

Achieving 2030 climate goals: an analysis of EU policy pathways to the targeted share of 27% renewable energy in gross final energy consumption

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Abstract

This thesis reviews the current process of adopting an EU renewable energy framework for 2020 to 2030, focussing on policy for reaching the 27% target. It captures and interprets the current state of legislation, describes the remaining political and operational steps, quantitatively analyses possible future trends in the RE share and identifies policy options. The existing 2030 target of 27% has been decided to be binding on the EU-level, but not for member states. This means that EU measures for driving the renewable energy share may be necessary in case member state contributions leave a gap to the target. Quantitative analysis implies that the target may be more ambitious than expected, which would make EU measures more important. Six main drivers affecting the development of the EU renewable energy share are identified, of which three are market-related and three are policy-related. The drivers can act as access points for EU-level policy measures. The EU can both take measures to prevent a gap and measures to fill a gap once it has arisen. Nine policy options for preventing a gap are suggested. A gap-filling mechanism would have to follow design criteria of additionality, swift execution, political feasibility and cost-effectiveness. The costs of such a mechanism could be covered through the existing EU budget resources, revenues from auctioning emission certificates or through an EU-wide levy for electricity consumers.

1 EU and member states in RE policy

The RE share is increased through economic actors realising RE projects. These aim for profit through doing business individually, operating in the system of EU and MS market rules and

utilising available support policies. EU and MS try to optimise the system of market regulation and support measures in order to achieve the desired change effectively and cost-effectively, but are constrained by the criterion of political feasibility.

In these three hierarchic levels (EU, MS, economic actors), the character of the EU as a legislative authority for RE policy can, theoretically, include both (1) regulating MS policy through rules and obligations and (2) devising support measures as a central actor. The two approaches are depicted.

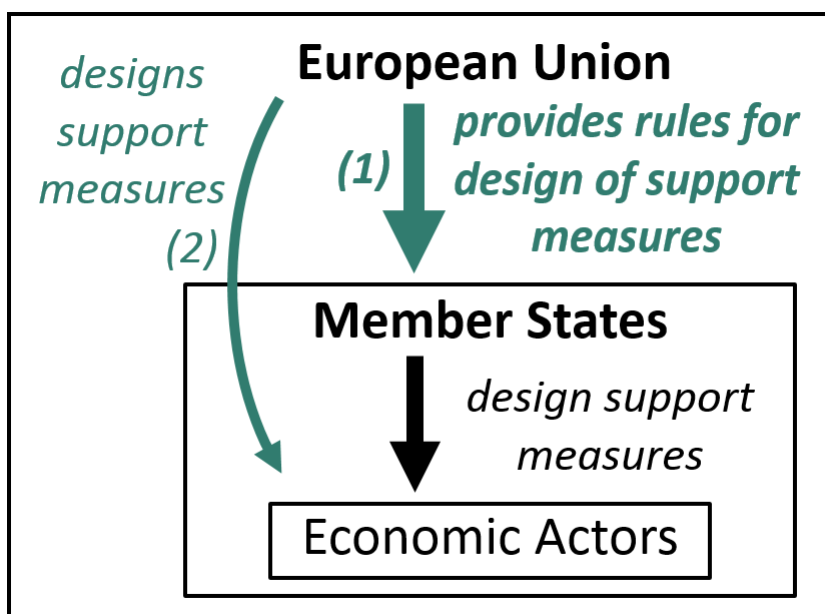


Fig. 1.1: Schematic interaction between EU and MS in RE policy; own elaboration

In broad terms, the legislative framework on the EU level has thus far, i.e. under the 2020 framework, consisted of a mandatory target share of renewable energy for member states and a relatively flexible framework of modalities for how this share can be achieved. While initially EU regulation gave a high level of freedom to MS in the design of support schemes, more specific rules were formulated in the course of the policy cycle. With renewable energy policy being refurbished for the 2030 framework, a possible change in this balance has arisen, as the provisions of the 2030 framework existing up to now leave possible policy scenarios where the EU would become more strongly engaged in support measures directly. The legal groundwork for this possible change is further explored later.

Among MS, there is a range of different positions towards RE support in the EU in terms of both ambition and how it should be carried out. The legislative process for the 2030 framework is governed by these varying MS interests, since ultimately the legislative content has to find a qualified majority in the Council of the EU. This need for consensus among MS is of overriding importance for future EU action.

