



# Building Renovation:

A kick-starter for the EU recovery



The Study was prepared by



## TABLE OF CONTENTS

Table of Contents .....	2
Executive Summary.....	3
1. Introduction.....	4
2. Impacts of the buildings sector on the job market.....	5
Employment effects of investing in building renovation .....	7
Country-level findings .....	8
3. Health and productivity benefits.....	10
Offices .....	10
Hospitals .....	10
Homes.....	10
4. Summary table .....	11
5. Conclusions.....	14
6. References .....	15

## EXECUTIVE SUMMARY

The BPIE has carried out this Study at the request of the Renovate Europe Campaign at a time when the topic of energy renovation seems to be on everyone's lips. The request was made following the realisation that an overview of recent research on the job creation and macro-economic benefits of energy renovation in the EU has not been compiled in almost 6 years. The findings are encouraging, in the sense that much research has taken place at all levels – national level, European level and global level – and that the stimulus effect of investing in energy renovation is great.

This makes this short Study a valuable contribution to the debate on how and where to spend the large funds that are being mobilised to help the EU and its Member States recover from the economic impact of tackling the COVID-19 pandemic.

### Key findings

In its review of 35 research reports, the BPIE highlights the following main findings:

#### *On jobs and economic impact:*

- For every €1 million invested in energy renovation of buildings, an average of 18 jobs are created in the EU. These are local, long-term jobs that will stimulate economic activity across the EU
- The number of jobs created per €1 million invested varies across the EU depending on national circumstances and employment cost. The Study reports that those numbers are: Croatia, 29; Estonia, 17; Finland, 16; Italy, 15 and Spain, 18
- At national level, the Study found that it costs an average of €14,000 to create a job in construction in Spain, whilst in the same country it costs €20,000 to support an unemployed worker. In addition, for each €1 of public money spent on energy renovation, the Spanish government gets €0.62 in return within one year, mainly via taxation.

#### *On macro-economic benefits by building segment:*

- Holistic, energy efficient renovation of office buildings increases productivity by about 12% leading to a potential benefit of about €500 billion to the economy per year
- Well-designed and executed energy renovation of hospitals reduces the average patient stay by about 11%, producing potential savings of about €45 billion per year to the healthcare sector
- For homes, it was found that in France medical costs of about €930 million per year are linked to poor quality housing. If we include the indirect consequences of such ill-health (absenteeism, lower productivity etc.), poor quality housing could be costing the French economy as much as €20 billion per year.

The clear message that comes from this Study is that investing in the energy renovation of our building stock is a very rewarding choice. It brings personal benefits, societal benefits and economic benefits. It is now up to each Member State of the EU to include energy renovation of our building stock in their Recovery and Resilience Plans so that the promised renovation wave can be successfully rolled out to the benefit of all.

## 1. INTRODUCTION

As the world faces the COVID-19 crisis and its consequences, governments are discussing economic measures and stimulus packages to recover from the economic effects of the pandemic. In its response, the European Union must not drift from its objective of achieving carbon neutrality by 2050. A transformative approach in our economic and social systems is needed to recover from the dramatic consequences of the crisis and equip ourselves for the fight against climate change. The buildings sector plays a crucial role in this transition and the planned Renovation Wave must become an engine of Europe's economic recovery plan. The European Green Deal acknowledges that the buildings sector is a key pillar for growth: the EU building stock needs an extensive upgrade to provide healthy and affordable living and working conditions, fight climate change and lift millions of Europeans out of energy poverty.

According to the European Builders Confederation,<sup>1</sup> the construction sector is currently experiencing a decline in private and public demand for new construction, renovation and maintenance of buildings and infrastructure: a recent survey amongst construction companies estimates an average expected loss in construction activity between 20% and 25% for both 2020 and 2021 as compared to 2019, for a total of almost 3 million jobs. Stimulating the demand for energy renovation is therefore critical to relaunch these activities and limit the impact of COVID-19, especially for micro-enterprises and SMEs. By introducing measures to trigger building renovation and sustainable construction, the European economic recovery plan has the potential to support EU citizens in the aftermath of the COVID-19 pandemic and provide opportunities in a period of negative economic growth and high unemployment,



whilst driving the EU towards its carbon-neutral future. An increase in renovations would have a direct impact on employment in all Member States. To achieve our climate and energy targets, energy renovation rates should triple and aim at transforming our building stock to nearly zero-energy buildings. It has recently been confirmed that the EU annual average energy renovation rate is stuck at 1%, with deep energy renovations accounting for only 0.2-0.3% of the renovated floor area<sup>2</sup>. Without a strong intervention in favour of energy renovation, these numbers risk decreasing even further in the coming years.

