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Designing planning and reporting for good governance of the EU's post-2020 climate and energy goals

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A HEIGHTENED ROLE FOR NATIONAL OWNERSHIP AND COMPETENCIES

The EU's 2020 Climate and Energy Package could assign legally-binding national targets to Member States for different aspects of their energy systems, such as for renewable energy, because these targets, although ambitious, remained at the margins of the national energy mix. But as the low-carbon transition makes progress, the changes required to national energy mixes become more fundamental and structural, and national competencies become increasingly important in defining the strategic direction of the energy sector and decarbonisation strategies.

A NEED TO ENSURE CONSISTENCY BETWEEN THE EU'S 2030 AND 2050 CLIMATE GOALS

However, it is also crucial that Member State's nationally determined strategies are consistent with the EU's overarching climate and energy goals, both to 2030 and 2050, and that their progress on key areas of EU relevance and competency can be effectively monitored. Doing this will require a more nuanced approach to governing EU climate policy than the two extremes that are currently presented in the debate: either a) a set of top-down, legally binding targets for all aspects of Energy Union, or b) a harmonised but ultimately very weak planning and reporting instrument with no buy-in or commitment from Member States.

A DIFFERENTIATED APPROACH TO PLANNING AND REPORTING ON THE ENERGY UNION PROJECT

This paper proposes a differentiated approach to the new climate and energy planning and reporting framework that the European Commission has proposed to govern the 2030 Framework and Energy Union project. Specifically, national plans should be made up of a three modules or chapters with different levels of commitment, rights of review by the Commission and reporting obligations attached to each. Modules would include: 1. A high-level Energy Union strategy to implement core EU goals with high-level of commitment and intensive review; 2. Detailed policies and measures document mainly for transparency and coordination purposes with less intensive review; 3. A 2050 decarbonisation strategy that is non-binding but provides direction to modules 1 and 2.

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1. INTRODUCTION AND KEY RECOMMENDATIONS

The issue of "governance" has emerged as a major issue for the implementation of the EU's 2030 Climate and Energy Framework. This has arisen partly because Europe's Member States have called for a more bottom-up approach to non-GHG target setting post 2020—such as for renewable energy. It also stems from a desire to eliminate administrative double up *via* a more streamlined planning and reporting framework. But perhaps more importantly, ever deeper decarbonisation of the EU energy system will require coherent action at Member State level in areas that are difficult to 'reach' with EU policies.

Under the 2020 Climate and Energy Package, Member States could accept a top-down approach to national target setting for specific sub-sectors of the transition because these changes remained relatively marginal to their overall energy systems. As the low-carbon transition progresses, however, such targets begin to require non-marginal and more fundamental structural changes to Member States' energy systems. The more complex challenges of redesigning national and regional energy systems will thus require a stronger role for Member State ownership and competencies. An example is the building sector, where demand reduction needs to increase dramatically between the 'Reference Scenario' and a scenario to achieve the 40% GHG reduction target.

However, a more bottom-up approach to setting non-GHG targets raises new challenges for coordination. For example: How is the EU to ensure that Member States' individual ambitions are consistent with the EU's collective 2030 and 2050 climate objectives? What governance processes will provide the certainty that investors need to invest while giving Member States the flexibility that they demand? What are the implications of Member State strategies for the internal market, and how can they be anticipated and addressed in a coordinated way?

To address these issues, the European Commission has proposed a new governance tool for the 2030 Energy Union Framework, based on National Energy and Climate Plans ("NECPs") and streamlined, regular reporting. The intention is that NECPs would list each Member State's contributions to meeting the EU's objectives in the various parts of the 2030 Climate and Energy and Energy Union Frameworks. These would be subjected to an iterative process of Commission and peer review before final submission by the Member State, and be reported on regularly.[1] It has suggested that these new integrated plans would be complemented by Commission monitoring of a list of indicators covering all 5 pillars of the Energy Union.

The Commission's approach has merit and will obviously be the basis of the new governance mechanism. However, this paper also argues that the current focus on a single, "one-size-fits-all" planning and reporting document and set of indicators covering *all* aspects of the Energy Union needs to be slightly recalibrated if it is to have any chance of creating an effective new governance dynamic based on a stronger role for Member State preferences and competencies.

There are two reasons for this. Firstly, the EU's climate and energy objectives have different governance implications if they are to be done successfully. This in turn calls for more differentiation in the approach to governance in general and to planning and reporting in particular than a "one-size-fits-all" planning and reporting document and long set of Energy Union indicators.

1. European Commission, 22/01/2014 - COM(2014) 15 - Communication: A policy framework for climate and energy in the period from 2020 to 2030

Secondly, the Energy Union covers virtually all aspects of national energy policy. If the diversity of governance issues is treated as a monolithic whole, then the overall governance system risks being unacceptable to all Member States – because it will involve too much intrusion into national competencies. Or, alternatively, it could be made acceptable by being an extremely weak mechanism that is little more than a long reporting and box-ticking exercise.

There is thus an urgent need for clarity in the governance discussion around the question of:

- 'What specifically needs to be governed?'
- 'What do these governance needs imply for good governance practice post-2020?'
- 'What does good governance practice imply for the design and uses of the new planning and reporting system?'

This paper therefore tries to shed light on the answers to these questions.

Based on these answers, we argue that the proposed "national energy and climate plans" need to be broken up into sub-chapters or modules reflecting three different but fundamental governance issues. These three issues must be addressed if the EU is to create an ambitious, effective, transparent, flexible and dynamic governance instrument that it needs to meet its post-2020 objectives. Each of these three modules or chapters would be associated with different kinds of obligations on Member States and provide a different but essential part of the new governance dynamic:

1. *High level Energy Union strategies to meet core EU goals by 2030.* This would be a short, high level outline the core elements of Member States' strategies to achieve the 2030 Climate and Energy Framework/Energy Union goals. It would be based mainly on a small subset of quantitative pledges related to the Energy Union's goals. The pledges would not be individually binding in themselves but would describe an overall strategy to meet broader CO_2 targets, EU energy security and internal market objectives that either are already binding in EU law (e.g. ESD targets, Security of Supply Targets) or would be considered to be "binding" commitments (e.g. completing the internal market). By outlining a coherent strategy reflecting national circumstances and interactions between decarbonisation, energy security and internal market integration, it would serve to give a more credible signal to investors, the Commission, neighbouring Member States, and other stakeholders and increase the likelihood the plan is implemented. The quantitative indicators would be reported on/monitored annually to ensure the Member State was on track to deliver its Energy Union strategy.

2. *Planning and reporting on policies and measures to implement the high level strategy and other elements of the Energy Union.* This would be a transparency and information sharing document and would not have the same level of commitment attached to it as the high level strategy document (provided EU law was shown to be complied with). It would be bigger and reported on less frequently (every 3 years). It would provide more detail on the specific policies, measures and progress that the Member State is making to achieve its high level 2030 goals. This module would build on and streamline existing planning and reporting requirements under the 2020 climate and energy acquis. This document would be used by the Commission to evaluate the implementation of existing Directives, to set agendas for regional cooperation and coordination, to provide transparency to stakeholders, and to keep track of implementation of non-structural elements of the energy Union.