The level of advocacy for (EU involvement in) RE support ranges among MS from strong backing to resistance. Both extremes can be based on different rationales, like ideological, economic or strategic considerations. MS resistance to RE support can be directly illustrated by how policy develops in certain MS, e.g. with recent cuts of RE support in the UK [?] or implemented barriers for wind energy in Poland [?].

The 2030 RE target of 27% that has been agreed upon in the European Council was a compromise of various MS positions. The majority of MS favoured an EU-binding target as it later materialised. Sweden, Denmark, Germany and Austria demanded higher ambitions, while Czech Republic and Romania were in favour of a non-binding target and Poland, Slovakia, Hungary and Bulgaria were against 27% in general.

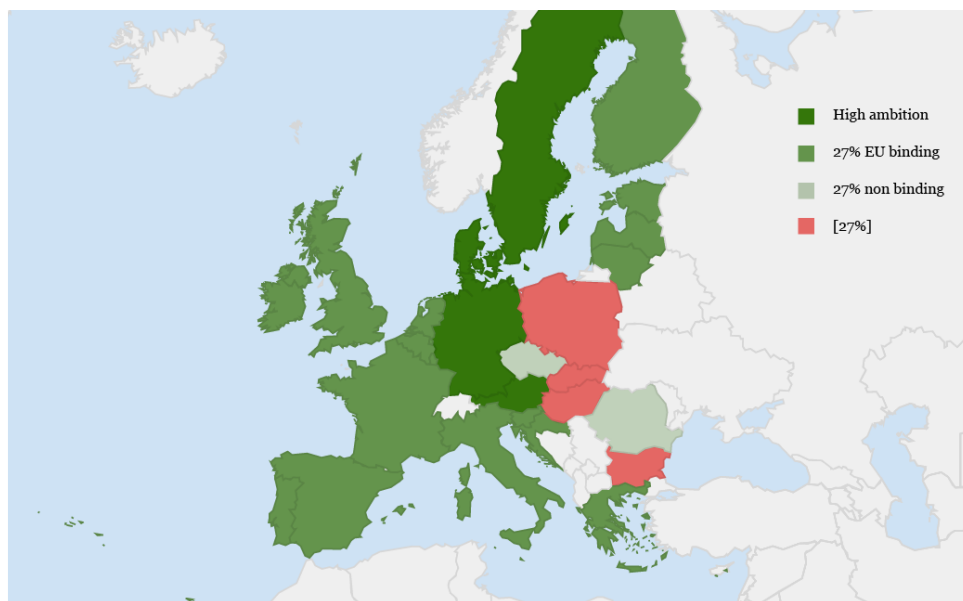


Fig. 1.2: EU member states shaded according to their favoured 2030 RE target; square brackets for countries that did not agree to the 27% figure; elaboration from [?]

Another more indirect indicator for varying attitudes toward RE support are MS performances towards the 2020 RE targets, under the assumption that MS governments devoted are by tendency performing better than those averse to RE support. It stands to reason that governments like Denmark, Ireland, Sweden and Austria, who are on track to surpass their targets considerably, are more strongly in favour of RE support than those, according to the graph, on track to miss their targets by far, like the UK or Netherlands.

The distribution of MS positions and resulting disparity of interests already has been and will keep on influencing the dynamics between EU and MS in implementing the 2030 RE framework,

limiting viable policy solutions to those that are politically feasible.

2 Timeline: legislative adoption and governance

A timeline for the 2030 RE framework was drafted and can be divided into three phases: legislative adoption, planning phase and reporting phase. Planning and reporting are the two key elements of the “governance framework”.

During legislative adoption (ongoing, approx. until mid-2018), a legislative framework for the two later phases is implemented, regulating EU-MS-interaction in reaching the target and changes in market rules.

In the planning phase (mid-2018 until late 2020), MS draft their national plans. These include projections for their expected RE share in 2030, or “pledges”. The collective EU outcome is evaluated by the Commission and possible additional measures are devised.

The reporting phase (2021 until 2030) is the “active” phase of the policy cycle. In this phase, the new rules become active. MS report their progress to the European Commission in biannual reports, which in turn monitors the need for (and implements) additional EU measures.

