4. A Social Pact for the Energy Transition

by Sofia Fernandes

The Energy Union seeks to adopt a holistic approach to the energy transition (see chapter 1.). However, it does not yet feature a strong social dimension that would grant decision-makers and citizens the necessary visibility and enable a better understanding of these issues, thus paving the way for determined action to rise to the challenge and garnering the popular support needed to make a just energy transition.

There are numerous social challenges associated with the energy transition.[293] The energy transition profoundly transforms the entire economy and modifies the labour market. New "green" jobs are created in the renewable sector as well as in energy efficiency. Some existing jobs are redefined and require upgrading of workers' skills. Other jobs are destroyed, notably in the fossil energy sectors and in industries with high greenhouse gas (GHG) emissions. Questions arise as to the support to be offered to the workers concerned, their training needs and the quality of new jobs. The challenge is to maximise the quality job-creating potential of the energy transition while mitigating its negative impact. This is imperative to ensure the "just transition" envisaged by the Paris Agreement.[294]

The social impact of the energy transition goes well beyond repercussions on employment. All Europeans are affected as citizens and consumers. Cleaner energy, coupled with a reduction in energy consumption, helps reduce air pollution and contributes to the improvement of citizens' health. The energy transition also offers consumers the opportunity to better manage their energy consumption and/or produce their own energy, thus reducing their energy bill. Finally, the energy transition—which must be inclusive—represents an opportunity to lift more than 50 million Europeans out of energy poverty.

293. For a definition of the energy transition, see the introduction.
294. Preamble of the Paris Agreement (December 2015) in which the signatories committed themselves to take "into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities".

Putting these issues at the heart of the Energy Union is, of course, primarily a question of social justice. The success of the energy transition will be put into question if workers are "left behind" or if the most vulnerable are excluded from the gains it promises. But adding a social dimension to the Energy Union is also justified on economic and political grounds. In a context of high unemployment, especially among young people, it is essential to fully exploit the potential for job creation in emerging sectors, just as it is crucial to make sure that the transition will not plunge some European regions into economic decline, a major source of structural unemployment. Finally, the nationalist surge across the continent underlines the fact that the EU has not sufficiently addressed questions surrounding the political sustainability of its structures and policies. The EU must overcome its elitism and refashion itself as a popular project at the service of the peoples of Europe. Within the framework of the Energy Union, the social dimension is an essential component underpinning the project's political sustainability and its ownership by as many stakeholders as possible which, in turn, is a prerequisite for the success of the energy transition.

The opportunities and challenges facing Europe's workers, citizens and consumers must therefore rank high on the agenda of the Energy Union. The latter comprises five key dimensions to which a sixth must urgently be added: the "Social Pact for the Energy Transition" that will tackle the social challenges of the transition.[295]

This chapter presents an outline of such Social Pact that will ensure the energy transition is a just transition, and not just a transition. It is structured in two parts. The first is devoted to workers; it analyses the impact of the energy transition on employment in Europe (4.1.1.) and presents the main course of action able to meet the challenges of the energy transition (4.1.2. to 4.1.4.). The second part looks at citizens/consumers and stresses from the outset that it is crucial to emphasise and take full advantage of the opportunities afforded by the energy transition, notably in terms of public health (4.2.1.) and increases in purchasing power through better management of energy consumption (4.2.2.). Then, the issue of energy poverty in Europe is broached. The energy transition represents a unique opportunity to eradicate this phenomenon in Europe (4.2.3.). The concluding section summarises the recommendations for establishing a Social Pact for the Energy Transition".

295. The five closely related areas on which the Energy Union project is based are: (i) energy security, solidarity and trust; (ii) internal energy market; (iii) energy efficiency; (iv) decarbonisation of the economy; (v) research, innovation and competitiveness.

4.1. A just transition for workers: reducing insecurity and maximising opportunities

For wider society to rally behind the energy transition, it is not only the environmental benefits—which are sufficient in themselves—that are highlighted but also the economic and social advantages it brings, and in particular its positive impact on job creation. Presented at the end of 2016, the European Commission's communication on "Clean Energy for all Europeans" illustrates this point: among the arguments for a more ambitious energy-efficiency target for 2030 (a 30% increase instead of 27%) it singles out the creation of 400,000 additional jobs.[296]

Numerous studies have been carried out to assess the job-creating potential of the energy transition, which naturally depends on the political resolve with which this transition is implemented and the level of public and private funding attached to it (see chapter 3.). Despite these uncertainties, we know that the energy transition leads to the creation of jobs in new emerging sectors, but it also entails job losses and restructurings in the fossil-energy and high GHG emissions sectors. The impact of the energy transition on the labour market is not limited to the sole quantity of jobs; the quality of the new jobs is just as important.

This chapter first offers an overview of the opportunities and challenges of the energy transition for the European labour market (4.1.1.). On this basis, the key employment-related features of the Social Pact that should be at the heart of the Energy Union will be outlined: the aim must be to boost the employment potential of the energy transition and to anticipate the attendant risks in order to mitigate them, while ensuring an equitable sharing of the inevitable costs of this process (sections 4.1.2. to 4.1.5.).

4.1.1. The impact of the energy transition on employment in Europe

In this section, we present some elements that allow for a better grasp of the job creation potential of the energy transition (4.1.1.1.) and the challenges the reduction of carbon emissions poses for carbon-intensive sectors and regions that are heavily dependent on these activities (4.1.1.2.).

296. European Commission, *Clean Energy for All Europeans*, 30 November 2016, p5

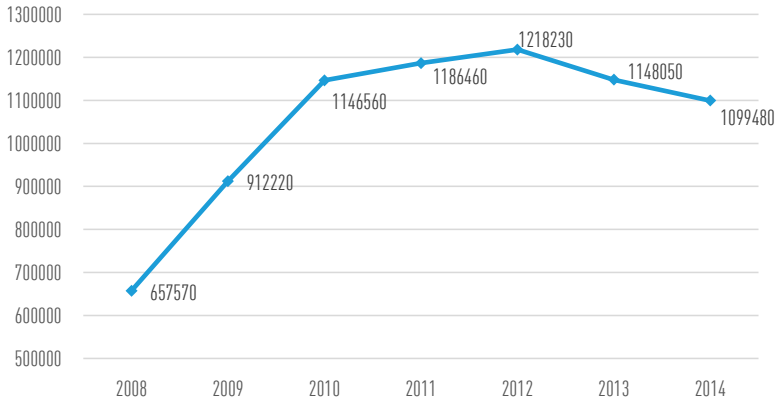
4.1.1.1. Renewable energies and energy efficiency: what potential for job creation?

Among the objectives of the Energy Union, the development of renewables and the improvement of energy efficiency are synonymous with creating new jobs and redefining existing ones.

A 2012 European Commission working paper estimated that by 2020 the development of renewable energies could create up to three million jobs, with gains in energy efficiency adding or maintaining another two million jobs.[297]

In recent years, employment trends in the renewable-energy sector highlight the job-creation potential of the energy transition: according to EurObserv'ER data, between 2008 and 2014, the number of jobs in renewable energy has increased by almost 70% (figure 1). There were more than one million jobs directly or indirectly linked to renewable energies in the EU in 2014.

FIGURE 1 ► Employment figures in the renewable-energy sector in the EU 27 (2008-2014)



Source: EurObserv'ER database (for the period 2008-2013); EurObserv'ER, The State of Renewable Energies in Europe, 15th annual overview barometer 2015 (for the year 2014)

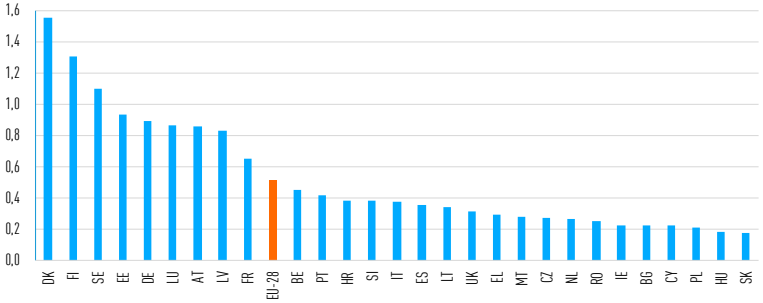
Despite this spectacular increase, the target of 3 million new jobs by 2020 will not be met for employment in renewable energies has been noticeably contracting since 2012. Even though part of this downturn can be attributed to

297. European Commission, *Exploiting the Employment Potential of Green Growth*, SWD (2012) 92, 18 April 2012, p8

structural factors (such as the shrinking photovoltaic sector where the production of solar panels is increasingly being relocated to China), cyclical factors play a more important role, according to the 2015 EurObserv'ER barometer. In the midst of a financial and budgetary crisis, the majority of Member States have decided to reduce investments in renewable energy, with predictably negative effects on employment in the sector.[298] By contrast, the US and Chinese governments have implemented stimulus packages that significantly increased investment in the renewables sector (see 4.1.4.1.).

Employment in renewables is unevenly distributed across the EU (figure 2). In the EU-28, jobs in renewable energies accounted for 0.52% of total employment in 2014, with a much higher share in some Member States. The Nordic countries have the highest proportion of workers in the renewables sector (the figure for Denmark, Finland and Sweden stands at 1.55%, 1.3% and 1.1% respectively). In the case of Finland and Sweden, these figures are the consequence of a highly developed biomass industry, whereas in Denmark, wind energy makes up almost 75% of renewable-energy jobs (the Danish company Vestas is the world leader in wind power). In southern and central European countries, the employment share of renewables is lower.

FIGURE 2 ► Jobs in renewable energies in the EU in 2014 (direct and indirect jobs as share of total employment)

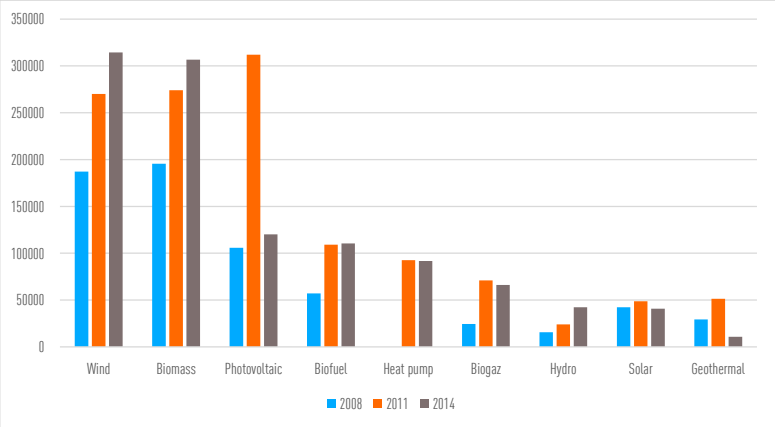


Source: Author's own calculations based on Eurostat data (for total employment figures) and EurObser'ER, The State of Renewable Energies in Europe, 15th annual overview barometer 2015 (for job numbers in the renewable-energy sector).

298. There are exceptions to this general tendency of employment figures in the renewable-energy sector to fall in the wake of the crisis, as the available annual EurObserv'ER data show. In the UK, Luxemburg and Malta, they have risen by 90 %, 130% and 500 % respectively between 2011 and 2014.

Of the different sources of renewable energy, wind and biomass boast the highest employment figures across the EU (with more than 300,000 jobs each), which rose significantly between 2008 and 2014 (as opposed to employment in photovoltaics which contracted sharply between 2011 and 2014).

FIGURE 3 ► Total employment in renewable energy by technology in the EU-27 by energy source



Source: Data available in EurObserv'ER's 9th, 12th and 15th annual barometers of the state of renewable energies in Europe. * For heat pumps the data are for 2012 and 2014

In addition to renewable energies, energy efficiency is a source of new jobs, while redefining existing jobs, especially in construction (renovation and insulation of buildings for example). A study by *Cambridge Econometrics* published at the end of 2015 estimates that in 2010 "jobs in energy efficiency" amounted to more than 900,000 in the EU-28.[299] If calculated as a share of total employment, these jobs represent 0.44% of employment in the EU as a whole. Unlike the situation for renewable energies, the countries of Central Eastern Europe have higher employment ratios in energy efficiency than the EU average (due to poor insulation in most of these countries).

299. *Cambridge Econometrics*, Assessing the employment and social impact of energy efficiency, November 2015, p7. This study defines "employment in energy efficiency" narrowly as "employment in firms whose principal activity is the supply of goods and services for which the main motivation for purchase by the customer is to save energy".

TABLE 1 ► Total estimated employment in the production of energy-efficiency-related goods and services in EU countries in 2010

	NUMBER OF JOBS	% OF TOTAL EMPLOYMENT
CZ	31 000	0.64
MT	1 000	0.62
EE	3 000	0.55
IT	119 000	0.54
HU	20 000	0.54
SI	5 000	0.53
BG	16 000	0.53
PL	79 000	0.52
SK	12 000	0.52
RO	43 000	0.52
LT	6 000	0.49
HR	8 000	0.49
DE	179 000	0.48
LV	4 000	0.48
PT	22 000	0.48
LU	1 000	0.46
FI	11 000	0.46
AT	17 000	0.43
SE	18 000	0.41
ES	72 000	0.39
BE	17 000	0.38
IE	7 000	0.38
FR	94 000	0.37
EL	15 000	0.35
DK	9 000	0.34
UK	93 000	0.33
NL	26 000	0.32
CY	1 000	0.26
EU-28	929 000	0.44

Source: *Cambridge Econometrics, Assessing the employment and social impact of energy efficiency,* November 2015, p41.

The impact of improved energy efficiency will not be limited to "employment in energy efficiency" (whether new or redefined jobs). The study adds that if we use a broader definition of "employment in energy efficiency", which includes companies whose goods and services can potentially bring energy savings (even if they are not purchased primarily to this end), the number of jobs in energy efficiency would rise to 2.4 million. Moreover, as the European Commission has pointed out, goods and services that improve energy efficiency also have important spill-over effects on employment across the economy through multiplier effects induced by changes in prices and income—the "double dividend". For example, reducing the energy bills of households through greater energy efficiency will allow them to spend a larger share of their income on other goods and services.[300]

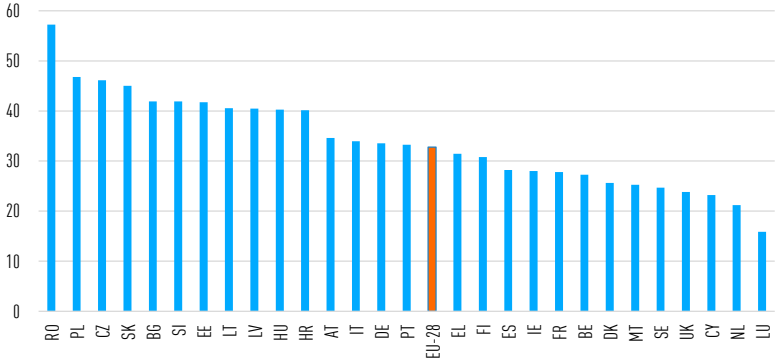
In conclusion, there are more than two million jobs in the EU in renewables or energy efficiency. According to the Commission's "Clean Energy for All Europeans" package, there is a potential to create an additional 900,000 jobs by 2030 (of which 400,000 in energy efficiency), provided that—public and private—investment is sufficiently mobilised (see chapter 3.).

