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ENERGY EFFICIENCY AS INFRASTRUCTURE

LEAPING THE INVESTMENT GAP

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As Europe moves to implement the Paris Climate Agreement, two-thirds of its low carbon energy infrastructure investment to 2040 will need to be in energy efficiency. This implies an eightfold increase in current levels of investment. The Energy Union Strategy has called for a fundamental rethinking of energy efficiency, to treat it as an energy source in its own right, representing the value of energy saved. Without a major rethink Europe risks it ability to meet its climate and energy targets in 2030 and beyond.

This briefing argues that the investment gap exists because, politically, we have failed to properly grasp the nature of the challenge. Going forward, energy efficiency needs to be redefined as a core part of Europe's energy infrastructure. This briefing outlines the arguments for this and the practical implications of moving forward with this proposal.

1. Summary

An eightfold increase in current levels of energy efficiency investment is needed to 2040 to keep Europe on track to meet its Paris Agreement obligations.

The European Commission's Heating and Cooling Strategy has started to set out the links between energy efficiency and the wider energy infrastructure system. But there needs to be more explicit integration. The first step is to define energy efficiency as an infrastructure priority. There are three core arguments for this:

- **Functional**: in a post-Paris Agreement world, around two-thirds of the investment needed to achieve 2°C in a cost-effective manner needs to be in

efficiency, meaning energy efficiency investment is the most critical part of the energy transition.

- **Logical:** Treating energy efficiency as infrastructure and integrating it into wider national infrastructure planning means supply side investment needs will fall as projected demand falls, thus reducing the risk of asset stranding and reducing costs to society.
- **Definitional**: Energy efficiency fulfills the definition of infrastructure used by the International Monetary Fund and other economic institutions. Like traditionally recognized infrastructure, energy efficiency is long-lasting capital stock, provides inputs to a wide range of goods and services and frees up capacity elsewhere in the economy.

Treating energy efficiency as infrastructure would transform how the Commission and Member States approach the energy efficiency agenda in four ways.

- **First, energy efficiency projects would be subject to economic appraisals that highlight its benefits as well as costs:** Treating energy efficiency as infrastructure would require it to be appraised in the same way as other social investments (such as road or school building programmes). Doing this will make visible the multiple benefits of energy efficiency – and the fact that a failure to deliver energy savings and demand response actually has a cost to society.
- **Second, there would be a strong case to review EUROSTAT accounting rules, allowing for adjustments in how energy efficiency investment is accounted**: Two review options could be considered: (i) Consider a new off balance sheet classification of 'productive debt' (applies to Government-led investment programmes); (ii) Consider an amendment to how IFRS rules are interpreted and recognise cash savings from energy efficiency investment programmes and Energy Performance Contracts in the 'scoring' of investments (applies to government led investment, as an alternative to the above, and also to industry-led investment).
- **Third, there would be opportunities to create a better functioning internal energy market:** To ensure the delivery of the best outcomes for consumers, energy markets need to be able to deploy the optimal amount of energy efficiency over time. This requires bespoke regulation of energy markets to drive the deployment of demand response and energy efficiency that create a "level playing field" where efficiency can compete equally with the supply side in energy markets (both the wholesale market but also in capacity markets and even auctions for low carbon capacity).
- **Fourth, a review of State Aid Treatment of energy efficiency would be triggered to facilitate streamling of public-private financing options:** The constraints placed on aid intensities for energy efficiency (30-50%) measures are the lowest of all environmental aid measures; energy infrastructure on the other hand is allowed 100% of eligible costs. Revising State Aid treatment

of energy efficiency to match the treatment of wider energy infrastructure will streamline the processes by which public-private financing structures are developed to support investment, which in turn will unleash the power of cities and regions to deliver efficiency and demand side measures.

2. Central to the global climate deal – but underperforming

The December 2015 Paris Agreement strengthened the global goal – first championed by the European Union (EU) - to keep global temperature increase well below 2˚C and to pursue efforts to limit it to 1.5˚C. The Agreement added a more specific target to achieve global peaking of greenhouse gas emissions as soon as possible, and to reach greenhouse gas (GHG) emission neutrality in the second half of the century. This goes further and faster than anything previously agreed. For the EU a reasonable working assumption is that a near-zero-emission economy must be delivered by 2050. While countries will ultimately take their own views on how best to pursue this decarbonisation goal, IEA analysis gives some indication of the challenges that lie ahead – and of the importance of ramping up energy efficiency investment.

