Part 2

The EuroPHit Project and the EnerPHit Standard



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Certification is necessary to prove the achievement of individual steps (especially to outsiders like banks)



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What banks need to know – technical aspects

Holistic approach: Consider the entire building and not just a part of it. What is my final objective in terms of energy consumption (kWh/m²/year) → even for step-wise refurbishment

Target value for primary energy: The same amount of consumption for electricity, oil, gas or RE *is different* in terms of primary energy

Reliable calculation tools: For base case as well as actual savings

Certification systems: To know whether particular efficiency targets have been reached (especially for step-wise refurbishment)



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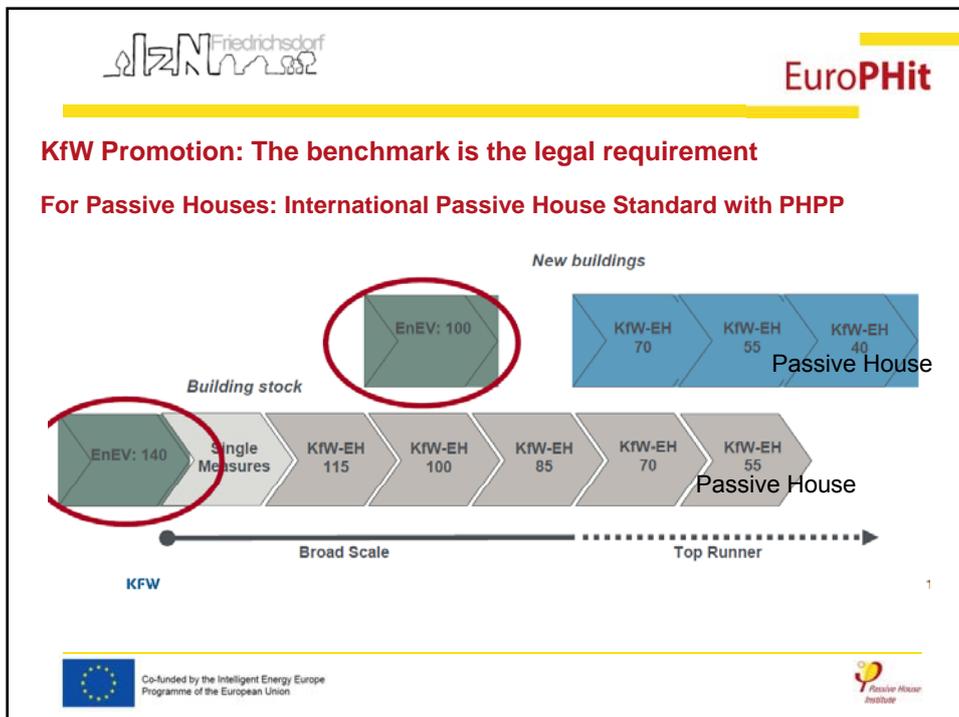
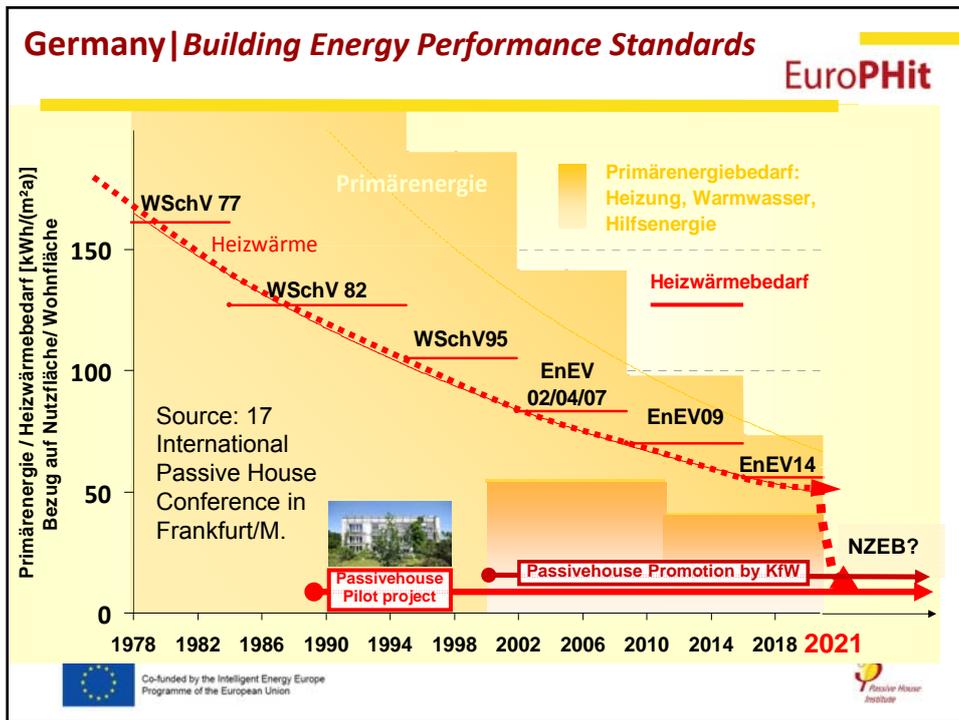
Part 3