4.1.1.2. Redefined jobs and job losses related to GHG emission reductions

If the energy transition creates a significant number of jobs, there are also sectors suffering from job losses or in which existing jobs are being redefined. The main sectors concerned are those with a high carbon intensity: energy production and manufacturing (accounting for 26% and 19% of GHG emissions in the EU, respectively), agriculture (12%), transportation (11%) and construction (11%, including other services).[301] These sectors were responsible for almost 33% of total EU employment in 2015, or about 70 million workers (see figure 4). The share of employment in the most polluting sectors differs considerably between EU countries. These jobs make up 57% and 47% of total jobs in Romania and Poland, respectively, compared to 16% in Luxembourg and 21% in the Netherlands. The rate is well above the EU average in all Central and Eastern European countries.

300. European Commission, *Employment in Europe 2009*, October 2009, p117
301. Eurostat data for 2014

FIGURE 4 ► Employment in sectors with high GHG emission as a percentage of total employment in 2015



Source: Author's calculations based on data from Eurostat's European Labour Force Survey (LFS).

However, in terms of employment, the transition to a low-carbon economy does not impact all polluting industries in the same way (see box 1). In agriculture, transport and construction, it is above all a matter of transforming existing jobs, or even creating new ones, rather than enduring job losses. The risk of job destruction exists primarily in the energy and manufacturing sectors. Fossil fuel-based energy production and extraction are gradually giving way to renewable energies.

BOX 1 ► Key employment trends in the carbon-intensive sectors resulting from the energy transition

- **Energy:** the shift from fossil-fuel-based power generation to renewable energy will entail job losses in sectors dependent on the use of fossil fuels such as coal mining and in the supply chains in the oil industry, but will create new jobs in other sectors;
- **Transport:** the transition from fossil fuels to electric power should not have a negative impact in terms of jobs. Still, the structure of this sector may profoundly change if autonomous vehicles are used more widely (affecting drivers' jobs) and consumers increasingly abandon the ideal of individual car ownership (affecting employment in car manufacturing);
- **Agriculture:** the development of biomass and more environmentally friendly agriculture (which is more labour intensive) represents an opportunity in terms of job creation;

- **Construction:** the objective of increased energy efficiency (specifically that of buildings) positively impacts employment in this sector.
- **Energy-intensive industries:** the impact on employment may be negative if (A) the sector is exposed to international competition and (B) public policies (notably in the guise of the European emissions trading scheme) raise production costs significantly compared to other regions in the world without offering any form of compensation. To ensure the competitiveness of industries at risk of relocation due to the costs of climate policies, the EU has already put in place measures intended to prevent "carbon leakage".

Source: European Commission, *European semester thematic fiche - Green jobs: employment potential and challenges*, 2015.

Coal mining exemplifies the difficulties encountered by these sectors. In 2015, the coal industry directly employed 185,000 workers in the EU, compared to more than 240,000 in 2012, a drop of more than 20% over the course of three years. This decline is partly attributable to the decline in European coal production, which is in turn related to falling coal consumption in Europe, the increasing automation in the sector and the changing dynamics of global trade.[302]

92% of coal mining jobs in the EU are concentrated in five states: Poland (54%), Germany (13.6%), the Czech Republic (9.7%), Romania (8.1%), Bulgaria (6.3%). OECD data show that the costs of adjustment are distributed unevenly across regions because the coal industry is highly geographically concentrated (the geographic concentration index is highest in Poland and the Czech Republic).[303] In some European regions coal mining companies are still among the biggest employers. The gradual reduction of these activities or, in some cases, their complete dismantling are severely affecting the regions concerned.

302. British Petroleum, *Statistical Review of World Energy 2016*, 65th edition, June 2016
303. OECD, *The jobs potential of a shift towards a low-carbon economy—final report for the European Commission*, Paris, 4 June 2012, p48

TABLE 2 ► Number of persons employed in the coal industry in the EU in 2012 and 2015

	2012	2015	CHANGE 2012—2015
PL	128 000	99 498	-22%
DE	34 200	25 068	-27%
CZ	22 000	18 000	-18%
RO	21 000	15 042	-28%
BG	13 000	11 765	-10%
EL	7 500	4 919	-34%
UK	5 800	1 975	-66%
SK	3 700	2 190	-41%
ES	3 400	3 324	-2%
HU	2 100	1 655	-21%
SI	1 600	1 274	-20%
EU	240 600	185 000	-23%

Source: Euracoal, Coal industry across Europe, 6th edition, 2017

In manufacturing, the industries where internal transformations are more likely to result in job losses are those that fit two cumulative criteria. Firstly, energy represents an important part of their production costs and the increase in energy costs is therefore large enough to significantly impact the cost of production. Secondly, these industries are exposed to global competition and consequently this increase is likely to put imported products at an advantage.

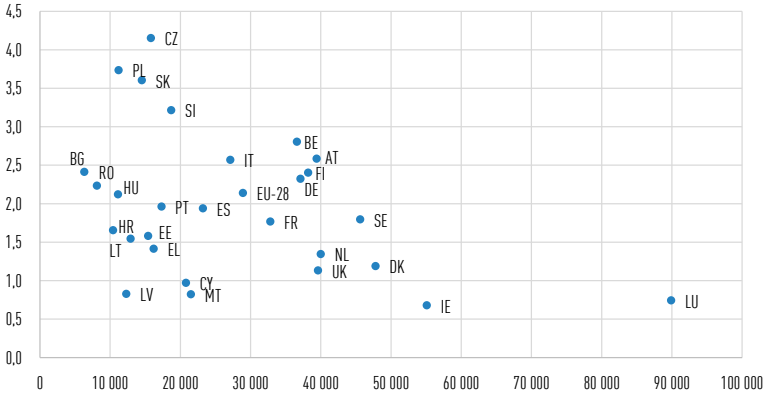
Several studies have shown that the key energy-intensive industries subject to a significant degree of global competition are metallurgy (iron, steel and aluminum), the paper and pulp industry, and the chemical and non-metal industry (cement and glass).[304] A global approach to the energy transition (see chapter 1) nevertheless also requires us to see the gains the energy transition holds in store for these industries. The deployment of wind turbines increases the demand for steel and correspondingly creates jobs in this sector. The same applies to the demand for aluminum, which goes up as measures to limit CO_2 emissions from vehicles encourage manufacturers to use lighter materials

304. Manfred Bergmann, Andreas Schmitz, Mark Hayden and Katri Kosone, "Imposing a unilateral carbon constraint on energy-intensive industries and its impact on their international competitiveness—Data and analysis", Economic papers n° 298, European Commission, December 2007

(such as aluminum or certain synthetic materials). Thus, a sector-by-sector study should take into account not only the costs but also the benefits of the transition resulting from higher demand for certain production-types.

Figure 5 shows the employment share of the sectors most likely to experience job losses as a result of the energy transition (the above-mentioned energy-intensive industries and the mining sector). This indicator is related to the per capita GDP of each country. The graph illustrates that some Central and Eastern European countries with per capita GDP levels below the EU average are particularly vulnerable to the risk of job losses due to the energy transition (the Czech Republic, Poland, Slovakia, Slovenia, Bulgaria and Romania) insofar as the employment share of the sectors in question is higher than the EU average.

FIGURE 5 ► Employment in the mining, chemical, metallurgical, non-metallic products, paper and pulp sectors as a percentage of total employment in 2015 and GDP per capita at current prices in 2015 (Euro)



Source: Author's own calculations based on Eurostat database.

The OECD has emphasised that, within the EU, the relative concentration of the sectors most likely to suffer job losses in countries with relatively low per capita GDP (see figures 4 and 5) goes hand in hand with a concentration of eco-innovation in some higher-income countries (notably the Nordic countries and Germany), suggesting that the labour market costs and benefits associated

with the energy transition may be unevenly distributed across countries—and potentially in a regressive manner.[305]

4.1.2. Turning a challenge into an opportunity: how to anticipate and organise the adjustment in sectors/regions at risk from job losses

In 2010, the EU Employment Committee published a report presenting four possible scenarios for a "greening of the labour market". The most pessimistic outlook is characterised by net job losses, as large job losses in the polluting sectors would not be offset by the creation of new jobs in the "green" sectors. The more optimistic scenario, in turn, is based on successful "green growth", with "carbon leakage" at manageable levels (notably through efficient energy technologies and greener production methods in the traditional sectors) and net job creation[306].

Depending on the policies pursued, the EU will move toward a more or less favourable scenario. As the OECD stresses, one of the peculiarities of the structural change associated with the energy transition is that the latter is largely driven by government policies (which is not the case, for example, for other transitions induced, to name but one example, by the revolution in information and communication technologies). Hence the importance of anticipating and organising the adjustments in sectors and regions threatened by job losses and responding to them through public action.

This implies a holistic approach that integrates the different public policies as presented in the chapter 1. As proposed in the chapter 2., the EU must assert an innovation-based industrial policy to address the adjustment issues of certain sectors. Regional policy must also address the problems faced by regions affected by the accumulation of various restructuring effects. Social and employment policies must facilitate the adjustment process by avoiding structural unemployment, guaranteeing the adequate supply of skills required for new jobs and making sure the inevitable costs are shouldered in an equitable manner.

305. OECD, *The jobs potential of a shift towards a low-carbon economy—final report for the European Commission*, Paris, 4 June 2012, p46
306. For further information on the four scenarios: Employment Committee, *Towards a greener labour market— The employment dimension of tackling environmental challenges*, Final report adopted by EMCO on 10 Novembre 2010, p7

4.1.2.1. Limiting, offsetting and spreading job losses over time

As far as the transformation strategy for sectors / regions that are potentially disadvantaged by the energy transition is concerned, three necessary steps can be outlined: i) anticipate change; (ii) organise and steer the process of change; (iii) provide accompanying social measures (see 4.1.3.).[307]

The first step is to identify the sectors / regions at greatest risk. It is necessary to evaluate the extent of the challenge facing these sectors and regions on the basis of research and data analysis and to conceive a transition towards a more environmentally and socially sustainable local economy. To the extent that the energy transition is not just passively endured but actively steered by national governments and European institutions, the process of anticipating and planning for change must go hand in hand with the definition and implementation of energy targets.

Thus, the best responses to the challenges facing the different sectors/ regions concerned can be identified and promoted. These responses will include (i) the adoption of measures to limit and spread over time the destruction of jobs; and/or (ii) the adoption of measures to compensate for job losses—measures that will be inevitable if the regions concerned are to not find themselves in a situation of economic decline, which would (in addition to its disastrous economic and social consequences) undermine citizens' support for the energy transition and could lead to a further rise of nationalism in Europe.

Job losses resulting from the pursuit of the target for GHG emission reductions could be reduced if major technological and behavioural changes were introduced into the production process to reduce the negative environmental impact of carbon-intensive industries (for example by developing economically viable technologies for carbon capture and storage, switching from fossil fuels to renewables or using "low-carbon" cement from waste recycling).[308] While this change often depends on the individual choices of private actors, these choices can and should be encouraged by public authorities. For example, an important part of the reorientation from fossil fuels to renewable energy sources now

307. GHK, The Impacts of Climate Change on European Employment and Skills in the Short to Medium-Term: A Review of the Literature Final Report, vol. 2, May 2009, p2
308. OECD, *The jobs potential of a shift towards a low-carbon economy—final report for the European Commission*, Paris, 4 June 2012, p78

takes place in large energy companies (e.g. electricity companies) where management is committed to retraining its workforce.[309]

BOX 2 ► The social pillar of the CARS 2020 action plan for the European automotive industry

The objective of the action plan for the automotive industry presented by the European Commission in 2012 is to have contributed to the strengthening the EU automotive industry by 2020. This action plan builds on the vision of a competitive and sustainable industry for 2020 and proposes concrete measures to be taken on issues relating to emissions, research funding, electromobility, road safety, new skills, smart regulation, trade negotiations and international harmonisation. The action plan includes four pillars, including a social one aimed at anticipating adaptation and mitigating the social impact of industrial adjustment processes. The social pillar features a series of initiatives:

- to encourage the use of the European Social Fund (ESF) for retraining and the upgrading of skills
- to identify good practises and to promote a proactive approach to restructuring based on consultations with representatives from the regions where the automotive sector plays an important role, labour offices and industry representatives
- to embolden, in the case of plant closures and significant cuts to the workforce, Member States to consider using the European Globalisation Adjustment Fund (EGF)

The European Commission is currently working on non-legislative and legislative proposals for the transport sector. These proposals, to be presented in the summer/autumn of 2017, should allow for a timely update of this 2012 plan.

Source: European Commission, *Action plan for the EU automotive industry in 2020,* Memo 12-845, 8 November 2012

The action plans presented by the Commission on the future of several industrial sectors (CARS 2020, Construction 2020), which set out the priorities for action in terms of investment and innovation funding, proposals for the revision of European regulations or measures to mitigate the social impact of industrial adjustments, illustrate the key role the EU has to play in this area (see box 2). It is necessary to draw lessons from these initiatives and examine in which other sectors such an approach could yield promising results. This could happen in conjunction with the establishment of a European industrial policy for the energy transition within the framework of the European Commission's "Clean Energy Industrial Forum".[310]

Despite these advances, a major restructuring of various economic sectors and/or regions will take place. It is important to organise this process at

309. OECD, *Ibid*, Paris, 4 June 2012, p109
310. European Commission, *Clean Energy for All Europeans*, COM(2016) 860, 30 November 2016

regional and local level, for example by arranging a gradual and orderly cessation of mining activity in order to spread over time the measure's impact on local employment and thus to better accompany workers, allowing for professional and/or geographical mobility.

When significant reductions in employment are anticipated in certain regions, it is essential to envisage a deep restructuring to reposition these regions and to put them on a sustainable socio-economic development path. This has already happened in the past and it would be useful to draw the lessons learned from these past experiences. In 2016, the Foundation for European Progressive Studies (FEPS) published a study looking at three successful cases of regional (Bilbao in Spain and the region of North Rhine-Westphalia in Germany) and sectoral (coal in the UK) restructuring.[311]

The anticipation and planning of restructuring therefore requires an ability to identify new sectors that will compensate for the loss of economic activity and the jobs cuts resulting from the decline of certain sectors. Denmark offers a good example: the development of wind power came to replace the fledgling shipyard industry.

BOX 3 ► Bilbao—a case of successful restructuring

Bilbao is one of the most successful examples of a deep transition. In the 1970s, the industrial structure of Bilbao was dominated by large manufacturing industries (steel, shipbuilding and mechanical engineering). The city suffered severely from the economic crisis of the 1970s, which resulted in a sharp increase in unemployment between 1975 and 1985. The city's economic and social plight was compounded by the considerable environmental damaged wrought by the local concentration of polluting industries.

Yet the region, which would have needed urgent action, was only restructured at the end of the 1980s. In 1991, the "Strategic Plan for the Revitalisation of Metropolitan Bilbao" was adopted, creating two agencies whose task was to facilitate and manage change: "Bilbao Metropoli-30" and "Bilbao Ría 2000". The plan's objectives comprise: (i) urban renewal, (ii) environmental response, (iii) the strengthening of cultural identity and (iv) the development of a knowledge-based high-tech sector. The Spanish government agreed to shoulder the costs of industrial relocation and has paid for early retirement schemes for workers over 50 years of age. The Basque government was for its part entrusted with the task of rebuilding the city by developing new sectors of activity. Industrial employment fell sharply from 48% of total employment in 1975 to 22% in 2005. However, the unemployment rate fell

311. Sanjeev Kumar, Arianna Americo and Charlotte Billingham, *The new social contract: a just transition*, Foundation for European Progressive Studies, 2016

from 25% in the 1980s to 11% in 2004 and the number of jobs in the metropolitan area rose from 267,000 in 1995 to 380,000 in 2005.