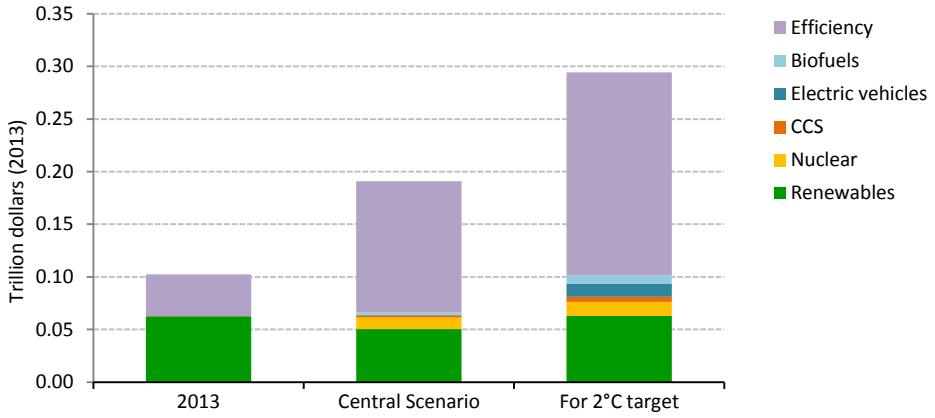

Figure 1. Average annual low-carbon investment needed in the EU to meet a 2°C target, 2014-2040. Source IEA (2014) World Energy Investment Outlook.

As shown in Figure 1, analysis by the IEA indicates that **to meet the well below 2°C goal, two-thirds of the EU's low carbon energy infrastructure investment to 2040 will need to be in energy efficiency.** It is true that the EU has made significant progress in improving the efficiency with which it uses energy. Overall energy demand in Europe is falling (it is now at around the same level it was in 1990). Looking more specifically at gas, demand is now 23% below its peak – and is falling across all three major sectors: power, industry and residential[1]. **But progress is not being made as fast as it could or should.**

[1] E3G (2015) Europe's Declining Gas Demand. See http://www.e3g.org/news/media-room/europes-declining-gas-demand

An estimated €60-100bn[2] of annual investment is needed in buildings alone to achieve Europe's 2020 energy efficiency targets. Current investments are less than half this level[34]. Looking out to 2040, the IEA estimates an average of $200bn (€178bn) needs to be invested annually across the economy to deliver the scale of energy efficiency investment needed to keep the EU on track to the well below 2°C goal. **This equates to an at least eightfold increase in energy efficiency investment compared to 2013 levels[5].** The Energy Union Strategy recognizes this gap – and sets out the need for a fundamental rethinking of energy efficiency[6], including (somewhat counter-intuitively) calling for it to be treated it as an energy source in its own right.

3. An opportunity for both the climate and growth

The calls to treat energy efficiency as an energy source in its own right have traditionally been made based on the value of the energy savings. **But economic analyses undertaken by a range of well-respected organizations demonstrate the benefits of energy efficiency go much wider than energy savings. They include positive impacts on the productivity of the EU economy and real-world social benefits for its citizens.** For example, it has been shown that investments in energy efficiency perform as well as, or better than, other forms of infrastructure investments in terms of tax revenues and jobs created in addition to the overall impact on GDP and balance of trade[7] (see Figure 2).

In addition to these macro-level benefits, there are local benefits. For example, energy efficiency investments in buildings improve air quality and health while alleviating fuel poverty and mitigate the intermittency of renewable energy sources[8]. **These multiple benefits can directly address some of the core challenges facing EU Member States today – including low growth and high unemployment, energy security concerns and the growing issue of energy poverty[9].**

[2] COM (2012) Consultation Paper: "Financial Support for Energy Efficiency in Buildings"; and EURIMA. (2012). Financing Mechanisms for Europe's Buildings Renovation.

[3] DIW. (2013). Financing of Energy Efficiency: Influences on European Public Banks' Actions and Ways Forward

[4] BPIE Estimates based upon 2011's "Europe's Buildings under the Microscope: A country-by-country review of the energy performance of Europe's buildings"

[5] IEA. (2014). Special Report: World Energy Investment Outlook.

