

# The socio-economic rationale for historic building reuse, and employment & business potential.



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## ECONOMIC VALUE OF CULTURAL HERITAGE



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## The potential - an example.

- *“.....existing buildings will need to be radically refurbished if national and international emissions targets are to be met by 2050.*
- *‘To complete the task in 40 years we would need to refurbish an entire city the size of Cambridge every month.*
- *If we assume that each intervention would take a team of trained workers two weeks, we would need 23,000 teams of people to work at this rate non-stop for the next 500 months’.*
- <http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/PO/releases/2009/april/buildings.aspx>

## Potential employment figures

- UK alone: 115.000 man/years jobs for a period of 40 years!
- Or 69.000 jobs (60%) on historic buildings.
- In the EU Energy efficiency measures on historic houses would create 30 709 047 jobs (30 million man year) yearly in total.

## **The potential - an example.**

- This work would also improve other sustainable development qualities through reuse of the historic building stock. Over the period some 1.259 million EU jobs would be sustained.
- Germany will, according to the same calculation generate over 152 thousand jobs per year, of which 91.250 jobs yearly on historic buildings.
- Germany will over the whole period create some 3,74 million jobs on historic buildings.

## ***Policy support and regulatory requirements (examples).***

- DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 May 2010 on the energy performance of buildings (recast). Official Journal of the European Union L 153/13. This Directive lays down requirements as regards:
  - common framework for a methodology for calculating the integrated energy performance of buildings and building units (CEN norm).
  - minimum requirements to the energy performance of:
    - (i) **existing buildings**, building units and building elements that are subject to major renovation;
    - (ii) **building elements** that form part of the building envelope and that have a significant impact on the energy performance of the building envelope when they are retrofitted or replaced; and
    - (iii) **technical building systems** whenever they are installed, replaced or upgraded;

# Exemptions

- (a) buildings officially protected as part of a designated environment or because of their special architectural or historical merit, in so far as compliance with certain minimum energy performance requirements would unacceptably alter their character or appearance;
- (b) buildings used as places of worship and for religious activities;
- (d) residential buildings which are used or intended to be used for either less than four months of the year or, alternatively, for a limited annual time of use and with an expected energy consumption of less than 25 % of what would be the result of all-year use;
- (e) stand-alone buildings with a total useful floor area of less than 50 m<sup>2</sup>.

## THE DEBATE

- But buildings defined in exemptions only max. 01% of Europe's building stock. So exemptions not much worth in a larger view of historic buildings.
- Which and what can be changed?
- But also for other, not exempted existing buildings there are possibilities to use alternative approaches. The objective here is not what to do but the results to reach.
- **“.....in so far as this is technically, functionally and economically feasible.”**

## THE DEBATE

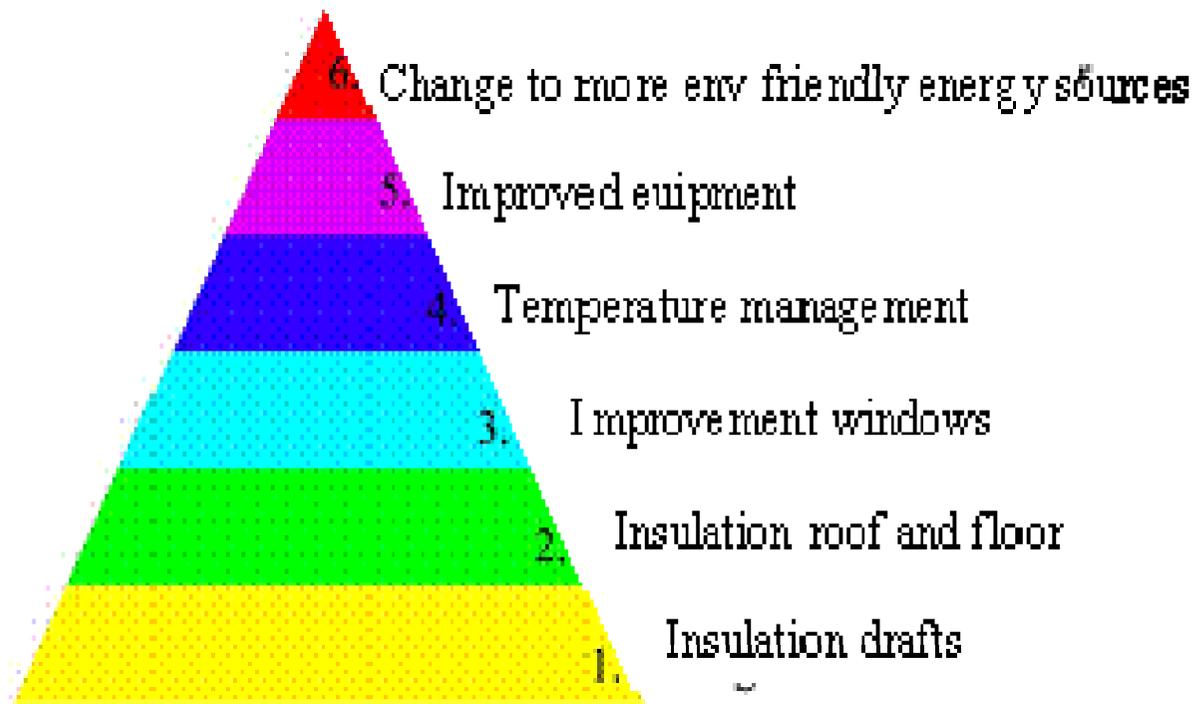
- Loss of historic fabric, destruction of historic ensembles.
- Reuse or replacement with new constructions.
  - Windows
  - Reuse or demolition and new buildings
  - Energy savings through reuse. Resource management.
- The larger environmental debate, not only energy.

