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Governing the Energy market between universal access to Energy and sustainable development

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1.Introduction: setting the scene

The article *Power to powerless* published in The Economist on 27 February 2016 was focused on the daunting amount of the population without access to energy or at least to modern energy services. Moreover it emphasizes the new electricity systems that are emerging to bring light to the world's poorest. The biggest numbers are in rural southern Asia and in sub-Saharan Africa. Although, according to the UN, 220m people gained electricity between 2010 and 2012, most of them were in urban areas, particularly in India.

So the key question is about what it would take to bring all people in rural areas into the modern world. All in all the answer could be to go "beyond the pylons" or, in other words, to supply "off-grid" power to poorer households in rural areas, individually or via neighbourhood "mini-grids". Experiences and experiments using new technologies in the hope to vault the electricity grid can be best-suited to private customers in rural areas whose energy needs are low and who cannot afford the costs to connect to grids. Moreover, when electrification replaces fires and wood stoves, it improves air quality. "Green projects" contribute to the battle against climate change as even the poorest countries are increasingly aware of the risks of pollution.

Public debates over energy policy are more and more dominated by the spectre of climate change. In this perspective the potential conflict between universal access to energy and the

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environmental conditions of sustainable development, as underlined for too long, could be tackled thanks to the new technologies and the renewable energy systems.

When the United Nations designated 2012 as the "International Year for Sustainable Energy for all" they called for "a major UN initiative" to achieve three goals by 2030: "universal access to modern energy services, reducing global energy intensity by 40 percent, and increasing renewable energy use globally to 30 percent of total primary energy supply" (UNF, 2012). Governments, policy-makers, regulators, and global development institutions are nowadays debating on targets such as universal access and widespread promotion of renewable energy systems and on eradicating energy poverty, mitigating climate change and promoting the transition to sustainable energy (Sovacool, 2012).

In the introduction of a recent book the editors have pointed out that the world has finally come to recognize the central role of energy in human and economic development and "this goal has now moved to the front burner"(Halff et al., 2014). In fact until very recently, there has been little mention of energy access even in the vast economic development literature[i]. Remarkably, energy access did not have any place and role in the UN Millenium Goals (UN, 2010). Currently, although the idea of a linkage between energy access and development is accepted, "understanding and measuring how the linkage exactly works is still in its infancy", so that energy poverty is still not one of the parameters to measure human poverty (Halff et al. : 2014, 3). Nonetheless, given that energy access is a necessary condition for economic development, providing modern energy services would not be sufficient to guarantee development (IEA, 2011 and 2012)[ii].

When in 2002 the IEA's World Energy Outlook made a first assessment of energy and poverty, the result was that at that time 1.6 billion people had no access to electricity. Since then, economic development and increasing urbanization in several developing countries and ongoing programmes promoting energy access have led to appreciable progress. Despite these improvements, today nearly 1.3 billion people still do not have access to electricity and around 2.6 billion rely on the traditional use of biomass and coal for cooking and heating which causes air pollution and potential health implications (Sovacool: 2014, 28).

Even though energy access is not a panacea, undoubtedly energy can facilitate all forms of development. Access to modern energy services produces many positive effects and enhances the life of the poor in countless ways affecting not only everyday life but rather education, productivity, health services, and mobility.

An alarming widespread assertion was the potential conflict between the key goal of universal access to energy and the environmental conditions of sustainable development. Adding billions of people to the grid suddenly and providing them with modern energy services would have destructive impacts on both global energy consumption and the climate with increasing greenhouse gas emissions. Instead, as stated by IEA and other experts, modern energy services and new technologies are more efficient and less polluting than traditional practices and achieving universal access would increase world energy demand only by 1.1% by 2030 (Sovacool: 2014, 42).

The first part of this contribution will compare definitions of energy access and energy poverty considering that energy poverty is not only a phenomenon affecting large amount of people in developing countries but there are also sizeable pockets of energy poverty in developed countries and in liberalized markets. Estimating the extent of energy poverty depends on the definition given. As affirmed above, there is no single definition agreed even at the European Union level. A variety of factors (briefly a combination of high energy bills, low income and poor energy efficiency of buildings) contribute to the phenomenon of energy poverty resulting in households in energy poverty or vulnerable consumers.