[6] See COM(2015) 80 final

[7] Cambridge Econometrics & Verco (2014) Building the Future: The economic and fiscal impacts of making homes energy efficient; Frontier economics (2015) Energy efficiency: An infrastructure priority; Copenhagen Economics (2012), Multiple benefits of investing in energy efficient renovation of buildings; KfW Bankengruppe (2011) study See http://www.kfw.de/kfw/en/KfW_Group/Press/Latest_News/ PressArchiv/PDF/2011/092_E_Juelich- Studie.pdf

[8] E3G (2012) The Macroeconomic benefits of Energy Efficiency – The case for public action

[9] A January 2016 survey by ComRes/Burson-Marsteller found slow economic growth in the Eurozeon, climate change and tensions with Russia are the 3rd, 4th and 5th priority, respectively, for influencers in the EU. (The Refugee crisis and the threat of Daesh/Islamic State being 1st and 2nd, respectively.).

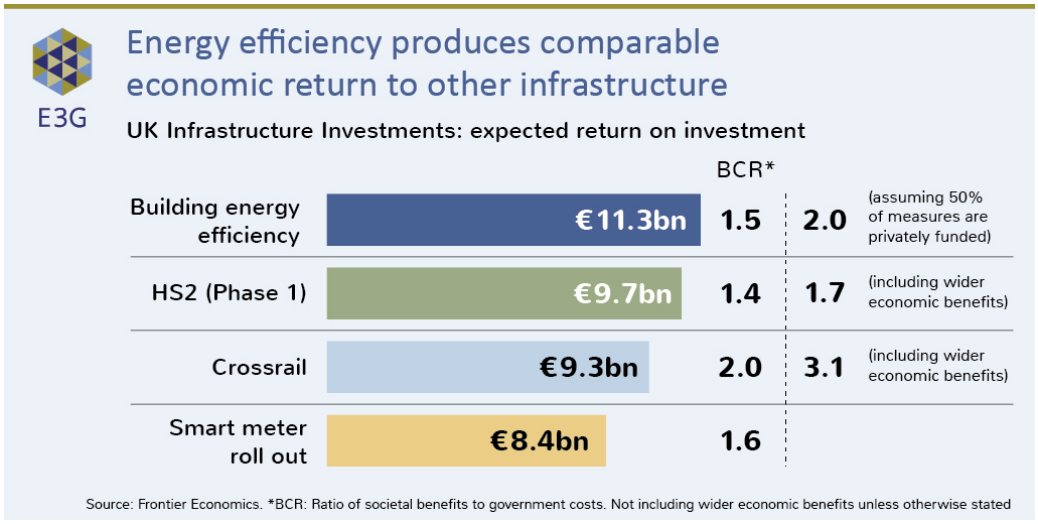

Figure 2. Summary of cost benefit analysis for a buildings energy efficiency programme in the UK compared to other infrastructure investment. Source: Frontier Economics[10]. HS2 refers to the new UK high speed 2 rail line.

4. Making good on the promise of "Energy Efficiency First"

Despite a growing understanding of the economic benefits of energy efficiency there remains a gap between the supportive rhetoric on energy efficiency and action taken by the European Commission and Member States to make its slogan 'Energy Efficiency First' a reality[11]. The 2016 energy efficiency legislative agenda and the key decisions being made on the Energy Union and governance of the 2030 climate and energy package present opportunities to turn this situation around. But it will require a complete change in how decision-makers think about energy efficiency.

Going forward energy efficiency (including demand response) must become the foundation from which:

- the European Commission considers how its 'at least' 40% GHG target is met in 2030; and
- Member State 2030 National Climate and Energy Plans are developed.

This is a significant change from the current approach – which is to treat energy efficiency as an 'add-on' to try to reduce energy use after infrastructure has been built. The Heating and Cooling Strategy recognises these linkages and **has at its centre a plan to boost the energy efficiency of buildings, improve linkages between**

[10] Frontier Economics (2015) Energy efficiency: an infrastructure priority. See: http://www.e3g.org/docs/Frontier_Economics_-_Energy_Efficiency,_an_Infrastructure_Priority.pdf

[11] Vice President Šefčovič's speech can be found at https://ec.europa.eu/commission/2014-2019/sefcovic/announcements/cornerstones-new-eu-energy-union_en The Coalition for Energy Saving's paper setting out Energy Efficiency First can be found at http://energycoalition.eu/sites/default/files/20150504%20Energy%20Efficiency%20First%20-%20making%20it%20happen%20FINAL_0.pdf

electricity systems and district heating systems which will greatly increase the use of renewable energy, and encourage reuse of waste heat and cold generated by industry[12]. Failure not to consider energy efficiency as part of the energy infrastructure planning in this way risks significant negative societal benefits, including the unnecessary cost associated with foreseeable asset stranding[13].