3. *A 2050 low-carbon transition strategy.* This would be an information sharing module. It would be non-binding on Member States apart from the obligation to submit it. Each Member State would also participate in subsequent iterative process of revision and coordination at EU level to develop a new EU 2050 strategy based on a "bottom up" vision developed by Member States. It would be presented every 5 years with no interim reporting. It would help to ensure that vital enabling conditions to meet 2050 decarbonisation targets (e.g. ambitious shares of low-carbon/renewable power, deep energy efficiency retrofitting strategies, etc.) are taken into account in the development of short term national strategies and would help to create a dynamic attractor in domestic stakeholder debates towards more ambition in future policies. It would also help, as a later step, to reinforce the mandates of regional or other fora to pursue other vital enabling conditions (e.g. internal energy market reforms to integrate renewables, interconnection infrastructure, setting R&D priorities, etc.).

These three modules or chapters of the plans would thus complement each other and form part of a package that is needed to introduce stringency and credibility, transparency and information for cooperation and investibility, and ambition coherent with 2050 targets into the new governance mechanism. Note also that the approach outlined above does not prejudge the resolution of the "what if" question about the overall share of renewables in the EU power mix and how an "EU binding" target would be met. Nevertheless, it would ensure that Member State's pledges on renewables were part of a credible national climate and energy strategy and help to create a dynamic

towards higher pledges on renewables over time via the 2050 strategy module.

2. WHAT NEEDS TO BE GOVERNED AND WHY?

2.1. EU energy and climate objectives

The Energy Union Framework Strategy Communication of February 2015 specified a number of different energy and climate objectives for the EU. The Commission has chosen to summarise these objectives as five "dimensions" of the Energy Union:

- Energy security;
- An integrated energy market;
- Energy efficiency;
- Decarbonising the economy, and
- Research, Innovation and Competitiveness

Furthermore, the European Council Conclusions on the 2030 Framework of October 2014 and the Energy Union Framework Strategy itself has further broken these objectives down into a number of more specific objectives, most notably in the 15 Action Points of the Energy Union (Table 1).

2.2. Implications of different energy and climate objectives for governance tools

The Energy Union project thus brings together a vast array of different energy and climate policy goals and, while they are all individually important, they also often have quite different governance implications.

Taking the Energy Union project as a whole and thinking about what it implies in terms of requirements of governance, one can identify three broad governance challenges that will be crucial for its success:

1. Achieving structurally important Energy Union targets, such as those contained in the 2030 Climate and Energy Framework

2. Driving forward the cooperation and coordination between Member States that is needed to implement the Energy Union more broadly.

3. Ensuring coherence of short-term actions with long term climate objectives

We now discuss each of these governance issues in turn, highlighting the implications of each for what is required for effective governance post-2020.

Table 1. 15 action points of the Commission's Energy Union Communication of Feb 2015

Measure	Dimension of Energy Union	Actors chiefly responsible for implementation
Full implementation and strict enforcement of existing energy and related legislation	Energy Security	MS/EU
Diversify its supply of gas and make it more resilient to supply disruptions	Energy Security	MS/regions/EU
Intergovernmental agreements should comply fully with EU legislation and be more transparent.	Energy Security	MS/EU
Improving infrastructure for completing the energy market, integrating renewables and security of supply.	Internal Energy Market	MS/regions/EU
Creating a seamless internal energy market that benefits citizens, remedying uncoordinated development of capacity mechanisms; review of market design.	Internal Energy Market	MS/regions/EU
The regulatory framework set-up by the 3rd Internal Energy Market Package has to be further developed to deliver a seamless internal energy market to citizens and companies.	Internal Energy Market	MS/regions/EU
Regional approaches to market integration	Internal Energy Market	MS/Regions/EU
Greater transparency on energy costs and prices as well as on the level of public support will enhance market integration and identify actions that distort the internal market.	Costs and Competitiveness / Internal Energy Market	MS/EU
At least 27% energy savings by 2030	Decarbonisation / Energy Security / Energy Efficiency	MS/private sector
Retrofitting existing buildings to make them energy efficient and making full use of sustainable space heating and cooling	Decarbonisation / Energy Security / Energy Efficiency	MS/private sector
The EU needs to speed up energy efficiency and decarbonisation in the transport sector, its progressive switch to alternative fuels and the integration of the energy and transport systems.	Decarbonisation	MS/EU/private sector
Implementation of the climate and energy framework for 2030.	Decarbonisation / Energy Security / Energy Efficiency	MS/EU/private sector
At least 27% renewable energy by 2030.	Decarbonisation / Energy Security / Energy Efficiency	MS/private sector
Develop a forward-looking, energy and climate-related R&I strategy to maintain European technological leadership and expand export opportunities.	Research and innovation / Competitiveness / Decarbonisation	MS/EU/private sector
Ensuring that a strong, united EU engages constructively with its partners and speaks with one voice on energy and climate.	Decarbonisation / Energy Security	MS/EU

Source: IDDRI, based on Commission's Energy Union Communication of Feb 25, 2015

2.2.1. Achieving 2030 targets to advance the goals of the Energy Union

The first governance challenge for advancing the aims of the Energy Union is to make progress in the period to 2030 on specific quantitative targets that are structurally important to each of its pillars. This includes, as a minimum, meeting quantitative targets in the areas of decarbonisation, energy security and electricity interconnections set under the 2030 Framework.

It is essential that the EU meets these goals. Failure to achieve the GHG targets would mean that the EU will fail to achieve its 2030 climate targets and thus fail to deliver on its international climate pledges by 2030. It would also undermine Europe's ability to achieve its objectives with respect to its 2050 climate targets. Failure on the interconnection targets would also leave many Member States with higher energy costs for consumers than would otherwise be the case and impede the capacity of the EU to achieve its longer term decarbonisation goals. Failure to implement the Energy Security Strategy would also leave gas consumers in many Member States in the EU unacceptably vulnerable to supply disruptions from a single gas supplier in Russia.

However, the achievement of the goals of the EU's 2030 Climate and Energy Framework alone is by no means assured. For instance, with respect to the GHG targets, post-2020, achieving the EU's goals in the non-ETS sectors will be significantly more challenging than it was in the pre-2020 period. Between 2005 and 2020, Member States were collectively required to reduce emissions by around 270 $MtCO_2eq$. But between 2020 and 2030, Member States will probably need to reduce their emissions by around 566 $MtCO_2eq$ relative to business as usual (author's estimates), i.e. roughly a doubling of the necessary effort. Interestingly, most of the emissions reductions that have occurred to date under the 2020 Effort Sharing Decision rely on are measures and policies that are required by the Renewable Energy and Energy Efficiency Directives. This suggests that if the EU is to maximise its chances to achieving its legally binding GHG targets beyond 2020, Member States will need to develop clear strategies clarifying the role of non-binding renewables and energy efficiency in meeting their GHG targets.

