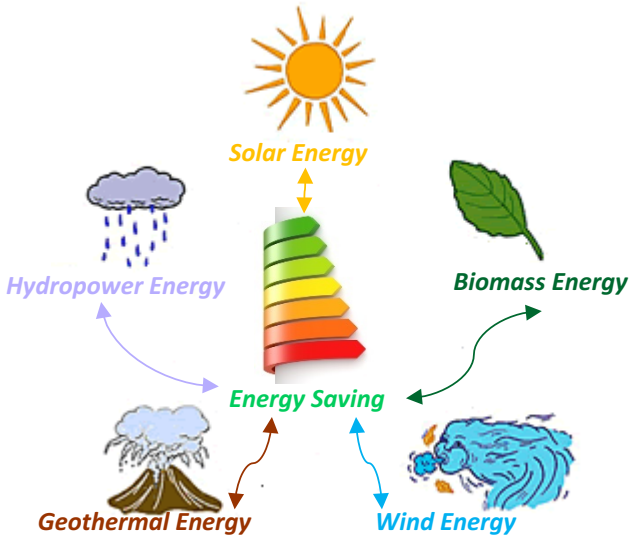
The role of innovation in skills and processes in reducing energy renovation costs



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Making the Negawatt dream a global reality

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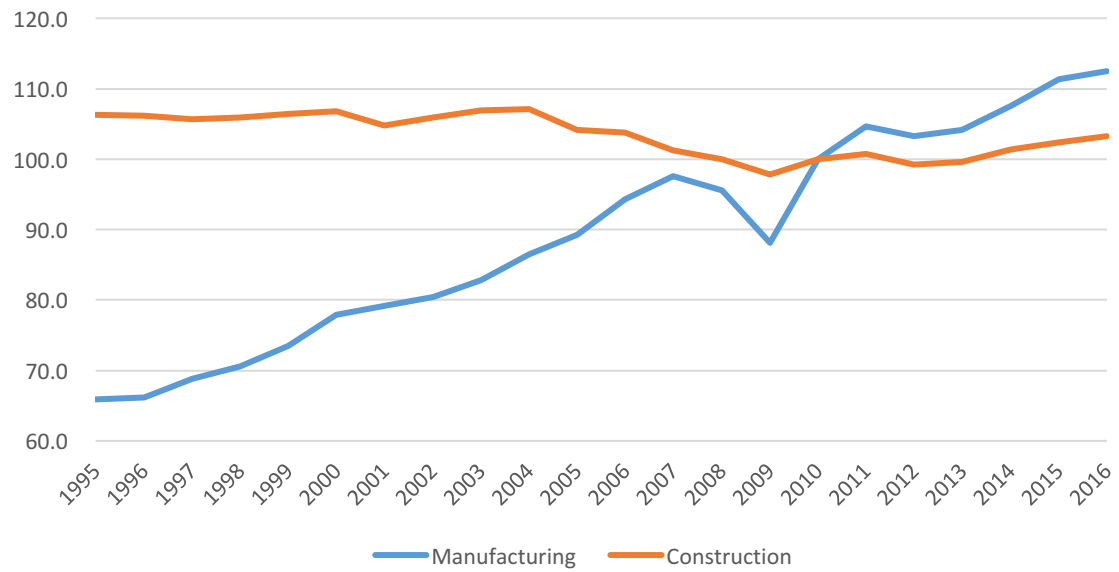
State of the art

Current industry practices lead to:

- Unaffordable energy renovation costs
  (Average energy renovation cost is at €1,200/m² which is equivalent to the cost of new buildings in some MSs)
- Unacceptable duration of on-site intervention
  (On average, more than 6 months are needed to fully renovate a home)
- Making Europe lagging behind other economies in terms of innovation
  (The first 3D printing building was delivered in Dubai in May 2016)
- Locking Europe in carbon and energy inequality
  (The rate and the depth of energy renovation put Europe at risk of missing its Climate and SDG targets)

Energy renovation is an innovation opportunity for the construction industry

Gross value added per person employed at constant price (2010=100)



Productivity in manufacturing has nearly doubled while in the construction sector it remained almost flat over the period 1995-2016

Areas for industry–led productivity improvement

Item	Action	Cost reduction
I-Design and Engineering	1-Holistic engineering • Improve design process and outcomes • Ensure early collaboration from all parties involved in design	8%
	2-Use of BIM • Invest in a chief digital/tech/innovation office and team • Make 3D BIM universal • Use digital collaboration and mobility tools on portable devices	8%
II- On-site execution	Smarter on-site logistics • Introduce rigorous integrated planning • Implement collaborative performance management • Mobilize projects effectively • Collaborate to reduce waste and variability	8%
III- Technology	1-Use of modules/kits	4%
	2-New material	5%
	3-BAT equipment	4%
	4-Integration of RE	3%