The German Case



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Budgetary effects end external effects

Public supports create investments and they can contribute to achieve external effects like GHG savings, health improvements etc.

- Theoretically a 20% subsidy for an investment project can generate VAT incomes for the government. With a 20% VAT it could be budget neutral
- In addition there are multiplier effects
- There is also the benefit of GHG savings (indicator CO₂): Depending on the value attached to a ton of CO₂ the savings can be between US\$ 25 (IMF) and € 80 (German environmental agency)



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Budgetary effects end external effects

The Swiss Prognos AG, for example, estimates

–in the basic scenario in a study for KfW –

the following values: (Bn Euro)

Subsidy fund 25

→ investments 428

→ energy cost savings 92

→ CO₂ reduction 15,6 Million ton p.a.,



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Public supports

Justification is over energy savings, external effects (CO₂/GHG-reduction), demand induced tax revenues, employment effects etc.

Public supports can help:

- To shorten the long repayment periods and to make a project financeable by market based instruments
- To create trust for a refurbishment project
- To improve the cash flow and the net-present value of a project
- To compensate for external benefits (like CO₂ reduction)
- To improve the financing structure in particular for communities and public institutions lacking financial sources under strict saving requirements



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Part 4

Ireland



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BUILD UP
energy solutions
for better buildings

THE EUROPEAN PORTAL FOR ENERGY EFFICIENCY IN BUILDINGS

News | Events | Publications | Links | Cases | Tools | People | Blogs | Communities | Financing | Training | Country Fact

Home > Financing Schemes > National/Regional schemes for Individuals (homeowners & tenants)

National/Regional schemes for Individuals (homeowners & tenants)
National, Regional, Local

Scheme Contents 2 Items

Advanced Search

Search

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Warm Homes scheme - Northern Ireland, UK
1043 visits | National official sites

Better Energy Homes scheme - Ireland
1120 visits | National and regional energy agencies and organisations

[View All Schemes](#)

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EuroPHit

Better Energy Homes scheme - Ireland

0 1120 visits

Posting Date | 1 March 2013
Country | Ireland
Geographic Coverage | National
Available link languages | English
Theme | Energy policies, Financing, socio-economics
Target Group | Local/regional/national authorities and facilitators, Building professionals, Building occupants
Type of Link | National and regional energy agencies and organisations
Tags: SEAI | renovation grants / energy savings / residential buildings | NEEAP | NEEAP scheme

URL | http://www.seai.ie/Grants/Better_energy_homes/

Through the Better Energy Homes scheme and the Sustainable Energy Authority of Ireland (SEAI) the Irish Government provides incentives to **homeowners** in the form of **Cash Grants** to install various upgrade measures.