With respect to gas security, many Member States and specific regions of the EU remain highly dependent on one single supplier in Russia, have limited negotiating power for new contracts and are highly vulnerable to a sudden supply interruption. Despite progress since 2009, many regions will need to make significant new investments in infrastructure and supply diversification potential to meet EU best practice standards (Sartor *et al.*, 2014).

Many Member States' progress to date in achieving the EU's 10% electricity interconnection target has been slow and indeed most have no official plans explaining how they will implement this target Umpfenbach (2015b).

In terms of governance, ensuring that the EU achieves these goals will require Member State governments to have clear and concrete vision of the national strategy for doing so. But these strategies will need to achieve two things. Firstly, they will need to be high-level, simple and clear enough for different actors (government ministers, investors, stakeholders, neighbouring Member States, the Commission) to easily understand the key pillars of the strategy. At the same time, Member States will need to have strategies that are coherent across the different energy use sectors (transport, heating and cooling, electricity) and between (potentially competing) objectives of decarbonisation, security of supply, and market integration. There is thus a balance to be struck between comprehensiveness and effectiveness.

In practice, however, it is difficult to see this governance need being met by the systematic reporting of a long list of Energy Union indicators against which Member States are not obligated to meet any specific objective. A list of indicators is after all not necessarily a coherent strategy and risks being a box ticking exercise of little practical value in terms of governance of EU objectives. A critical challenge for ensuring a strong and effective governance mechanism post-2020 is ensuring Member State "buy-in" and commitment to the Energy Union project and the objectives of the 2030 Climate and Energy Framework. A long list of indicators that do not allow Member States' to reflect their core aims, priorities and trade-offs within their climate and energy strategies will not deliver this buy-in and commitment.

Nor is it realistic to suppose that long and detailed national plans covering the detail of the implementation of national policies and measures on all 15 action points of the Energy Union, and on which the Commission and other Member States would comment, would be an effective approach to defining a clear, coherent and ambitious national energy strategy. Such a document would likely suffer from reduced visibility of the overall strategy due to an excess of detail. Moreover, it is difficult to see Member States being willing to accept Commission and peer review of all the details of the *implementation* of their strategies, as opposed to the strategies themselves. A long list of very specific requirements on all aspects of energy policy is likely to be perceived by Member States excessive intrusion on their domestic sovereignty and right to determine their energy strategies. If the

governance mechanism attempts to create national plans that are subjected to a target setting and monitoring framework for *all aspects* of energy policy, then this could be counterproductive.

To be a meaningful governance tool for ensuring that all Member States do what they are required to do, strategies should thus be based on a *limited set of national objectives that are structurally critical* to achieving the EU's 2030 goals under the 2030 Framework/Energy Union. They should build the strategy around a limited set of quantitative obligations that Member States will accept as involving a legitimate role for the Commission and peer review in the reviewing and monitoring process (e.g. GHG targets, the interconnection target, quantitative energy security goals). Indeed, an important lesson of the open method of coordination approach to governance under the European Semester is that ensuring that Member States comply with their obligations is to have a limited set of structurally critical indicators that can focus the attention of high level officials. Moreover, it is unrealistic to expect that the peer review process would work as an attractor towards higher ambition as the Commission intends if it were based on a detailed list of all aspects of a Member State's energy and climate policy. For this reason also, strategies would need to be based on a core set of issues where there is a clear and legitimate role for an intergovernmental/European approach.

2.2.2. Cooperation and coordination to implement the Energy Union

A second major governance issue for the Energy Union is the management of the increasing importance of the coordination and cooperation implied by many of the Energy Union objectives.

If goals such as internal market completion via new rules or infrastructure, cross-border projects for natural gas security, and the development of low-carbon electricity and transport are to succeed, they will require enhanced cooperation and coordination between Member States.

Cross border cooperation in these areas are already pursued in different fora, many of which can be built upon beyond 2020. However, to date, many of these initiatives have been based on a reactive approach—for instance Member States have sought to tackle integration issues raised by the *current* fuel mix (Umpfenbach *et al.*, 2015a). Beyond 2020, the focus will need to shift to a more forward-looking approach, based *anticipated developments* in different Member States.

For governance, this suggests three things. Firstly, there is a need for Member States to be held firmly to their 2030 commitments to CO_2 reductions, energy security and contributions to completing the internal market as laid out in their high level national strategies (described above). An important lesson of regional cooperation initiatives in the internal energy market to date is that such cooperation often depends on the assumption that a specific objective will be met (e.g. interconnection targets, renewables deployment, LNG terminals, etc.). After all, governments and other stakeholders need something concrete ad stable on which to cooperate. Thus, effective cooperation will depend in part on the credibility of the high level strategies that Member States set out to achieve 2030 objectives (see preceding section).

Secondly, the need to enhance cooperation and coordination will require *more detailed* and *coordinated* information sharing between Member States. More detailed information will be required than what is included in the high level national 2030 strategies alluded to above. Member States and other stakeholders will need to have access to information about the national policies and measures in specific subsectors of the energy system to be able to identify potential risks and opportunities requiring coordination and cooperation.

This information will also need to be collected and deployed in a coordinated way if it is to genuinely drive forward regional cooperation. A risk of the national planning approach proposed by the Commission is that large amounts of information are written down and published on websites but that this information is not used productively. Careful thought will need to be given to what mandates should be given to the Commission and to existing or new regional cooperation authorities (ACER, ENTSO-E, etc.) in terms of aggregating and setting cooperation and coordination agendas based on the content of national energy and climate plans.

2.2.3. Coherence with long-term climate objectives

A third major governance issue posed by the Energy Union Framework is the question of how coherence with the EU's long term (2050) climate objectives is to be assured. Energy systems in sectors such as transport, electricity and the energy efficiency performance of the building stock are subject to high inertia and potential lock-in risks. Thus, as noted by the Impact Assessment for the 2030 Climate and Energy Framework,[2] interim targets could be met in a variety of different ways, not all of which would necessarily allow for subsequent 2050 targets to be met.

2. European Commission, 2014, Impact Assessment to the EU 2030 Climate and Energy Framework, Article 7.2

Moreover, the 2050 GHG target has an important overarching coordination role for European energy policy. This is because the climate objective is the only objective for which there is a clear long term quantified target to 2050 and because, among all the other objectives, it requires the most significant structural change to energy systems. The 2050 GHG target is therefore an essential element for the *defining an agenda for what needs to be coordinated* between Member States over the medium-to- longer term, e.g. in the internal energy market reform (4th Package?) or on energy security issues.

To date, coherence between the EU's short term actions and long term climate objectives has in principle been assured by the Commission's PRIMES modelling process that contributes to the setting of targets for each decade. However, this top-down approach to ensuring that enabling conditions for the 2050 targets are met in each 10-year period has now begun to be overtaken by Member State calls for sovereignty over their energy choices. For example, the EU's renewables targets will not be binding at national level in the post-2020 period.