The second part will deal with the reciprocal influence between sustainable development and energy policies and the effective contribution that can be given by governments and policy makers if they recognize the economic and social benefits of adopting decentralized and renewable energy technologies.

The third part will highlight that also across the EU there is a significant part of the population that is unable to access adequate energy services and that EU institutions and member states are seeking to put in place measures to protect vulnerable consumers and consumers at-risk-for-poverty.

The concluding paragraph will underline that the attempt to enhance energy access within national and international energy policies requests a new design for the governance focusing on polycentrism and the involvement and thorough cooperation of multiple actors and stakeholders.

2. Defining energy access and energy poverty

Regarding the meaning of energy access, in the IEA's analysis energy access refers to a situation in which households benefit from "reliable and affordable access to clean cooking facilities, a first connection to electricity and then an increasing level of electricity consumption over time". Such a definition of energy access includes the provision of cooking facilities which can be used

without harm to health and are more sustainable for the environment than traditional biomass used in many developing countries. However it is noteworthy that defining access to modern energy services at the household level doesn't take into consideration other relevant elements such as electricity access to business, schools and hospitals that are essential for social and economic development.

This point of view is also shared in other analyses where the idea that only lighting and cooking matter is criticised. They focus on at least two instrumental energy services: mechanical or productive energy and mobility which improve education, health services and markets (Birol: 2014, 12).

Extending modern energy access for rural and increasingly poor communities is a key challenge. However, as stated in a recent analysis, understanding the energy needs of the underprivileged calls for the concept of energy poverty to be explored (Sovacool: 2014, 22). Even if poverty has been traditionally based on income, in recent documents a "multidimensional notion of poverty" has emerged focusing on non-income metrics and, among them, on two energy indicators: electricity (having no electricity is a condition of poverty) and cooking fuels (relying on wood, charcoal and/or dung)[iii].

What these elements reveal is that the analyses on such issues need new standards of evaluation considering energy poverty as a multidimensional phenomenon. In this perspective energy services such as lighting, heating and cooking, mechanical power, and mobility should be integrated into development and energy strategies challenging conventional definitions of energy poverty. A new way to tackle energy poverty is to consider it as a "service-oriented issue" or "a fundamental human rights concern" rather than a technological issue (Sovacool, 2014: 42, 47).

The awareness that "there is a right to energy" and that it is grounded in human rights has increased over time, even if there is no recognition in international law and "no human rights tribunal has yet concluded that failure to provide access to energy constitutes a human rights violation" (Gonzales: 2016, 120; Bradbrook et al., 2008; Lodovici: 2012, 29)[iv].

In fact, the literature highlights that the poor are "too politically distant and it is economically too costly to provide them with energy services, even under many international programmes" and "have income levels, purchasing power, and consumption levels far below what private companies and electric utilities typically deem profitable" (Sovacool: 2014, 41, 21).

Nonetheless, as afore mentioned, the emergence of a new form of energy poverty is a "hallmark" in the energy liberalized markets in advanced countries. Escalating household electricity prices

has led to growing affordability problems exacerbated by the recent financial crisis (Chester and Morris: 2011, 436).

The EU Survey on Income and Living Conditions estimates that 54 million European citizens (10.8% of the EU population) were unable to keep their home adequately warm in 2012. Similar numbers are reported with regard to the late payment of utility bills or presence of poor housing conditions.

EU member states define the issue of energy poverty and vulnerable consumers on the base of strong subsidiarity approach and they address energy affordability concerns in quite distinctive ways. As for energy poverty, it is a critical issue and in many countries an widespread phenomenon. An investigation about how energy poverty is described in Europe referred to various indicators and defined it as "the impossibility (or the difficulty) for a household to gain access to the energy it needs to ensure dignified living conditions at an affordable price from the point of view of its income". In principle this definition should be based on a common understanding of such indicators, but, if this is not the case, the outcomes of energy poverty are undoubtedly the same (forgoing energy use and consumptions in other areas, having arrears in energy accounts, etc.) (Grevisse and Brynart, 2011).