5. Energy efficiency as infrastructure

There are three core arguments for redefining energy efficiency as an infrastructure priority: functional, definitional and logical. Each is examined in turn.

Functional: In a post-Paris Agreement world, two-thirds of the investment needed to get to achieve 2°C in a cost-effective manner needs to be in efficiency, meaning energy efficiency investment is the most critical part of the energy transition.

Despite the recent fall in gas demand and the current spare capacity on the system, a significant quantity of gas infrastructure is being planned in Europe. This includes both new import capacity and strengthening internal gas transmission networks within the EU. A number of large 'mega-projects' – such as Nordstream II, Southern Gas Corridor and Bulgaria Stream - aimed at increasing import capacity are included. The investments are planned with the expectation of rising gas demand. In actuality, gas consumption in Europe has been falling and in 2015 was approximately 20% lower than its peak in 2010[14]. **Wasting public and private capital on financing unnecessary infrastructure while failing to address rising energy poverty, risks the Energy Union being seen by European citizens as an illegitimate project[15].**

Logical: Treating energy efficiency as infrastructure and integrating it into wider national infrastructure planning means supply side investment needs will fall as projected demand falls, thus reducing the risk of asset stranding and reducing costs to society. To optimise the design of networks and supply side investments there is a need to understand demand and demand management potential – and therefore energy efficiency – better and include this as an active process inside all network planning.

[12] European Commission (2016) An EU Strategy on Heating and Cooling {SWD(2016) 24 final} https://ec.europa.eu/energy/sites/ener/files/documents/1_EN_ACT_part1_v14.pdf

[13] This applied notably to gas infrastructure but also power generation investments that are no longer needed and must be 'written off' financially.

[14] J. Gaventa, M. Dufour, L. Bergamaschi (2016) Energy Union Insight Series: More security, less money: A smarter approach to gas infrastructure in Europe. E3G

[15] Even in Germany – the wealthiest Member State in Europe, 13% of households live in fuel poverty. In the EU, the Commission estimates around 56m people (11% of EU citizens) are unable to keep their homes warm as energy prices keep rising.

As governments plan their energy infrastructure choices to deliver Europe's Energy Union and 2030 climate targets there needs to be an integrated approach to considering the role of both demand and supply side investments for achieving the goals of an affordable, secure and low carbon energy supply. Member States should consider the reduction of their energy demand as a first phase and assess the full cost and benefits of the required investments and measures against supply side alternatives while drafting their National Energy and Climate Plans[16]. The Commission should assess the methodology used by Member States to estimate their energy demand and the subsequent plans for infrastructure. Member States should then set out the potential for demand versus supply side investments to meet this demand[17]. Together with a regional assessment of the needed infrastructure projects, this should be an integral part of the iterative dialogue between the Commission, a Member State and its neighbours. Realistic demand projections (ones that include a view of the role of efficiency and demand side measures in managing future energy demand) must be the basis from which governments plan to secure their remaining energy needs through supply side investment.

Definitional: Energy efficiency fulfills the definition of infrastructure used by the International Monetary Fund and other economic institutions. Like traditionally recognized infrastructure such as roads, railways and energy supply investments, energy efficiency is long-lasting capital stock, provides inputs to a wide range of goods and services and frees up capacity elsewhere in the economy[1].

It is widely agreed that a key role of the State is to ensure the necessary infrastructure to support society is in place. When the term "infrastructure" is used, roads, railway systems, cables, wires and pipelines tend to come to mind – not energy efficiency. Yet **energy efficiency does have the characteristics of other traditionally recognized infrastructure. It is long-lasting capital stock requiring significant upfront investment; provides inputs to a wide range of goods and services; and frees up capacity elsewhere in the economy**. There are major benefits to treating energy efficiency as infrastructure and integrating it into wider national infrastructure planning – as it means supply side investment needs will fall as projected demand falls, thus reducing the risk of asset stranding and the cost to society.