The objectives of the scheme are to:

1. Support homeowners in making intelligent choices to improve the energy performance of their home
2. Reduce energy use, costs and greenhouse gas emissions
3. Build market capacity and competence by driving contractor standards and quality
4. Stimulate market innovation.

Grants are available to eligible applicants for undertaking works in the following fields:

1. Insulation
2. Heating System

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Part 5

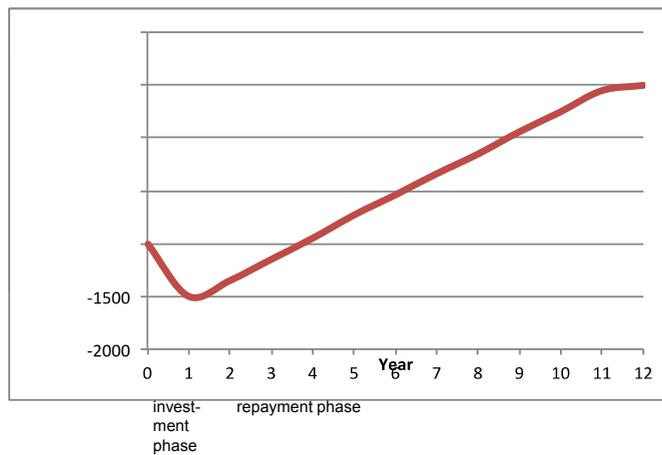
Financial Instruments



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Typical cash flow profile of an energy efficiency project



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Cash flow example: Housing refurbishment (Rental homes)

in 1000 €

Year	C	D	E	F	G	H	I	J	K	L	M	N
4.1. Revenue	0	169	169	169	169	169	169	169	169	169	169	169
5. Renovation rent increase		85	85	85	85	85	85	85	85	85	85	85
6. Rent increase energy efficiency		84	84	84	84	84	84	84	84	84	84	84
7.2. Investment (energy efficiency part)		625										
8.3. Maintenance cost (2% ann.increase)		0,0	6,0	6,1	6,2	6,4	15,0	6,6	6,8	6,9	7,0	
9.4. Project Cash Flow (energy)	line 6-8	-625	84,0	78,0	77,9	77,8	77,6	69,0	77,4	77,2	77,1	77,0
10.4a. Project cash flow after tax	line 9-18		83,5	78,0	77,9	77,8	77,2	69,0	75,7	74,9	74,1	73,3
11.5. Equity			125									
12.7. Loan Finance												
13.8. Loan disbursement+debt service	line 14+15	500	70,0	70,0	68,0	66,0	64,0	62,0	60,0	58,0	56,0	54,0
14.8.1. Principal	line 16 *c15		50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0
15.8.2. Interest	4%		20,0	20,0	18,0	16,0	14,0	12,0	10,0	8,0	6,0	4,0
16. Loan balance			500	450,0	400,0	350,0	300,0	250,0	200,0	150,0	100,0	50,0
17. Net Cash flow before tax	line 9-11-13	-125	14,0	8,0	9,9	11,8	13,6	7,0	17,4	19,2	21,1	23,0
18. Profit before tax**			1,5	-4,5	-2,6	-0,7	1,1	-5,5	4,9	6,7	8,6	10,5
19. Profit tax 35%	35%	-125	0,5	0	0	0	0,4	0	1,7	2,4	3,0	3,7
20. Net Cashflow after tax	line 17-19	-125	13,5	8,0	9,9	11,8	13,2	7,0	15,7	16,9	18,1	19,3
21. Plus repayment subsidy 15% (tax free)	15%		7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5
22. Net cash flow after tax+subsidy		-125	21,0	15,5	17,4	19,3	20,7	14,5	23,2	24,4	25,6	26,8
23. Pre Tax financial IRR*	2,4%											
24. After tax financial IRR*	1,1%											
25. After tax/subsidy financial IRR*	9,8%											
26. *) refers to equity												
27. Debt service cover			1,20	1,11	1,15	1,18	1,21	1,11	1,29	1,33	1,38	1,43
28. Debt service cover after-tax			1,19	1,11	1,15	1,18	1,21	1,11	1,26	1,29	1,32	1,36
29. Debt service cover after subsidy			1,30	1,22	1,26	1,29	1,32	1,23	1,39	1,42	1,46	1,50
30. Economic IRR												
31. Total investment (energy)		-625										
32. Project cash flow	line 9	-625	84	78	78	78	78	69	77	77	77	77
33. Total cash flow + repayment subsidy		-625	92	86	85	85	85	77	85	85	85	84
34. Economic IRR**	4,1%											
35. Economic IRR incl. repayment subs.**)	6,0%											
**) No externalities included												