This Study provides an overview of the impact of building renovation on job creation and other selected benefits, like health and productivity. It is based on **analysis of 35 studies** assessing the economic potential of renovating and upgrading energy performance in the EU and beyond.<sup>3</sup> Some studies quantify direct and indirect jobs; others provide only a figure, but the explanation of whether it refers to direct jobs, total jobs or net jobs is not always available. For this reason, data sets have not been directly compared as their comparability depends on the methodology, the geographical coverage (national, EU or global), the applied definition of jobs and which segments of the renovation value chain are accounted for in each study. The Summary Table in Section 4 outlines all relevant data collected through this study.

---

<sup>1</sup> <https://www.ebc-construction.eu/2020/04/30/european-recovery-fund-joint-declaration-with-the-requests-for-the-construction-sector/>

<sup>2</sup> [Comprehensive study of building energy energy buildings in the EU \(Navigant, Ipsos Belgium, 2019\)](#)

<sup>3</sup> A detailed analysis of the methodology used in each study is beyond the scope of this short analysis and will not be discussed.



**The review contained in this study highlights that, on average, for every €1 million invested in upgrading the building stock 18 jobs will be created.**



Most of these jobs are local and non-transferable. Differences among Member States are noticeable: low employment costs and productivity result in higher numbers in Central and Eastern countries (e.g. 29 jobs created per €1 million invested in Croatia) and lower numbers in other countries (average of 17 jobs generated per €1 million invested in Estonia, 16 in Finland, 15 in Italy). The analysis also shows that investing in building renovation can have other benefits on public budgets, like increasing revenues from income taxation, corporate taxation and VAT, reduced expenditures linked to unemployment benefits, and lower direct and indirect health costs.

## **2. IMPACTS OF THE BUILDINGS SECTOR ON THE JOB MARKET**

Micro, small and medium-sized enterprises (fewer than 250 employees) make up 99.9% of the European construction sector. In the EU, micro-enterprises account for the biggest share of the sector (94.1%) and make up the larger share of the sector's total employment.<sup>4</sup>

Data from Eurostat (2019) shows that the construction industry employs around 13.4 million people (manufacturing is not included) in the EU27. Most workers in the construction sector work in SMEs with fewer than 50 workers.

The role of the buildings sector in employment depends on the structure of the national economy, but the Joint Research Centre (JRC) estimates that the economic and financial crisis of 2008-2011 led to employment losses in the buildings sector of 30-40% in most Member States.<sup>5</sup> Similar or worse losses could be expected as a consequence of the economic downturn that will follow the COVID-19 crisis.

According to a recent study published by the European Commission, the workforce employed in the renovation of residential buildings was estimated to be about 4.6 million full time employees (FTE) per year on average in the period 2012-2016. In the same period, the estimated workforce employed in the energy and non-energy renovation of non-residential buildings was around 1.9 million FTE per year.<sup>6</sup>

The study does not account for jobs generated in manufacturing and highlights the need for additional workforce if renovation rates and depths increase in the next few years. A detailed breakdown per EU country (including the UK) is presented below.

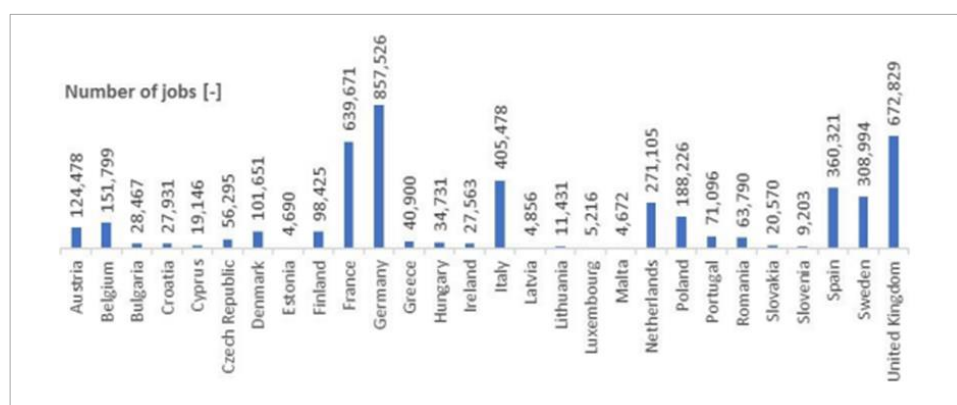


<sup>4</sup> <https://www.ebc-construction.eu>

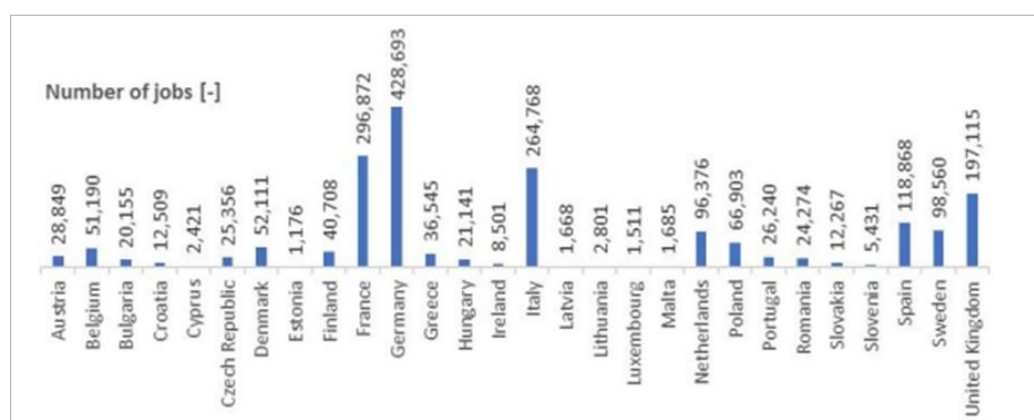
<sup>5</sup> Energy Renovation: The Trump Card for the New Start for Europe (JRC, 2015)