## Energy efficiency. What do we know?

- Underselling the thermal performance of our old buildings by not fully understanding them
- Heat loss through vernacular materials **can be up to three times lower than expected**, according to new research conducted for the Society for the Protection of Ancient Buildings (SPAB).
- 79% of the traditionally built walls sampled – including timber, cob, limestone, slate, and granite – actually perform better than expected.
- Dr Caroline Rye, University of Portsmouth.research ,14 March 2011

## Energy efficiency. What do we know.

- Norwegian study demonstrated that simple measures that do not conflict with antiquarian interests have a great effect.
- 70% more energy efficiency can be achieved.
- This can greatly contribute to energy savings in historic houses without diminishing or destroying their character.
- Planning energy efficiency improvement for existing buildings should be made according to a priority list, where the simplest measures with the lowest consequences should be implemented first.



*Figure 1: The steps and effects of different measures to increase energy efficiency in historic buildings.*

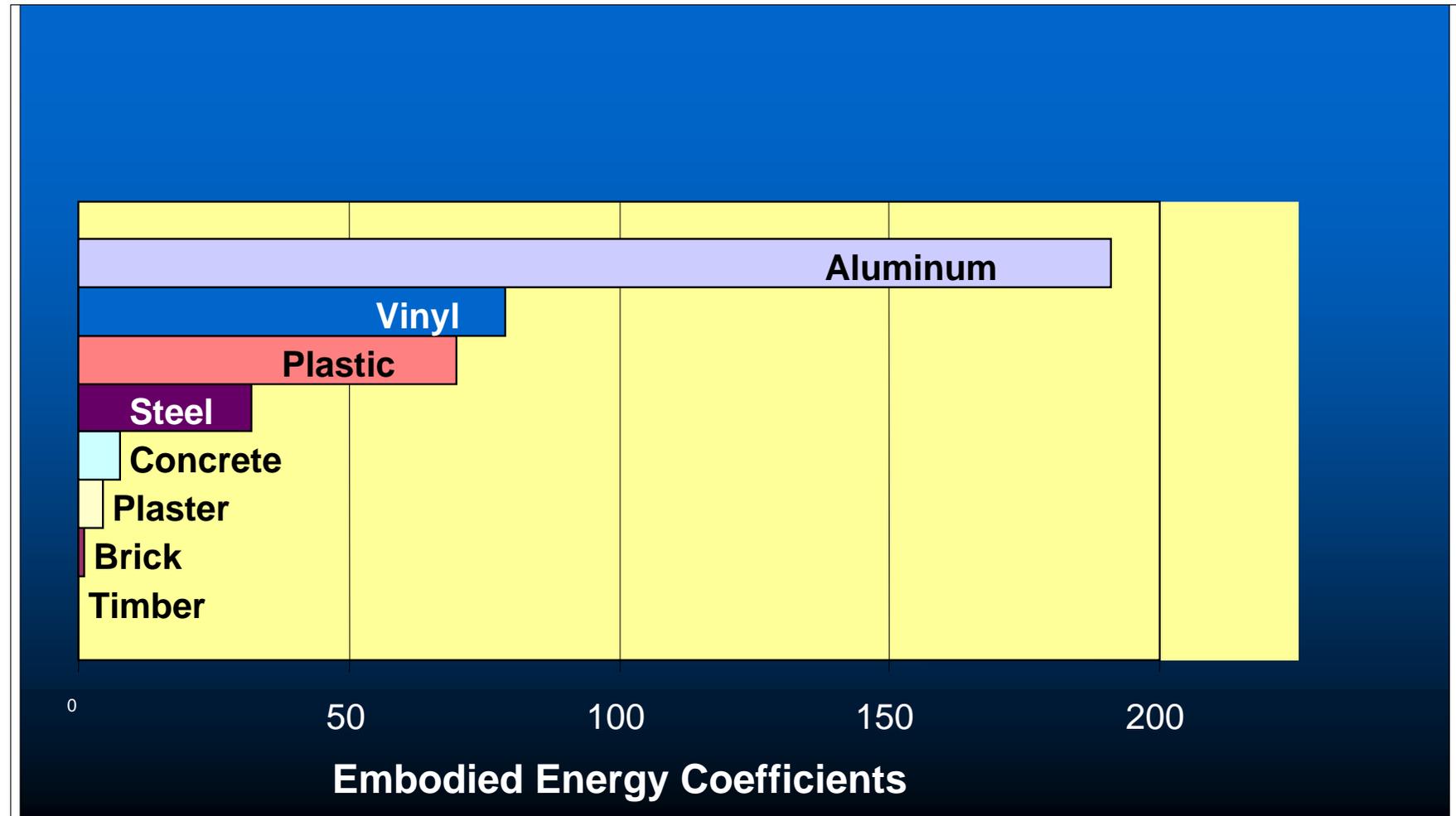
## Effects of minimum and non destructive measures.

Measure	before kWh/ yr.	after kWh/ yr.	% reduction	%accumulated	measure name
1	68 200,00	63 900,00	6,30	6,30	Closing and insulating draught % air leakages
2	63 900,00	58 800,00	7,98	14,29	Insulation joisting between heated space and cold loft:
3	58 800,00	46 400,00	21,09	35,37	Insulation floor against cold basement:
4	46 400,00	30 600,00	34,05	69,43	Installation 1 layer windows LowEnergy coating:
5	30 600,00	26 800,00	12,42	81,84	Installation new temperature control system el-heating

## Windows

- This is with respect to a number of environmental categories (i.e. global warming potential, acidification, photo-oxidant formation, eutrophication, and consumption of fossil fuels) over a period of 90 years.
- The **total energy consumption over 90 years**, however, is higher for the older window supplied with an inner frame with single or double glazing than with new windows with energy glass.

# Energy use from extraction to building site for different construction materials. Source: D. Rypkema.



# Resources and resource management.

- Demolition. Research = 1000 times more waste for a 3 story 6 apartment building if it is demolished instead of rehabilitated.
- Demolition creates pressure on limited waste dumps capacity, demands energy for the transport and releases important amounts of bound CO<sub>2</sub>.
- New building materials of industrial production are much more energy intensive than traditional building materials.
- *Most often more than 30 years before any savings achieved.*
- Heritage buildings reuse can make a substantial contribution to the EU resource policies and be able to tap into the funding provided for such measures.

