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COVER NOTE

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COMMISSION STAFF WORKING DOCUMENT

EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT

Accompanying the document

Communication from the Commission to the European Parliament and the Council

Energy Efficiency and its contribution to energy security and the 2030 Framework for climate and energy policy

{COM(2014) 520 final}
{SWD(2014) 255 final}

EXECUTIVE SUMMARY OF IMPACT ASSESSMENT

1. Policy context

1. In 2007 the European Council set the target of saving 20% primary energy by 2020 (compared to 2007 projections). The Energy Efficiency Directive (EED) establishes a common framework of measures for the promotion of energy efficiency to ensure the achievement of the target. It requires the Commission to assess by June 2014 whether the EU is likely to reach the target and to propose further measures if necessary.

2. The recent European Energy Security Strategy (EESS)[1] highlights moderating energy demand as *"one of the most effective tools to reduce the EU's external energy dependency and exposure to price hikes"*.

3. The 2030 Communication lays down the broad modalities of the EU climate and energy framework for the period between 2020 and 2030[2]. While the Communication states that *"A greenhouse gas emissions reduction target of 40% would require an increased level of energy savings of approximately 25% in 2030"*[3], it also indicates that the exact ambition of future energy savings policy and measures necessary to deliver it are to be established in the review of the EED building on the analysis underpinning the 2030 framework and the targets and objectives for greenhouse gas reductions and renewable energy proposed in 2030 Communication.

2. Lessons learned and problem definition

4. Having increased from 1618 Mtoe in 2000 to 1721 Mtoe in 2006, the EU's primary energy consumption has been decreasing ever since. While the economic crisis that began in 2008 had a significant impact on energy demand, the effect of efficiency gains (driven by prices and policies) was greater. Efficiency has improved since 2000 and the rate of improvement has accelerated since 2008. However, if current trends continue by 2020, roughly 1/3 of reduction in energy consumption compared to the 2007 Reference will stem from lower growth than anticipated, and only about 2/3 from increasing energy efficiency improvements

5. Between 2008 and 2012, primary energy consumption fell in the majority of Member States. Changes in the level of economic activity played a big part in this, as did changes in the electricity generation mix and changes in industrial structure. In certain countries, the effect of these factors was countered by changes in the level of consumption (e.g. increasing average size of dwellings).

6. The energy efficiency policy framework has developed significantly in the last years. The target EU target on 20% energy savings has now been clearly defined, providing political momentum, guidance for investors and a benchmark to measure progress At European level, the most effective policies so far have been product efficiency standards, including ecodesign and energy labelling of products and the CO_2 legislation for cars and vans. The Energy Performance of Buildings Directive (2010 recast) and the Energy Efficiency

1 COM(2014) 330

2 COM (2014) 15 final.

3 25% energy savings for the target of 40% GHG corresponds to the scenario GHG40 from the 2030 IA, which was identified as the most cost-effective way to achieve 40% GHG savings.

Directive of 2012 have the potential to further drive energy efficiency in the EU provided they are properly implemented by Member States. The long-term potential of the EED is however limited to some extent by the fact that some of the key provisions stop applying in 2020.

7. At national level, Member States report success with different policy measures. The up-to-date information submitted by Member States in their 2014 National Energy Efficiency Action Plans indicates further strengthening of national policies, including new measures to implement the Energy Efficiency Directive, in many Member States.

8. Despite this progress, analysis suggests that at current pace, the EU energy efficiency target of saving 20% of energy by 2020 will be missed by 1 to 2 percentage points.

9. Various analyses looking beyond 2020, including by the IEA and Fraunhofer ISI, indicate that the current policy framework will not suffice to realise the full cost-effective energy-saving potential. The Impact Assessment accompanying the 2030 Communication also makes it clear that current policies (as depicted in the Reference scenario[4]) would not ensure a cost-effective transition to a low-carbon economy achieving merely 21% savings by 2030 compared to 2007 projections.

10. The principal reason why the 2020 target is expected to be missed is that, even with recent more positive developments, there is sometimes insufficient commitment at Member State level to the implementation of the existing legislative framework. As regards the perspective beyond 2020, some of the key policy tools were designed within a 2020 timeframe and therefore do not provide long-term incentives for investing in energy efficiency. Furthermore even with current rules important barriers to energy efficiency persist.