<sup>6</sup> Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU (Navigant, Ipsos Belgium, 2019)

**Table 1 Workforce employed in the renovation of residential buildings, average for the period 2012-2016**  
(Source: Navigant, Ipsos Belgium 2019)



**Table 2 Workforce employed in the renovation of non-residential buildings, average for the period 2012-2016**  
(Source: Navigant, Ipsos Belgium 2019)



The construction sector value chain is quite complex, as it includes a broad range of actors: raw materials suppliers, construction companies, material and equipment manufacturers, consulting and energy services, like energy auditors or architectural and engineering companies. When considered in its entirety, this represents around **8.2% of the EU's GDP and around 10% of its total employment.**<sup>7</sup>

Assessing the potential for job creation in the buildings sector is not a straightforward task, as this impact depends on which segments of the value chain are considered. The section below presents the main findings of a selection of the studies reviewed. Some provide an average of jobs created per €1 million invested, others in FTEs or total additional jobs per year. Where available, a breakdown between direct, indirect and induced jobs is also reported.

<sup>7</sup>The European Construction Value Chain: Value Chain (The Vienna Institute for International Economic Studies, 2017)

Should the rate of energy renovations across Europe triple as required to achieve a highly energy efficient and decarbonised building stock by 2050, the demand for skilled workers in the construction sector would also increase dramatically, with positive impacts on employment.



**New skills will be required and new types of jobs can be created**, with rising demand for digital skills (linked to technology innovation, data mining, data management, and the progressive implementation of the EU digital strategy<sup>8</sup>), construction/renovation project management to coordinate local demand and supply, prefabrication and on-site installation, management and consulting services (linked to the design and execution of renovation packages joined with new financial and fiscal schemes), sales and distribution. Looking at the full array of jobs connected with building construction and renovation, the range of skills required spans from highly skilled, technical and innovative jobs to more traditional low-skilled jobs.

### **Employment effects of investing in building renovation**

A study carried out for C40 Cities in 2019 (based on 132 global sources) estimates that overall job creation in the renovation of residential buildings, offices and schools ranges between 13 and 28 jobs per €1 million invested, with an estimated median of 18 jobs. This range is aligned with several studies published in the past few years, including EEIF's assessment (average of 19 new jobs for

every €1 million spent on energy efficiency upgrading<sup>9</sup>) and a paper published by NEUJOBS (a research project financed by the European Commission under the 7<sup>th</sup> Framework Programme), which determined an average of 12 to 17 new jobs per €1 million invested. The paper used data from several studies from different European countries (Germany, France and the UK, among others) and the US.

The C40 analysis also considers that 33% of these jobs would be direct (created as result of the intervention, e.g. on-site construction), 52% indirect (manufacturing jobs) and 15% induced (jobs created in the adjacent neighbourhood, such as a local coffee shop).

Even if some individual country studies show higher numbers (e.g. total 29 jobs per €1 million invested in Croatia<sup>10</sup>, 42 in Poland), based on the high number of sources included in the C40 study, **the calculated range of 13-28 jobs per €1 million invested (with 18 jobs as a median) is considered an accurate and comprehensive estimation of the potential job creation of building renovation for the EU.**



<sup>8</sup> <https://ec.europa.eu/digital-single-market/en/content/european-digital-strategy>

<sup>9</sup> How Many Jobs? A Survey of the Employment Effects of Investment in Energy Efficiency of Buildings (EEIF, 2012)

<sup>10</sup> Of which 11.5 direct, 9.5 indirect and 8 induced.

## Country-level findings

In addition to impact estimations for the EU or at global level, the review highlighted some interesting findings from studies conducted at national level. **The studies underline different impacts that the buildings sector has on national job markets and confirm the positive effects of renovation on public finances.** A selection of these findings is presented below.

### Germany

A recent study on the workforce needs to achieve the planned energy transformation in buildings<sup>11</sup> stresses how the country is facing a shortage of qualified workers necessary to modernise the building stock. The study concludes that to achieve the CO<sub>2</sub> reduction target of 80% by 2050 by delivering an “almost climate-neutral building stock”, an additional investment of 75% compared to current investments in buildings would be required, and that this would generate a total of 673,900 jobs in 25 years (Table 3). A breakdown of the employment effect on the HVAC sector is also provided.