# Resources management. Hollistic perspective

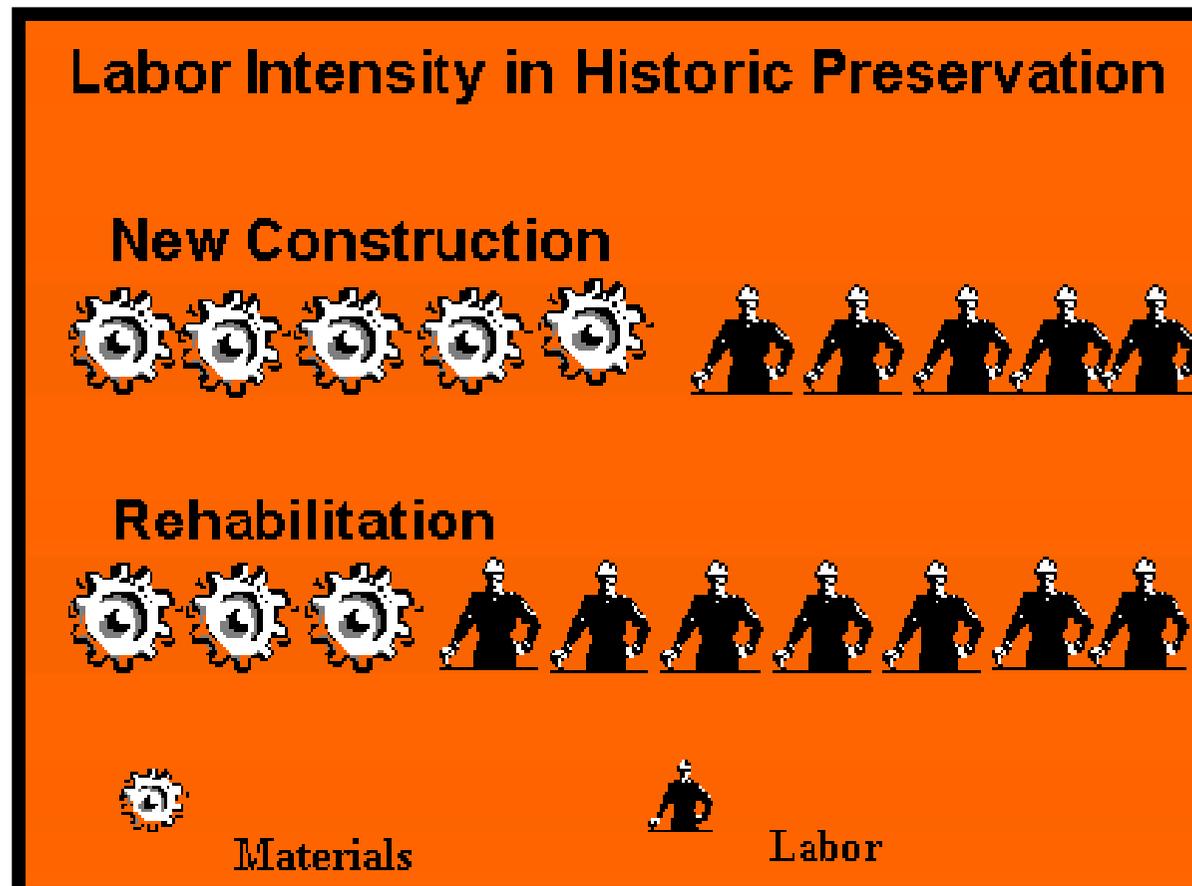
- *«The resources consumed, the emissions, the environmental, health, social, and economic benefits and impacts that are attributable to goods and services (products) are estimated taking into account their supply chains, their use, recycling, recovery, and ultimate disposal. « EU*
- *This includes the rucksack of impacts associated with imported goods, domestic consumption and production, as well as exports.*
  - *Sustainability is taken into account in business and policy through broad concepts such as life cycle thinking. social/environmental life cycle assessment, life cycle costing, and cost/benefit analysis.*
  - *Sustainability analysis is a core theme in the Europe 2020 Strategy.*
  - *the Sustainable Consumption and Production/Sustainable Industrial Policy (SCP/SIP) Action Plan,*
  - *the Thematic Strategy on the Sustainable Use of Natural Resources*
  - *Thematic Strategy on the Prevention and Recycling of Waste.” [i]*

[i] Action 22005 - Environmental Assessment and the Sustainable Use of Resources (ENSURE). [Environmental Assessment and the Sustainable Use of Resources. http://ies.jrc.ec.europa.eu/index.php?page=87](http://ies.jrc.ec.europa.eu/index.php?page=87) More on this topic to be found at [http://ec.europa.eu/sustainable/welcome/index\\_en.htm](http://ec.europa.eu/sustainable/welcome/index_en.htm) And [A resource-efficient Europe – Flagship initiative of the Europe 2020 Strategy](#) (26/01/2011)