Source: Sanjeev Kumar, Arianna Americo and Charlotte Billingham, *The new social contract: a just transition*, Foundation for European Progressive Studies, Brussels 2016

4.1.2.2. Bringing the social partners and local authorities to the fore

Anticipating and planning change should follow a bottom-up approach for it is the actors closest to the companies and workers concerned that must be the drivers of the transition. The energy transition must be based on efficient cooperation between local authorities and the trade unions, insofar as there is a popular consensus on the need for the energy transition (see chapter 1.).

The FEPS study on the successes of regional and sectoral restructuring highlights three common features of the transitions analysed.[312]

The first is the need for a break with the past in order to undertake a transition process that will take a long time (one or two decades, perhaps even more). To this end, it is essential to get the social partners on board so they can have their say on the sectoral action plans and/or regional restructuring in order to find a compromise between the needs of traditional industries and the need for renewal.

A second common feature among the three restructurings is the need for political consensus and ownership of the transition by political leaders. This is especially important for regional and local leaders who are accountable to the local population. Since the transitions take many years, it is necessary to "depoliticise" the transition plans in order to ensure a degree of continuity between governments.

Finally, there must be a clear sharing of responsibilities among the different actors. Regions need to focus on transformation, whereas national governments and the EU should concentrate on measures supporting the sectors affected by job losses. The FEPS study foregrounds the importance of the EU Structural and Cohesion Funds for financing the transition.

312. See Sanjeev Kumar, Arianna Americo and Charlotte Billingham, *Ibid*

4.1.3. Supporting those "left behind" by the transition and ensuring an equitable sharing of the inevitable costs

4.1.3.1. Reducing the insecurity resulting from job losses and the redefinition of jobs

In its 2015 communication on the Energy Union, the European Commission argues that "an energy transition that is just and fair will therefore require re-training or up-skilling of employees in certain sectors and, where needed, social measures at the appropriate level."[313]

Guidance and social support measures are essential to avoid or at least mitigate the negative social consequences (in particular an increase in structural unemployment) of sectoral/regional adjustments linked to the transition to a low-carbon economy. This must take the form of adequate income replacement benefits coupled with an effective activation of the recipients of these benefits. It must be ensured that the flows of workers from declining companies to firms with growth potential will be undergirded by income security and training schemes for new jobs. This is an essential precondition for achieving the desired reallocation of workers while defusing potential opposition to energy transition policies.

BOX 4 ► Programmes to support workers in the German coal mining sector

As late as the 1950s, the coal mining sector employed more than 500,000 workers in Germany. By 2007, their number had plummeted to 33,000. In 2015, there were only 10,000 jobs in coal mining left. The drastic reduction in employment in this sector was cushioned by a package of social measures, which ensured the continued cooperation of trade unions and attenuated structural unemployment in the regions most dependent on coal mining.

In the 1960s, Germany introduced compensatory payments and transitional subsidies for workers affected by job cuts. These includes two types of support:

- "Financial adjustment aid" (Anpassungsgeld), which is available to workers in coal mining who have lost their jobs and who are over 50 years of age. On average, the aid amounts to about 13,500 euros per year and is paid for five years (in 2015, a total of 116 million euros was spent on this financial aid).
- "Adjustment allowance" (Anpassungsbeihilfe), aimed at helping younger workers to move to other sectors of employment. This allowance covers training, travel and relocation costs.

Source: Sabrina Schulz and Julian Schwartzkopff, "Instruments for a managed coal phase-out—German and international experienes with structural change", *Briefing paper,* E3G, July 2016

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313. Communication from the European Commission, *A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy*, COM(2015) 80 final, 25 February 2015, p17

In order to provide the most appropriate response to workers affected by the transition, it is useful to look closely at their individual profiles. In spite of the great heterogeneity of situations, studies—in particular those conducted by the OECD and the European Commission—show that low-skilled and/or elderly workers are overrepresented in many energy-intensive sectors (although there are exceptions such as the electricity and chemical industries).[314]

This may complicate the transition, as empirical research has established that low-skilled and older workers face above-average transition costs, resulting in longer periods of unemployment and a loss of earnings when they return to work.[315]

The question is whether targeted programmes are needed to provide additional support to workers most severely impacted by the energy transition. This could take many forms. For the transitions in Bilbao (see box 3) and North Rhine-Westphalia, to name but two examples, plans for early retirement have been introduced as social support measures.

4.1.3.2. For the creation of a European Energy Transition Adjustment Fund

At EU level, the Commission should propose the establishment of a European Energy Transition Adjustment Fund. This fund would help Member States and local authorities to finance training, retraining, support and entrepreneurship measures for workers who have lost their jobs as a result of major structural changes brought about by the energy transition (the Commission could derive lessons from what has been done in 2006 for the "losers" of globalisation with the creation of the European Globalisation Adjustment Fund (EGF), see box 5). As early as 2011, the International Labour Organisation suggested expanding the scope of the EGF to include adjustment processes arising from the "greening" of the economy.[316] In addition to the economic arguments for such an instrument, there are considerations of equity: it would be unfair for the whole population to reap the benefits of the energy transition when the adjustment costs are borne only by a small minority of workers.

The Energy Transition Adjustment Fund could be financed by revenue from the EU Emissions Trading Scheme (EU ETS). The European Parliament has recently put forward a resolution which goes in this direction, stating that

314. OECD, *The jobs potential of a shift towards a low-carbon economy—final report for the European Commission*, Paris, 4 June 2012; European Commission, "Exploiting the Employment Potential of Green Growth", SWD (2012) 92, 18 April 2012
315. OECD, *Ibid*, p50
316. International Labour Organisation, *Towards a greener economy: the social dimensions*, 2011

"Member States should also address the social aspects of decarbonising their economies and use auction revenues to promote skill formation and reallocation of labour affected by the transition of jobs in a decarbonising economy".[317] Failing this, it could be financed by the EU budget, as is the case today with the EGF (see box 5).

BOX 5 ► The European Globalisation Adjustment Fund

The European Globalisation Adjustment Fund (EGF) was created in 2006 to help workers who have lost their job as a result of globalisation-related major structural changes in international trade (e.g. when a large company outsources its production to non-EU parts of the world) or in the wake of the global economic and financial crisis. The GEF co-finances projects that include measures such as jobseekers' assistance, vocational guidance, financial aid for studies, training and retraining, coaching and mentoring, entrepreneurship and setting up a business.

In general, the EGF can only intervene when more than 500 workers have been laid off by a single company (including its suppliers and downstream producers) or when a large number of workers are laid off in a particular sector in one or more neighbouring regions.

The Union may co-finance up to 60% of the cost of the reinsertion into the labour market of workers made redundant. The EGF has a very small budget, amounting to no more than 150 million euros per year. In practice, the first demand came from France on 9 March 2007 and concerned 1345 redundancies among Peugeot subcontractors who lost their jobs due to increased competition, particularly from Asia, in the market for small cars. Since then, the Commission has received 148 applications for EGF co-financing from 21 Member States for a total amount of nearly 600 million euros, to help 138,888 dismissed workers and 2,944 unemployed persons who do not receive any education or training (NEET). The three sectors receiving the most EGF funding are: (i) automotive manufacturing, (ii) computer products and electronic components, and (iii) machinery and equipment.

Source: European Commission, Employment, Social Affairs and Inclusion.

4.1.4. Maximising the job creation potential of the energy transition

If the energy transition holds considerable potential for job creation in the EU, its realisation should not be taken for granted. As a case in point, the expected target of three million jobs in renewables by 2020 will not be reached, not least because of the policy decisions since 2010 (see 4.1.1.).

317. European Parliament, Cost-effective emission reductions and low-carbon investment, adopted on 15 February 2017

4.1.4.1. Providing the necessary investment and promoting innovation

The first condition for maximising the job creation potential is to make the necessary investments in renewable energies and energy efficiency (see chapter 3.). The decline in employment in renewable energy since 2012 has been largely due to investment cuts.

According to the annual report of the United Nations Environment Programme (UNEP), investment in renewable energy fell by 14% in Europe in 2015, while increasing by 17% in China and by 19% in the United States. In 2011, Europe accounted for 44% of global investment in renewable energy. Today it only makes up 17%, compared with 36% for China (see table 3). The Ernst & Young Renewable Energy Country Attractiveness Index is topped by the United States, followed by China and India, as the most attractive locations to invest in renewable energy projects. Of the ten most attractive countries, only two are European: Germany (raking fifth) and France (coming in at seventh place).[318]

TABLE 3 ► Investment in renewable energy (in billions of dollars)

	2011	2014	2015	CHANGE 2014-2015
World	278.5	273	285.9	5%
United States	49.1	37	44.1	19%
Europe	122.9	62	48.8	-21%
China	47.4	87.8	102.9	17%
India	12.8	8.3	10.2	22%

Source: United Nations Environment Programme (UNEP), *Global trends in renewable energy investment 2016,* 2016.

If Europe is serious about creating more green jobs, it must invest more in renewables and energy efficiency. To meet the EU's energy targets for 2030, the European Commission estimates that it is necessary to invest around 379 billion euros each year over the period 2020-2030, mainly in energy efficiency, renewable energy sources and infrastructure.[319] These investments are a significant source of growth, notably for countries in the South that have favourable climatic conditions for the

318. Ernst & Young, *Renewable Energy Country Attractiveness Index*, October 2016
319. European Commission, *Clean energy for all Europeans*, COM(2016) 860 final, 30 November 2016

development of solar energy and where the housing stock is in need of renovation and thermal insulation (see 4.2.).

But if European countries should invest in the energy transition, they also have to set out on their own specialised path in order to remain competitive. The experience of renewable energies in the EU, particularly photovoltaics, has left little doubt as to the stiff competition from China. With a large majority of the solar panels installed in EU countries imported from China, the European priority should not be to recover market share on existing solar panels, but rather to invest in the next generation of solar panels. To this end, industrial and innovation policy proposed in the chapter 2. will be key.

4.1.4.2. Identifying the skills needed for new jobs

Increasing investment and strengthening innovation policy are necessary but not sufficient conditions to maximise the job creation potential of the energy transition. In order to make the most of the dynamic set in motion by the transition to a low-carbon economy—while simultaneously facilitating this transition—it is therefore essential to guarantee a supply of skilled labour and to avoid a skill deficit, which, according to the European Centre for the Development of Vocational Training (Cedefop), is already noticeable in certain sectors in some countries.[320] Additionally, vocational training can help some workers to become innovators within their companies (see chapter 2., particularly the section on intrapreneurship).

The energy transition must have an impact on education and training policies in order to ensure the development and provision of the skills needed for new jobs or those redefined by the demands of a low-carbon economy.

The skills component of the energy transition is centred on two priorities: (i) to better identify and anticipate the skills needs created by the energy transition so that the competent authorities and stakeholders can adapt to change; (ii) to encourage workers to acquire these skills.

For several years now, the EU has initiated various exercises aimed at identifying the skills required for new jobs, whether linked to the energy transition or other challenges such as the digital transition. These include the "EU Skills Panorama"

320. See for instance CEDEFOP, *Green skills and environmental awareness in vocational education and training—synthesis*, Research paper No.24, Luxembourg, 2012, 9: "Some skill shortages persist, particularly for sheet-metal workers, electricians and insulation workers. Germany, Finland and the UK report sizable skill shortages in these occupations".

initiative, which provides an overview of short- and medium-term employment prospects and skills needs at European, national and sectoral level. The latter dimension of this exercise is fundamental and would benefit from greater stakeholder input at the sectoral level, in particular sector skills councils and sectoral skills alliances.

This EU exercise is a good starting point. Yet an exclusive "one size fits all" approach would not be useful given the differences between Member States in terms of business sectors. The Member States must draw on the results of this European exercise to draw conclusions and lessons for their respective labour markets.

In this diagnostic exercise, the introduction of a second element to identify those skills of workers in the declining sectors that are in high demand for new occupations would be salutary. The aim is to maximise the upgrading of skills rather than the acquisition of new skills for workers. This reduces training costs and enhances the skill base of workers who have to retrain.

4.1.4.3. Promoting skills acquisition—towards a "Green Erasmus"?

Once skill needs for new or redefined jobs in the energy transition have been identified, Member States must modify or adapt vocational qualifications and the corresponding education programmes in order to respond to the new demands of the market. Numerous examples of good national practice exist. In Spain, for example, the region of Navarra has seen a sharp increase in the provision of renewable energy training, in particular through the creation of a fully-fledged training centre (box 6).

In order to promote careers in these new jobs, while it is certainly necessary to ensure a match between the supply of training and the needs of companies this by itself is not enough to guarantee that workers will embrace the professional trajectories offered by the transition. Indeed, there are two further challenges.

Firstly, these new jobs remain little known, making it unlikely that a young worker will set out to pursue a career in a profession with which he is unfamiliar. It is therefore urgent—for local and European (by creating greater transnational awareness) rather than national authorities—to communicate better and to furnish more information.

Secondly, there is the issue of the attractiveness of these jobs. As the European Commission has demonstrated, some Member States wanting to develop "green" employment are confronted with the difficulty of attracting young

people to manual jobs with poor working conditions and low wages.[321] European and national authorities should strive, alongside the social partners, to improve the status of these new jobs.

Moreover, several studies indicate that the acquisition of skills in new or redefined energy transition-related jobs would benefit from two developments in the education systems of the Member States: (i) an increase in the number of young students in science, technology, engineering and mathematics (STEM); (ii) the development of vocational education and training (VET) since most countries, the OECD argues, "regard a well-functioning VET system as an essential element for green growth".[322]

An EU initiative that could make a significant contribution to promoting and showcasing energy transition professions would be to put in place a green component of the Erasmus Pro programme, which the Commission announced at the end of 2016 and which, by 2020, will enable 50,000 apprentices and trainees to participate in six- to twelve-month mobility programmes in another Member State. The Commission could allocate part of the funds for this initiative (which will need to be reinforced from 2020 to reach more young people) to mobility programmes aimed at apprentices from sectors that offer training for jobs in the energy transition. This would also have the advantage of encouraging young people to pursue training schemes in growth sectors, which will help reduce youth unemployment in Europe.

Lastly, it is essential to pay particular attention to the training needs of worked employed by SMEs and self-employed workers. The OECD's research has shown that SMEs struggle to upgrade the skills of their workers and to adapt them to the changing employment requirements of the energy transition. Another study on energy efficiency recalls that while there is strong potential for employment in the construction sector due to increased energy efficiency, the workforce may suffer from a skill deficit linked to high rates of self-employment in this sector.[323] This might make it difficult to meet the emerging skill needs and could slow progress towards improved energy efficiency. For example, in response to this challenge, Spain has adopted the "Emplea Verde" program, which aims to create

321. European Commission, *Exploiting the employment potential of green growth*, SWD (2012) 92, 18 April 2012
322. OECD, *The jobs potential of a shift towards a low-carbon economy—final report for the European Commission*, Paris, 4 June 2012, p96
323. *Cambridge Economics*, *Assessing the employment and social impact of energy efficiency*, November 2015, p93

1,000 new "green" companies and to train 50,000 workers that are either self-employed or employed by SMEs.[324]

BOX 6 ► The Navarre experience: expanding the provision of training schemes for the renewable energy sector

In the 1980s and 1990s, the Spanish region of Navarre suffered from a severe economic downturn when high oil prices impaired the competitiveness of its single large industrial employer, a Volkswagen car plant.
Unemployment soared to a peak of 13% in 1993. The regional government responded with active industrial policy measures, including worker retraining, to expand the renewable energy sector. A rapid and successful development of a wind power industry followed, facilitated by the favourable geographical and climatic conditions of the region alongside a clear corporate and public strategy. The region expanded the share of its electricity production derived from renewable sources to 65%.
From 2002 onwards Navarre has been implementing its Environmental Training Plan. In cooperation with the Confederation of Entrepreneurs of Navarre and the Navarre Industry Association, the regional government identified the main skills shortages in the region through a project entitled "Strategic talent in the renewable energy sector", and on the basis of its findings set up CENIFER, a public training centre for renewable energies, which became a major training provider for the sector. In 2006, the country's first graduate programme for electrical engineers in wind and solar electricity was launched at the Public University of Navarre.
Between 2002 and 2006, employment in renewable energies across Navarre increased by 183%. In 2007 alone, 100 companies and over 6,000 jobs in renewable energies were created. Unemployment dropped to 4.76%. Even in the economic and employment downturn of 2009 Navarre maintained the lowest unemployment levels in Spain. This achievement bears witness to the success of a policy mix which incorporated environmental and skills measures in a proactive response to an economic crisis with a view to long-term dynamic development.