This view was confirmed in a study commissioned by E3G from Frontier Economics[18], and which provides a comprehensive overview of why energy efficiency should qualify as an infrastructure investment. Frontier's analysis also found a strong value for money case (see Figure 2), showing that an energy efficiency programme can have

[16] According to the Energy Union's progress all member states are required to prepare an integrated energy and climate plan.

[17] E3G (2015), Options for a 2030 Energy Efficiency target: delivering the "at least" 40% GHG cuts through Energy Efficiency First

[18] Frontier economics (2015) Energy efficiency: An infrastructure priority. See http://www.e3g.org/docs/Frontier_Economics_-_Energy_Efficiency,_an_Infrastructure_Priority.pdf

comparable benefits to other major infrastructure investments. In fact, the study found a programme to make British buildings more energy efficient would generate £8.7bn of net benefits (€12bn). This finding holds, even without quantifying many of the key social benefits of energy efficiency measures (for example health improvements and option value).

The value for money case for investing in energy efficiency has not just been made in the UK but also in Germany and Hungary. In Germany in 2011 it was found that insulation of outer building walls and roofs or renovation of heating systems created around €14bn in added value to the economy and 280,000 jobs[19]. A similar study[20] undertaken in Hungary in 2012 found the roll out of a national energy efficiency prorgamme would enhance the balance of trade by a €2.5bn, create 50,000 new jobs and result in additional revenues to the state budget through increased productivity[21].

6. What would this change? Practical implications

Economic analyses undertaken by a range of well-respected organizations has shown time and again that the benefits of energy efficiency go much wider than simply energy savings. The sector currently employs around 900,000 people[22]. Expanding employment through boosting investment not only creates jobs - it also helps to reduce energy imports and dependency, improve the competitiveness of European businesses and deliver the EU's greenhouse gas emission reduction goals.

In addition to these macro-level benefits, there are local benefits. For example, energy efficiency investments in buildings improve air quality and health while alleviating energy poverty and mitigating the intermittency of renewable energy sources[23].

Along the road to delivering these positive impacts, a number of specific changes would happen. They are set out below.

Implication 1: A move to appropriate economic appraisal of energy efficiency projects

Treating energy efficiency as infrastructure would require it to be appraised in the same way as other social investments (such as road or school building programmes). Doing this will make visible the multiple benefits of energy efficiency – and the fact that a failure to deliver energy savings and demand

[19] Municipal Value Added Through Energy-Saving Building Refurbishment, Institute For Ecological Economic Research (Iöw) And Ecofys, 2014
[20] More Efficient Homes – Macro Economic IMPACTS A macro-economic analysis of a significant state support scheme to household energy efficiency investments, Energiaklub Climate Policy Institute & Applied Communications, 2012
[21] 30% would be refunded of the invested amount by state sources
[22] See report by Cambridge Econometrics (2015) Assessing the Social and Employment Impact of Energy Efficiency https://ec.europa.eu/energy/sites/ener/files/documents/CE_EE_Jobs_main%2018Nov2015.pdf
[23] E3G (2012) The Macroeconomic benefits of Energy Efficiency – The case for public action

response actually has a cost to society. This benefits would then be included in the appraisal of any instruments to deliver energy efficiency e.g. grants, soft loans, energy efficiency feed-in-tariffs – creating a level playing field for economic assessments of energy efficiency investment programmes.

Why is this important? As noted above, estimates suggest that €60bn-100bn annual investment is required in EU buildings alone to achieve Europe's 2020 energy efficiency targets. While private capital is available to provide investment where investment pipelines emerge[24], both public and private capital will be needed to deliver investment at this scale. Public finance will need to be targeted to public-private risk sharing instruments to stimulate investment across a range if sectors – and, within housing specifically, will needed to deliver investment in the homes of those on lower incomes[25]. A study ordered by the European Commission shows that 11% of the European population suffers from energy poverty[26]. Vice President Šefčovič (who is overseeing the Energy Union) has recently underlined the issue as being a core element of the social dimension of the Energy Union[27]. Treating energy efficiency as infrastructure is part of the solution. At a time when public budgets are under pressure, it is argued by some that energy efficiency is too expensive to deliver – and yet public capital is available. Over the next 15 years $90tr (€80tr) is expected to be invested globally in infrastructure[28]. Within the G20 grouping, of which the EU is a member, there is a strong focus on driving growth through infrastructure investment.