11. Because of these underlying drivers the general problem is that the cost-effective energy-saving potential (both short- and long-term) is not fully realised and therefore energy efficiency does not sufficiently contribute to the EU's energy policy objectives. This has the following consequences: (a) high energy demand increases the dependence of the EU on energy imports, notably of gas; (b) the unused energy efficiency potential negatively impacts the affordability of energy and limits the competitiveness of the EU economy; (c) high energy demand makes the transition to a low-carbon economy more costly because many energy efficiency measures are among options for GHG abatement with the lowest cost.

3. Subsidiarity

12. Member States are at the centre of the realization of energy efficiency policy and EU intervention should be well targeted and supportive to their actions. The EU's role is in: (a) establishing a common framework which creates the basis for coherent and mutually reinforcing mechanisms while leaving in being the responsibility of Member States to set the means to achieve the agreed objectives; (b) creating a platform for exchanging best practice and stimulating capacity building; (c) setting minimum requirements in areas where there is a risk of internal market distortions if Member States take individual measures; (d) using EU instruments to promote energy efficiency, e.g. through financing.

[4] EU ENERGY, TRANSPORT AND GHG EMISSIONS TRENDS TO 2050 - REFERENCE SCENARIO 2013 available at: http://ec.europa.eu/energy/observatory/trends_2030/.

4. Scope and objectives

13. The general objective is to ensure that energy efficiency contributes to the development of a competitive, sustainable and secure EU energy system.

14. The specific objectives are to:

    - To agree on the measures necessary to achieve the 20% energy efficiency target in 2020 providing thus the relevant actors with information on the actions that need to be undertaken in the short term;

    - To agree on the level of ambition of energy efficiency policy in the long term providing thus Member States and investors with more predictability and certainty.

5. Description of policy options and methodology

15. Regarding policy options for closing the gap towards the 2020 target the following elements are considered:

    a. No action.
    b. New primary legislation laying down binding national targets or additional binding measures.
    c. Strengthened implementation of current policies.

    Option a is discarded from further detailed analysis as the 2020 target would not be fully achieved and the benefits associated with meeting it would not be realised.

16. Regarding the analysis of the optimal level of energy savings for 2030, six scenarios with a stepwise increase in the intensity of energy efficiency efforts in all sectors targeted by current policy measures were modelled. By comparing the results of the scenarios with the Reference case, the impacts of these efforts on energy system (including security of supply aspects), competitiveness and sustainability are assessed in 2030 as well as in 2050 perspective. The scenarios achieve in 2030 respectively: 27.4%, 28.3%, 29.3%, 30.7%, 35.0% and 39.8% of savings compared to PRIMES 2007 baseline and consequently later are referred to as EE27, EE28, EE29, EE30, EE35 and EE40 scenarios. The analysis builds on and is fully coherent with the IA underpinning the 2030 Communication including 40% GHG reductions and (at least) 27% share of renewable energy in final energy consumption proposed by the Commission as binding targets for 2030. It takes into account the progress that Member States are making towards their national targets under the EED.

17. Regarding options for the architecture of the energy efficiency framework post-2020 the following options are identified

    a. No action. This implies that post 2020 there would be no energy efficiency target;
    b. Indicative EU target, coupled with specific EU measures. This would be a continuation of the current framework.
    c. Binding EU target, coupled with specific EU measures. This would replicate the approach proposed by the Commission in the 2030 Communication for RES.
    d. Binding MS targets, coupled with EU polices solely in areas linked to the internal market.

18. In addition, irrespective of the character and level of a possible target, it needs to be considered how it could be formulated. The following options for target formulation are identified:

    a. Consumption target;
    b. Intensity target;
    c. Hybrid approach.

6. Analysis of impacts and conclusions

Policy options for closing the gap to 2020 target

19. For 2020 the impact analysis shows that a proper implementation of the current policy framework would be both necessary and sufficient to bridge the expected gap. By contrast, proposing new primary legislation would be unlikely to make a significant contribution to bridging the gap given the minimum time necessary to carry out the normal legislative procedure and transposition into national law.

Analysis of the optimal level of ambition for 2030

20. In terms of energy system impacts (including security of supply), all scenarios show that energy efficiency policies reduce effectively energy consumption (both primary and final) and decrease the energy intensity. The different policy scenarios demonstrate some differences in terms of the consumption of various primary energy sources.