Furthermore, while it has been useful thus far, this approach has not been fully effective at creating ownership of this long term vision by Member States. For the governance of EU climate policy to work in the absence of top-down binding sectoral targets, this ownership—which only currently exists in a handful of Member States—will need to be created. Ownership of the low-carbon transition is critical to creating the numerous enabling conditions that are necessary throughout different laws, institutions, policy process, financial supports, etc. that all contribute to and are necessary to exploit the big levers of decarbonisation (deep energy efficiency improvements, large scale roll-out of low-carbon technologies and related infrastructure, etc.).

Without a specific mechanism to build ownership and ensure coherence between 2030 and 2050 goals in the absence of top-down sector-specific targets set by the EU, a fundamental and overarching element of creating an effective European energy and climate governance regime will be missing post-2020—unless a new process replaces it.

An important part of ensuring coherence with long decarbonisation targets is identifying feasible pathways to long-term climate goals. In the absence of a top-down, PRIMES approach, identifying these pathways will be essential for Member States to interrogate the level of ambition that they wish to include in key parts of their 2030 strategies to implement the 2030 Framework/Energy Union. If Member States focus only on their obligations to the 2030 period, then governments will simply pledge the minimum of action necessary to satisfy the Commission and their other EU legal obligations. However, if Member States have gone through a process of reflection and engagement with stakeholders about their long term strategy and have begun to develop the national capacity to implement these strategies, they will be more likely to take account of long term enabling conditions for 2050 decarbonisation. This could in turn help to lift the level of willingness of Member States to include higher ambition in terms of items like renewables, energy efficiency retrofits, transport infrastructure, gas security actions, interconnections, etc., in their 2030 strategies.

Moreover, experience to date in a handful of EU Member States (such as France, Germany, UK) has demonstrated that the process of developing long term strategies to decarbonisation can be a surprisingly effective "soft-governance" tool for achieving stakeholder engagement, ownership and convergence on what medium-term strategic objectives need to be met to create the enabling conditions to achieve the long term goals.

Note that this part of the new governance mechanism would not be an additional demand on Member States. Under the new EU Monitoring Mechanism Regulation, which is based on UNFCCC reporting requirements, all EU Member States are already required to submit a national low-carbon development strategy with a long time horizon. However, this requirement is insufficient because it contains no obligations in terms of the structure, content and process of development of these strategies, making them effectively unfit for the purpose described above. The new governance mechanism for the post-2020 period can and should rectify this critical gap by replacing the requirements of the MMR with a harmonised, structured and practically useful approach that contributes to ownership and genuine coherence between 2030 and 2050 goals.

3. PROPOSAL FOR A NEW NATIONAL CLIMATE AND ENERGY PLANNING AND REPORTING SYSTEM

3.1. Differentiating governance in national planning and reporting

Until now, Europe's new energy governance process has been largely represented as being centred around the idea of a single national climate and energy plan that would replace, integrate and streamline existing planning documents

under EU energy and climate legislation, detail Member States goals and strategies to implement the Energy Union and 2030 Frameworks, be reviewed by the Commission and be systematically reported on.

However, the preceding section has also argued that the Energy Union project has several different elements with different implications for effective governance and thus for the optimal approach to planning and reporting in particular.

This section thus presents a proposal for how national plans could be to split into three complementary, but separate, parts, each of which would be subject to different kinds of planning requirement and different procedures for using the information contained in the plans/reports.

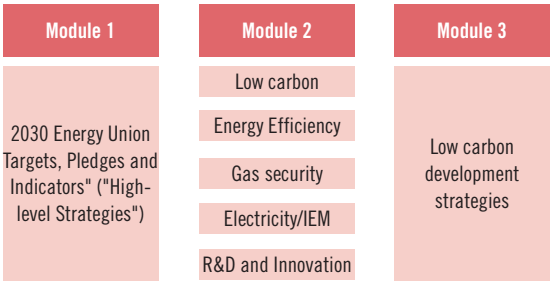
We propose three complementary chapters or modules:

1. A high level Energy Union strategy to meet core EU goals by 2030;

2. A national climate and energy policies and measures document (covering all 5 pillars);

3. A 2050 low-carbon transition strategy.

Figure 1. Modular structure of proposed new planning and reporting architecture for energy and climate governance



Source: IDDRI

3.2. National high level 2030 climate and energy strategies

The first module or chapter submitted by Member States would be a short, high level strategy document. It would briefly explain where the Member State currently stands in terms of the implementation of 2030 Framework Targets. It would then outline, using a small list of quantitative pledges, the core elements of the strategy that the Member State proposes to follow to implement the EU's climate and energy goals in terms of decarbonisation and energy efficiency, gas security and internal market integration to 2030.

To structure the description of the strategies and to make sure that strategies are concrete and credible, Member States would be required to provide a quantitative summary and detail what its strategy would imply for a set of core indicators that are "structurally important" and applicable to all Member States for meeting the goals of the 2030 Framework and the Energy Union. A suggestion for how this set of strategy indicators might look is outlined below in Table 2.

Several principles have been used to define these strategy indicators:

- We focus on areas that are of most structural relevance to the Energy Union goals, and those where the EU has taken quantified targets for 2030. These include: GHGs, renewables, energy efficiency, energy security and competitiveness, and interconnections and the internal electricity market
- We focus on areas that are clearly Member State competency, and try and avoid an overlap with EU instruments that effectively address their relevant policy challenge. For example we exclude the industry sector here, as this is covered by the EU ETS. On the other hand, we include power sector indicators, because i) renewables in the power sector are crucial for the EU's 2030 renewables target; ii) understanding the projected level of renewables deployment is crucial for the internal electricity market agenda; iii) even a strengthened ETS cap and price would be insufficient by themselves to drive large, uncertain capital investments in zero carbon technologies in the power sector, be it renewables, CCS or nuclear. Complementary policies at Member State level are required, hence the logic of defining indicators here.
- We try and keep the indicators few in number, for simplicity and visibility.
- We try and define a list of indicators that is spread across the Energy Union's core objectives, and reflects the different interests of different Member States. Each Member State should be able to see that 'there is something in it for me' in developing such a strategy, even if not all areas or indicators are priority for each Member State.

Table 2 thus covers many of the actions that the Commission has prioritised to further the goals of the Energy Union. However, it deliberately does not include a *complete* list of all of the quantitative measures that could be relevant to the Energy Union. This is done to avoid the risk of a box-ticking exercise that is disconnected from actual national strategies and to help focus the attention of the governance mechanism at EU level on those structurally essential elements to implementing the 2030 Framework goals. In addition, some scope is given for Member States to include specific indicators that they see as relevant to implementing their national strategies but which may not be included in the common set of indicators.

As simple and "high-level" strategies, the above template should allow for a *clear, credible and internally coherent picture* to be given of how each Member State intends to integrate and balance the different elements of the Energy Union. However, Member States would be given room to explain why they have chosen their particular strategy as part of a narrative complement to the quantitative pledges.

Monitoring the fulfilment of Member States' strategies

Member States would report annually on each of the indicators in their strategy.