Sensitivity analysis: If additional income -10%:
After tax IRR -9,1%; DSR in year 2 below 1



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Financial Instruments for Energy Efficiency Investments in Buildings

- ① Debt financing, credit lines, revolving funds,
- ② ESCO financing,
- ③ Forfaiting
- ④ Leasing



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Debt financing, Credit lines, Revolving funds,

- **A conventional bank loan is the simplest form of debt**
- **As recourse financing:**
 - Creditworthiness of borrower, not necessarily project
- **As project finance:**
 - Private house-owner: Standardised procedures, normally under a public programme requiring standardised technical as well as financial ratios
 - Community: Cash-flow must be sufficient for loan-service
 - Separate finance for “incidental part” (equity or recourse financing)



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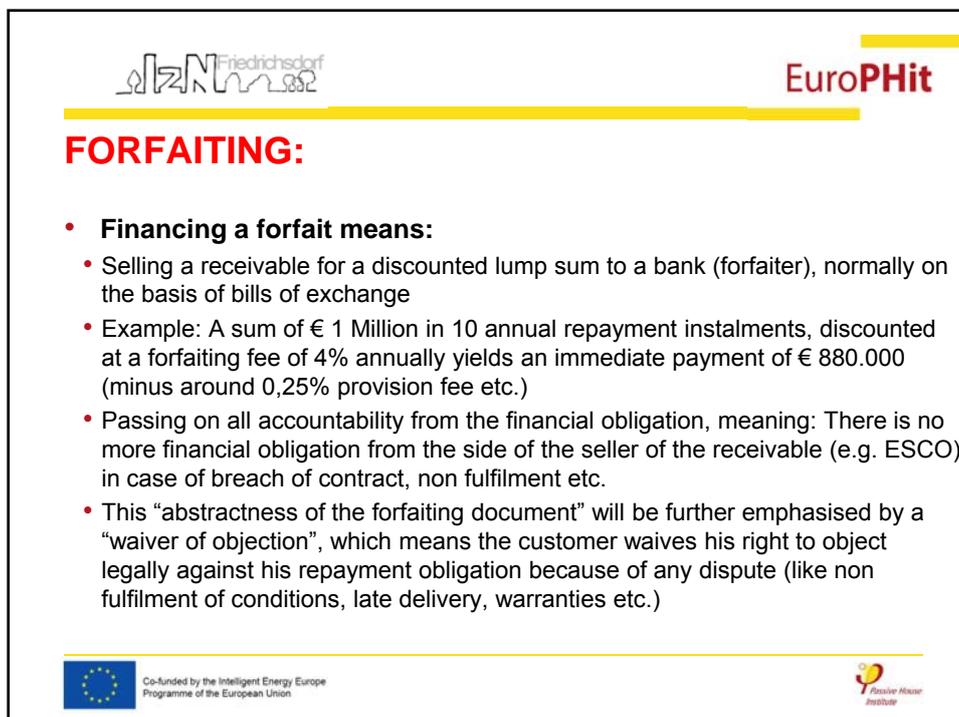
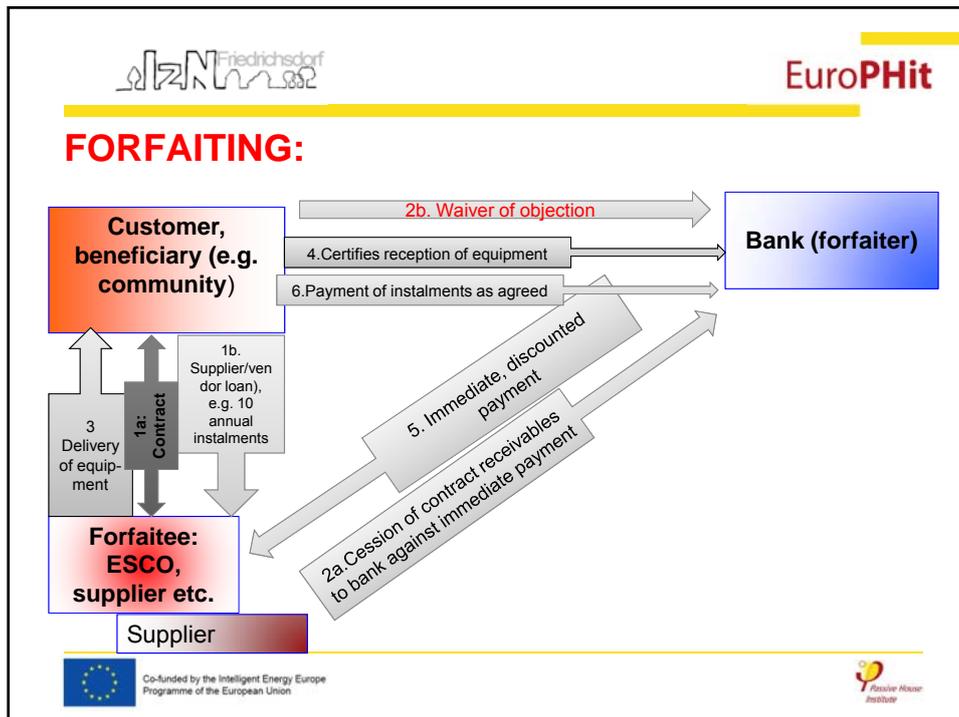
EPC and ESCO FINANCING :