Source: United Nations, *Just transition of the workforce, and the creation of decent work and quality jobs, technical paper,* 26 October 2016.

4.1.5. Guaranteeing the quality of new and redefined jobs

The number of studies on the quantity of jobs created by the energy transition contrasts with the limited information on the quality of these jobs, in particular in terms of: (i) wages, (ii) coverage through collective bargaining, and (iii) health and

324. Website of *DG Employment, Social Affairs and Inclusion* of the European Commission

safety at work. Nevertheless, some trends emerge which present both opportunities and challenges when it comes to improving the quality of jobs.

The energy transition, to be sure, requires investment in research and innovation to develop and implement new, less polluting production methods. Several studies contend that low-skilled jobs will be replaced by more skilled jobs. This demand for more skilled workers should be accompanied by correspondingly higher wages. Similarly, jobs that will be redefined and entail the upgrading of workers' skills—particularly in the construction sector—will arguably lead to wage gains.

However, the energy transition does not only create high-skilled jobs. New employment in renewable energy also relies on low-skilled labour. For these jobs, there is indeed a risk of wage losses. For example, in the traditional manufacturing and extractive industries, which are highly unionised, the coverage through collective bargaining in the new sectors could be weakened, which could negatively affect workers' pay levels and benefits. For the energy transition to favour the creation of "decent" work, to quote the term used in the Paris Agreement, it is necessary to involve the social partners at all levels.

The commitment of the social partners is also key for addressing health and safety issues. Even though cleaner technologies and products are more likely to reduce the risk of exposing workers to harmful substances—thus diminishing the health risks for workers—new risks associated with new or redefined jobs in the energy transition should be carefully assessed. The social partners play a fundamental role in identifying and evaluating any new risks. It will then be up to the European authorities to adapt the existing European health and safety regulations accordingly.

4.2. An inclusive transition for citizens and consumers: making sure everyone benefits

Europeans are affected by the energy transition as workers (see 4.1.), citizens but also as consumers. The second component of the Social Pact for the Energy Union must ensure that the energy transition brings a series of tangible benefits to all Europeans. First and foremost among these benefits is the positive impact on public health, whether by reducing air pollution through the use of cleaner energy sources or by providing better thermal comfort—for poor households in particular—through renovation measures and improved energy efficiency (see 4.2.1.).

In addition to this, consumers can slash their energy bills by reducing their energy consumption. To do this, consumers must play their part (by changing their consumption behaviour) but also by choosing more energy-efficient goods, opting for heating systems that are less energy intensive, initiating construction work to limit heat and energy loss in their home or producing their own energy (becoming "prosumers"). Public authorities should facilitate their taking a more active role, which is advantageous to energy consumers, and offer protection and guidance in an energy market that is often perceived as complex (see 4.2.2.).

The main risk of the energy transition for consumers is that some of them—especially those affected by or at risk of sliding into energy poverty—will be excluded from the benefits of this process. Without adequate public policy, the energy transition could drive a wedge between those consumers able to take full advantage of the transition and others who, for lack of improvement in terms of energy efficiency, will not witness a decline in their energy consumption. Worse still, this second group could see its precarious situation getting worse when subsidies for renewables result in higher taxes on electricity. For the energy transition to be successful, it must be inclusive. The fight against energy poverty in Europe must be one of the central objectives of this transition. In section 4.2.3., the extent of energy poverty in Europe will be investigated. It will be followed by an outline of a strategy that puts the energy transition at the service of the fight against energy poverty in Europe.

4.2.1. The energy transition as a public health issue

The energy transition, by promoting "clean energy",[325] should have a positive impact on the health of European citizens. This issue is key if national and European authorities are to win the active support and commitment of citizens. Given the breadth of the problem, the following analysis shall restrict itself to two major consequences of the energy transition for public health: its contribution to reducing air pollution (4.2.1.1.) and the benefits of increased energy efficiency for household thermal comfort and indoor air quality (4.2.1.2.). While the first issue affects all citizens, the second concerns especially households facing energy poverty.

325. Clean energy is energy whose output emits a small amount of greenhouse gases and air pollutants (e.g. solar, wind, hydro). Biomass is an exception: although it is considered neutral in terms of greenhouse gas emissions, its combustion fumes contain many regulated compounds (oxides of nitrogen, sulfur dioxide, particles, etc.).

4.2.1.1. The energy transition as a means of reducing air pollution

The World Health Organisation (WHO) underlines the fact that a reduction in air pollution levels leads to better cardiovascular and respiratory health of the population, both in the short and long term.[326] In recent decades, the EU has made considerable strides to improve air quality: since 1990, sulfur oxide emissions have dropped by almost 90% and nitrogen oxide emissions by more than 50%. Emissions of fine particulate matter have been reduced by almost 20% since 2000.

BOX 7 ► Overview of EU action to improve air quality

In 2013, the EU adopted a policy package entitled "Clean Air for Europe", which delineates the problem and the measures needed to achieve the new intermediate targets for reducing the effects of pollution on health by 2030. It also contains a proposal for the ratification of the amendment to the Gothenburg Protocol to the UN Economic Commission for Europe's (UNECE) Convention on Long-range Transboundary Air Pollution to reduce the acidification, eutrophication and ground-level ozone.

The EU has three legal mechanisms to address air pollution:

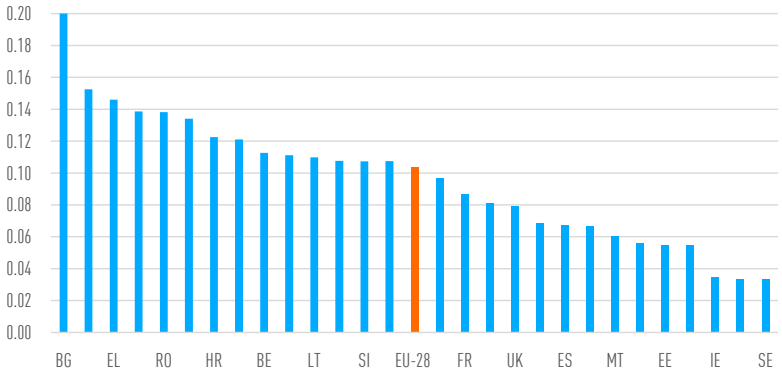
- defining general air quality standards for ambient air content of air pollutants. Directive 2008/50/EC on ambient air quality sets EU air quality standards for tropospheric ozone, particulate matter, nitrogen oxides, hazardous heavy metals and a number of other pollutants.
- imposing (national) limits on total pollutant emissions; The National Emission Ceilings Directive (adopted in 2001 and revised in 2016) limits the overall emissions of five pollutants: sulfur dioxide, nitrogen oxides, non-methane volatile organic compounds, ammonia and particulate matter fines.
- adopting legislative measures for the various sources of pollution, for example, by controlling industrial emissions or setting standards for vehicle emissions, fuel efficiency or fuel quality.
    - in order to limit pollution from road transport, a number of directives have been adopted to set emission performance standards for various categories of vehicles and to regulate the quality of fuels.
    - to reduce air pollution generated by ships, Directive 2012/33/EU limits the sulfur content of marine bunker fuels in European seas.
    - the Industrial Emissions Directive (Directive 2010/75/EU) lays down obligations for highly polluting industrial installations and is the basis for licensing and operating permits for these installations. It consolidates and brings together all applicable directives (waste incineration, volatile chemical compounds, large combustion plants, integrated pollution prevention and control, etc.) into a single text in order to facilitate their application and to minimize pollution from various industrial sources.

Source: European Parliament, Air and noise pollution, fact sheet, December 2016.

326. World Health Organisation, *Ambient (outdoor) air quality and health*, Fact sheet, no 313, September 2016

Despite these improvements, air pollution in the EU remains one of the main environmental dangers to public health. The European Environment Agency estimates that in 2013, there were more than 430,000 premature deaths due to air pollution in the EU.[327] The International Energy Agency (IEA) has a lower figure of 340,000 for 2015 but indicates that about half of the EU's 510 million people are exposed to fine particle concentration levels that are above the limits recommended by the WHO.[328] As illustrated in figure 6, the countries most affected by premature mortality due to air pollution are the Eastern Member States (except Estonia) and Southern Member States (Greece and Italy).

FIGURE 6 ► Premature mortality due to exposure to fine particulate matter (PM2.5) as a percentage of the total population in 2013



Source: Data available in European Environment Agency, *Air quality in Europe—report 2016*, n° 28/2016.

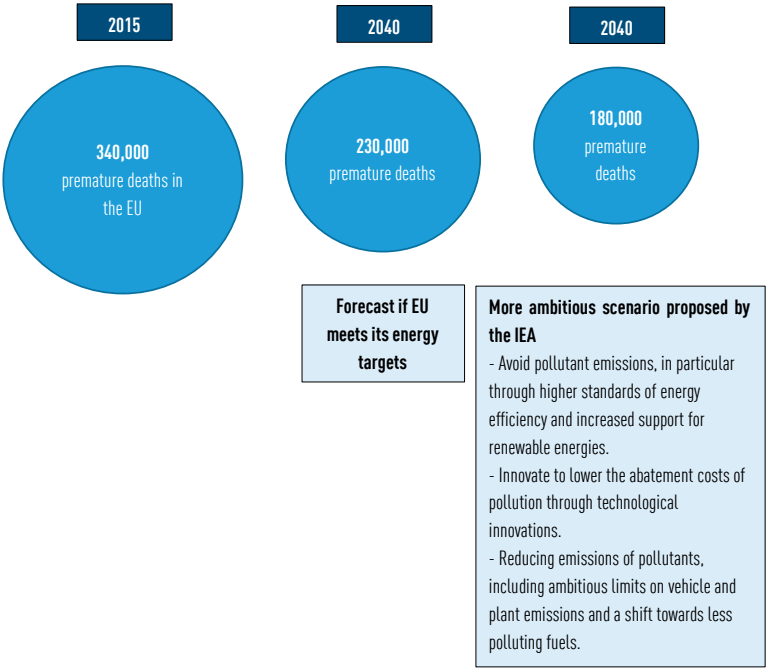
Whereas the production and use of energy is the most important source of air pollution from human activity, progress towards accomplishing the objectives of the Energy Union (reduction of greenhouse gas emissions, improved energy efficiency and the development of renewable energies) have significant co-benefits, particularly in reducing air pollution.[329] The IEA estimates that the num-

327. European Environment Agency, *Air quality in Europe—2016 report*, November 2016
328. International Energy Agency, *Energy and Air Pollution: WEO 2016 Special Report*, 2016, p153
329. Ibid.

ber of premature deaths linked to pollution will be reduced to 230,000 per year by 2040 if the EU meets its energy targets.

EU countries are moving in the right direction but the IEA urges them to be more ambitious, proposing an alternative scenario in which countries would adopt stricter pollution control standards, further enhance the energy efficiency of buildings and increase the share of renewables in energy production (see box 7). In this scenario, the number of premature deaths would be reduced to less than 180,000 per year by 2040 and the number of Europeans exposed to fine particle pollution above the levels recommended by the WHO would be less than 10% (compared to 50% today).

BOX 8 ► Reducing air pollution in Europe—IEA guidelines for a more ambitious strategy



Source: International Energy Agency, *Energy and Air Pollution: WEO 2016 Special Report*, 2016

Working towards a more ambitious scenario of reducing air pollution naturally comes at a price. Still, the IEA believes that, in addition to its positive impact on health, pursuing this path would also bring economic benefits that would far exceed the costs. An impact assessment by the European Commission corroborates this hypothesis, concluding that the economic benefits of the new EU air quality policies can be twenty times higher than the costs of implementing them.[330] What hampers more determined action by the public authorities is the fact that the costs are immediate, whereas the benefits will only be visible in the medium to long term.

Similarly, the costs and benefits of the energy transition are not evenly distributed across Member States. If all EU countries stand to gain in terms of public health, the IEA evinces that the Eastern European Member States, which are currently heavily dependent on traditional solid fuels for their heating needs, would derive the greatest relative benefits from an accelerated energy transition.[331]

In this context, the idea of a Social Pact for the energy transition is particularly salient. As we have already seen, the Eastern European Member States also need to address major challenges for they are more affected than other Member States by job losses and employment redefinitions. A package is required to develop a systematic approach to the costs and benefits of the energy transition. The Social Pact would enable the EU to have a better grasp of the social challenges and opportunities the energy transition brings, both for the EU as a whole and for individual countries.

4.2.1.2. Energy transition and energy efficiency measures for improved thermal comfort and better indoor air quality

The benefits of the energy transition for public health are not limited to the reduction of external air pollution. Indeed, one of the three objectives of the

330. Thomas Verheye, Head of Unit on Industrial Emissions, Air Quality & Noise, Directorate-General for Environment, European Commission, *EU Air quality and the EU energy system*, PowerPoint presentation, March 2016
331. In the more ambitious scenario proposed by the IEA, by 2040, the average loss of life expectancy would be reduced by about 30% in Poland, Romania and Hungary (compared to the scenario based on the continuation of current policies). The same trend would hold for the decline in the number of premature deaths due to exposure to fine particles.

energy transition is to improve energy efficiency (in particular for housing), which requires better thermal insulation.

While the first objective of the energy transition for public health concerns all citizens, the second is aimed at those living in dilapidated, poorly insulated and/or humid housing (and concerns more than 15% of European citizens, see table 4) and/or lack the financial means to adequately heat their homes (almost 10% of the European population is concerned). Overall, these problems affect between 50 and 125 million Europeans. Individuals already living in energy poverty are particularly vulnerable (see 4.2.3.).

Numerous studies have established a link between temperature, indoor air quality and the health of the inhabitants. The WHO has conducted a study (LARES – Large Analysis and Review of European Housing and Health Status) that examined the relationship between the energy efficiency of more than 3,000 housing units in eight European cities and the health of their occupants. After adjusting for the characteristics of individuals, reports of poor health (with specific symptoms and pathologies such as hypertension, asthma attacks, allergies, headaches, colds and sore throats) appeared to be significantly associated with poor thermal comfort, waterproofing problems and moisture and/or mould.[332]

332. Study cited in Host S., Grange D., Mettetal L, Dubois U. *Précarité énergétique et santé : état des connaissances et situation en Île-de-France*, Regional Health Observatory Île-de-France, 2014, p8

TABLE 4 ► EU-27 Excess Winter Mortality Index (1980-2013) in %

COUNTRY	EXCESS WINTER MORTALITY INDEX
MT	29,4
PT	28
CY	23,6
ES	20,6
IE	19,7
UK	18,6
EL	17,9
BG	17,8
RO	17,5
IT	16
FR	13,8
BE	13,6
SE	13,3
AT	13,2
SI	13,2
HU	12,3
DK	12,2
NL	11,8
DE	11,7
PL	11,7
LV	11,5
LT	11,5
LU	11,2
EE	10,9
CZ	10,8
FI	9,5
SK	8,2

Source: Data from Liddell, C. et al, "Excess winter deaths in 32 European countries: a critical review of methods", *Journal of Public Health* (2015).