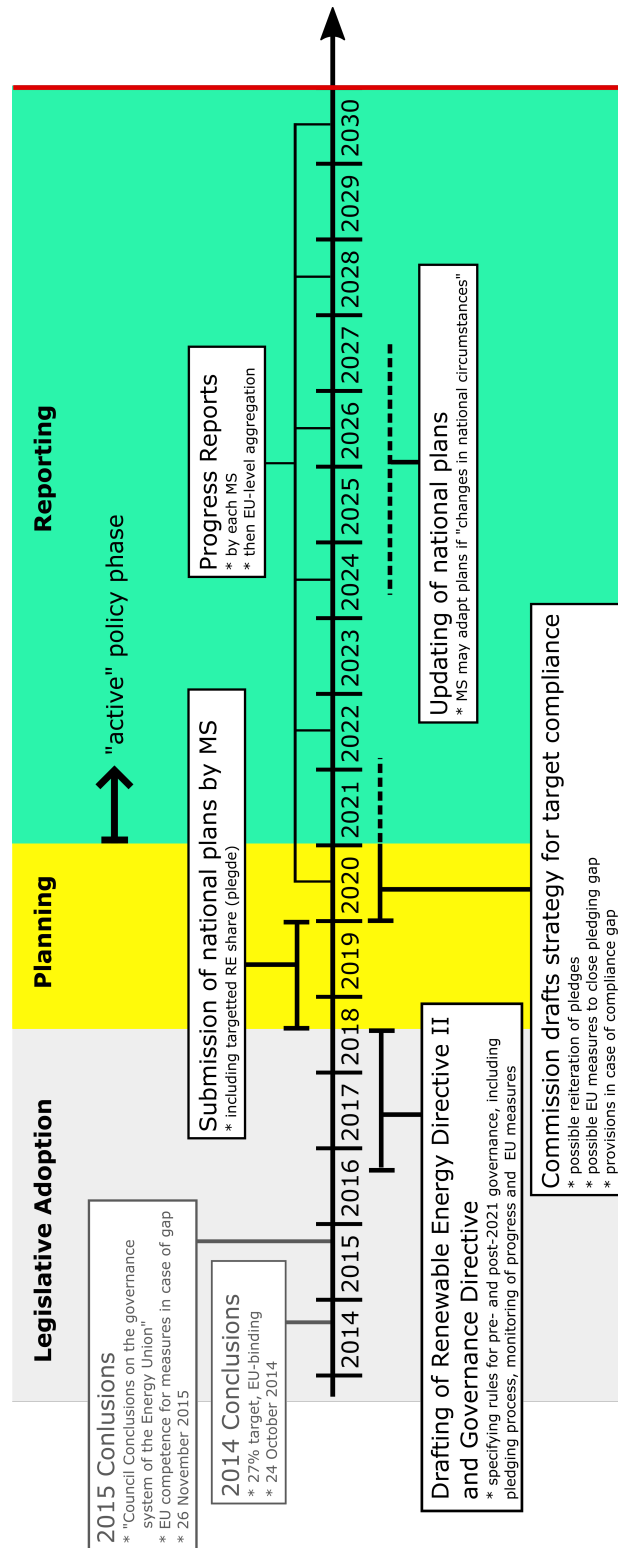


Fig. 2.1: Timeline covering legislative adoption and governance of the EU 2030 framework for RE

3 Qualitative analysis of key drivers of the RE share

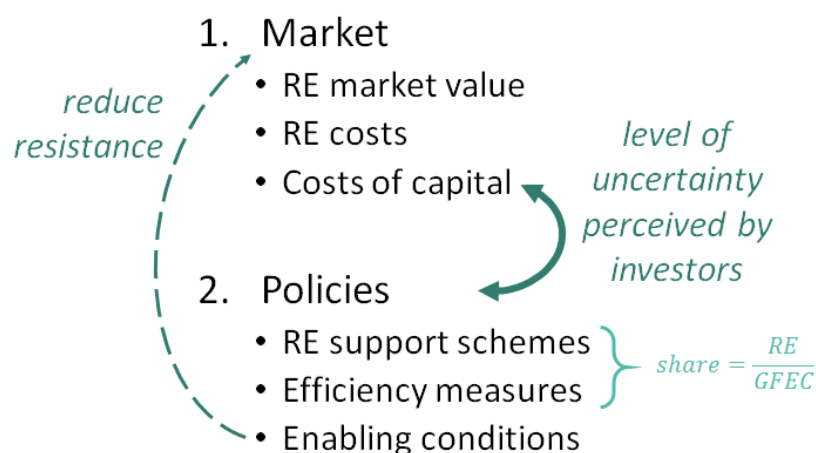


Fig. 3.1: Key drivers affecting the deployment of RE from an EU point of view; own elaboration

Principal political and economic drivers of the RE share, which can act as access points for EU measures, have been identified and characterised. They are split into two categories: drivers relating the market and drivers relating to policies.