The quantitative pledges that Member States put down *for each and every line* of the national strategy template outlined above would not be legally binding on Member States. Nor would Member States necessarily be expected to fulfil every single sub-target exactly as intended in the original strategy. After all, there are inevitably unforeseen circumstances that call for changes to strategies over time.

However, to ensure robust governance of the EU's collective 2030 strategy, Member States would be held accountable for achieving those goals within the strategy which are legally binding. This would therefore include the GHG targets in the non-ETS sectors, the n-1 gas security requirements of the (soon to be revised) 2010 Security of (Gas) Supply Regulation,[3] as well as the cumulative impact of the implementation of EU directives (e.g. the energy savings provisions in the Energy Efficiency Directive).

Furthermore, for some of the indicators, the EU has agreed specific quantitative targets with which all Member States are expected to comply. For example, the EU's 15% interconnection targets fall into this category. Thus, Member States should also be held accountable relative to these benchmarks as part of the annual monitoring process at EU level.

Thus, in practice, Member States would be given some flexibility with respect to the achievement of individual pledges/indicators; for example, for the sub-target of reducing the rate of energy consumption in the transport sector (which might increase due to a temporary economic boom).

But they would be nevertheless required to ensure that improvements in energy efficiency or CO_2 efficiency in other parts of the non-ETS sectors kept them in compliance with their obligations under the Effort Sharing Decision.

Similarly, for gas security, a Member State may be allowed to have a more limited storage capacity that it sets out to achieve if it finds that access to LNG or a more significant interconnection capacity with its neighbours is a preferable way to achieve the same security goal. However this flexibility would be allowed provided that the totality of its measures met the legally binding requirements of the Security of Supply Regulation (currently the n-1 standards).

However, the price of this flexibility is that Member States would be considered to be obligated to achieve outcomes consistent with the sum of the parts of the overall strategy for CO_2 reductions, Energy Efficiency and Security, and internal market completion.

The approach to the design and use of module 1 of the new planning and reporting tool would therefore allow for the national strategy indicators to be used as a genuinely effective governance instrument for ensuring EU obligations are met, while also allow Member States the flexibility to pursue those strategies that best match their national circumstances. This should make it more likely that Member State's strategies to achieve the objectives of the Energy Union/2030 Framework are actually implemented.

Finally, it should be noted that the approach to national strategy development and monitoring outlined above does not necessarily prejudge or exclude complementary measures to facilitate the achievement of EU targets, such as proposals to introduce project-based flexibility mechanisms into the ESD sector, or similar mechanisms for ensuring that the "EU binding" 27% renewable energy target is achieved.

3.3. National climate and energy policies and measures (detailed)

In this module of the new planning and reporting system, member states would complement the high level strategies provided in the first module with more detail on the specific policies and measures that they intend to undertake to implement their quantitative 2030 pledges in module 1. To ensure transparency and that quantitative pledges are backed by a credible policy development process, Member States could be asked to provide information on the extent, timeline, budget, legal form, allocation of responsibility for each major action that is to be used to implement their pledges. Expected spill-overs for neighbouring Member States would also be mentioned where relevant.

This information would be based on a reformulation and synthesis of the most essential existing

3. Note that a revision of this Regulation 994/2010 is currently under consideration. The stakeholder consultation for this revision concluded that "A majority of stakeholders argue that N-1 rule is a good proxy for 'minimal level of infrastructure' to safeguard security of supply in the event of a technical failure". Although it also found that the new regulation could potentially complement this standard with other standards.

Table 2. List of sectoral sub-objectives for pledges and indicators detailing Member State 2030 strategies

Element of Energy Union	Suggested Indicator(s)	Rationale
Decarbonisation & Energy Efficiency (E-U. pillars 1 and 2)		
Buildings	Total energy use CO_2 intensity of energy Retrofit rate of building stock per year (% of building stock)	Thermal renovation is a crucial intervention to achieve energy cost reductions, energy security goals and both 2030 and longer-term climate targets; it is also an area typically of Member State competency where EU-determined targets would be difficult to determine. Defining the retrofit rate and total targeted energy use would give visibility to the ambition of a member state's strategy in this field. Energy supply also needs to be decarbonized through a shift to electricity (heat pumps, etc) and low or zero-carbon fuels (biomass, natural gas). This indicator would require member states to define their ambitions in this field.
Transport	Total energy use Penetration of low-carbon carriers (% final energy consumption)	Aspects of transport sector decarbonisation can be effectively addressed via EU-level standards for the vehicle fleet. Non-marginal change like electrification, modal-shift, or energy conservation require Member State policies, e.g. on infrastructure. Defining objectives for total energy consumption and penetration of low-carbon carriers can capture such changes.
Power sector	CO_2 intensity of electricity production % of total final domestic electricity production from low-carbon or renewable sources	This section would have Member States detail firstly, their renewable ambitions, which is crucial to understand internal energy market coordination issues. But it would also require Member States to detail their ambitions regarding the carbon intensity of electricity supply: some Member States may rely on other technologies than renewables, and the residual thermal fleet must also be progressively decarbonized, hence the interest of understanding the CO2 intensity of power generation in total.
Land use sector	CO2 emissions from LULUCF GHG emissions from agriculture	The EU's 40% aggregate target includes LULUCF and agriculture is a potentially crucial element of the ESD; Member States strategies in this sector will be crucial to achieving the 40% target.
The share of renewable energy in total final energy supply	Percentage of total domestic energy production from renewables	This would allow an understanding of how the EU as a whole would perform against its 27% renewables target for 2030.
Total primary energy consumption	Total primary energy consumption	This would allow an understanding of how the EU as a whole would perform against its 27% energy savings target
Total GHG Emissions	ESD Sector[1]** ETS Sector*	This would be crucial to understand how Member States project themselves against their legally binding ESD targets, provide information useful for flexibility mechanisms within the ESD, and to understand how the sum of a member state's policy ambitions in covered sectors reflects the overall tightness of the EU ETS cap (policy coordination).
Energy (Gas) Security (pillar 3)		
Resilience to Supply Shocks	n-1 supply capability as % of annual consumption**	This is a crucial and reasonably successful indicator for the resilience to supply shocks.
Price convergence	Transport-cost adjusted price difference with largest EU hub Two-way interconnection capacity	A gap between liquid hub prices and illiquid long-term contracts is a good indicator of the level of internal market integration and the level of contestability in gas markets
Other	Other relevant national indicators	Different Member States will have different priorities which may make other indicators just as relevant as the above two.
Internal Energy Market Integration (pillar 4)		
Electricity interconnection	Interconnect level (%)	The level of interconnection projected can provide a crucial coordination point for regional and market actors
Other	Other relevant national indicators	Different Member States will have different priorities which may make other indicators just as relevant as the above one.

* Note that this must be an estimate of expectations (based on an assumed CO2 price) rather than a concrete pledge as it depends on outcome of the carbon market.
** Legally binding obligations on MS expected to exist beyond 2020.

templates and planning and reporting requirements in the 2020 acquis (e.g. under the RES, EED, ESD, MMR, internal energy market related reports of national regulatory authorities on interconnection and market rules). Thus, Member States would also be required to refer to and account for the impact of measures required under existing European law where relevant in elaborating the quantitative breakdown of their high level 2030 strategies in module 1.