**Table 3 Direct and indirect employment effects of building renovation to achieve 2050 target on construction industry**

Employment creation (in # jobs)	2015	2020	2025	2030	2035	2040
Direct effects	64,028	73,726	92,341	83,298	80,933	72,903
Indirect effects	28,322	32,611	40,845	36,845	35,799	32,247
<b>Total</b>	<b>92,35</b>	<b>106,337</b>	<b>133,187</b>	<b>120,143</b>	<b>116,733</b>	<b>105,15</b>
HVAC	22,153	21,531	19,701	17,331	15,951	14,965

Another study, focusing on the effect on employment of increased renovation of the building envelope to achieve Germany’s 2050 objectives,<sup>12</sup> shows that almost 400,000 employees are involved in the building envelope industry (planning and installation) in Germany, 180,000 of them in new construction and 215,000 in renovation. The employment potential to achieve the 2050 targets amounts to 283,185 additional jobs, 67,696 in new construction and 215,489 in renovation (Table 4).

**Table 4 Employment potential to achieve 2050 objectives linked to building envelope**

Column1	New construction	Renovation	Total
Single family homes	12,648	124,008	136,656
Apartment buildings	55,048	91,481	146,529
<b>Total</b>	<b>67,696</b>	<b>215,489</b>	<b>283,185</b>

### Spain

It is estimated that the public contribution required to create a job in building renovation (between €13,500 and €14,500 per job) would be 27-33% cheaper than the annual cost in unemployment benefits for each jobless worker (€19,991 on average)<sup>13</sup>. Just in 2018, these savings would amount to around €416 million, as 69,500 jobs were created in the buildings construction sector, according to Instituto Nacional de Estadística.<sup>14</sup> Public resources used to stimulate investment in energy renovation produce an annual average return of around 62% to Spanish national treasuries through taxes, either directly (VAT) or indirectly (for example through increased collection of social contributions from the new jobs created).



### Italy

A 2014 study looked at the Ecobonus system, a tax deduction programme allowing 65% of renovation costs to be recovered through tax credits over a period of 10 years. It found that, if all the eligible areas were insulated in the period 2014-2023, a total investment of €116.6 billion would be needed, and it would help to create over 1.7 million jobs (174,000 jobs per

<sup>11</sup> Wirtschaftliche Bedeutung der Gebäudehülle im Wohnungsbau (FIW, 2016)

<sup>12</sup> Fachkräftebedarf für die Energiewende in Gebäuden (Prognos, 2018)

<sup>13</sup> La rehabilitación de edificios como motor de crecimiento y empleo (CEOE, 2014)

<sup>14</sup> <https://www.ine.es/jaxiT3/Tabla.htm?t=4128>



year).<sup>15</sup> More recent estimates published by the Italian national agency for energy efficiency (ENEA) and the research centre of the House of Representatives<sup>16</sup> indicate that the investments activated by building renovations and energy renovations under the scheme provided an annual average of over 250,000 jobs in 2011-2018, a number increasing to 378,000 if indirect jobs are also considered.<sup>17</sup> This is particularly important for a sector that saw over 550,000 jobs lost in the decade 2008-2018. The agency also estimates that, on average, an investment of €200,000 can create two direct employees and one indirect.

**Table 5 Incentivised renovation investments  
- Effects on direct and indirect job creation  
(2011-2018)**

Year	Total renovation investments (M €)	Direct jobs	Total jobs (direct and indirect)
2011	16,716	166,361	249,541
2012	19,209	191,166	286,749
2013	27,957	278,226	417,340
2014	28,457	283,200	424,800
2015	25,147	250,266	375,399
2016	28,243	281,075	421,613
2017	28,106	279,709	419,564
2018	28,587	284,497	426,745
Total	202,422	2,014,500	3,021,751
Avg/year	25,303	251,813	377,719

(Source: Servizio Studi Camera dei Deputati, 2018)

The recent changes announced to the scheme by the Italian government to overcome the COVID-19 impact on the economy are also expected to have a positive effect on employment. The measures increase the tax deduction for building renovations to 110% and allow the transfer of this “fiscal credit” from homeowners to third parties with sufficient fiscal debt, including banks. It is anticipated that these changes will boost the energy renovation market in the country. The National Association of Buildings Construction

foresees a positive spill-over effect of €21 billion (against €7 billion invested by 2023).

### France

As with previous countries, several studies published between 2017 and 2020 show the positive economic impact of energy renovation in France: it is estimated that the deep renovation of 7,4 million energy-inefficient dwellings (class F-G) by 2025 would create 126,000 net full-time equivalent jobs over the period 2017-2025 and a long-term net employment generated through increased households’ purchasing power of 18,000 FTE<sup>18</sup>. The Institute of Climate Economics reports that energy renovation in residential buildings represents a market worth €29 billion and more than 200,000 jobs (FTE) and advocates for an increase in public investment in seven key economic areas, including the renovation of residential and tertiary buildings, to trigger the post-COVID economic recovery. An increase in public financing from €1,9 billion to €2,1 billion per year for the renovation of residential buildings would trigger €16,1 billion in investments per year. For the tertiary sector, an increase in public financing from €0,5 billion to €1,3 billion per year would trigger €2.9 billion in yearly investments<sup>19</sup>.