However energy poverty is a linked yet distinctive issue from vulnerable consumers, and requires different parameters to define and to measure it. Even in the case of vulnerable consumers the definition varies in member states, but it typically counts households and individuals at risk of energy poverty, and also "those consumers who are significantly less able than a typical consumer to protect or represent their interests in the energy market; who are significantly more likely than a typical consumer to suffer detriment, or for whom detriment is likely to be more substantial" (OFGEM, 2013)[v].

Energy poverty and the concept of vulnerable consumers have recently been recognized in European legislation. The "third energy package" (adopted in 2009) deals with such issues and offers some proposals to the member states to tackle them in the internal market : "Member States […] should therefore develop national action plans […] aiming at decreasing the number of people suffering such situation. In any event, Member States should ensure the necessary energy supply for vulnerable customers. In doing so, an integrated approach, such as in the framework of social policy, could be used and measures could include social policies or energy efficiency improvements for housing"[vi]. In the perspective pointed out by the Directive measures and action plans established by Member States must not hinder the effective opening of the market or its functioning. In short this means that such interventions do not hamper the

principal objective of a well-functioning internal market and the implementation of competitive, energy-efficient and fair retail markets for consumers.

The Energy Union Package launched by the European Commission in 2015 envisages "a new deal for consumers" who should be able to act more easily and consciously in the energy market in their own interest. However this evolution in the energy market includes the phasing-out of regulated prices often retained especially to protect households from increases in energy costs. Hence the protection of vulnerable consumers is seen as the main way to fight energy poverty: "When phasing out regulated prices, Member States need to propose a mechanism to protect vulnerable consumers, which could preferably be provided through the general welfare system. If provided through the energy market, it could be implemented through schemes such as a solidarity tariff or as a discount on energy bills"(Energy Union Package: 2015, 11-12).

3. Energy poverty and climate change: the power of technology

There is a lack of international consensus over the concept of sustainable development and the term sustainability is used in different contexts without referring to a precise set of parameters and conditions. Nonetheless sustainable development as a concept has influenced the evolution of energy policy. A general but meaningful description can be found in the report of the "Brundtland Commission" where sustainable development was defined by explaining that "humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs"(World Commission on Environment and Development: 1987, sec. 3 para. 27; Nanda, 2016).

Though sustainable development was originally framed in relation to environmental issues, energy policies are crucial to achieve its goals. Going back to the late 1990s, it must be recalled that since then the understanding of the adverse environmental impacts of lack of access to modern energy services has increased, leading to enhanced international efforts to address the situation (Matinga et al.: 2016, 146). As mentioned in the introduction, in 2012 the UN launched the Sustainable Energy for All (SE4ALL) initiative.

The efforts to achieve the SE4ALL objectives (providing universal access to modern energy services; doubling the global rate of improvement in energy efficiency; and doubling the share of renewable energy in the global energy mix) by 2030 focus also on promoting Appropriate Sustainable Energy Technologies (ASETs), aimed at replacing traditional sources to reduce environmental damage and including decentralized energy technologies.

Promoting the use of sources of fairly clean and reliable energy may contribute to change behaviours also among policy makers who do not support ASETs and make technological innovations and regulatory interventions unlikely. Behavioural changes are needed because in the past governments and policy makers in developing countries had opted for central grid electricity that was believed to be the best way to progress to full electrification. Unlike the poor reputation gained by ASETs at the time of the first projects, recently the awareness of the benefits of adopting decentralised and clean technologies has increased.

Several experts believe that awareness campaigns to educate poor people about the social and economic benefits, especially to pay for small but life-changing amounts of power, are necessary to implement strategies relying on "off-grid" systems. Decentralized electricity generation[vii] is particularly appropriate either where extension of the existing electric grid would be cost-prohibitive or providing intermediate energy pending the arrival of electricity (Guruswamy, 2011 and 2016: 318).