The degree of **market**-driven deployment is governed by:

Key driver	Characteristics
Market value of RE	<ul style="list-style-type: none"> • defines how much revenue RE can obtain from the market • is a function of fossil fuel prices, carbon & energy taxes and market shares by technology
RE investment cost	<ul style="list-style-type: none"> • outweighs variable cost and is key component for production cost • decrease over time due to learning effects
Cost of capital	<ul style="list-style-type: none"> • interest paid on investment • second key component in production cost, differs among MS

Policy affects the RE share through:

Key driver	Characteristics
RE support schemes	<ul style="list-style-type: none"> • provide additional revenue/obligations for RE
Efficiency measures	<ul style="list-style-type: none"> • reduction in energy consumption leads to higher RE share, if RE consumption stays constant
Enabling conditions	<ul style="list-style-type: none"> • non-economic barriers (e.g. complex administrative processes), infrastructural constraints (e.g. grid access, research & development)

4 Quantitative analysis 1: gap analysis based on the 2014 Impact Assessment

Quantitative analysis was carried out in order to better understand how great the challenge of the 27% target is and how likely a gap will arise.

The IA the target decision was based on predicted a gap of 0.6-1.5 percentage points in a market-only scenario, i.e. if no support policies were continued after 2020. The following developments became evident after the target decision and give reason to expect a lower turnout:

1. Oil prices have fallen considerably, gas and coal prices have been following continuous downward trends; this has demonstrated that the assumption of continually rising fossil fuel prices made in the IA is subject to considerable uncertainty
2. Carbon price assumptions in the IA are high
3. New information suggests that more RE installations will reach their end of lifetime in the 2020's compared to the 2010's, leading to higher net capacity growth necessary to reach the target
4. The bulk of EU biofuels production has been assessed to be unsustainable, implying a likely reduction of biofuels' contribution to the target

Based on own calculations, an estimation is made that the gap in a market-only scenario would be at least 2.2 to 3.1 percentage points (accounting for the biofuels reduction) and even lower¹ due to the other three factors. The share of the target remaining to be stimulated through support measures would then be more than 0.7 to 1.6 percentage points higher than what the target decision was based on.

5 Quantitative analysis 2: aggregated RE growth in EU-28 based on past growth

Another quantitative approach was applied by taking official energy consumption forecasts and extrapolating past EU-28 RE growth data to project the 2030 RE share.

Past RE growth would have to increase slightly and then remain constant throughout the 2020's in order to reach the target. The amount of support effort necessary to sustain this growth depends on the how strong the market pull will be. One key driver, decreased RE investment cost, is very likely to have a positive impact on the market pull. However, continuously low fossil fuel, carbon