The data used for the excess winter mortality index[333] also shows that this indicator is not climate dependent but strongly related to poor housing conditions and the inability to adequately heat one's home.[334] Indeed, the excess winter mortality was highest in countries with milder winters: Malta (29.4), Portugal (28), Cyprus (23.6) and Spain (20.6). In an article published in 2003, J. D. Healy has accentuated this "paradox of winter excess mortality": there is a greater risk of death during the winter for those living in southern Europe, where the climate is temperate and winters mild, than for those living in countries further north, such as the Baltic countries (index between 10 and 12) or Finland (9.5), where winters are severe.[335] These differences can be accounted for by divergent levels of health spending and dissimilar socio-economic conditions but above all by differences in indoor temperatures (well-heated housing is imperative in countries with severe winters). The study cited reveals that countries with higher energy efficiency in housing have a lower winter mortality index.[336]

The objective of improving energy efficiency, particularly by means of thermal insulation measures, should therefore heighten the thermal comfort and indoor air quality of homes, which in turn will have a positive impact on consumer health (while also lowering health care costs). But this requires that special attention be given to households living in fuel poverty (see 4.2.3.).

BOX 9 ► The cost of housing rehabilitation vs. the cost of poor housing conditions

In 2004, the United Kingdom launched a housing health and safety rating system (HHSRS). The entire housing stock has been classified according to criteria of safety and degradation. 29 potential hazards and the average probability of their occurrence were assessed. These calculations help estimate the average financial costs to the healthcare system (other measures that could be taken into account are: number of days off work, loss of income, insurance indemnities, etc.). At the same time, the direct financial expenditure required for a large-scale rehabilitation of dilapidated homes has been evaluated. The conclusion is that energy poverty costs the British healthcare system an estimated 5.3 million pounds

333. The accepted EU-wide definition of Excess Winter Mortality is: "the surplus number of deaths occurring during the winter season (December to March inclusive) compared with the average of the non-winter seasons". Angela Tod and Harriet Thomson, "Health impacts of cold housing and energy poverty" in Katalin Csiba (ed.), *Energy poverty handbook*, Les Verts/Alliance Libre Européenne du Parlement européen, October 2016, p40.
334. Sian Jones, "Social causes and consequences of energy poverty", in Katalin Csiba (ed.), *Energy poverty handbook*, p32.
335. J. D. Healy, "Excess winter mortality in Europe: a cross-country analysis identifying key risk factors", *Epidemiol Community Health*, n°57 (2003), p784-789.
336. Study cited in Angela Tod and Harriet Thomson, "Health impacts of cold housing and energy poverty", in Katalin Csiba (ed.), *Energy poverty handbook*, p41.

(6.5 million euros) per 100,000 housing units, whereas rehabilitation measures would amount to 1.5 million pounds (just over 1.8 million euros).

Source : Host S., Grange D., Mettetal L, Dubois U. *Précarité énergétique et santé : état des connaissances et situation en Île-de-France*, Regional Health Observatory Île-de-France, Paris, 2014, 14.

4.2.2. "Consumactors" and "prosumers"- ensuring that citizens benefit fully from the advantages of the energy transition

The liberalisation of energy markets, by exposing monopolies to competition and enabling customers to choose their energy provider or switch rates, was a necessary step for the "activation" of consumers in the energy sector.

With the energy transition, the role of "active consumers" takes on a new dimension: the success of the transition process depends in part on the participation and commitment of consumers.

Above all, to achieve the goal of improving energy efficiency by at least 27%-30% by 2030, households—which account for about 26% of the EU's energy consumption—must play their part. This involves reducing energy consumption through better insulation of homes or the adoption of new behaviours, services and technologies. In return, in addition to the overall benefits of the energy transition, households will see their energy bills slashed and their purchasing power increased.

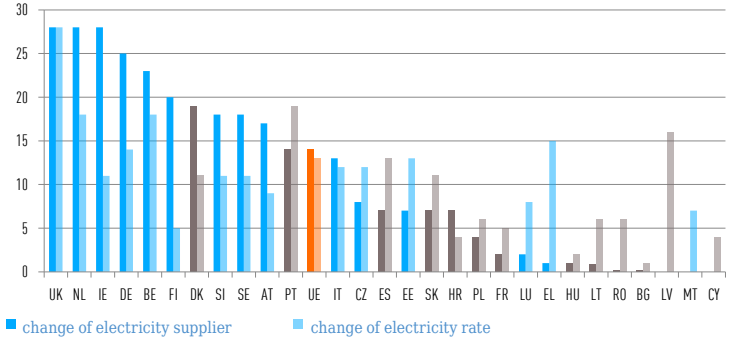
Moreover, consumer behaviour will increasingly affect the development of renewable energies. Indeed, since renewables are often variable energy sources, their development beyond a certain threshold will require consumers to align their consumption to peak production times.[337] Last but not least, active consumers and prosumers are helping to raise public awareness, highlighting the need for and the importance of the energy transition and thus encouraging people to take greater ownership of the energy transition, which is essential if it is to be successful.

Yet although the energy transition must be centred on consumer-actors, a gap remains between consumers and the energy market. As the European Consumers' Organisation (BEUC) argues, the majority of consumers simply want to use energy services without having to get too involved in understanding a complex market.[338]

337. Wind power and photovoltaics are the two fastest growing forms of renewable energy. They depend on sunlight or wind and are not necessarily available when consumers most need them.
338. BEUC, *Building a consumer-centric Energy Union*, position paper, July 2015, p16

This judgement needs to be qualified. To be sure, at the EU level less than 15% of consumers have switched electricity suppliers during 2012 to 2015 (see figure 7). But this average conceals large national disparities, with figures varying from 0% to almost 30% depending on the country, which seems to suggest that consumers are not inherently passive. Rather, certain national policies maintain them in a state of passivity, while others succeed in activating them.

FIGURE 7 ► Consumers who reported having changed their electricity supplier/rate at least once in the last three years (spring 2012 to spring 2015)



Countries without regulated prices for households appear in blue; those with regulated prices in grey.
Source: Data from a Consumer Survey conducted by Ipsos, London Economics and Deloitte between February and June 2015. The information is available in European Commission, *Second consumer market study on the functioning of the electricity market for consumers in the EU—Country fiches*, 2016.

One of the objectives of the Social Pact for the Energy Union should be to ensure that consumers are able to take full advantage of the energy transition. In order to do so, consumers must be aware of the "why"—individual benefits such lower energy bills, a greater sense of control over their energy consumption as well as collective advantages such as the sense of having made a contribution to the energy transition and better air quality—and "how" of becoming an active energy consumer.

In this context, the European Commission's awareness campaign, which will be launched in 2017, aiming to encourage more consumers to participate in energy market developments, stressing the benefits of energy efficiency and the possibility of switching one's energy provider is certainly a step in the right direction.[339] As

339. European Commission, *Second Report on the State of the Energy Union*, COM (2017) 53 final, 1st February 2017, p10

a follow-up, the Commission could encourage Member States to set up educational programmes for primary and secondary school pupils in order to raise awareness of green energy and energy efficiency, as Claude Turmes proposes.[340] The goal is not only to educate children but also to raise awareness among their parents.

By itself, greater awareness is of course insufficient to induce behavioural changes and to empower consumers so that they can reap the gains of the energy transition. In the energy market, there are still obstacles and impediments to be overcome. Policy-makers must ensure that consumers intent on reducing their energy consumption, renovating and isolating their homes, or becoming a producer of photovoltaic or wind energy are emboldened to do so.

4.2.2.1. Removing barriers to an active role for energy consumers

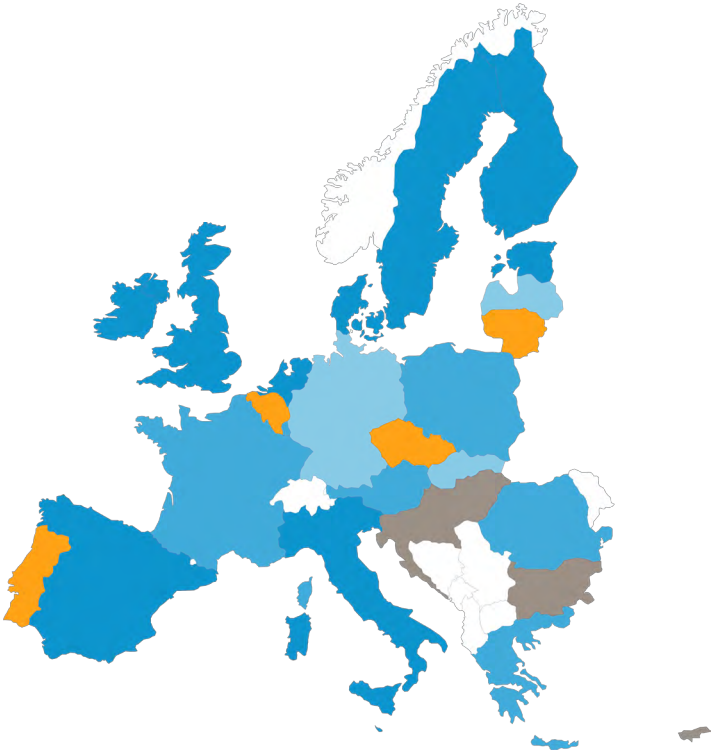
One of the major obstacles to greater involvement of consumers is the fact that today the majority of Europeans receive up-to-date information about their energy bill only once or twice a year. Consumers will find it difficult to change their consumption patterns and save energy unless they receive more comprehensive information about their energy consumption and costs and have easy access to their consumption data in real time.

A necessary step to remedy this situation is the replacement of conventional meters by so-called "smart" meters, which will provide consumers with free and frequent access to precise consumption data.

As part of third energy package of 2009, EU Member States committed themselves to implementing smart meters wherever they are cost-effective, with the aim of replacing 80% of electricity meters with smart meters by 2020. As of now, installing smart meters proceeds at different paces across Member States. 17 out of 28 countries have committed themselves to a large-scale roll-out of smart meters (i.e. more than 80%) by 2020 (see map 1). Other Member States are still awaiting the profitability analysis of this measure or, in thoses case where it has already been carried out, remain as yet unconvinced about the profitability of a large-scale roll-out. In 2015, Germany, which was committed to the measure, declined to stage a mass roll-out after an unfavourable cost-benefit analysis.[341]

340. Claude Turmes, *Transition énergétique—une chance pour l'Europe*, Les petits matins, Paris, 2017, p449
341. A 2013 study by Ernst & Young estimated that the costs for a mass roll-out in Germany would amount to between 15 and 20 billion euros. The country cannot rely on economies of scale, unlike France for example, where Enedis regularly stages large-scale roll-outs of new meters, thus reducing costs (five billion euros).

MAP 1 ► Expected level of smart meter use by 2020 in EU Member States



Source: Data from the Joint Research Center for Smart Electricity Systems and Interoperability (consulted in January 2017)

The deployment of smart meters will not automatically save energy. Energy saving will depend on the use each consumer makes of this new device. For example, a report by the French *Conseil Général de l'Environnement et du Développement* concluded that in France, using smart meters for energy control is not widespread:

only 0.3% of customers having a smart meter installed in their home have chosen a secure account enabling them to track their consumption.[342] It is crucial to change this situation, in particular by linking the deployment of smart meters to programmes and/or apps that enable consumers to have access to their consumption in real time and by alerting them to the possibilities their new meter offers.

Studies have shown that providing consumers with information about their consumption enables them to reduce their energy consumption. For example, the European Commission has undertaken a study which shows that tenants, once they are furnished with information about their energy use, are able to reduce their consumption by around 8% simply by changing their heating habits.[343]

Taking an interest in one's energy consumption can be facilitated by a playful approach. Five years ago, no one would have thought that consumers would be attracted to apps/smart watches allowing them to count their steps on a daily basis. Some years from now, it could well be possible that consumers will be interested in how much energy their home appliances consume, tracking the energy costs of their everyday activities, just as they currently count their steps or measure their calory intake. It is also up to the European authorities to come up with original solutions.

The deployment of smart meters is a first step that must be accompanied by the creation of regulatory and incentive frameworks for consumers. In November 2016, the European Commission proposed a revision of the regulatory framework for the electricity market in order to enable a more active role of consumers. The proposal contains new provisions to improve and clarify the information on electricity bills and demands that each state put in place electricity price comparing tools to provide independent information to all consumers, that consumers can switch energy suppliers more easily, at short notice (three weeks) and without incurring cancellation fees.[344] Another important project for the Commission is to promote consumer access to dynamic electricity pricing in order to bring about a modulation of demand (with spikes in consumption when energy prices are low and a drop in consumption when they are high). This will allow consumers to pay less if their energy use occurs at certain times.

342. Bernard Flüry-Hérard and Jean-Pierre Dufay, *Le déploiement du compteur Linky*, Conseil général de l'environment et du développement durable, report n° 010655-01, January 2017
343. European Commission, *Delivering a New Deal for energy consumers*, COM (2015) 339, SWD (2015) 141, 15 July 2015, p3
344. It is crucial to ensure the independence of this tool for power suppliers could support non-independent price comparisons whose algorithm favours one supplier over others.

4.2.2.2. Creating a European regulatory framework for prosumers

The development of renewable energies offers consumers the opportunity to generate their own energy and to resell what they do not consume.

At this stage there is no common regulatory framework and no common definition of "prosumers" at EU level. Significant disparities exist between Member States regarding the opportunities for citizens to become prosumers. According to a report commissioned by Greenpeace on the rights of prosumers, in Germany about half of the renewables are held by citizens (individual or group prosumers via cooperatives). Conversely, in Poland, by the end of 2015 there were only 4,700 micro-installations that produced electricity from renewable energy (with an installed capacity of about 35 MW).[345]

While the issue of prosumers currently for the most part hinges on national responses, once the European Commission asserts that citizens are at the heart of the Energy Union, it should also guarantee some form of equity between consumers so that they can make the most of the energy transition, irrespective of the country they live in.

The Commission should therefore undertake to define a European regulatory framework for prosumers which would include a common definition of the term and answers to the main obstacles to be overcome.

Three issues in particular must be addressed at European level.

- Lack of support or access to reliable information on the various technological options on the market in a context where the quality of the offers available varies widely. BEUC has identified certain trends that may become major problems if a response is not forthcoming quickly: lack of independent advice during sale, problems during the installation process, or consumer dissatisfaction regarding the performance of the device or the service offered by the installers. The definition of a common framework would therefore make it possible to define specific provisions for informing and protecting prosumers that would be valid in all EU countries.
- Lack of clarity of the regulatory framework for prosumers, which stems from the fluctuations in renewable development support programmes in many Member States. This includes, among other things, the introduction of network costs, the inability to receive fair remuneration for excess

345. Josh Roberts, *Prosumer rights: options for a legal framework post-2020*, ClientEarth, May 2016, p12

electricity that is exported to the grid, or the retroactive introduction of changes to support mechanisms for renewables.