As the Antalya Action Plan stated "Infrastructure investment helps lift medium-term growth, reduce inequalities and improve productivity, while also having positive near-term impacts on job creation and demand. Actions to channel long term finance for investment in infrastructure are particularly important." Infrastructure investment is usually based around long-term projects that require many years to plan, procure and deliver. These protracted timelines help explain why, even in periods of austerity, infrastructure investment tends to be the last area that is cut within the national budgets. The same usually cannot be said for energy efficiency investment supporting programmes – despite the fact that delivery of a major energy efficiency program would also require several years to plan, procure and deliver (see Box 1).

Redefining and treating efficiency as infrastructure creates a strong argument for funding energy efficiency programmes from government capital expenditure (rather than operational) budgets – which in turn makes the costs and also benefits (including energy savings but also other side benefits) visible on the government's balance sheet as it is for other infrastructure. The next step is to consider how this 'productive' debt is classified.

[24] EEFIG, "Energy Efficiency – the first fuel for the EU Economy. How to drive new finance for energy efficiency investments"
[25] REF Finncing energy efficiency paper and EEFIG
[26] INSIGH_E (2015), Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures. https://ec.europa.eu/energy/sites/ener/files/documents/INSIGHT_E_Energy%20Poverty%20-%20Main%20Report_FINAL.pdf
[27] European Commission (2016), Speech by Vice-President for Energy Union Maroš Šefčovič at the European Policy Centre - Launch Event Task Force on Energy Poverty. http://europa.eu/rapid/press-release_SPEECH-16-164_fr.htm
[28] Seizing the Global Opportunity, New Climate Economy report, 2015

Implication 2: Review EUROSTAT rules and allow adjustments for how energy efficiency investment is accounted

Current EU accounting rules make it difficult for many Member States and their local authorities to develop energy efficiency investment programmes with the private sector. This is because these investments, even when delivered and mainly financed by third parties (Energy Service Companies - ESCOs), including as Energy Performance Contracts, are counted towards public sector debt and recorded on the government balance sheet. Given the multiple benefits of energy efficiency – including the contribution that can be made to improving European competitiveness and security – and the highly productive nature of this debt there is a strong case for reviewing these rules.

Why is this important? The current interpretation of IFRS accounting rules, recently confirmed in relation to governments' use of Energy Performance Contracts by EUROSTAT[29], make it difficult for many Member States and their local authorities to develop energy efficiency investment programmes with the private sector. This has a big impact, in particular, when public sector actors are trying to develop public infrastructure investment programmes, including for buildings renovation. This is because these investments, despite being delivered and financed wholly or in part by private sector partners, require capital budget to cover the cost and as a result are recorded as being on balance sheet and counted towards public sector debt[30]. This is a disincentive for governments to act. Similar barriers face industry. Despite using third party finance and Energy Performance Contracts, businesses must count the debt on their corporate balance sheets. These disincentives result in a continued focus on grant-funded schemes, leaving private sector public-private financing options under-exploited and ESCO markets under-developed.

There are three reasons to review the current accounting treatment for energy efficiency investment programmes – including via energy performance contracting:

- The non-level playing field for energy efficiency compared to other infrastructure investments funded by via public-private partnerships (and which enjoy a 'service' categorisation that means they don't require capital budget and are classed as off balance sheet). This constitutes a failure to implement the Energy Efficiency First principle.
- The failure to take into account the productive nature of these investments – including the energy savings made from the first day the assets are operational. A precedent has already been set under the Junker Plan, which allows accounting rules exemptions for Member State contributions to the

[29] See http://ec.europa.eu/eurostat/documents/1015035/6934993/EUROSTAT-Guidance-Note-on-Energy-Performance-Contracts-August-2015.pdf/dc5255f7-a5b8-42e5-bc5d-887dbf9434c9

[30] Forthcoming analysis by Deloittes.

European Fund for Strategic Investment (EFSI), which are not scored in debt calculations[31].

- In the specific case of Energy Performance Contracts, the majority of risks (related to construction, finance and operations) lie with private sector providers – and so do not represent a liability to the public sector.

Two routes can be explored to address these issues.