¹not easily quantifiable

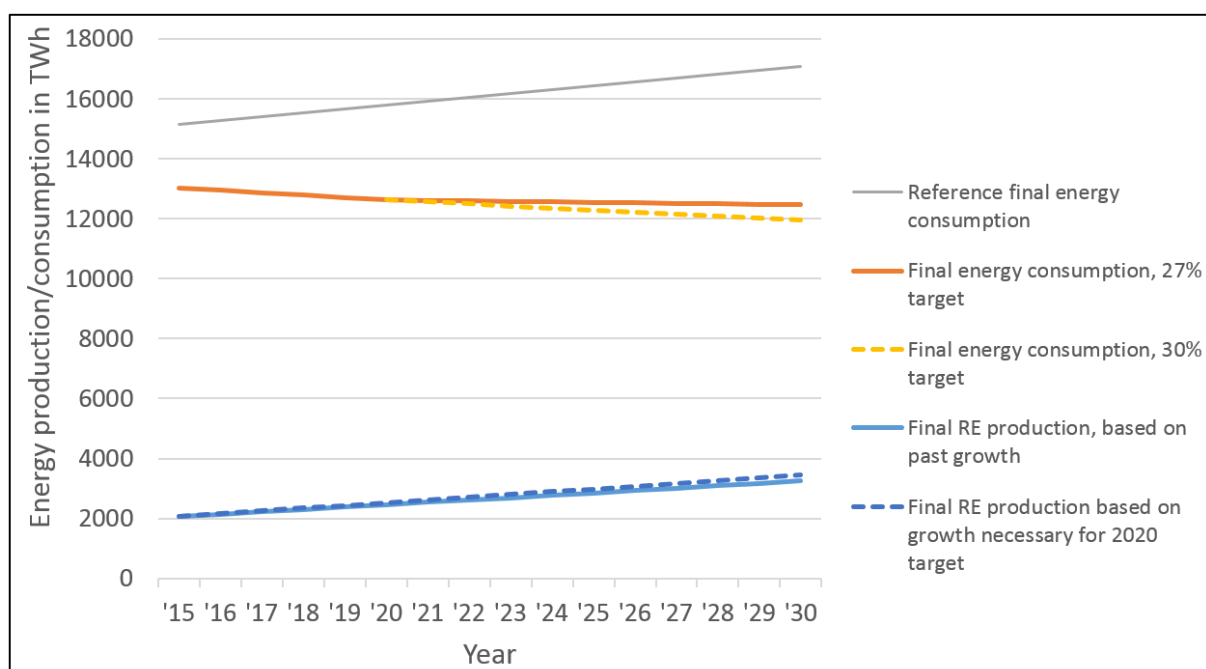


Fig. 5.1: Projected development of EU-28 RE production and final energy consumption in the 2030 policy cycle, each based on two different assumptions; own elaboration

		Energy Efficiency Scenario		
		24,4% energy efficiency	27% energy efficiency	30% energy efficiency
Renewable Energy Growth Scenario	Based on past growth	25,2%	26,1%	27,3%
	Based on growth necessary for 2020 target	26,6%	27,6%	28,8%

Table 5.1: 2030 RE shares resulting from different scenarios regarding RE production growth and final energy consumption

and and wholesale electricity prices may negatively affect the market value of RE, and unless EU and MS are able to build a reliable regulatory and economic environment, high cost of capital may continue to slow down RE growth.

6 Conclusion from quantitative analyses

Both approaches indicate that the ambition of the 27% EU target, i.e. the (financial) support efforts necessary to achieve it, may be underestimated. In light of the EU's liability for reaching

the binding target under the 2030 framework, this finding implies a need for adequate EU measures aimed at preventing and, at a later stage, filling a gap, should collective MS efforts not suffice.

7 Policy Options 1: EU measures for preventing a gap

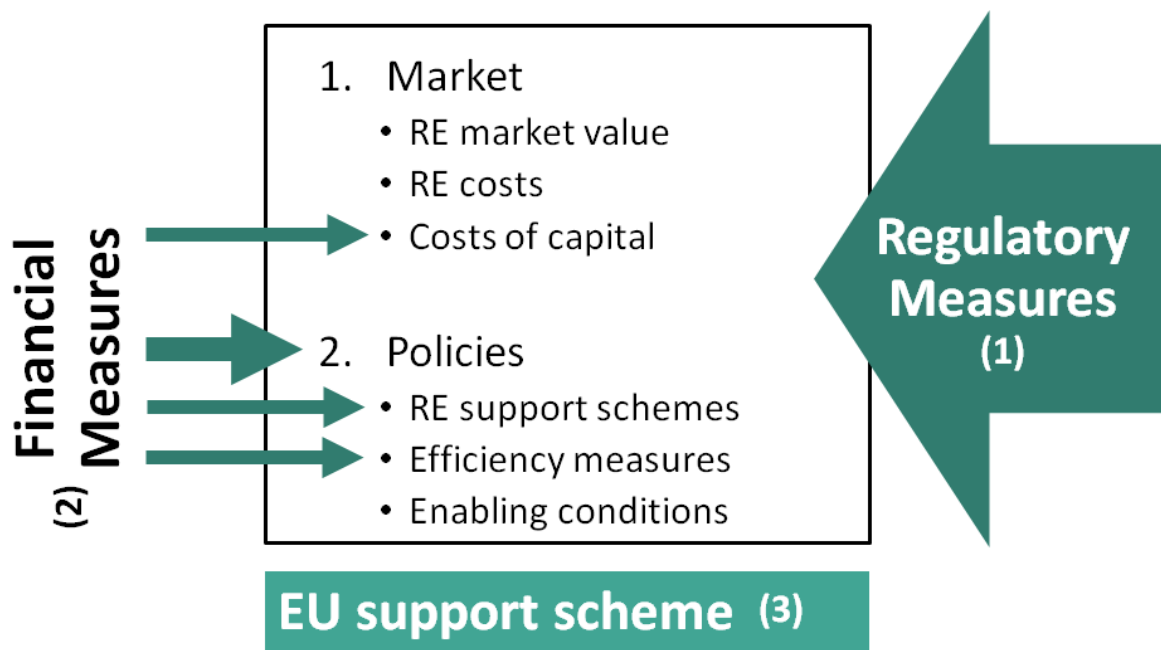


Fig. 7.1: General ways in which the EU can influence the key drivers in figure 3.1; own elaboration