- Difficulties in accessing the network in certain Member States where administrative barriers, including long and complex authorisation procedures, discourage consumers and increase investment costs. For example, the current proposal by the European Commission suggests ensuring priority access to the electricity grid for renewable energy furnished by small producers (installations below 500kW), which protects small prosumers. Nevertheless, addressing the question of prosumers also requires an in-depth analysis of how network costs are shared between consumers and prosumers, as the BEUC points out, in order to find the right compromise between "autonomy of production and consumption on the one side and solidarity in one's contribution, via distribution and transport networks, to the balance of the system on the other".[346]

Defining this common framework is not an ancillary issue, since cases of abuse, fraud, mismanagement, etc. will prevent people from taking ownership of the energy transition (especially since prosumers are meant to have a positive impact on the political sustainability of this transition). Spain provides an instructive example, with national policy on renewables having disastrous consequences for consumers (see box 10).

It would also be useful to share experiences (in order to encourage the exchange of good practices) and to ensure a better visibility of prosumers within the EU as part of the annual report on the state of the Energy Union. In this respect, the European Economic and Social Committee (EESC) recommends, in an own-initiative opinion on this subject, that the Commission should "monitor the development of prosumerism in the Member States as part of the annual Energy Union reporting".[347]

Lastly, the development of prosumerism raises questions of social equity: public authorities must put in place the necessary mechanisms to ensure that, given the high cost of entry, there is no polarisation between wealthier households who could become prosumers and poorer households who do not have this option

346. Claude Turmes, *Transition énergétique — une chance pour l'Europe*, 2017, p442
347. EESC, *Prosumer Energy and Prosumer Power Cooperatives: Opportunities and challenges in the EU countries*, own-initiative opinion, 19 October 2016, p5

but would nonetheless contribute to funding financial incentive programs for renewables (see 4.2.3.).

BOX 10 ► Learning the lessons from Spain's system of support for renewable energy development

In the 2000s, there was a push to develop renewable energies in Spain. In 2007, the government set up a very generous system of premiums and feed-in tariffs for green energy. The price it paid for photovoltaic electricity was twelve times the market price for electricity. To some extent, the initiative was a success because the capacity of photovoltaic solar panels increased five-fold in one year (from 690MW in 2007 to 3.5GW in 2008). At the same time, the cost of the system of premiums and feed-in tariffs also exploded from 190 million euros in 2007 to 3.5 billion euros in 2012. As the government did not want to pass this increase in costs entirely on to consumers, the cumulative energy deficit (the difference between the costs and the regulated revenues of the electricity system) reached 26 billion euros (or almost 3% of GDP). In order to cope with this deficit, in 2009 the government for the first time cut the premiums introduced in 2007. From then on, about ten legislative changes (with retroactive effect) gradually eroded the profitability of the installations and led to financial difficulties for producers. Small producers (individual producers or cooperatives) were hit particularly hard. This naturally fueled consumer distrust of investment in renewable energy, which has collapsed in recent years. Spain, which at the end of 2000 was one of the ten most attractive countries in the World for investment in renewable energies, ranks only 28th in 2016.

Source: "Les sacrifiés de la bulle verte espagnole", *Les Échos*, 12 May 2014; "Spain solar power clouded by government U-Turn", *EUObserver*, 27 October 2015, "The cost del sol", *The Economist*, 20 July 2013; Ernst&Young, Renewable Energy Country Attractiveness Index, October 2016

4.2.2.3. Making sure consumers and their personal data are protected

Protecting consumers means above all protecting them from unfair, deceptive and/or aggressive commercial practices. Since consumers are often unfamiliar with the energy market, which often changes due to the provision of new goods and services, allows the above-mentioned business practices to take hold.

In addition to existing consumer legislation in energy sector, the third energy package has introduced a specific set of rights for energy consumers.[348] It must be ensured that these rights are respected and enforced in each Member State (see chapter 1.).

Protecting energy consumers also means protecting their personal data. Indeed, with the deployment of smart meters, it is crucial to tackle the risk of user profiling

348. Working Group Consumers as Energy Market Actors, *Draft Report*, p11

via energy consumption data (which would make it possible to gain information about time spent at home and away from home, lifestyle choices, heating type, etc.). As we have seen in France, the deployment of the Linky smart meter has raised many concerns from privacy advocates, despite rather stringent recommendations on the collection of data from the National Commission on Informatics and Liberty (CNIL) (see box 11). The BEUC, insisting on the basic principle of individual freedom of choice, argued that the decision of consumers who have certain reservations and do not wish to be equipped with a smart meter must be respected.[349] No additional fees should be imposed upon them. Alternatively, it may be necessary to offer consumers the possibility to have all their data stored on a hard drive in their home that only they would be able to access.

BOX 11 ► Protecting consumer privacy in France

The CNIL has specified the modalities for reading the load curve of customers so as to protect their personal data:

- Linky meters must be set up to record on site (i.e. at the customer's home) the load curve at hourly intervals for a maximum of one year;
- the customer's consent must be requested for the load curve to be fed into the ENEDIS information system and for passing the information on to third parties;
- the user has the right to oppose even this local form of data storage; without having to give reasons for this decision, it suffices to tick the relevant box;
- the user can deactivate the local storage at any time and delete the data (especially in the event of moving house).

Source: Commission nationale de l'informatique et des libertés, Délibération n° 2012-404 portant sur la recommandation relative aux traitements des données de consommation détaillées collectées par les compteurs communicants, 15 November 2012

4.2.3. For an energy transition that aims to eradicate energy poverty

There are more than 50 million people in the EU who are at risk of energy poverty—they are unable to heat their homes adequately and/or to pay their energy bills. While the energy transition brings tangible benefits to consumers, there is a risk that vulnerable consumers will not be able to take full advantage of the benefits of the energy transition. Without public support policies, the energy transition could even exacerbate social polarisation.

349. BEUC, *Protecting and empowering consumers in future smart energy markets*, February 2013, p3

On the basis of an overview of the problem of energy poverty in the EU (4.2.3.1.), the impact of the energy transition on energy poverty (4.2.3.2.) is analysed. While it is essential to ensure that the energy transition does not have a negative impact on consumers living in or at risk of energy poverty, more needs to be done. The Social Pact of the Energy Union must ensure that the energy transition aims for the eradication of energy poverty throughout Europe (4.2.3.3.). It is above all a question of social justice but also a political issue, because—similarly to the situation of workers—if there are consumers who lose out from the energy transition, it will prove more difficult to attract the citizen support that is essential to the success of the energy transition.

4.2.3.1. Energy poverty in the EU

The problem of energy poverty has been publicly acknowledged in the United Kingdom, and since the late 2000s it has gained increasing political attention throughout the EU. Although there is no common European definition of energy poverty, it is commonly accepted that this situation concerns "a situation in which individuals or households are unable to properly heat their housing or to use other energy services needed at an affordable price".[350]

With the third energy package adopted in 2009, the problem of energy poverty has been explicitly recognised in EU legislation. The package states that: "Member States shall take appropriate measures to protect final customers, and shall, in particular, ensure that there are adequate safeguards to protect vulnerable customers. In this context, each Member State shall define the concept of vulnerable customers which may refer to energy poverty and, inter alia, to the prohibition of disconnection of electricity to such customers in critical times.… Member States shall take appropriate measures, such as formulating national energy action plans, providing benefits in social security systems to ensure the necessary electricity supply to vulnerable customers, or providing for support for energy efficiency improvements, to address energy poverty where identified, including in the broader context of poverty".[351]

350. Steve Pye et Audrey Dobbins, "Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures", Policy report Insight_E, May 2015, p2
351. Articles 3.7 and 3.8 of the Directive 2009/72/EC concerning common rules for the internal market in electricity, 13 July 2009

BOX 12 ► Defining and measuring energy poverty

The approach commonly used to quantify energy poverty at the national level explores the ratio of household income to energy expenditure. According to this approach, an energy poor household is one which needs to spend more than a certain share of disposable income on energy (for example 10% in Northern Ireland, Scotland and Wales). Similarly, in 2010, the Commission proposed that households allocating more than twice the national average of their total consumption expenditure to energy products should be considered energy poor. Although this expenditure approach has the advantage of being relatively straightforward, it is not without shortcomings. On the one hand, it excludes households that restrict their energy consumption in order to limit their spending. But it might, on the other hand, include more affluent households that use an excessive amount of energy.

OFFICIAL DEFINITIONS OF ENERGY POVERTY IN THE EU		
Great Britain	Northern Ireland, Scotland and Wales (since 2001)	"Defined as having to spend more than 10% of income (including housing benefit) on all household fuel use to maintain a satisfactory heating regime."
	England (since 2013)	"A household where i) their income is below the poverty line (taking into account energy costs); and ii) their energy costs are higher than is typical for their household type."
France (since 2010)		"Is considered in a situation of energy poverty "a person who encounters in his/her accommodation particular difficulties to have enough energy supply to satisfy his/her elementary needs, this being due to the inadequacy of resources or housing conditions."
Ireland (since 2016)		"Energy poverty is a situation whereby a household is unable to attain an acceptable level of energy services (including heating, lighting, etc.) in the home due to an inability to meet these requirements at an affordable cost."
Slovakia (since 2015)		"Defined as a condition when average monthly household expenditures for the consumption of electricity, gas and heat, represent a significant share of the average monthly household income."
Cyprus		"Energy poverty may relate to the situation of consumers who may be in a difficult position because of their low income [...] in conjunction with their professional status, marital status and specific health conditions and therefore, are unable to respond to the costs for the reasonable needs of the supply of electricity, as these costs represent a significant proportion of their disposable income."

Source: Katalin Csiba (ed.), *Energy Poverty Handbook*, The Greens/EFA group of the EP, 2016, p137-138

The problem of energy poverty is certainly linked to the larger fight against poverty, but it must be treated as a challenge in its own right because it has its own causes and solutions (see 4.2.3.2 and 4.2.3.3.). Moreover, recognising this challenge in European legislation and addressing it in the context of energy policy is particularly relevant given that the EU has more competences in the field of energy (which is a shared competence of the EU) than in the fight against poverty (where essentially the EU can only coordinate the action of the Member States).

There is no common definition of energy poverty nor is there a common rule for measuring this phenomenon. At the national level, indicators based on the level of energy expenditure as a percentage of income are often used to measure the problem for public policy purposes. However, this expenditure approach has some limitations (see box 12). For this reason, pan-European studies trying to gauge the extent of the problem mostly use three indicators from EU statistics on income and living conditions (EU-SILC): (i) inability to keep the home adequately warm; (ii) having arrears in utility bills; and (iii) living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor.

TABLE 5 ► Energy poverty indicators (2015) in percentage of total population

	INABILITY TO KEEP THE HOME ADEQUATELY WARM	TOTAL POPULATION LIVING IN A DWELLING WITH A LEAKING ROOF, DAMP WALLS, FLOORS OR FOUNDATION, OR ROT IN WINDOW FRAMES OR FLOOR	ENERGY ARREARS
EU-28	9,4	15,2	9,0
BE	5,2	18,2	5,1
BG	39,2	12,9	31,4
CZ	5,0	8,9	3,0
DK	3,6	16,1	3,4
DE	4,1	12,8	4,0
EE	2,0	13,4	7,9
IE	8,9	14,5	18,2
EL	29,2	15,1	42,0
ES	10,6	15,2	8,8
FR	5,5	12,6	5,9
HR	10,0	10,9	28,5
IT	17,0	24,1	12,6
CY	28,3	26,5	20,1
LV	14,5	24,4	16,7
LT	31,1	17,0	8,4
LU	0,9	14,4	2,4
HU	9,6	25,4	19,4
MT	13,9	10,2	10,2
NL	2,8	15,7	2,7
AT	2,6	11,7	3,5
PL	7,5	11,9	9,2
PT	23,8	28,1	7,8
RO	13,1	12,8	17,4
SL	5,6	26,9	17,5
SK	5,8	6,3	5,7
FI	1,7	4,4	7,5
SE	0,9	7,5	2,7
UK	7,8	14,8	7,0

Source: Eurostat EU-SILC, data for Ireland is from 2014.

According to Eurostat data, in 2015, 9.4% of the European population could not maintain an adequate temperature in their home in 2015, i. e. about 50 million people in the EU, with a similar number of Europeans in arrears with their energy bills.

Underlying these figures are very heterogeneous national realities (see table 5). A central-periphery asymmetry is noticeable: with a few exceptions (Spain, Poland, Estonia and Malta), the countries of Southern and Eastern Europe have a larger share of the population at risk of fuel poverty than the countries of the centre and the North of the EU. This has led some authors to speak of a geographical and social "energy fracture" running through the EU, which results in a higher proportion of households in the least developed Member States being unable to meet their basic energy needs.[352]

Greece and Bulgaria have the highest percentage of energy arrears. In Greece this concerns more than 40% of the population, which is obviously linked to the economic crisis that the country has been experiencing since the beginning of the decade. By contrast, the problem is rather more limited in Sweden, Denmark, Austria, Germany, the Netherlands, Luxembourg and the Czech Republic.

In six European countries—all of them in Eastern and Southern Europe—about one in four inhabitants live in houses with water infiltration, humidity or mould (Italy, Cyprus, Latvia, Hungary, Portugal and Slovenia).

Bulgaria, Lithuania, Greece, Portugal and Cyprus are the countries with the highest share of the population having difficulty maintaining an adequate temperature in the home. Given their location in the south or in the Mediterranean basin, which promises milder winters, this may seem surprising for the Mediterranean countries, which have milder winters. Indeed, countries with very cold winters (Sweden, Finland, the Netherlands and Denmark) are much less affected by this problem. But the countries of the South are suffering from the consequences of a poorly insulated housing stock and the lack of adequate heating systems in most of the houses. Since the beginning of the decade, the problem of fuel poverty in some countries of the South is also linked to the austerity policies pursued in these countries which have led to a fall in household income.

352. Stefan Bouzarovski and Sergio Tirado Herrero, "Understanding the core-periphery divide in the geographies of European Energy Poverty", in *Energy Poverty Handbook*

As far as the Eastern European countries are concerned, Bouzarovski and Herrera argue that in the former Soviet bloc the "number of inadequately heated homes has seen a dramatic expansion during the past two decades due to the combination of, inter alia, rapid price rises, inadequate social protection and low residential energy efficiency".[353]

4.2.3.2. What impact does the energy transition have on energy poverty?

Energy poverty is caused by three main factors: i) low household income; ii) high energy prices; and iii) poor energy efficiency in the home. To understand the impact of the energy transition on energy poverty, it is necessary to understand its impact on these three main causes of the problem. While the energy transition does not have a direct impact on household income levels, it has a direct impact on energy prices and household energy efficiency. These two issues are analysed in this section.

The impact of the energy transition on energy prices

According to a report by the Agency for the Cooperation of Energy Regulators (ACER) and the Council of European Energy Regulators (CEER), electricity prices for households increased by 28 % between 2008 and 2015, while the price of gas increased by 15%.[354]

Figures 8a and 8b show two indicators illustrating two drivers of energy poverty: low incomes (measured by the at-risk-of-poverty rate, i.e. the share of people with an equivalent disposable income below 60 % of the national median equivalised disposable income after social transfers) and the price of energy (as measured by the price of electricity and gas at purchasing power parity).