<sup>15</sup> Valutazione della convenienza e dell’impatto economico dell’isolamento termo-acustico degli edifici (CRESME, 2014)

<sup>16</sup> Il recupero e la riqualificazione energetica del patrimonio edilizio: una stima dell’impatto delle misure di Incentivazione (Servizio Studi Camera dei Deputati, 2018)

<sup>17</sup> 65% fiscal deductions for energy renovation of existing buildings (ENEA, 2018)

<sup>18</sup> Coûts et bénéfices d’un plan de rénovation des passoires énergétiques à Horizon 2025 (SiaPartners, 2017)

<sup>19</sup> Investir en faveur du climat contribuera à la sortie de crise (Institut de l’économie pour le climat, 2020)

### 3. HEALTH AND PRODUCTIVITY BENEFITS

The positive effects of buildings renovation on health are widely recognised co-benefits in the scientific community. However, the actual economic impact of these benefits is not often quantified. Understanding the magnitude of these impacts is even more important in light of the current crisis and the effects that increased time spent indoors may have on our health and productivity. Some examples of the economic benefits associated with improved indoor environmental quality, such as the savings for healthcare systems due to reducing the length of stay in hospitals and the value of productivity increase, are summarised below. They cover three types of buildings: offices, hospitals, and residential buildings.

#### Offices

A third of European employees work in an office and companies spend around 90% of their operating costs on staff. Poor indoor environmental quality can significantly affect occupants' health, attendance, concentration and working or learning performance. A BPIE study from 2018 highlights how **a holistic, people-centric renovation** (guaranteeing adequate ventilation levels, air temperature, daylight and acoustics) **of a typical office can result in up to a 12% increase in employee productivity. At a European scale, this would lead to a productivity increase worth up to €500 billion annually.**

#### Hospitals

The same study shows that providing adequate indoor environmental quality in hospitals can **reduce the average length of stay by around 11%.** Considering the EU27 average cost of a hospital bed per day, the number of beds



<sup>20</sup> Health service costs include the costs of health services and the costs of medicines. Labour costs include losses

available and the EU average rate of occupancy of hospitals, this would amount to **€110-150 million in daily savings, or around €40-50 billion savings per year.**

#### Homes

Concerning the economic impact of renovation in residential buildings, two studies conducted in France and Spain show how addressing poor housing quality by investing in renovation could result in considerable health and labour cost savings.



#### France

In France, a study on the costs and benefits of renovating 7,4 million energy-inefficient dwellings (class F-G) by 2025 estimates that it would result in €758 million in annual savings for the healthcare system, including €666 million in avoided public healthcare costs funded through social security and €66 million in private contributions. The same study reports that direct medical costs linked to poor housing amount to €930 million per year. Indirect costs (including absenteeism at work or school, productivity losses, grade retention) amount to up to €20 billion per year (almost 22 times more than direct costs).

#### Spain

In Spain, the Catalonia institute of Energy Research examined the economic impacts of energy renovation on people's health and concluded that renovating 1.5 million dwellings (built between 1960-1980) considered to be at risk of energy poverty would save the public administration €370 per household per year (€150 per household in health services costs, €220 in labour costs<sup>20</sup>). This would lead to a total €555 million saved annually by the Spanish public administration.

associated with temporary incapacity to work (counted only for persons under 65).

## 4. SUMMARY TABLE

The main facts and figures regarding the economic impacts found in the literature are summarised in Table 6. and classified according to the source they belong to, country/region covered, year and type of

impact (job market, health or other).The sources' numbering is provided in the references section, with the purpose of saving space and simplifying the overview.

Table 6 Summary of key findings in literature review

SOURCE No.	COUNTRY/ REGION	YEAR	TYPE OF IMPACT	FACT
2	Global	2019	Jobs	Overall job creation ranges between <b>13 and 28 jobs</b> (direct, indirect, induced) per €1 million invested.
2	Global	2019	Jobs	In the renovation sector, it is estimated that <b>33%</b> are <b>direct jobs</b> , <b>52% indirect</b> and <b>15% induced</b> .
7	EU	2019	Jobs	Jobs in building renovations, residential and non-residential (average 2012-2016): 8.52 FTE per €1 million spent.
19	EU	2012	Jobs	<b>19 jobs</b> created per €1 million invested in energy efficiency renovation (direct and indirect).
4	EU28	2012	Jobs	Investment opportunities from energy efficiency renovations in EU MS can <b>increase jobs by 760,000 – 1,480,000 people</b> and bring benefits to GDP of €153-291bn (depending on level of investments). These benefits come from increased revenue from income taxation, corporate taxation, and VAT, and from reduced outlay on unemployment benefits (consequence of increased activity and employment). Not permanent benefits, but “one-off” benefit from stimulating activity in a period of economic underperformance.
8	EU28	2016	Jobs	Impact of measures in Policy Option II: Increase market of EU industry (mainly insulation and flat glass) by €23.8bn at EU level in 2030; create a renovation market for SMEs (value between €80bn and €120bn); <b>about 220,000 retained/created jobs</b> from the reference scenario in 2030. EU additional energy-related activity (roof insulation, windows replacement, building system upgrade, etc.) for construction sector estimated at approx. €47.6bn. Impact of measures in Policy Option III: Increase market of EU industry (mainly insulation and flat glass) by €30bn at EU level in 2030;