Based on the initial conceptualisation of key drivers of the RE share, policy options for EU measures were identified, which would be able to boost the RE share from early in the policy cycle, so as to prevent a gap. They include:

Measure	Key driver addressed
Increased carbon pricing/taxing and energy taxing	Market value of RE
Rules for MS policy changes/a European arbitration procedure	Cost of capital
EU guarantee scheme	
”Naming and shaming” low-performing MS through benchmarks	Policy
Financial incentives for MS contributions	
Raising the 2030 efficiency target to 30% ²	Efficiency measures
Support scheme s for energy efficiency ³	
Better enabling conditions	Enabling conditions
Increased EU-based RE support (loans, grants, feed-in schemes)	RE support schemes

8 Policy Options 2: Gap-filling mechanism

If MS contributions and complementary EU measures for preventing a gap would not be enough, a GFM could be applied. Design criteria for such mechanism were characterised and possible policy cost estimated under a set of assumptions.

A gap-filling mechanism would have the the following design criteria:

- Additionality
 - no negative interference with MS support schemes
 - no negative impact on MS ambitions
- Swift execution
 - effectively raising of the RE share, from activation of the mechanism to operating RE installations, within few (about 4) years
- Political feasibility
 - a high degree of differentiation may be necessary to account for different MS interests and market environments
- Cost-effectiveness
- Side effects
 - effects of rapidly increased demand/supply in up/down-stream markets

²if mitigated consumption is not RE

³see previous footnote

In policy workshops attended throughout the work for this thesis, MS representatives have repeatedly communicated commitment to adhere to the principles defined in the 2014 and 2015 Conclusions. Four of these principles are relevant for GFM design:

- EU-bindingness of the target
- EU competence to take additional measures, should MS not reach the target collectively
- MS freedom to determine their own energy mix
- MS's right to change their pledges (projections in national plans), should there be a change in national circumstances

Based on these principles some logical considerations about the dynamics of negotiation among MS in creating a GFM can be made.

The first two items of the above list justify a position in support of the GFM per se. The GFM would constitute the “additional measure” that is foreseen for the case MS alone don't reach the binding target. At the same time, the latter two items justify opposing MS to object against interference with their own energy mix. In the literal sense, this would mean that MS would have the right to deny a GFM access to its market. By implication, participation in the scheme would be voluntary.

However with the 2014 Conclusions clearly stating both EU-bindingness and the EU's role of implementing additional measures in case of a gap, and with all MS equal members of the EU, all MS would theoretically be obliged to contribute to the financing of the GFM. At least, MS in favour of an obligation for financing the GFM could base their argument on this rationale. If then, for example, funds were taken from the existing EU budget, financial contributions to the GFM would de facto be distributed the same way that MS contribution to the budget are structured. In such a case, it seems unlikely that any MS would make use of their theoretical right not to participate in the GFM, as this would constitute an indirect financial loss.

Under these assumptions, the EU is facing the task of designing a GFM that is funded by and applied to all MS. But even if not all MS were participating, a key challenge would still lie in designing a single instrument that addresses the wide range of different MS circumstances, including varying market prices, cost of RE, energy mixes, RE potentials, investment conditions, and internal political trends regarding RE. In negotiating the GFM, all MS would defend their interests. The resulting high level of complexity may make a political solution of GFM design lengthy and difficult.

A simple solution that meets the hard condition of political feasibility seems unlikely and a strong degree of differentiation in the GFM necessary. Normally, such need for differentiation would

favour subsidiarity (management of the GFM on the MS level), which is somewhat paradox in this case, the GFM being an inherent EU measure.

9 Policy cost of a gap-filling mechanism

Based on a set of assumptions, the cost of a gap-filling mechanism per percentage point of gap was estimated to be about €7.5bn per year over a period of 20 years. Three options for covering this cost were compared: the cost would be equivalent to about 5% of the EU budget or a levy paid EU-wide by all electricity consumers of about 0.25 cent per kWh (or 1% price increase on average). Revenues from ETS auctions could, based on an assumed increased carbon price in phase 4 of the ETS, theoretically cover the cost of a 1.4 percentage points gap. All three options would be challenging in terms of political feasibility, but the options of EU budget and ETS revenue may be more feasible, as an EU-wide levy would be a legally complex issue.