- **EPC (Energy performance contracting)** refers to the contractual arrangement between a provider of energy services and the customer
- **ESCO (Energy service company):** “Natural or legal person who delivers energy services or other energy efficiency improvement measures in a final customer’s facility or premises” (*Energy Efficiency Directive (EED, 2012/27/EU)*)
- **ESCO by itself is not yet a financing solution.** Depending on the share of hardware/equipment to be installed upfront there is still a financing problem for the ESCO which might also affect the customer: Financial solutions like project finance or forfaiting will have to be applied



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Forfeiting pros and cons:

- Immediate cash for the contractor (ESCO etc.)
- For the contractor: **The debt is not booked on his balance sheet**, so the potential for further debts remains unlimited (in principle)
- Forfeiting needs **immaculate creditworthiness** of the debtor and/or the project (otherwise it becomes expensive or impossible)
- The debtor is always the institution which receives the investment (never the ESCO or the supplier)
- The **waiver of objection** poses the problem that the investor cannot stop the payments any more if contractual obligations are not reached
- This can, however, be avoided if the **operational part is separated from the investment part** (Operation cost normally need no financing anyway)



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LEASING:

- Investment goods are only **leased to the investor** and will be taken back after an agreed time (with the option to buy them at an agreed residual value)
- **Operating Leasing**: Leasing period is much shorter than life time
- **Financial Leasing**: Leasing period approaches life time
- Normally leasing makes only sense for **goods that can be given back** without high cost for de-installation: therefore leasing will be the **exception for housing retrofits** (if ever: financial leasing with the option to buy)
- **Tax reductions**: Leasing (in particular cross border leasing) reached some positive (as well as negative) reputation on the basis of tax saving models. Contracts, however, are complicated, sometimes tricky and therefore a good team of international tax experts and lawyers are needed



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Part 6
Discussion and
questions



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Thank you

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 MosArt

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Feedback and Summary

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 MosArt

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Lunch & Networking



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Thank you for your attention

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