353. Stefan Bouzarowski and Tirado Herrero, "The energy divide: integrating energy transitions, regional inequalities and poverty trends in the European Union", *European Urban and Regional Studies* 24, no 1 (2017): p72
354. ACER/CEER, "2015 electricity and gas market monitoring report—retail markets", November 2016, p9

FIGURE 8A ► Average electricity prices for households in PPP (per 100 kWh) and at-risk-of-poverty rate in the EU-28 in 2015 (in percent)

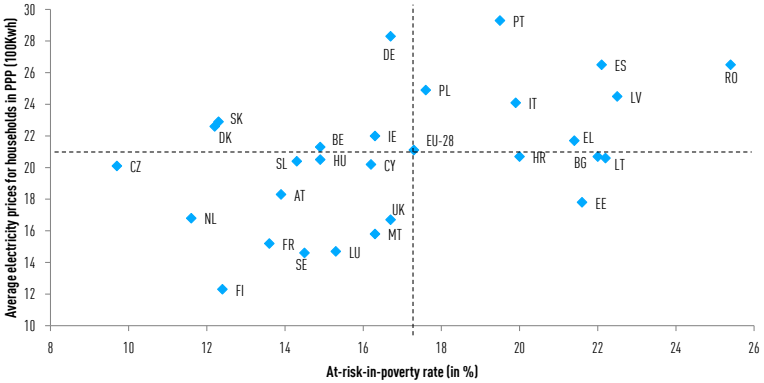


FIGURE 8B ► Average price of gas for households in PPP (per 100 kWh) and at-risk-of-poverty rate in the EU-28 in 2015

Source: Author's elaboration on the basis of Eurostat data

All countries suffering from a combination of high electricity/gas prices and an above-average poverty risk are in Southern and Eastern Member States. In five of these countries, the population is particularly at risk of energy poverty,

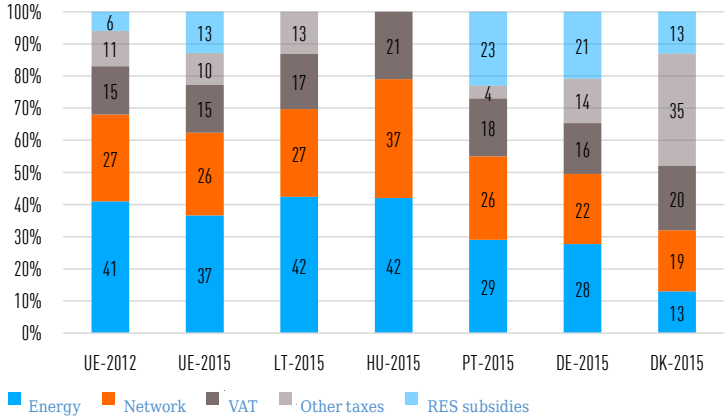
according to table 5: Portugal, Greece, Italy, Bulgaria and Latvia. This data also highlights the fact that energy prices and low incomes are not the only causes of energy poverty. Indeed, in three countries with below average poverty rates and electricity prices there is a significant risk of energy poverty. Cyprus, Slovenia and Hungary are indeed particularly affected by poor housing, which translates into low energy efficiency, another cause of energy poverty.

Will the energy transition lead to lower energy prices, thus making a significant contribution to the fight against energy poverty? It does not look likely, at least not in the short term. Member States' investments in renewable energy are often financed by an increase in electricity taxes. According to the 2015 ACER/CEER report, within the EU these consumer charges doubled between 2012 and 2015, amounting to 13% of the electricity price in 2015 compared to 6% three years earlier. This European average hides very heterogeneous national realities: the renewable energy charges (or RES charges) make up more than 20% of the electricity price in countries such as Portugal and Germany, but less than 1% in other countries, notably Hungary and Latvia (see figure 9).

Experts have warned of the regressive effect of this mode of financing the energy transition, since an increase in energy prices has a negative impact on the income of poor households which is disproportionately greater than the repercussions for wealthier households.[355] This is strictly a national choice. Individual states could have financed renewable subsidies via any other form of tax (for instance income tax, VAT, corporate tax, etc.). Moreover, researchers at the European Parliament add that poor households "face a 'double penalty', since they pay for RES subsidies through their energy bills but cannot benefit from producing renewable energy themselves because of high up-front investment costs."[356] However, it should be pointed out that many Member States protect the poorest households from rises in energy prices (thereby dampening the cost impact of financing the development of renewable energies) through social policy interventions: social energy tariffs, energy vouchers, etc.

355. Louise Suderland and Darryl Croft, "Energy poverty—risks, conflicts and opportunities in the development of energy poverty alleviation policy under the umbrella of energy efficiency and climate change", in *Energy efficiency first: The foundation of a low-carbon society*, European Council for an Energy Efficient Economy Summer Study, 2011
356. Nikolina Šajn, "Energy poverty: protecting vulnerable consumers", Briefing, European Parliament Research Service, May 2016, p6

FIGURE 9 ► Distribution of the electricity cost of the standard offers for households made by the incumbent operator in EU capital cities (2012-2015)



Source: Data from the ACER/CEER report, 2015

Impact on the energy efficiency of housing

One of the objectives of the energy transition is to considerably improve energy efficiency (for example by 27%-30% by 2030 at the EU level and by 50% by 2050 in France and Germany). This requires significant improvements in building energy efficiency. Since poor energy efficiency in housing is one of the causes of energy poverty, the energy transition must use energy efficiency improvements to reduce energy poverty in Europe. If energy costs rise but households are able to reduce their energy consumption, lower energy bills are possible.

However, the measures that achieve the best results in terms of improving energy efficiency, such as insulation work or changes in heating mode, often involve high costs. Without public aid, they will remain beyond the reach of the poorest households. Similarly, tenants will find it harder to take advantage of the opportunities offered by improved energy efficiency than homeowners. This calls for targeted measures supporting consumers living in or at risk of energy poverty (see 4.2.3.3.).

To conclude, the energy transition can indeed heighten the risk of energy poverty (if we take into account the two main channels through which the energy

transition has an impact on energy poverty)—unless ambitious measures to increase energy efficiency are put in place.

4.2.3.3. The Energy Union: paying more attention to energy poverty and supporting national initiatives to tackle this challenge

The Energy Union has already put the issue of energy poverty on the agenda. However, this did not yet translate into effective and ambitious actions to combat energy poverty. As Dobyns and Pye explain, this is due to an at most partial understanding of the problem, originating in the deficiencies of the existing indicators and in the willingness of the European Commission to leave this problem to the Member States (the subsidiarity principles prevails).[357] In order to ameliorate this situation, the "energy poverty" section of the Energy Union's Social Pact must address two challenges. It should work toward a better understanding and greater visibility of the problem, and it must identify and support the best solutions to this problem (regardless of whether they derive from European legislation, community funds or the coordination of national or local initiatives).

How to gain a better understanding of the extent and impact of energy poverty and identify the best solutions

The first step to be taken in order to ensure that the Energy Union serves the fight against energy poverty is to gain a better understanding of the challenge and ensure greater visibility. Today, as we saw in section 4.2.3.1., the European approach to the challenge of energy poverty remains fragmented and uneven. There are different definitions, various metrics to measure the problem, and profoundly heterogeneous responses (as outlined below). Although a one-size-fits-all top-down approach to the challenge of energy poverty is not desirable, not least because national particularities need to be taken into consideration—such as the energy performance of buildings, the energy system or the local climate—, stronger EU intervention is needed to ensure that the energy transition will not leave some of the consumers on the margins.

This requires improved data collection methods, which ought to furnish additional information on the extent and impact of energy poverty within the EU, an evaluation of the effectiveness of the counter-strategies, and the promotion of an exchange about good practices. Many reports stress the importance of

357. Audrey Dobbins and Steve Pye, "Member state level regulation related to energy poverty and vulnerable consumers", in *Energy Poverty Handbook*, p119

developing a common European definition of energy poverty, which does not necessarily imply a single metric for calculating it. By way of example, in 2015, the European Parliament has asked the European Commission to propose a definition and indicators of energy poverty and an action plan to defeat it.[358]

The Commission has taken a major step in this direction by announcing the creation of an observatory on energy poverty by the end of 2017, which will produce statistics on energy poverty, disseminate good practices and provide information on energy poverty. Identifying the challenge of energy poverty and providing a better understanding of it is an indispensable but insufficient step towards addressing the problem.

Overcoming energy poverty: from palliative to preventive measures

There are various instruments available to protect those who are in living in or at risk of energy poverty. This includes, first of all, measures to support and inform consumers, protecting them against electricity cuts in particular (the European Commission has proposed to strengthen these protective mechanisms by introducing new procedural safeguards which take effect before a consumer's energy supply is cut), and campaigns to raise awareness of the topic (including tools to compare energy prices, measures to improve energy efficiency, the use of smart meters to track energy consumption, etc.).

While these measures are important, the two main instruments for responding to energy poverty are, on the one hand, financial interventions to reduce energy bills and, on the other, measures to improve energy efficiency.

The former include social tariffs (particularly in the Southern countries, notably in Cyprus, Spain, France, Greece and Portugal, but also in Belgium) or energy subsidies for low-income households.[359] Nonetheless, these are, as it were, passive measures which preserve the status quo and represent a growing and recurrent burden on public budgets (in view of the fact that energy prices rise faster than the average household income). Moreover, this type of measure often has various shortcomings, as a report on energy poverty published in 2013 by the French Caisse des Dépôts highlights. One problem is how to target households living in or on the cusp of energy poverty. For example, in the United Kingdom, only 12% of the beneficiaries of the "winter fuel payment" (an initiative that

358. European Parliament, *Towards a European Energy Union*. Resolution of 15 December 2015, paragraph 150
359. Steve Pye and Audrey Dobbins, "Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures", Policy report Insight_E, May 2015, p46

makes up 90% of the budget for income support measures to combat energy poverty) are in a precarious energy situation.[360] In addition, non-use rates are often significant due to a lack of knowledge or the insufficient comprehensibility of the measures. For example, in France, the non-use rate for social tariffs hovers around 20%.[361]

Financial interventions to cut energy bills are palliative—not preventive—measures that respond to the effect rather than the cause of the problem without creating any added value or having a leverage effect on private investment or growth. While these short-term initiatives are necessary in order to alleviate the most severe symptoms of energy poverty, they must be considered as transitional measures and need to be coupled with preventive action.

Ambitious measures to renovate and isolate the homes of vulnerable households can provide a structural response to energy poverty, since better energy efficiency will cut energy bills and improve the thermal comfort of homes. This is the most effective and sustainable way forward to lift consumers in Europe out of energy poverty.

Yet in any one year investments in in-depth renovation of homes with poor energy performance potentially cost more than other responses to energy poverty such as social tariffs or energy subsidies. This can impede the development of preventive measures. Yet energy efficiency expenditures in a given year yield gains over several years (and not just in terms of capital development), which is not the case for spending on energy subsidies that has to be renewed each year. In addition to reducing energy poverty, investing in home renovation brings many other benefits:[362]

- In social terms, building renovation programmes, when targeting the poorest, not only help reduce energy poverty but also contribute to improvements in public health (as we saw in section 4.2.1.) and foster social inclusion through the rehabilitation of deprived neighbourhoods;
- In economic terms, these measures increase investment (public investment leads to private investment) and create employment (given the labour

360. The winter fuel payment, ranging from 100 to 300 pounds, is handed out every year before Christmas to retired persons aged 60 or over. This aid is aimed at combating the excess winter mortality of elderly people. See the Association for the Conservation of Energy, *National fuel poverty budgets*, Briefing, May 2012, p4.
361. Johan Tyszler, Cécile Bordier and Alexia Leseur, "Combating fuel poverty. Policies in France and in the United Kingdom", Climate Report, n°41, Caisse des dépôts et Consignations, September 2013, p24
362. Bogdan Atanasiu (ed.), *Alleviating fuel poverty in the EU—investing in home renovation, a sustainable and inclusive solution*, Buildings Performance Institute Europe, May 2014, p8

required renovation activities have considerable potential for job creation in the construction sector), which has a positive impact on growth;

- In budgetary terms, improvements in public health resulting from greater thermal comfort and better indoor air quality should lead to lower public expenditure on health and social protection (for example less sick leave);
- In environmental and energy terms, improving the energy efficiency of buildings contributes to achieving the objectives of the European energy strategy (i.e. improving energy efficiency by 27%-30% by 2030 or cutting CO_2 emissions through lower energy use).

A report funded by the European Commission, after having analysed the measures adopted by EU countries to combat energy poverty, comes to the conclusion that 30% of the national measures are dedicated first and foremost to improving energy efficiency, compared with 40% which are used for financial aid and 20% to avoid energy supply disconnections[363].

For example, in the United Kingdom, in 2013/2014, the public budget spent on fighting energy poverty was just over three billion euros, of which about 2.6 billion euros were spent on income support programmes or measures aimed at dampening the impact of energy price hikes, compared with only 500 million (around 15%) for energy efficiency measures. Between 2010 and 2014, public spending to counter energy poverty was significantly cut (-30%) but spending on energy efficiency fell even more sharply than the overall government budget spent on fighting energy poverty (-50%).[364]

Within the framework of the Energy Union, the European Commission should take the initiative and encourage Member States to gradually move from price control mechanisms and energy subsidies to more effective public spending on renovating residential buildings in order to eradicate energy poverty in the EU in the medium term. In this respect, it could use European governance instruments, both existing ones (for example the European Semester because it concerns the budgets of Member States) and those under construction (for example

363. Steve Pye and Audrey Dobbins, "Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures—appendices to main report", Policy report Insight E, May 2015, p50
364. Total expenditure decreased from 4.4 billion euros in 2010/2011 to 3.1 billion euros in 2013/2014. Investment in energy efficiency over the same period fell from almost 1.1 billion euros to about 500 million euros, according to data available in Bogdan Atanasiu (ed.), *Alleviating fuel poverty in the EU—investing in home renovation, a sustainable and inclusive solution*, Buildings Performance Institute Europe, May 2014, p32

in the context of the current negotiations about the governance structures of the Energy Union, see chapter 1.).

Targeting energy-poor households more effectively in initiatives to improve the energy efficiency of buildings

National programmes to improve the energy efficiency of buildings are often aimed at very different households not all of which are living in energy poverty. The European Commission's requirement in this regard is that a part—and not all—of the energy efficiency measures should be implemented as a matter of priority in energy-poor households or social housing.

Given the economic and environmental and energy benefits of energy efficiency programmes in buildings, financial aid should not be restricted exclusively to households living in energy poverty. It is however essential to target energy poverty more effectively in these national programmes to increase their social and budgetary benefits (reducing energy poverty, improving public health/lower health costs and greater social inclusion).

In order to ensure better targeting, Member States must first have access to indicators that facilitate the identification of households living in or at risk of energy poverty. While it is necessary to identify households in energy poverty, it is equally important to know about their specific characteristics, for instance whether they are owners or tenants of their dwelling.