As observed in some analyses, the lack of attention to energy poverty in the climate change negotiations is surprising for many reasons, in particular as energy poverty contributes to global deforestation and climate change through both traditional greenhouse gas emissions and those from black and brown carbon (Sovacool: 2012, 9157 – 62). Therefore international agencies and multilateral financial institutions (such as the World Bank, the Asian Development Bank or the IEA) should be encouraged to prioritize renewable energy projects and/or specific programmes to reach poor people, even if it is not likely to reach the goals of SE4ALL[viii].

Since the 1990s, intergovernmental organizations have approved recommendations to change energy production systems through renewable energy technologies, calling for a global energy 'transformation' (Bruce, 2013). Undoubtedly, the international collaboration to support renewable energy programmes and to facilitate the achievement of SE4ALL has increased, but the road to global cooperation for protecting the environment and even more for enhancing global energy policies risks being too long.

4. Protecting vulnerable consumers across EU

In the aftermath of the recent economic crisis across the EU, with a negative impact on income and employment, and the increases in energy prices, risks of energy poverty are growing (European Economic and Social Committee, 2010 and 2013). As affirmed in other parts of this paper, the extent of energy poverty depends on the definition given, and there is no agreed definition even at EU level. Therefore general indicators are used to share some understanding of

this status. Population "at-risk-for-poverty" is defined by Eurostat as households with an income of 60% of the median national income. However vulnerability results from a combination of factors, and income is not the only one[ix].

In fact, not all low-income households are fuel-poor although some are more vulnerable, such as older people, people with health or disability issues, very large families, those in isolated rural communities, those with a low literacy level, and those without access to the internet or with old, insufficient energy appliances (Chester and Morris: 2011, 442). According to the assumption that the concepts of energy poverty and vulnerable consumers do not overlap and different metrics are required to tackle both, it is noteworthy that less than a third of member states recognise energy poverty at an official level, while only four countries have legislated definitions (UK, Ireland, France, Cyprus). Most countries base interventions and protection measures on an unofficial definition basically considering the share of income spent on energy (INSIGHT-E: 2015, table 6, 34-36).

Recalling the "Third Energy Package", the Directives foresee a series of consumer rights and specific protections as energy is an essential service for consumers' life. In this perspective, the right to universal service (supplying electricity at an affordable, easily and clearly comparable, transparent and non-discriminatory price) is of particular relevance. Consequently an appropriate level of protection, including specific measures for vulnerable customers, must be provided in well-functioning retail energy markets (CEER, 2015; EU Commission, 2015).

Considering that member states differentiate the measures they put in place to protect vulnerable consumers, in its recent "position paper on well-functioning retail energy market" the Council of European Energy Regulators (CEER) focuses on protection against disconnection due to non-payment and on information (understandable billing and readily comparable information) (CEER: 2015, 25).

As for the former, the INSIGHT_E analysis reports that measures concerning protection against disconnection are implemented, though in different forms, approximately by 80% of member states. Moreover energy companies, working alongside the regulators, play an important role in protecting consumers, also issuing a code of conduct, registering vulnerable consumers and providing additional assistance to customers (INSIGHT_E: 2015, 48).

Among the measures envisaged to face the risks of energy poverty the EU legislation recommends especially improvements in energy efficiency for housing. Such interventions, even if not always specifically targeted on vulnerable consumers or low income households at risk of fuel/energy poverty, have significant effects in reducing energy costs in the long term.

Energy efficiency measures reflect the different policy approaches in member states and differ in terms of what they provide to the consumer, how implementation mechanisms work, who implements them, and how they are targeted. In the case of energy efficiency, as resulting from the Dir. 2012/27/UE, member states do not have any obligation or binding target set by the European Commission. When they comply with the general lines drawn up in the directive, they can choose the measures and mechanisms that are more suitable to improve energy efficiency. More than in the past governments and local authorities are supposed to promote improvements of public and private building stocks.

On these premises it might be worth considering some experiences and practices targeted at reducing energy poverty and supporting vulnerable households through measures which make energy consumption more affordable.