Areas for industry and policy-led productivity improvement

Item	Action	Cost reduction
IV-Capacity building	Dedicated well skilled teams • Build an apprenticeship model • Develop frontline training • Ensure knowledge retention and management	6%
V-Collaboration and contracting	1-Better industry collaboration	4%
	2-Business models	2%
VI- Procurement and management	1-Economy of scale	9%
	2-Industrialisation • Encourage repeatability of design across projects	9%
Sub-total Industry and Policy-led cost reduction		20%
Sub-total Industry-led cost reduction		50%
Total cost reduction		70%

Industry and policy-led productivity improvement

Improving industry productivity could reduce renovation costs by at least 70%

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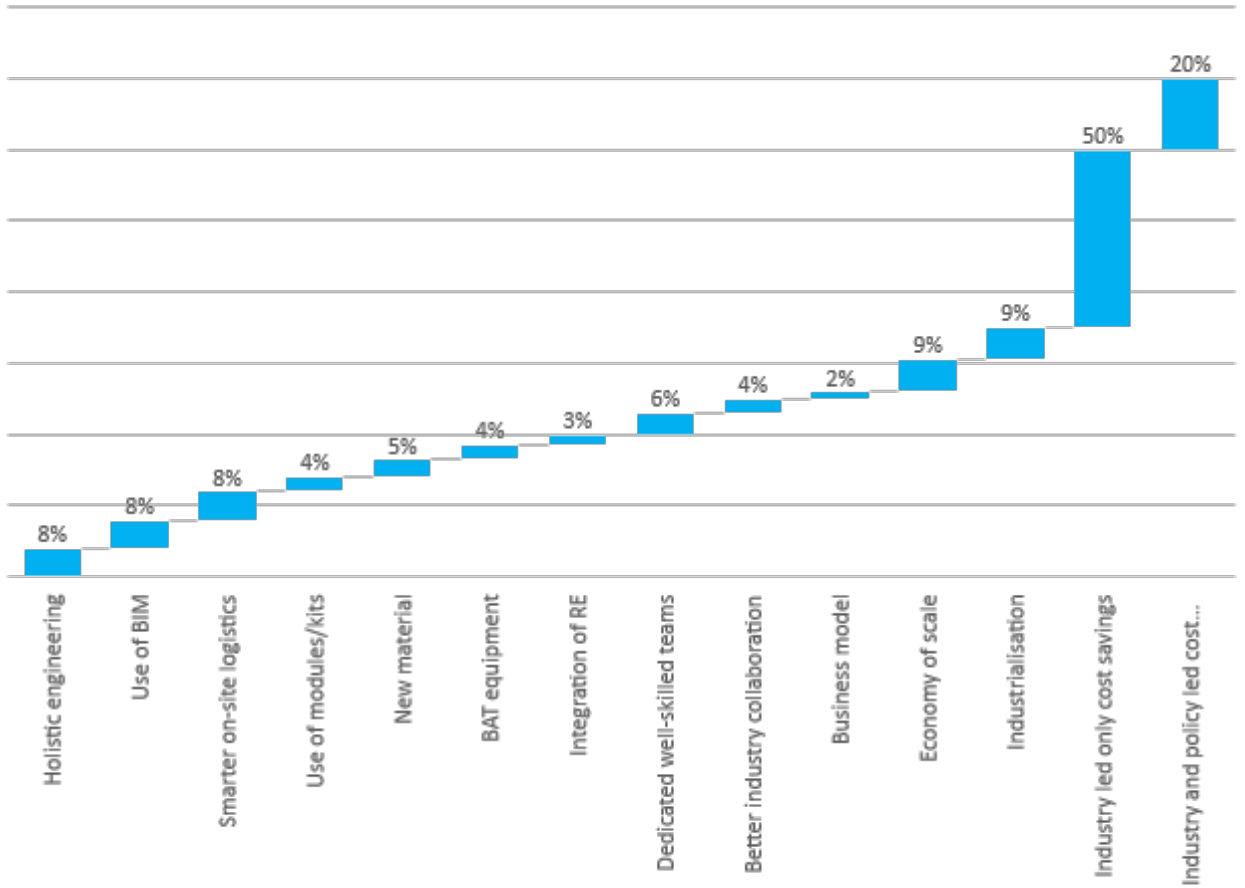
Energy renovation cost reduction cascade



50% of energy renovation cost is due to low productivity of industry while 20% of energy renovation cost is due to the combined inefficiency of industry and policies

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Concluding remarks

- Energy renovation should be considered an industrial project for Europe and an innovation opportunity for the construction industry.
- Improving the productivity of the construction sector is FIRST the duty and the responsibility of the industry.

But industry will modernise/innovate only if:

- Policies are clear about the ZEB target to achieve each time a building is renovated.
- Public finance is used only to support buildings renovated at ZEB consumption level and at an affordable cost (€300/m²).