When energy-poor households are owner-occupied, furnishing information on the benefits of energy efficiency improvements and providing adequate financial incentives is often enough to induce them to undertake building work to improve the energy efficiency of their dwelling. For tenants, on the other hand, financial incentives should be accompanied by compulsory rules for landlords, who are often reluctant to improve the energy efficiency of their property from which, they often think, they stand to gain little. Great Britain is an encouraging example. The government, since April 2016, has banned owners from refusing requests for energy efficiency improvements from their tenants when financial support is available. From April 2018, it will be illegal to let housing with very poor energy efficiency (rating lower than "E") when public co-financing for energy efficiency improvements would be available (see box 13).[365] In a similar vein, Claude Turmes, hoping to accelerate the renovation of the European housing stock, proposes "to establish a level of

365. Bogdan Atanasiu (ed.), *Alleviating fuel poverty in the EU—investing in home renovation, a sustainable and inclusive solution*, Buildings Performance Institute Europe, May 2014, p36

performance below which a building cannot be sold or let. On a scale from A to G, one would begin with category D, and then gradually move upwards."[366]

BOX 13 ► Energy efficiency of housing in the United Kingdom. The Green Deal and the Energy Company Obligation (ECO)

The "Green Deal" launched in 2013 (and replacing all existing energy efficiency programmes) is an insulation improvement programme for the housing stock which is based on the principle of third-party investment. This programme allows individuals to have their energy renovation financed by a third-party investor (a group of certified power suppliers and specialised industrial companies). The occupant then repays the loan through the energy savings (the mechanism is ongoing even in the event of a change of owner). The mechanism aims to combine insulation improvement and net savings for the owner after repaying the loan. The Green Deal is based on two principles: the monthly repayments for the works scheduled on the bills must be lower than or equal to the forecast energy savings; the repayment period must not exceed the expected useful life of the improvements performed. These principles place a de facto limit of around 10,000 pounds on the amount of the loans. Where the improvement projects are too costly (for example on the external insulation of solid walls), an obligation, known as the Energy Company Obligation, has been introduced for the country's six main power suppliers, has been introduced as a measure to support the Green Deal. For the period between 2013 and 2015, power suppliers committed themselves to allocate 760 million pounds annually to renovation projects deemed too expensive to meet the Green Deal criteria. The ECO also requires 540 million pounds to be allocated to insulation improvement works for low-income and remote households, particularly in rural areas, as well as for vulnerable households that are at risk of fuel poverty. The ex-ante impact assessment of the British government estimates that the Green Deal and the ECO will help lift between 125,000 and 250,000 households out of fuel poverty by 2023.

Source: Johan Tyszler, Cécile Bordier and Alexia Leseur, "Combating fuel poverty. Policies in France and in the United Kingdom", Climate Report, n°41, Caisse des dépôts et Consignations, September 2013, 25-26.

The priorities of national renovation programmes for buildings should be the following: i) the renovation of social housing; ii) the granting of subsidies or loans without interest or at very low rates for households living in energy poverty; iii) tackling the challenge of renovating tenants' living in energy poverty. In its May 2016 resolution "A New Deal for Energy Consumers", the European Parliament has underscored these priorities, suggesting "that an objective of reducing the number of energy-inefficient homes by 2030 should be considered, with a focus on rental properties and social housing".[367]

366. Claude Turmes, *Transition énergétique—une chance pour l'Europe*, 2017, p283
367. Resolution of the European Parlament, *A New Deal for energy consumers*, 26 May 2016, paragraph 38

Numerous studies furnish examples of good practices in national energy efficiency programmes aimed at vulnerable consumers or consumers living in/at risk of energy poverty (see box 14). One of the tasks of the future European Observatory on Energy Poverty will be precisely to draw up an overview of these good practices and to outline recommendations to the Member States, thus allowing for better targeting of households living in energy poverty within the framework of housing renovation programmes.

BOX 14 ► Energy efficiency programmess targeting low-income households in France: "Habiter Mieux" and "Chèque énergie"

The "Habiter Mieux" Programme

The "Habiter Mieux" (Live Better) programme, launched in 2010, is an energy renovation programme for low-income households. The programme is managed by the Agence nationale de l'habitat (ANAH) and co-financed by public funds (83%) and operators (17%) which contribute to a budget of 1.45 billion euros. It was originally intended only for owner-occupiers under certain income conditions. The small number of renovations undertaken in the first three years of the programme (less than 50 million euros for a target of 300 million euros by 2017) led, in 2013, to significant changes in its provisions. The scope of beneficiaries was extended to include landlords and joint owners, and the eligibility threshold was broadened from the first decile up to the median income. This change has made 46% of homeowners eligible, leading to a real-location of funds to middle-class households at the expense of those with lower incomes.

Still, it should be stressed that these changes have also reduced the residual amount that households are required to finance (which initially often exceeded 5,000 euros) by increasing the initial ANAH grants and the state premium. The programme is based on the following principles:

1. The procedure of identifying households thanks to the initiatives implemented by local authorities, the power networks, local social organisations, power suppliers and construction specialists.
2. Guidance of these households by approved social, technical and financial engineering organisations. In this matter, homeowners benefit from a complete project manager assistance that is technical (energy assessment and definition of the project assistance), administrative and social (help with setting up a project, support in assembling, and completion of the project).
3. The implementation of local procedures to collect energy savings certificates (CEE), which enables the three major liable parties, namely EDF, Engie and Total, to increase the share of energy savings certificates obtained in exchange for the financial contribution to the Habiter Mieux programme;
4. The mechanism for financing works through:

a. the basic ANAH subsidies for owner occupiers, under income conditions, which are intended to finance 35% or 50% of the amount of the works undertaken;

b. A government grant financed by the French Insulation Improvement Assistance Fund, in the form of a fixed-rate grant amounting to 3,000 euros, which can be combined with the ANAH grant;

c. The potential involvement of the social departments of socially beneficial cooperative companies for home ownership (SACICAP) for households that have no equity and need to access a bank loan. SACICAP organisations grant interest-free loans with no management fees up to a maximum amount of 20,000 euros and with a repayment period of up to 10 years.
d. Additional grants may be provided by regional authorities. From an energy efficiency point of view, the programme performs well with average recorded energy savings of 38% after renovation, which are well above the minimum of 25% required for each renovation project.

"Chèque énergie"

The energy cheque, launched in 2016, is gradually replacing social energy tariffs. It has been introduced on an experimental basis in several departments (Ardèche, Aveyron, Côtes d'Armor and Pas-de-Calais) and will be extended to the whole country in 2018. The energy cheque is a financial aid allocated to beneficiaries, under income conditions, that can be used to pay their energy bills (the advantage over social tariffs is that they can be used to finance any energy source, whereas social tariffs concern only electricity and gas) or to finance renovation work. This is a step towards an integrated (i.e. curative and preventive) approach to combating energy poverty.

Source: Johan Tyszler, Cécile Bordier and Alexia Leseur, „Combating fuel poverty. Policies in France and in the United Kingdom", Climate Report, No. 41, Caisse des Dépôts et Consignations, September 2013; Steve Pye and Audrey Dobbins, "Energy poverty and vulnerability in the energy sector in the EU: analysis of policies and measures", Policy report Insight_E, May 2015; And www.chequeenergie.gouv.fr/.

European funds for the improvement of the energy performance of dwellings

Between 2007 and 2013, of the 347 billion euros provided by cohesion policy, 10 billion euros were allocated to sustainable energy projects (5.1 billion euros for energy efficiency measures and 4.9 billion euros for renewable energy development in existing housing).

Over the past decade, the European Commission has relaxed the conditions for the use of structural funds for the purpose of housing renovation. A major change in this context was initiated in 2009. Until May 2009, structural funds for investments in housing (mobilised via the ERDF, which could not exceed 2% of the total allocation of this fund) could exclusively be used in collective and social housing as well as in public building and only by Member States that joined the EU in or after 2004. In May 2009, an amendment to regulation 1080/2006:

a) has extended to all Member States the possibility of financing expenditure on improving energy efficiency and the use of renewable energy in existing housing;

b) has made all existing housing units (and not exclusively collective, social or public buildings) eligible for financing;

c) has increased to 4% the amount of the ERDF allocation that could be spent on energy efficiency projects and renewable energy use in the existing housing stock.

This reorientation has been continued with the current multiannual financial framework: funds allocated to sustainable energy projects more than doubled between 2007-2013 and 2013-2020 from 10 billion euros to 23 billion euros. Cohesion policy now has a minimum share (12% for the least developed regions, 15% for regions in transition and 20% for the most developed regions) of total ERDF resources which must be allocated at national level to actions supporting the transition to a low-carbon economy. In addition to the ERDF, the Cohesion Fund is also involved in investments in energy efficiency and renewable energy in housing, because a part of the fund's 63.4 billion euros can be allocated to it (see chapter 3.).

As we have seen, public funds mobilised for investment in building renovation have a leverage effect. While it has been estimated that one euro of grant money allocated energy efficiency projects can mobilise 9 to 12.50 euros of private financing, the 23 billion euros (over seven years) of the ERDF for energy projects can raise more than 200 billion euros of private financing.[368] Therefore, in addition to the 23 billion euros programmed for the period 2014-2020, more than 200 billion euros could be invested in energy efficiency programmes thanks to European funds.

To be sure, the European Commission is moving in the right direction but many actors are urging it to go even further, notably by increasing the share of EU funds invested in renovation programmes for vulnerable consumers (including those living in energy poverty).

BOX 15 ► Renovation programme of 800,000 social housing units in France thanks to the ERDF

In the Grenelle Law, France has committed 320 million euros from the ERDF to renovate 800,000 social housing units with low energy performance by 2020. Based on the evaluation of the renovation programme, between February 2009 and April 2013, 58,800 households received 233.7 million euros from the ERDF. The measures adopted have reduced the energy consumption of households by an average of 40%. Morever, the 233.7 million euros from the ERDF generated a total investment of 1.22 billion euros in the local economy, providing 17225 additional jobs (mostly in local SMEs).

Source : Bogdan Atanasiu (ed.), Alleviating fuel poverty in the EU—investing in home renovation, a sustainable and inclusive solution, Buildings Performance Institute Europe, May 2014

368. Bogdan Atanasiu (ed.), Alleviating fuel poverty in the EU—investing in home renovation, a sustainable and inclusive solution, Buildings Performance Institute Europe, May 2014, p52

CONCLUSION

Equiping the Energy Union with a Social Pact for the Energy Transition would signal that European leaders recognise the imperative to ensure a just and inclusive transition. The social challenges of the energy transition would gain visibility and an integrated approach to the various challenges—as well as effective ways of tackling them—could be put in place. It would provide the basis for more determined actions by European, national, regional and local authorities, in close cooperation with the social partners. This Social Pact would aim at maximising the opportunities the transition offers to citizens, minimising its potential costs, and making sure that vulnerable citizens benefit from it.

In a Europe where, notwithstanding the relative upswing of recent years, unemployment remains too high, the energy transition is synonymous with job creation. About two million Europeans work in renewables or in energy efficiency and, according to the European Commission, an additional 900,000 jobs could be created by 2030. In order to maximise the job-creation potential, it is imperative to boost investment and foster innovation in all relevant sectors, which will enable EU countries to gain a competitive advantage vis-à-vis the rest of the world (see chapter 2., section 2.1.3.). It is also essential to enable workers to acquire the skills required for these new (or redefined) jobs to avoid a skills shortage that would make it harder to meet the needs of companies. It is mandatory to better anticipate the skills needed for "green" jobs (which can be done at the European level, notably within the framework of the "European Skills Panorama") and promote the acquisition of these skills by workers. The creation of a "Green Erasmus Pro" would increase the mobility of apprentices and trainees in the sectors that are relevant to the energy transition. Moreover, it would lead to a greater appreciation of apprenticeships and encourage young people to prepare for the jobs of the future, thus helping to reduce youth unemployment.

The energy transition is synonymous with an improvement in public health (and, by implication, a decrease in public spending on health and social protection). In 2015, there were more than 430,000 premature deaths linked to air pollution in the EU. Accelerating the energy transition—by imposing more ambitious limits on vehicle emissions, coal-fired power plants and factories—would mean faster improvements in air quality, lower mortality rates and fewer pollution-related diseases. Housing renovation programmes also have a positive impact on public health, including a reduction in winter excess mortality due to better thermal comfort in homes.

The energy transition also has the potential to increase the purchasing power of consumers by cutting their energy bills. To do so, consumers must play a part (by changing their consumption behaviour) and invest in this transition (by favouring more energy efficient or less polluting goods, improving the energy efficiency of their homes or producing their own energy). Public authorities should remove unnecessary obstacles and encourage Europeans to become "consumactors" or even "prosumers". This includes awareness-raising campaigns, making it easier to switch between energy suppliers, the use of smart meters, guaranteed access to dynamic electricity prices, priority access to networks for small producers and the privacy protection to forestall undue user profiling.

Faced with these opportunities, the energy transition also presents two major risks.

The first is that the transition would not be fair, inasmuch as all Europeans would benefit, but only a small part would bear the costs that any transition inevitably entails. Indeed, the energy transition involves employment redefinitions and job losses in the fossil energy sectors and GHG-emitting industries that are exposed to global competition. It is unavoidable to restructure some sectors and regions (especially those relying on coal). The EU must, alongside a close cooperation between national authorities and social partners, anticipate these restructuring processes. This will make it possible to put in place action plans to limit and, where they prove ineluctable, spread over time jobs cuts (for example, by progressively reducing the activity of coal mines). In this way, the energy transition will not lead to economic decline in the affected regions, a major source of structural unemployment. New sectors of activity must replace those in difficulty. Workers in the sectors "left behind" by the energy transition should have the prospect of securing future employment. It must be ensured that the shift of workers from declining to growing firms will be accompanied by income security and adequate training for new jobs. To this end, a European Energy Transition Adjustment Fund should be set up to finance training, retraining, support and entrepreneurship initiatives for these workers. Lastly, in order to guarantee a fair transition for workers, public authorities and the social partners must ensure the quality of employment, in particular in terms of wages, coverage of collective bargaining and health and safety standards.

The second risk is that the energy transition will not be inclusive and shut out the most vulnerable citizens from the benefits it brings. Without appropriate public action, consumers affected by energy poverty—more than 50 million in the EU—could be worse off, especially when certain countries decide to finance investment in renewable energy by raising electricity taxes. Given the scope of the initial

investment required, these same consumers are also likely not to be able to reduce their energy bills by producing their own energy or by improving the insulation/heating of their dwelling. A transition that is inclusive will aim to eradicate energy poverty in Europe. While palliative measures—such as financial aid for the payment of energy bills—are necessary in the short term to combat energy poverty, they should only be temporary, as the only long-term solution to the problem consists in the renovation of residential buildings. As a matter of priority, public subsidies to improve the energy efficiency of housing should be allocated to households in a precarious situation. Greater attention should be paid to the situation of tenants, for example by adopting a renovation obligation for those renting or selling energy-inefficient property. In order to tackle this challenge, the European Commission should help Member States gain a better understanding of the extent and impact of energy poverty in the EU, assess the effectiveness of their strategies and promote the exchange of good practice between countries.

An integrated approach to these various social challenges allows us to say that, in social terms, no country in Europe is a looser of the energy transition. Certain countries in Central and Eastern Europe are particularly affected by declining employment due to the energy transition, since their employment figures in the fossil-fuel sectors and industries with high levels of GHG emission are above the EU average. Nevertheless, in the countries of Central and Eastern Europe (as well as in the countries of the South where unemployment remains very high), renovating the (often poorly insulated) housing stock is particularly important because of its positive impact on employment in the construction sector. In addition, housing renovation programmes not only bring benefits in terms of jobs. They also contribute to the fight against energy poverty (which is relatively widespread in a number of countries in Eastern and Southern Europe), lead to greater social inclusion and a decline in cardiovascular and respiratory diseases (the number of pollution-related deaths reaches the highest levels in Eastern European countries, and excess mortality in the EU's Southern countries).

The Social Pact for the Energy Transition, far from being an extra or a luxury, is crucial to its success. It is not just a matter of launching a transition to "decarbonise" the European energy system, but also of using this opportunity to address other major problems affecting people's lives: unemployment, air pollution, poverty. The Social Pact must become the sixth dimension of the Energy Union to ensure a fair and inclusive transition. The political and social sustainability of the Energy Union and the European Union as a whole may depend on it.