The new synthesis templates would be detailed in a new government instrument which would give guidance to Member States. These would have to be coordinated with the revised EED and RED to ensure that all essential requirements of Member States were included. This would need to preserve essential components of the existing acquis.

An important challenge of preparing detailed and integrated plans and frequently reporting on the many actions required to implement the Energy Union's many goals is that it would require coordination and involvement of many different government departments in Member States. In practice, achieving this degree of coordination, let alone avoiding a watering down the ambition of plans could be difficult. To partially mitigate this risk, this module would be reported on every 3 years (rather than annually as module 1 would be). Further, this module would probably need to be divided into sub-sections that different governmental departments could feed into. One option would thus be to divide it into 4 sections:

1. Policies and measures relevant to implementing Decarbonisation, RES and Energy Efficiency goals for 2030.

2. Policies and measures relevant to regional gas security (detailing medium term plans to implement the Energy Union's gas security priorities)

3. Policies and measures relevant to internal electricity market (detailing medium term plans with respect to interconnections, market rules, and the integration of low-carbon generation)

4. Policies and measures relevant to R&D and innovation for EU energy & climate objectives.

The valuable information relevant to the energy Union's 5 pillars would be covered in these four topics.

This module would involve lighter obligations on Member States that module 1. Whereas module 1 would be subject to review by the Commission for coherence and annually monitored by the Commission, this module would be subject to a less stringent process. The main obligations would be that Member States:

- Share complete information based on the reporting templates, etc.
- Ensure that information is complete, coherent and consistent with what is reported in module 1's pledges and indicators strategy.
- Fully implement EU law in the pieces of legislation to which the reporting in this module refers in part (e.g. the EED, etc.).
- Participate in regional fora or other cooperation and coordination processes that are based on the information that is shared in this module.

However, provided they met these requirements and that they did not deviate significantly from their 2030 strategies as revealed by the monitoring of the indicators in module 1, they would not be subject to regular review and interrogation of the details of their national strategies.

The practical uses of this module would thus be the following:

- To oblige Member States to have thought through the concrete implementation of their high level strategies and involve stakeholders in its development.
- To set agendas for Member State cooperation and coordination and review the implementation of existing EU law (e.g. by the Commission and/or existing regional fora).
- To allow other EU Member States to better understand national strategies and react to actions which have spill-overs and require coordination or cooperation with themselves.
- To give investors and private sector stakeholders a clearer picture of actions and opportunities for their own decisions.
- To provide transparency to civil society stakeholders.

Relationship of this module to existing planning and reporting requirements under EU law

The EU has a number of existing arrangements that involve planning and reporting (P&R) on different parts of energy and climate policy (Table 3). Some of these requirements are not excessively burdensome and are examples of good information sharing practice that should be preserved. Thus, it is crucial that in streamlining the existing P&R framework, that what is good in the existing acquis is protected and improved, rather than weakened.

However, recent analysis of the scope and content of these different P&R requirements also highlights that there is indeed overlap and some scope to better harmonise and reduce the administrative burden of current P&R requirements under EU energy and climate law. Specifically, Umpfenbach (2015b) has pointed out that there is significant overlap and repetition between policies and measures reported under the Energy Efficiency (EED)

and Renewables Directives (RED) and under the requirements for projections based on Policies and Measures (PAMs) under the Monitoring Mechanism Regulation. There is also overlap in terms of the basic energy use data reported for projections and there are of course interactions between assumptions for the two sets of projections. She also points out that further streamlining could be achieved by harmonising the dates and time horizons used for these projections, suggesting that a common planning and reporting instrument for these elements is an important streamlining opportunity. Furthermore, there is an overlap between the reporting on policies to remove barriers to renewables and enable cost-effective integration into the grid under the RED and national regularity authority reports. Furthermore, there is a clear and already recognised overlap between the Energy Performance in Buildings Directive and the requirements of the MMR and EED.

At the same time, streamlining these documents will inevitably involve some trade-offs. For example, the Energy Efficiency and Renewables Directives have good planning and reporting templates, but also ask for substantial amounts of information on tangentially related measures or very specific details of national implementation (such as the impact of biofuels on commodity prices, the share of agricultural land dedicated to biofuels) which would arguably be dispensed with for EU level reporting in the interests of a more focused and integrated picture on progress in meeting EU targets and implement EU laws.

There are also some gaps in terms of what is relevant to the Energy Union project in the current P&R framework. A complete and systematic vision of the role of transports' contribution to decarbonisation strategy is missing (it is only partially and not systematically covered by RED, EED and PAMs under the MMR); there is no place where Member States are required to clarify their medium and longer term strategies to improve their natural gas security (only emergency response plans exist), nor is there a concrete plan to implement electricity interconnection targets (Umpfenbach, forthcoming). These elements should be included for the sake of a clear and integrated picture of progress on the Energy Union's aims.

We therefore propose that the core of the planning and reporting content in this module would be based on the collecting, integrating and streamlining of existing obligations and templates under the EED, EPBD, RED, PAMs and ESD-related reporting under the MMR, and NRA reporting on measures to provide a better enabling environment for electricity. However, this would added to by a dedicated section on transport, reporting on actions to improve natural gas security with respect to the indictors on n-1 security of supply scenarios and price convergence and other proposals contained in the Energy Union where relevant. Furthermore, detail on electricity market reform, especially with respect to the interconnection targets, the goals of retail market reform and the medium term strategy to implement higher shares of renewables/low-carbon electricity into the system should be included. Finally, a section on R&D and innovation would also need to be added. The bulk of these changes are further detailed in Table 3 below.

An examination of the content of Table 3 shows that the information required by the new comprehensive information sharing document would be substantial and cover several diverse issues, involving different government departments, authorities and private sector actors in their preparation. A potential challenge for Member States would therefore be their internal capacity to meet all of the reporting requirements on a regular basis. We would therefore propose that the planning component of this module would be submitted only every 5 years, while reporting could perhaps be done on three year cycles.

3.4. National 2050 decarbonisation strategies

The purpose of this third module would be to respond to the third major governance challenge identified above: i.e. to ensure coherence between Member States' 2030 strategies and the EU's 2050 decarbonisation objectives.

In this module or chapter, Member States would have a light (but important) obligation to participate in a process of developing a collective vision of feasible pathways to the EU's 2050 GHG objectives.

Each Member State could be asked to provide a sector-by-sector description of its own vision of its low-carbon transition out to 2050, if it were to act consistently with the EU Council-endorsed 80-95% reduction target. Member States should not be instructed to adopt any particular target or strategy, since this process must come from the Member States themselves and should not be a "burden sharing" exercise.