Option 1: **consider a new off balance sheet classification of 'productive debt'** (applies to Government-driven investment - notably in buildings): Adjustments to Eurostat rules on how energy efficiency investment programmes (whether financed by the public sector or via ESCOs) are scored in government accounts would remove the need for governments to find capital budget to cover the cost of investment. Consideration should also be given to creating flexibility in how the debt is accounted for under the Stability and Growth Pact rules.

Option 2: consider an amendment to how IFRS rules are interpreted and recognise cash savings from energy efficiency investment programmes and energy performance contracts in the 'scoring' of investments (applies to government and private sector-driven investment across the economy): Adjustment to the interpretation of IFRS rules to allow for applications for capital budget to cover Energy Performance Contracts to be considered in the context of the initial capital budget required net of the future savings to governments or businesses going forward. This would have the effect of EPCs being prioritised and scored higher in the approvals process compared to other standard infrastructure projects (in the case of governments) and other investments (in the case of businesses). Requiring this calculation to be undertaken would also mitigate the risk of misuse of EPCs by public and private entities[32].

To facilitate options 1 and 2, further measures to ensure transparency around how amendments to the interpretation of accounting rules are implemented through facilitating the development of standardised operational guidelines and procurement processes accelerate government and also business investment in energy efficiency services and products.

[31] EurActiv (2014) - Eurozone countries will be offered the opportunity to invest further top-up amounts into the fund, to be spent in their countries, which will then be discounted from the calculations of their deficits within the European Semester. https://www.euractiv.com/section/social-europe-jobs/news/juncker-s-315bn-investment-plan-unveiled-fifteenfold-leverage-and-solidarity-for-the-south/

[32] The transparency of this approach would mitigate against the risk that the procuring entities remove from their balance sheet assets for which they assume full risks (thus helping to ensure the spirit of the IFRS rules is implemented).

Implication 3: opportunities to create a better functioning internal energy market

To ensure the delivery of the best outcomes for consumers there is a need to have markets and incentives capable of deploying optimal amount of energy efficiency over time. This requires bespoke regulation and markets to drive forward the deployment of demand response and energy efficiency that create a real "level playing field" where efficiency can compete on an equal basis to the supply side in energy markets (both the wholesale market but also in capacity markets and even auctions for low carbon capacity).

Why is this important? Given the multiple market failures that need to be addressed and the amount of upfront investment that needs to be secured in the coming decades, significant intervention is needed to level to playing field. Treating energy efficiency as an infrastructure allows decision-makers to take the relevant decisions in order to facilitate investments without heavy regulatory interventions needed. The suite of upcoming Energy Union legislation is an opportunity to deliver these reforms and build a better functioning internal energy market that accelerates the delivery of demand side and energy efficiency investment. These reforms could include:

- Efficiency being delivered as a specific type of regulated investment, with an explicit delivery body allowed to make a regulatory return on investment.
- Efficiency becoming a deployable option for network operators, where it represents better economic value.

Much of this needs to be done to deliver flexible demand side markets and decarbonise heat, as such it makes sense to build energy efficiency reforms into that process.

Implication 4: review State Aid Treatment of energy efficiency and streamlining of public-private financing

The constraints placed on aid intensities for energy efficiency (30-50%) measures are the lowest of all environmental aid measures; energy infrastructure on the other hand is allowed 100% of eligible costs. Revising State Aid treatment of energy efficiency to match the treatment of wider energy infrastructure will streamline the processes through which public-private financing structures are developed to support investment, which in turn will unleash the power of cities and regions to deliver efficiency and demand side measures.

Why is this important? State Aid is one of the most powerful levers the European Commission has at its disposal to enforce internal market principles. As a result it is one of the most important tools to ensure the creation of a truly European internal energy market, drive the low carbon transition and create a level playing field for

resource efficient products and services. However it can also be a burdensome process that creates unnecessary hurdles to accelerating the transition of Europe's energy systems. The constraints placed on aid intensities for energy efficiency (30-50%) measures are the lowest of all environmental aid measures; energy infrastructure on the other hand is allowed 100% of their eligible costs (see Table 1).