# Job creation

- *“The restoration of buildings, roads and other elements of the built environment with heritage value is a labour-intensive type of activity. Therefore, it has high employment content. According to the ILO, experience has shown that*
- *for the same level of investment in local construction, the use of labour-based technologies can create between **two and four times more employment.***
- *In addition, the use of labour-intensive methods promotes small and medium enterprises, causes the drop of **foreign exchange requirements** by 50% to 60%, decreases **overall cost** by 10 to 30%, and reduces **environmental impacts.***
- *It also implies the increased use of associated local resources. (...) stimulates the local economy.*
- ILO, Dr. Edmundo Werna, EUP Hearing, Brussels 2009 .

# Labour and material relation.



In new building construction, 5 parts are materials and 5 parts are manpower.  
In historic rehabilitation the input consists of 3 parts material and 7 parts manpower.

## The attraction of heritage as Real Estate and Property market.

- Premium real estate prices in the UK are higher the older the buildings on the property are, under condition of a good maintenance level.
- The premium for pre-1919 dwellings was app. 18% and for
- historic homes app. 36% (before 1880) .
- One US study states that *“In no case did historic designation and protection depress property values”* .
- Similar findings many other studies = historic is value added.

## Renovation market.

- In Europe the building stock is both older and makes up a relative larger part of the total market.
- If we just convert the US figures to € we arrive at a possible European figures which we may assume to be in the area of 100 billion €.

## The expect type of works.

- Installation 1 layer windows LowEnergy coating. 34 % reduction.
- Insulation floor against cold basement. 21% reduction.
- Insulation joisting between heated space and cold loft. 8% reduction.
  - 2+ 3 above together = 29% reduction.
- Closing and insulating draught % air leakages. 6.3% reduction.
  - 2+3+4 Same operation = 35% reduction. Add windows = 69% reduction.
- Installation new temperature control system el-heating. 12,5% reduction.

## The expect type of works

- (d) heat pumps
- (c) district or block heating or cooling
- (a) decentralised energy supply systems based on energy from renewable sources;
- (b) cogeneration;
- (c) district or block heating or cooling, particularly where it is based entirely or partially on energy from renewable sources;
- (d) heat pumps.
- (e) Small scale hydro electricity, pellets, wood etc.

## *The expect type of works.*

- Also works of general maintenance importance. General renovation & refurbishment
- Education and training of skills (EU priority).
- Works that feed the supply chain:
  - forestry and wood trade, masonry and brick production,
  - restoration of windows, some production also.
  - local transport etc.

## ***Consequences of type works.***

- More use of local resources.
- Consequences for demographic spread of population.
- Consequence for cultural landscapes and landscape management.
- Consequences for total energy accounting; Low carbon economy
- Consequences for environment globally (refer windows case).
- More salaries than investments.
- Jobs create more local commercial activity, more cross cutting and diversified employment and higher tax income.
- Jobs cannot be exported, income remain in local economy.

Figures from 2009.

## Figures Germany

	Millionen €	% altbaute	Altbaute n Millionen €
Deutsche markt		n	€
Umsatz konstruktionsmarkt	32 249,60	60	19 350
Specialised construction works:	22 706,60	90	20 436
Demolition	3 060,2	90	2 754
umsatz in solaranlagen, wärmepumpen	5 761	60	3 457
			<b>45 996</b>

These are present figures. If we include potential for energy efficiency work as given  
In this presentation we can increase turnover (umsatz) here with 3 651 million-

# Jobs

- This work in Germany will generate over 91.250 jobs per year, or over the whole period of work some 3,74 million jobs or for the total EU 1.259 million jobs.
- The added turnover in Germany from intensive historic energy improvements can easily exceed € 3 651 million pr year. An increase of almost 10%.
- The economic benefits from tourism and the preferences in the real estate market argue for the sensibility of retaining historic visual environments. And these historic environments are non renewable resources.
- The opening for such an approach is open through art. 6. Of the Energy Efficiency regulations:
- *“Member States shall encourage, in relation to buildings undergoing major renovation, the consideration and taking into account of high-efficiency alternative systems, as referred to in Article 6(1), in so far as this is technically, **functionally and economically** feasible.”*

END.