The UK experience is an interesting case as measures to tackle fuel poverty were already put in place at the end of the last century and the Fuel Poverty Strategy issued by the government in 2001 focused on improving energy efficiency and reducing the costs of fuel for poor households[x]. A specific characteristic of the policies in UK is that they have deployed a number of schemes and measures inside the wider context of policy on sustainable development and climate change[xi].

First, the programme for energy efficiency was based on the Energy Efficiency Commitment, "an obligation on licensed gas and electricity suppliers to encourage or assist domestic customers to take up energy efficiency measures". Moreover low-income households could be helped to "save energy and money" by the so called Energy Efficiency Advice Centres in partnership with local and national bodies. Second, with regard to energy market measures the government's approach was to make energy more affordable for consumers on low incomes through the engagement of the industry that was encouraged to undertake initiatives as part of its commercial strategies. Third, strategies for social inclusion were aimed at fighting the causes of poverty and enabling people to improve their incomes in the long term.

As often mentioned, measuring fuel/energy poverty does not always give the same results because they rely to a large extent on which measures and statistical indices are used. The Hills Review[xii] has shown that fuel poverty is a distinct issue from income poverty and some indicators draw a clear distinction between fuel poverty and income poverty. Hence the traditional approach to measuring fuel poverty – where a household was fuel poor if it spent more than 10% of its income to keep warm – captured many not fuel poor, for example with properties 'excessively sized'. The idea behind the indicators proposed in the Hills Review is that

households are fuel poor when they are both on a lower income and have higher than typical energy costs (DECC: 2013, 11).

While reframed through the new indicators, energy efficiency is seen as the most cost effective way of reducing energy costs. Currently the Green Deal is the key policy to lower energy costs and is designed to help households pay for energy efficiency improvements thanks to the savings that they make on their bill. In addition, the Energy Company Obligation (ECO) requires suppliers to support measures in favour of low income households. The effectiveness of these measures in tackling energy poverty has been questioned by several commentators, who affirm that the major part of the ECO funds are not delivered to fuel poor and/or that under the current ECO approach interests of energy companies and fuel poor consumers do not align (Platt et al., 2013; Preston et al., 2014).

The Italian policy to support vulnerable consumers is based on a completely different scheme that delivers benefits payable for electricity and gas consumption (see Law 205/2005 implemented through the Ministerial Decree of 28 December 2007 ('electricity bonus') and the Law Decree 185/2008 ('gas bonus')[xiii].

Given that in Italy the eligibility criteria are independent of actual household consumption, a recent analysis has sought to assess the extent of households eligible for benefits considering different indicators such as quality of accommodation, arrears in mortgage, rent or utility bill payment in addition to the equivalent income indicator. The result is that the eligibility criteria are inadequate particularly in several cases: for example, in the case of households facing difficulties because their bills amount to more than 5% (or 10%) of their net income, more than 40% of households are not entitled to the benefits ; or because the ISEE (Indicatore di Situazione Economica Equivalente – that is Equivalent Economic Conditions Indicator) value is compared to the standard threshold regardless the region of residence(Miniaci et al.: 2014, 17-19).

The conclusion is that alternative indices may represent the situation in different ways, but the different measures agree in highlighting that energy consumption has become less affordable since 2007. The scheme introduced in Italy to support vulnerable households consists of a lump-sum contribution. The analysis has shown that the decision to use a discount does not provide any support for consumers who have been disconnected and cash transfer could be more effective to help households in need.

As in other EU countries, also in Italy civic organisations and/or private institutions are engaged in tackling energy poverty and supporting vulnerable consumers. An interesting project,

promoted by the two Foundations related to A2A, an energy utility located in Milan and Lombardy, is about to start. The programme foresees the creation (initially only for a period of 6 years) of a legal entity, called Comitato Banco dell'Energia Onlus, funded by donors such as the management and the employees, and different kinds of customers of the A2A utility, in addition to the Banking Foundation Cariplo, aimed at supporting vulnerable consumers, households in arrears and also people at risk of poverty also temporarily. These direct subsidies can complement the 'social bonus' and recipients, who can be customers of any energy utility, will only be the inhabitants of the Lombardy region.