21. Energy efficiency has a significant impact on security of supply and the level of gas imports in particular. Net energy import decreases translate into savings in the energy fossil fuel imports bill. For the EE27, EE28 and EE29 scenarios, the savings in fossil fuel import costs in the period 2011-30 can reach between €285bn and €346bn. For the more ambitious targets of 30% energy saving and beyond, the savings can reach between €395bn and €549bn.

22. In terms of economic impacts, energy system costs increase in all scenarios compared to the Reference scenario. Increased energy efficiency leads to average annual (2011-2030) energy system costs in policy scenarios that are between 0.01 and 0.8 percentage points of GDP higher than the Reference. The increases in absolute values (average annual for the period 2011-2030) are between €2bn and €114 bn.

23. There is a general shift in the structure of costs with diminishing energy purchases and increasing capital costs and direct efficiency investments. Investment expenditure increases sharply in all scenarios - more significantly in more ambitious scenarios and again mostly in the residential and tertiary sectors.

24. Electricity price changes compared to the Reference are very small in 2030 ranging from 1% to 3% in the year 2030. The ETS price differs substantially across the various scenarios, reflecting the important contribution of energy efficiency to emission reductions in the ETS sectors (via reduction of demand for electricity) and the fact that energy efficiency achieves significant reductions in the non-ETS sector. As their ambition grows, EE policies reduce both costs and incentives from the ETS itself for GHG abatement.

25. GDP impacts for scenarios reducing emissions by 40% GHG and increasing energy efficiency can be either negative or positive (depending on theoretical approach and consequent assumptions) with the main driver being the magnitude of investments. In general-equilibrium modelling, the "crowding out" effect leads to negative results . If it is not assumed that resources are currently fully used -, the effects on GDP are positive.

26. In terms of social impacts, the overall net employment impacts, as for GDP, depend on many assumptions. In general, employment is positively impacted by using carbon pricing revenue to lower labour costs. The analysis suggests that the employment effect will overall be more positive in scenarios with more ambitious energy efficiency policies reflecting the significant job-creation potential in these areas (notably in the construction sector) – with magnitude of effect depending on theoretical approach.

27. Affordability of energy for households is not significantly impacted (compared to the Reference scenario) in scenarios with energy savings up to 28% (both in 2030 and 2050 perspective). The most ambitious scenarios lightly (and mostly in 2050 perspective) increase the share of energy-related costs in household budgets as energy efficiency improvements typically need investment resulting in capital cost increases in such scenarios.

28. In terms of sustainability (and consistency with the targets of the 2030 energy and climate framework), all scenarios (except for EE40) demonstrate reduced GHG emissions in 2030 in line with the GHG target proposed in 2030 Communication and broadly in line with the split of emissions reductions (in 2030) in ETS and non-ETS sectors proposed therein. All scenarios pursue the decarbonisation objective. All scenarios are consistent with the (at least) 27% target for renewables.

29. The balance of GHG emissions reductions in the various sectors of the economy does not change between the scenarios as the mix of energy efficiency policies is not altered among the scenarios (it always follows the logic of current legislation and only the overall level of ambition intensifies). The highest reductions occur in the power generation sector (driven by ETS as proposed in 2030 framework) and in residential and tertiary sector (as the key energy efficiency policies address specifically these two sectors).

Architecture of the 2030 policy framework

30. Regarding the legal nature of a possible future energy efficiency target, the analysis concludes that a purely indicative target would be economically efficient and coherent with the 2030 energy and climate policy framework. National binding targets would be incoherent with the proposed energy and climate policy framework. Their effectiveness and economic efficiency is uncertain. Not proposing any target is an option but this would deprive the post-2020 policy framework of the benefits this element provide to provide so far, i.e. a benchmark for tracking progress and making policy adjustments; a signal to relevant actors, about the policy direction; and a basis for additional policy elements.

31. Irrespective of how a target is formulated economic developments should be taken into account in progress monitoring.

Financing

32. Significant energy efficiency improvements will require significant investments, and these will have to be primarily privately financed. The business case for investing in energy efficiency needs therefore to become more apparent to the financial sector and this will entail a number of actions, such as establishing reliable procedures for measuring and verifying energy savings, developing standards for energy efficiency investment processes and providing technical assistance in order to make energy efficiency projects bankable.