The emphasis of this part of the process should be on the *transition pathway, the content of the Member States' strategies* and the *enabling conditions* along that pathway that allow for 2050 targets to be met. Thus, we suggest that Member States could be asked to use a "back-casting" approach to determining the timing of the deployment of different abatement measures. In other words, based on their GHG goal in 2050, Member States should

Table 3. Envisioned relationship between existing planning and reporting (P&R) requirements and this proposal

Key, existing P&R requirements relevant to module 2	Legal basis for P&R under new proposal	P&R submitted under single national reporting document or separately?	Vital information to be preserved in *new* instrument	Key changes in new instrument
Renewables Directive ("RED")	New P&R guidance instrument & coordination of P&R with existing legislation	Included into common plans/reports under module 2	Existing quantitative reporting on technology deployment by sector every 2 years, key policy measures, financial data, key actions to create enabling environments in NREAPs and Progress Reports	Elimination of double up + harmonise timing between RED, MMR, and PAMs Some details could potentially be removed or made optional (e.g. info on guarantees of origin, biofuel price impacts, etc.)
Energy Efficiency Directive ("EED") & Energy Performance in Buildings Directive (EPBD	New P&R guidance instrument & relationship to existing legislation	Included into common plans/reports under module 2	Existing quantitative and policy information corresponding to each article of the Directive in NEEAPs and Progress Reports	Elimination of double up and harmonise timing between RED, MMR, and PAMs Many fine details on implementation could potentially be made optional (as under the existing NEEAP guidelines)
Monitoring Mechanism Regulation ("MMR") Articles on PAMs, ESD and low-carbon development strategies.	New P&R guidance instrument	Streamlined into common plans/ reports under module 2 and module 3	Core of articles related to PAMs and ESD reporting and projections for all sectors. Requirements to develop low-carbon development strategies	PAMs streamlined to use reporting under RED and EED templates. Low-carbon development strategies are given more concrete structure and common templates and fed into EU roadmap process.
Monitoring Mechanism Regulation ("MMR") Articles on GHG inventories, data quality and reporting to the UNFCCC	Kept in MMR	Reported separately under MMR	N/A	N/A
Cars and vans legislation	New P&R guidance instrument	Included into common plans/reports under module 2	No existing planning or reporting requirements for governments.	Could invite a wider focus on whole transport sector, outlining the strategy underlying the PAMs. Indicators for penetration of low-carbon carriers and demand reduction policies and measures would be valuable
SoS Gas Regulation Reg. 994/2010	New P&R guidance instrument & existing legislation	Included into common plans/reports under module 2	biennial response plans	Should include reporting on indicators to meet key goals under MS Energy Union strategies, esp. n-1 security target and price convergence targets
IEM Package legislation (e.g. Ten Year Network Development Plans)	New P&R guidance instrument	Partially included into common national plans/reports under module 2 (as the IEM package is broader than issues related to the energy union).	NRA annual monitoring reports on interconnection, on market rules and REMIT related reporting by companies *kept separated* from Energy Union reports.	Would integrate concrete infrastructure and market rules (e.g. retail deregulation) information into common P&R for energy union. An explicit requirement to explain how the strategy is coherent with objectives of RES/low-carbon deployment should be required

first determine the level of energy use, emissions, fuel mix and technologies deployed in each major emissions sector in 2050, then work backwards to what would be required by 2040 to meet that 2050 target, then move to 2030, etc..

Note that this would *not* be a new reporting requirement as Member States are currently already required to develop low-carbon development strategies under the Monitoring Mechanism Regulation. However, the intention here would be to make these strategies significantly more structured, concrete and useful for thinking about long term coherence and to help them talk to other governance tools more effectively than what is currently required under the Monitoring Mechanism Regulation, which contains no templates or

other concrete guidelines on how they are to be developed or used.

Member States would be required to provide two kinds of information. Firstly, to make the strategies concrete, Member States could be asked to describe what *potential strategy or strategies* they see as feasible—on the basis of their national energy circumstances, preferences, and political constraints—for achieving these targets in 2050. These strategies would require detail about the fuel mix in each sector, the technological choices, the rate of deployment of these technologies, and how specific challenges would be overcome (political, financial, economic cost, public acceptance). This concrete sectoral-level strategy component would help to ensure that Member State strategies were not simply computer modelling exercises with no tangible information for national stakeholders in terms of what the transition would mean for them.

As a second step, Member States would then be required to translate these strategies into the concrete numbers for a common high-level "Sector Dashboard" template for all Member States. This would summarise the essential quantitative characteristics of each Member States decarbonisation strategy to 2050 in a comparable way and give structure, internal coherence and transparency.

To keep it to the minimum requirements while providing a comprehensive picture of the national strategy, the Sector Dashboards could be built on indicators based on the basic drivers of emissions (i.e. Emissions = Population x Sector Output/Population x Energy use/Output x CO_2/Energy use + Process emissions). The advantage of this approach is that it can be used for any sector and provides a simplified but complete overview of the sectoral transition at a glance. An example of how this could look in practice and the data requirements is provided below for the Energy Use in Residential Buildings Sector (Table 4). Annex 1 includes examples for the power and transport sectors as well.

Process for making effective use of 2050 Decarbonisation strategies

Part of the value added of the low-carbon development strategies is that, by their simple existence, they would oblige Member States to begin to take account of issues of long term policy coherence in the development of their 2030 strategies. In a context in which Member States are reluctant to accept EU-set national targets for important enabling conditions to meet the 2050 GHG targets, this process promises an alternative way of bringing long term coherence considerations into the 2030 strategies.

Another important contribution of the 2050 strategies would be that they could reveal crucial information about Member States' barriers to reducing emissions in line with the EU's 2050 goals. It is likely that Member States would initially submit strategies that do not collectively add up to the EU's 2050 goals of 80-95% decarbonisation. An essential part of the process would therefore consist of creating an iterative process of strategy submission and dialogue between the Commission and the Member States on why they have not been able to submit a strategy that is consistent with the EU's 2050 goals.

This would help to provide a concrete opportunity for Member States to dialogue about the barriers they face and to identify the specific enabling conditions that are required for them to achieve their 2050 decarbonisation goals. As a later step, this information could eventually be used as an input into the definition of a more concrete EU R&D and innovation agenda, more ambition electricity market reform agenda, more ambitious gas security agenda, etc. It could therefore be a potentially very practical information source of information for furthering the aims of the Energy Union.

For this process to work and for Member States to take it seriously, a coordinating role would need to be played by the Commission. To begin the process for developing the strategies, Member States should not be given concrete targets to meet as this must not be a "burden sharing" process. However, to ensure that Member States aim for ambitious outcomes, they would be given "attractors"—these are quantitative indications of approximately where the EU needs to be on average in terms of CO_2 emissions in a given sector in 2050 (e.g. heating and cooling emissions per unit of floor space, emissions per MWh of electricity, etc.). Member States would then submit their strategies based on these attractors.