5. Conclusion: a new paradigm for governance of energy markets

The arguments advanced in the previous paragraphs refer to different conditions: the need for universal access to modern energy services and the dissemination of programmes oriented towards eradicating 'energy poverty' in developing countries, on the one hand, and, on the other, the experience of the energy-impoverished population whose number is increasing in advanced countries including EU since the start of the financial crisis in 2007.

Nonetheless the attempt to enhance energy access within national and international energy policies and the measures of many governments to reduce large pockets of energy poor and support vulnerable consumers have several elements in common: first the need to fight climate change by means of the use of renewable energy technologies and programmes to improve energy efficiency. Second, the inclusion of a plurality of stakeholders in programme design and implementation as global cooperation between state and non-state, public and private, political and financial actors is essential to make projects effective (for instance, supporting financial commitments, providing transparent and comparable information, facilitating technology transfer from industrialized to particularly vulnerable countries, etc.). Third, a common focus on the quality of energy services, the level of income, and energy affordability.

Drawing lessons from the experiences of the other countries in planning interventions for dealing with energy poverty can be a good strategy. The exchange of good practices among the countries is a useful instrument for regulator and policy makers. However the model "one-size-fits-all" is not a solution to the problem of energy poverty. Dealing with this issue calls for a thorough understanding of the particular contexts and especially of the cultures of the different populations.

The new paradigm that is emerging at a global level related to the design of energy policies focuses prevailingly on polycentrism and the involvement of multiple actors from multiple

spheres. Regarding developing countries, the cooperation of local governments, donors, governmental and non-governmental bodies, financial institutions, and members of civil society can put in place programmes not based on technological diffusion but aimed at achieving environmental sustainability, reduction of greenhouse gas emissions, and improving energy services and household income.

With regard to advanced EU countries, cooperation between public and private institutions, administrations at different levels, regulators, industry, and in addition consumers should be able to reduce greenhouse gas emissions and support vulnerable consumers and households at risk for energy poverty implementing long term projects in energy efficiency. On both sides the definition of energy affordability varies according to the market segments, the technologies, the household incomes, the geography, and social and political factors. But measuring affordability is essential because energy is an essential condition for a decent life.

[i] When F. Birol economist at the International Energy Agency called on his colleagues, as recently as 2007, to make "a place for energy poverty" in the agenda, he put a question mark at the end of the title (*Energy Economics: A Place for Energy Poverty in the Agenda?, The Energy Journal,* 2007).

[ii] As stated in several cases of foreign aid or subsidies, if not well designed, these tools can fail to deliver on their promise or can result in wasteful consumers' habits (IEA, World Energy Outlook, 2011 e 2012) .

[iii] In this perspective many documents: United Nations Development Programme, *Human Development Report 2010,* UNDP, New York, 2010; International Energy Agency, United Nations Development Programme, United Nations Industrial Development Organization, *Energy Poverty: How to Make Modern Energy Access Universal?* OECD, Paris, 2010; IIASA, *Global Energy Assessment*, 2013 (available at: http://www.iiasa.ac.at/research/ENE/GEA/).

[iv] Access to energy is implicit in a variety of existing human rights obligations, including the rights to life, heath, food, water, and an adequate standard of living. Moreover, the Convention of Elimination of All Forms of Discrimination Against Women explicitly obligates to ensure that rural women "enjoy adequate living conditions, particularly in relation to housing, sanitation, electricity, and water supply, transport and communication" (CEDAW, 1979, article 142 (2) (h)).

It is noteworthy that in a different context focusing on features and powers of the Italian energy regulator (recently established) the "right to energy" was seen as a task to be implemented by the regulator itself on the assumption that it represent a premise of human and individual rights (Sorace, 2003, 339).