Overview table with key results of the modelling in 2030 (unless otherwise stated)

	Reference	GHG40	EE27	EE28	EE29	EE30	EE35	EE40
MAIN FEATURES OF SCENARIOS								
GHG reductions vs 1990	-32.4	-40.6	-40.1	-40.2	-40.1	-40.1	-41.1	-43.9
Renewables share - Overall	24.4	26.5	27.8	27.7	27.7	27.7	27.4	27.4
Energy Savings in 2030 (*evaluated in % against the 2007 Baseline projections for Primary Energy Consumption)*	21.0%	25.1%	27.4%	28.3%	29.3%	30.7%	35.0%	39.8%
ENERGY SYSTEM IMPACTS								
Gross Inland Energy Consumption (Mtoe)	1611	1534	1488	1470	1450	1422	1337	1243
- Solids share	10.8	10.1	9.9	10.4	10.8	11.3	12.9	12.4
- Oil share	32.3	32.8	32.4	32.6	32.7	33	34.2	36.2
- Natural gas share	24.6	22.5	22.5	21.9	21.5	21	19.2	18.5
- Nuclear share	12.5	13.1	12.7	12.8	12.7	12.5	11.8	11.1
- Renewables share	19.9	21.6	22.6	22.4	22.3	22.3	22	22.1
Energy Intensity (2010=100)	67	64	62	61	61	59	56	52
Gross Electricity Generation (TWh)	3664	3532	3469	3461	3423	3336	3080	2804
SECURITY OF SUPPLY								
Import dependency	55.1	53.6	53	53	52.6	52.8	53.5	54.4
Net Energy Imports (2010=100)	96	89	86	85	83	82	78	74
Net Imports of Gas (2010=100)	105	91	88	84	81	78	67	60
Fossil Fuels Import Bill Savings compared to Reference (bn € '10) *(cumulative 2011-30)*	n.a.	-190	-285	-311	-346	-395	-503	-549
ENVIRONMENTAL IMPACTS								
GHG emissions reduction in ETS Sectors vs 2005	-36.1	-43.3	-45.3	-44.4	-43.3	-42.2	-41.8	-45.6
GHG emissions reduction in non-ETS Sectors vs 2005	-20.3	-30.5	-27.6	-28.7	-29.5	-30.5	-32.9	-35.3

	Reference	GHG40	EE27	EE28	EE29	EE30	EE35	EE40
SYSTEM COSTS								
Total System Costs, avg annual 2011-30 (bn €)	2067	2069	2069	2074	2082	2089	2124	2181
compared to Reference (bn €)		+1	+2	+7	+15	+22	+57	+114
Total System Costs as % GDP, avg annual 2011-30 (bn €)	14.30%	14.31%	14.31%	14.35%	14.40%	14.45%	14.69%	15.09%
compared to Reference (bn €)		+0.01%	+0.01%	+0.05%	+0.11%	+0.15%	+0.39%	+0.79%
Total System Costs in 2030 (bn €)	2338	2364	2361	2389	2423	2455	2632	2999
Total System Costs in 2030 as % GDP	14.03%			14.18%	14.16%	14.33%	14.53%	14.73%	15.79%	17.99%
OTHER ECONOMIC FACTORS								
Investment Expenditures , avg annual 2011-30 (bn €)	816	854	851	868	886	905	992	1147
Energy Purchases, avg annual 2011-30 (bn €)	1454	1436	1422	1417	1411	1401	1378	1365
Average Price of Electricity (€/MWh)	176	179	180	179	178	178	177	182
ETS price (€/t of CO2-eq.)	35			40	39	35	30	25	13	6
MACRO-ECONOMIC MODELLING								
Impacts on GDP (% change from Reference case) Results first for general equilibrium modelling and secondly for post-Keynesian modelling	€ 16.766 bn € 16.960 bn			n.a.	n.a.	- 0.13/ +0.75	n.a.	- 0.22 / +1.06	- 0.52 / +2.02	- 1.20 / +4.45
Impacts on employment (% change from Reference case) Results first for general equilibrium modelling and secondly for post-Keynesian modelling	219 million of people 232 million of people			n.a.	n.a.	+1.47 / +0.29	n.a.	+1.90 / +0.35	+ 2.53 / +0.62	+2.96 / +1.50