				create a renovation market for SMEs (value between €167bn and €250bn); <b>about 500,000 retained/created jobs</b> from the reference scenario in 2030. EU additional energy-related activity (roof insulation, windows replacement, building system upgrade, etc.) for construction sector estimated at approx. €101bn.
21	EU28	2012	Jobs	<b>12 to 17 new jobs</b> created per €1 million invested in renovation.
33	EU and North America	2000-2010	Jobs	<b>Average of 17 jobs</b> created per €1 million invested in building renovation.
22	Croatia	2016	Jobs	Energy renovation projects in Croatia create <b>29 jobs</b> per €1 million invested (11.5 direct, 9.5 indirect and 8 induced). The multiplier of the funds invested in the energy saving renovation of residential and public buildings in Croatia is estimated at 2.5-2.9.
26	Estonia	2014	Jobs	<b>Average of 17 jobs generated</b> per €1 million invested in renovation: 10 on construction sites, 6 in construction material and products manufacturing and 1 in consulting sector. The tax revenue (including VAT and direct and indirect labour taxes) directly attributable to projects is 32–33% of total renovation project cost.
31	Finland	2012	Jobs	<b>16 jobs generated</b> per €1 million invested in renovation: 8 on construction sites, 5 in construction material and products manufacturing and 3 in consulting sector.
17	France	2020	Jobs	Energy renovation in residential buildings represents a market worth €29 billion and more than 200,000 jobs (FTE). An increase in public financing from €1,9 billion to €2,1 billion per year for the renovation of residential buildings would trigger €16,1 billion in investments per year. Increase public financing from €0,5 billion to €1,3 billion per year in renovation of tertiary buildings would trigger €2.9 billion in investments per year.
29	France	2017	Jobs	The deep renovation of 7.4 million energy-inefficient household dwellings (class F-G) by 2025 would create <b>126,000 net FTE jobs over the period 2017-2025</b> and a long-term net employment generated through increased households' purchasing power of 18,000 FTE.



16	Germany	2018	Jobs	<b>397,450 employed in building envelope</b> (design and execution) in Germany: 180,000 in new construction and 215,000 in renovation. <b>Employment potential to achieve 2050 targets: 283,185 additional jobs</b> , 67,696 for new construction and 215,489 for renovation.
27	Germany	2018	Jobs	Additional investment of 75% compared to current investments in buildings would be required to achieve the CO <sub>2</sub> reduction target of 80% by 2050 by delivering an “almost climate-neutral building stock”. <b>Total of 673,900 jobs in 25 years (2020-2045)</b> , spreading between 92,350 and 133,187 additional jobs, depending on the year.
5	Italy	2014	Jobs	Renovating all eligible areas under the 65% tax credit programme (Ecobonus) between 2014-2023 would require an estimated total investment of €116.6bn and help to <b>create over 1.7 million jobs over a 10-year period. 174,000 jobs per year (116,000 direct jobs and 58,000 indirect jobs)</b> .
6, 28	Italy	2018	Jobs	Investments activated by building renovations and energy renovation under the Ecobonus scheme provided an average of over <b>250,000 jobs in 2011-2017</b> , a number increasing to <b>378,000 if considering also indirect jobs</b> .
3	Spain	2014	Jobs	Creating a job in buildings renovation requires 27-33% less public investment than average unemployment benefits. In 2018, that would account for around <b>€416 million of savings to the Spanish public administration</b> . €1 million invested in energy efficient renovation would <b>generate 18 jobs (direct and indirect)</b> .
35	Poland	2012	Jobs	€1 million invested in energy efficient renovation could <b>generate 42 jobs</b> .
25	USA	2016	Jobs	Home weatherisation and commercial retrofits <b>generate nearly 3 times as many jobs as fossil fuel industries for the same level of spending</b> .
20	EU27	2018	Health	Holistic renovation of a typical office can lead to <b>up to a 12% increase in employee productivity</b> . At a European scale, this would lead to a productivity increase worth <b>up to €500 billion annually</b> .