[v] According to OFGEM, vulnerability has developed over the last decade, from 'disadvantaged' consumers to 'social issues' to vulnerable consumers. In addition, vulnerability is not just about an individual; the market can cause or exacerbate vulnerability, and different consumers may be vulnerable in different situations (OFGEM, Consumer Vulnerability Strategy, 4 July 2013 (Ref 102/13)

[vi] Directive 2009/72/EC, recital 53. Moreover this Directive for electricity and the Directive 2009/73/EC for natural gas provide the framework for identifying vulnerable consumers: In this perspective article 3 (7 and 8) seems to be of most relevance: "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 ensure that rights and obligations linked to vulnerable customers are applied. In particular, they shall take measures to protect final customers in remote areas". And "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".

[vii] ASETs include, as example, decentralized electricity generating systems based on solar, wind, and local biodiesel; improved and efficient cook-stoves; solar thermal heating; and simple windmills for pumping water.

[viii] "[…] the world as a whole is falling short of its ambition to provide affordable, reliable, sustainable and modern energy for all. Despite the serious efforts already made, today an estimated 1.2 billion people – 17% of the global population – remain without electricity, and 2.7 billion people – 38% of the global population – put their health at risk through reliance on the traditional use of solid biomass for cooking. The newly agreed UN Sustainable Development Goals embrace a goal on energy, a move long advocated by the IEA, including the target to achieve universal access to energy by 2030. In our Outlook, the number of people without electricity falls to 800 million by 2030 and the number without access to clean cooking fuels declines only gradually to 2.3 billion in 2030", as explained in Executive Summary of OECD/IEA, World Energy Outlook 2015, 5 (available at: http://www.worldenergyoutlook.org/weo2015/).

[ix] For more detailed information on EU member states using the indicators such as income, energy consumption, energy prices and housing characteristics, see INSIGHT-E, Energy poverty and vulnerable consumers, cit, 9 and 11 -13.

[x] To achieve this targets a range of measures have been put in place addressing the main causes of fuel poverty: "(1) programmes to improve energy efficiency and reduce the costs of fuel for fuel poor households. These include the separate home energy efficiency schemes within each country as well as efforts through local authorities and registered social landlords; (2) continuing action to maintain the downward pressure on fuel bills, ensuring fair treatment for the less well off, and supporting the development of energy industry initiatives to combat fuel poverty; (3) continuing action to tackle poverty and social exclusion recognising that these are
multi-dimensional problems" (The UK Fuel Poverty Strategy, 2001).

[xi] "The central thrust of the UK's policy to reduce emissions from households is through measures to improve energy efficiency, including the new Energy Efficiency Commitment (EEC), better appliance standards and labelling, higher standards in the building regulations, and action to encourage the modernisation of community heating schemes. The Government is also encouraging more use of renewable forms of energy and Combined Heat and Power (CHP) " (The UK Fuel Poverty Strategy, 2001) .

[xii] Professor Sir John Hills of the London School of Economics was commissioned to undertake a review by the Department of Energy and Climate Change in 2011. Specifically, Professor Hills was asked to look at the problem from first principles, setting out the causes and impacts of fuel poverty and assessing whether the current definition and indicator of fuel poverty (set out in the Act and the first fuel poverty strategy of the 2001) were fit for purpose (Getting the measure of fuel poverty – Final report of the Fuel Poverty Review, 2013).

[xiii] Such benefits can be provided to: poor housholds or households at-risk-poverty; large households; and households which include a disabled or an ill person. Considering the income criteria, it is foreseen to use an indicator called ISEE (Indicatore di Situazione Economica Equivalente) that gives information about three elements: income; real and financial asset; and the composition of the household. A household is eligible when the ISEE not exceeds 7,500 euro; in case it includes more than 3 dependents the threshold is increased to 20,000 euro. The benefits are paid in the form of discount only to domestic customers in its primary residence. The program is funded through components in transmission or distribution, paid by all consumers. Domestic customers who meet the eligibility criteria can apply at the municipality where they reside (see http://www.autorita.energia.it/it/bonus_sociale.htm; http://www.autorita.energia.it/it/bonus_gas.htm).

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