Table 1: Maximum aid intensities for environmental protection measures

Environmental protection measure	**Level of maximum aid intensity**
Carbon capture and storage	100%
Energy infrastructure	100%
Aid for environmental studies	50%-70%*
District heating and cooling using conventional energy	45%-65%*
Renewable energy	45%-65%*
Energy efficiency	30%-50%*

**dependent on the size of the enterprise.*

The Commission has made a provision for 100% aid intensity to be allowed if aid is awarded on the basis of a competitive bidding process. However, there is a lack of guidance on a suitable competitive bidding process for energy efficiency measures, of which there are a numerous and diverse range in the buildings and industry sector alone. This creates uncertainty on what would be accepted as a correct procedure in order to grant 100% aid intensity for energy efficiency measures.

Box 1. The political and economic importance of where energy efficiency appears on government balance sheets

Research by E3G on the political visibility of energy efficiency in G20 countries and across the EU indicates that efficiency programmes are fragmented and so lack impact. The energy efficiency related budgets (which are relatively small compared to those available to support supply side investment) that are often mismanaged by public authorities. This is most obvious in countries such as Turkey, Russia but also – within the EU – in many Central and Eastern European Member States. Energy efficiency financing programmes are usually targeted not to the sectors of the economy where the highest value energy savings can be achieved but to those sectors believed to be most rewarding politically in the short-term. For example programmes are targeted to support lightbulb or refrigerator replacements which only provide minimal gains. Or they target highly vocal members of the population such as affluent and retired people. With the rise of austerity measures in some countries, energy efficiency programmes are especially vulnerable to cut backs. For example in 2015 the UK the underperforming Green Deal Programme has been abandoned while a new nuclear plant is being planned at vast cost. Similarly in Russia, also in 2015, the energy efficiency support budget was cut back entirely as a "natural" part of austerity policies, while wider capital spending on infrastructure has been retained. This single action has wiped out around$1.5bn (€1,7bn) of investment across Russia.

Shifting energy efficiency to sit within the capital expenditure budget would be more than just a symbolic change. It would signify taking efficiency out of the short-termist discussion about annual operational spending priorities. It would also end the suboptimal situation of energy efficiency competing with health or education spending needs – since it would no longer be financed from the same operational expenditure 'pot' as these items. Instead it would compete with other capital expenditure priorities such as rail, road, power supply, where it is competitive due to the multiple benefits large scale investment can bring.

The result is that energy efficiency suffers multiple disadvantages including: a lack of clarity on what form the aid should take; a lack of clarity on what process public authorities should follow; and restrictions on aid intensity[33].

These restrictions are likely to have significant real economy impacts: in Sweden, Belgium and Bulgaria a lack of available finance for energy efficiency measures has specifically been highlighted as a key barrier for energy efficiency deployment[34].

[33] See forthcoming E3G briefing

[34] The Coalition for Energy Savings (2015) Putting energy efficiency first – addressing the barriers to energy efficiency

Reducing the ability for public support will exacerbate this issue by reducing the potential of leveraging private investment.

Reviewing the aid intensity for energy efficiency to bring it in line with infrastructure would avoid the need to run competitive binding processes, streamline project development, simplify the process of putting financing packages together and accelerate deployment of efficiency in the real economy.

7. Final thoughts

Despite calls by the Commission for "Energy Efficiency First" and a "fundamental rethinking of energy efficiency"[35] within the Energy Union a clear move to make good on this promise is yet to materialise. The recent Heating and Cooling Strategy has started that process, stating it has at its core is "a plan to boost the energy efficiency of buildings, improve linkages between electricity systems and district heating systems which will greatly increase the use of renewable energy, and encourage reuse of waste heat and cold generated by industry". This is a positive step forward, but the Commission needs to be more explicit in how linkages between energy efficiency in building and industry are integrated into wider energy infrastructure planning.

If Mr Šefčovič is to stay true to his words that: "the energy we don't use is our first fuel" the time has come to Europe to walk the talk on 'energy efficiency first' and translate this slogan into a set of real political priorities and actions. The European Commission can start by declaring energy efficiency a key infrastructure priority within the Energy Union. From that point a range of reforms can be implemented to accelerate investment into energy efficiency, close the investment gap and turn up the dial on ambition.

[35] See COM(2015) 80 final

About E3G

E3G is an independent global think tank, working to accelerate the transition to a low-carbon economy. E3G specializes in climate diplomacy, climate risk, energy policy and climate finance, building cross-sectoral coalitions to achieve carefully defined outcomes, chosen for their capacity to leverage change.

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