## 5. CONCLUSIONS

The buildings sector is recognised as a core economic activity across Europe. It is also characterised by low levels of innovation and digitalisation. While other sectors have adopted new production and organisation methods, this sector has been slow to adapt to the transition to a low-carbon and digital economy. This is also one of the reasons the sector is so vulnerable to economic downturns. The European Green Deal was presented as the new growth strategy for Europe, with the aim to create a fair and prosperous society and to protect the health and well-being of EU citizens. This will hold true also in the light of the COVID-19 crisis only if the Green Deal and the EU economic recovery plan are designed to kick-start renovation and better adapt the building infrastructure to economic, environmental, and societal challenges.



We have a long horizon ahead, a marathon towards economic recovery and climate neutrality. Increasing and improving building renovation has the potential to become a catalyst for economic recovery. It would unleash a whole set of positive impacts at a macroeconomic level (job creation, higher productivity, reduced health and energy costs, decent living conditions), which would alleviate the negative effects of the COVID-19 pandemic and set the conditions to achieve climate neutrality by 2050. In this context, designing policies to trigger a renovation wave also means to stimulate local economies, create new and better jobs across the value chain and support new services and industries.

It also demands plans for training, upskilling and re-skilling the workforce to prepare them to face the demand for better and higher-



performing buildings. New and better jobs will not materialise spontaneously: they will need to be shaped by combining bold and farsighted policies and investments, and better education, training and upskilling of the existing workforce.

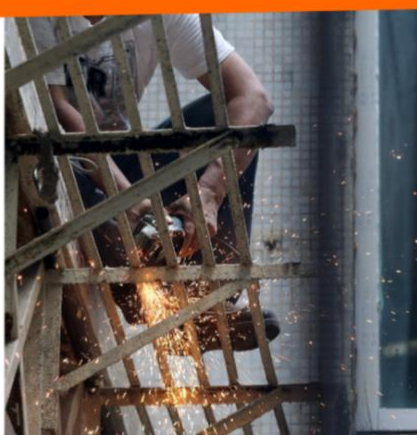
## 6. REFERENCES

1. Alexandri, E., Boonekamp, P., Chewpreecha, U., De Rose, A., Drost, R., Estourgie, L., Farhangi, C., Funcke, D., Markkanen, S., Moret, G., Pollitt, H., Rodenburg, C., Suerkemper, F., Tensen, S., Theillard, P., Thema, J., Vethman, P., Vondung, F. & Voogt, M. (2016) "The Macroeconomic and Other Benefits of Energy Efficiency". Cambridge Econometrics for the European Commission.
2. C40 Cities (2019). "The multiple benefits of deep retrofits: A toolkit for cities"
3. Confederación Española de Organizaciones Empresariales, CEOE (2014). "La rehabilitación de edificios como motor de crecimiento y empleo"
4. Copenhagen Economics (2012). "Multiple benefits of investing in energy efficient renovation of buildings"
5. CRESME (2014). "Valutazione della convenienza e dell'impatto economico dell'isolamento termo-acustico degli edifici"
6. ENEA (2018). "65% fiscal deductions for energy renovation of existing buildings"
7. Esser, A., Dunne, A., Meeusen, T., Quaschnig, S. & Wegge, D. (2019). "Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU." Ipsos Belgium and NAVIGANT for the European Commission.
8. European Commission (2016). "Impact assessment, accompanying the document Proposal for a Directive of the European Parliament and of the Council amending Directive 2010/31/EU on the energy performance of buildings" (Commission staff working document)
9. Eurostat (2017). Construction of buildings statistics - NACE Rev. 2. [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Construction\\_of\\_buildings\\_statistics\\_-\\_NACE\\_Rev.\\_2&oldid=435218](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Construction_of_buildings_statistics_-_NACE_Rev._2&oldid=435218)
10. Eurostat (2017). Manufacturing statistics - NACE Rev. 2. [https://ec.europa.eu/eurostat/statistics-explained/index.php/Manufacturing\\_statistics\\_-\\_NACE\\_Rev.\\_2](https://ec.europa.eu/eurostat/statistics-explained/index.php/Manufacturing_statistics_-_NACE_Rev._2)
11. Eurostat (2017). "Healthcare resources statistics – beds" [https://ec.europa.eu/eurostat/statistics-explained/index.php/Healthcare\\_resource\\_statistics\\_-\\_beds#Hospital\\_beds](https://ec.europa.eu/eurostat/statistics-explained/index.php/Healthcare_resource_statistics_-_beds#Hospital_beds)
12. Ferreira, M., Almeida, M. & Rodrigues, A. (2017). "Impact of co-benefits on the assessment of energy related building renovation with a nearly-zero target, Energy and Buildings" <http://dx.doi.org/10.1016/j.enbuild.2017.07.066>
13. Ferreira, M., Almeida, M. & Rodrigues, A. (2017). "Co-benefits of energy related building renovation - Demonstration of their impact on the assessment of energy related building renovation (Annex 56)." International Energy Agency.
14. Gloser, J., Baker, P., Giustozzi, L., Hanzl-Weiss, D., Merkus, E., Molemaker, R. & Stherer, R. (2017) "The European Construction Value Chain: Performance, Challenges and Role in the GVC." Ecorys for the European Commission.
15. Hepburn, C., O'Callaghan, B., Stern, N., Stiglitz, J. & Zenghelis, D. (2020). "Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?" Oxford Smith School of Enterprise and the Environment. Working Paper No. 20-02 ISSN 232-4214
16. Holm, A. & Maderspacher, C. (2018). "Wirtschaftliche Bedeutung der Gebäudehülle im Wohnungsbau." FIW.
17. Institut de l'économie pour le climat (2020) « Investir en faveur du climat contribuera à la sortie de crise »

18. Instituto Nacional de Estadística (2018). "Encuesta de Población Activa (EPA), Sector Construcción de edificios (41), Valor absoluto"
19. Janssen, R. & Staniaszek, D. (2012) "How many jobs? A Survey of the Employment Effects of Investment in Energy Efficiency of Buildings." Energy Efficiency Industry Forum (EEIF).
20. Kockat, J., Paraskevi, V.D., Volt, J. & Staniaszek, D. (2018). "Building 4 People: Building the business case for better office, school and hospital buildings in Europe." BPIE.
21. Meijer, F., Visscher, H., Nieboer, N. & Kroese, R. (2012). "Jobs creation through energy renovation of the housing stock." NEUJOBS.
22. Mikulić, D., Rašić Bakarić, I. & Slijepčević, S. (2016). "The economic impact of energy saving retrofits of residential and public buildings in Croatia." *Energy Policy* 96: 630-644. 10.1016/j.enpol.2016.06.040.
23. Ortiz, J. & Salom, J. (2016) "Estimación del efecto de la rehabilitación energética en la salud de las personas. Enfoque económico". Institut de Recerca de Energia de Catalunya.
24. Paardekooper, S., Lund, R. S., Mathiesen, B. V., Chang, M., Petersen, U. R., Grundahl, L., David, A., Dahlbæk, J., Kapetanakis, I. A., Lund, H., Bertelsen, N., Hansen, K., Drysdale, D. W. & Persson, U. (2018). Heat Roadmap Europe 4: "Quantifying the Impact of Low-Carbon Heating and Cooling Roadmaps". Aalborg Universitetsforlag.
25. Peltier, H. (2016). "Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model." *Economic Modelling* 61. 10.1016/j.econmod.2016.11.012.
26. Pikas, E., Kurnitski, J., Lias, R. & Thalfeldt, M. (2014). "Quantification of economic benefits of renovation of apartment buildings as a basis for cost optimal 2030 energy efficiency strategies". *Energy and Buildings* 86: 151-160. <https://doi.org/10.1016/j.enbuild.2014.10.004>
27. Seefeldt, F., Rau, D. & Hoch, M. (2018) "Fachkräftebedarf für die Energiewende in Gebäuden." Prognos.
28. Servizio Studi Camera dei Deputati (2018). "Il recupero e la riqualificazione energetica del patrimonio edilizio: una stima dell'impatto delle misure di Incentivazione"
29. SiaPartners (2017). "Couts et bénéfices d'un plan de rénovation des passoires énergétiques à Horizon 2025."
30. Tadeu, S.F. (2015) "Rentabilidade da reabilitação energética de edifícios - Cost optimality of energy retrofit of buildings". Doctoral thesis in Civil Engineering, Universidade de Coimbra.
31. Vaino, T. (2012). "Rakentamisen yhteiskunnalliset vaikutukset", Asiakasraportti, VTT, Espoo.
32. Zamora, B. (2012). "Strategic Intelligence Monitor on Personal Health Systems, Phase 2 -Interim Report on Impact Assessment State of the Art and Justifications. Impact assessment final report." Joint Research Centre.
33. Zámečník, M. & Lhoták, T. (2016). "Analýza ekonomických nákladů a přínosů renovace a adaptace budov na změnu klimatu" (Analysis of economic costs and benefits of renovation and adaptation of buildings to climate change). Prosinec.
34. Ürge-Vorsatz, D. (2010) "Employment Impacts of a Large-Scale Deep Building Energy Retrofit Programme in Hungary."
35. Ürge-Vorsatz, D., Wójcik-Gront, E., Herrero, S.T., Labzin, E. & Arena, D. (2012). "Employment Impacts of a Large-Scale Deep Building Energy Retrofit Programme in Poland."



## NOTES



# Building Renovation:

## A kick-starter for the EU recovery

---



@Renovate Europe



@RenovateEurope

*Renovate Europe is a political communications campaign with the ambition to reduce the energy demand of the EU building stock by 80% by 2050 through legislation and ambitious renovation programmes. Accelerating the rate of renovation is a key tool in the fight against climate change, and will deliver major benefits for people, their quality of life, and the economy.*

**#PrioritisePeople**  
**#AccelerateRenovation**

[www.renovate-europe.eu](http://www.renovate-europe.eu)



The Study was prepared by