Inevitably, the numbers would not add up to the EU's 80-95% goal in the first or iteration. Thus, we would suggest that the Commission could set up an iterative process somewhat similar to the rounds of iterative consultation that the Commission engaged in to develop its reference scenario for the EU 2030 Climate and Energy Trends publication on which its modelling for the 2030 Climate and Energy Framework was based. These rounds of dialogue would inevitably focus the discussion on the collective gap between the 2050 EU targets and the aggregated scenarios of Member States. It would thus require Member States to begin to reveal the specific barriers and enabling conditions for each of them to collectively bring their scenarios into line with the EU's 2050 decarbonisation goals. The process would thus reveal crucial

Table 4. Sector Dashboard Template (Building Sector Example)

Building & Transport Sector Inputs and Indicators								
Residential Sector Inputs		**2010**	**2020**	**2030**	**2040**	**2050**	**2050 vs. 2010**	**Ave. Ann. Change**
Floor area, residential units	Msqm	2 019	2 236	2 416	2 565	2 696	34%	0,73%
Residential FEC	EJ	1,96	1,83	1,81	1,86	1,54	-22%	-0,59%
Residential non-electricity FEC	EJ	1,54	1,45	1,43	1,38	0,79	-49%	-1,65%
Residential district heating	EJ	0,00	0,03	0,05	0,15	0,25	2400%	
Residential solar thermal	EJ	0,00	0,00	0,00	0,00	0,00	-100%	-100,00%
Residential pipeline gas	EJ	1,34	1,36	1,33	1,22	0,54	-60%	-2,25%
Residential liquid fossil fuels	EJ	0,14	0,05	0,03	0,00	0,00	-100%	-100,00%
Residential coal and coal gas	EJ	0,02	0,01	0,00	0,00	0,00	-100%	-100,00%
Residential solid biomass	EJ	0,02	0,00	0,03	0,01	0,00	-100%	-100,00%
Residential final electricity	TWh	126	114	118	173	289	129%	2,10%
Residential non-electricity CO_2 emissions	$MtCO_2$	83	77	73	67	30	-64%	-2,53%
Residential total CO_2 emissions	$MtCO_2$	139	112	77	65	21	-85%	-4,59%
Residential Sector Indicators								
Per capita residential floor area	sqm/cap	32	33	34	35	35	9%	0,22%
Residential energy intensity	kWh/sqm	269	227	208	201	159	-41%	-1,31%
CO2 intensity of residential FEC	tCO_2/TJ	71,11	61,46	42,69	34,71	13,78	-81%	-4,02%
Non-electricity CO_2 emission factor	tCO_2/TJ	53,74	52,94	51,05	48,23	37,49	-30%	-0,90%
Share of final electricity in residential FEC	%	23%	22%	23%	34%	67%	179%	2,71%

Source: IDDRI

information about what is needed in the immediate term to unlock more ambitious longer term potentials for Member States. To date, the EU has not begun to have this (increasingly urgent) discussion between the Member States.

4. CONCLUSION

The EU's energy and climate governance system will need to evolve in the post-2020 period. As the transition towards a low-carbon and energy efficient economy requires increasingly non-marginal changes to Member States' energy systems, there is a heightened need to respect Member States' right to determine their national energy mix and to cultivate national ownership of the EU's energy and climate objectives.

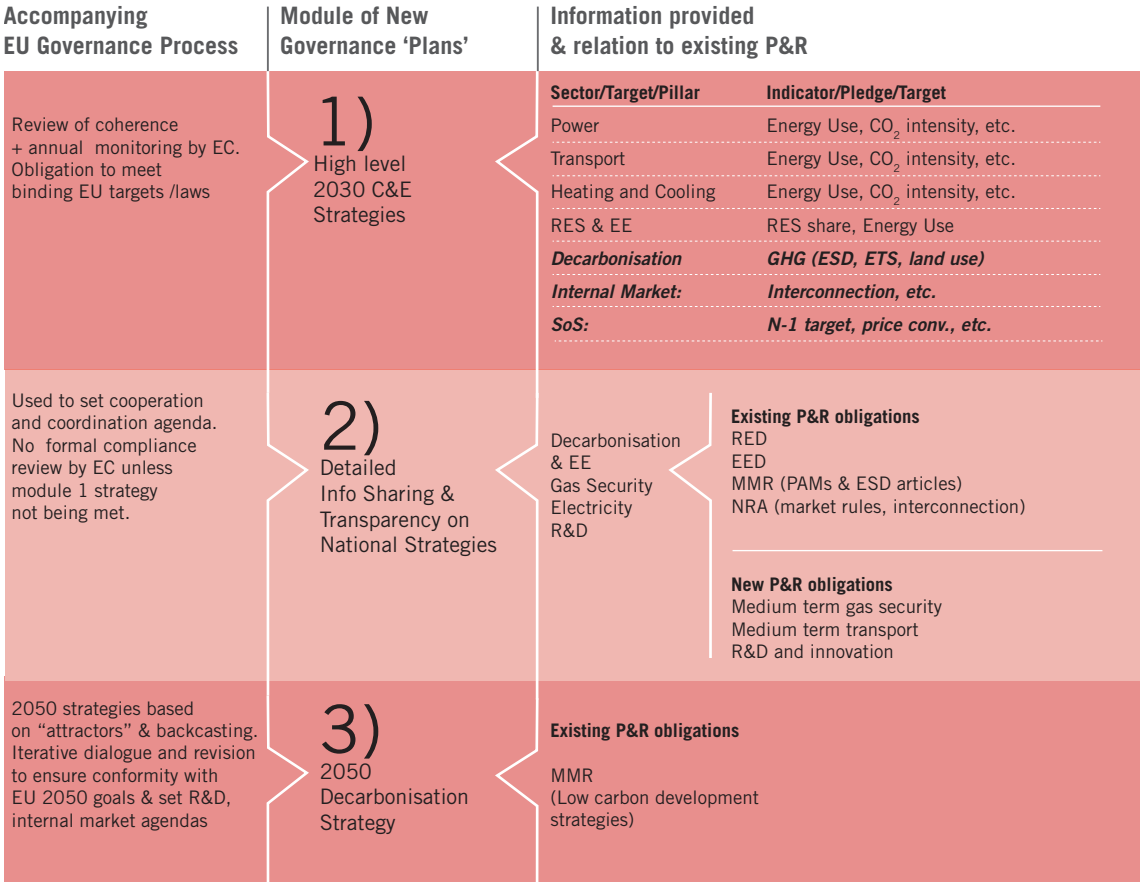
The Commission's approach to developing national energy and climate plans is thus a step in the right direction and an important opportunity to establish a firmer footing for European energy governance beyond 2020.

However, the EU's energy and climate objectives for the post-2020 period raise a number of different governance issues. These issues cannot be reduced to monolithic national energy plans or a simple set of biennially reported indicators without calling into doubt the basic capacity of the EU to achieve its objectives. A failure to reflect the different kinds of governance issues in a differentiated approach to governance and to the design of planning and reporting obligations for Member States risks creating a governance system that is a lengthy box-ticking exercise and which is not adequate to the objectives the EU is setting for itself.

This paper has thus proposed a new planning and reporting architecture (Figure 2) based on a need for differentiation between 3 different "modules" or chapters of national energy planning and reporting. This would allow for a comprehensive but differentiated treatment of the different governance issues presented by the 2030 Framework and Energy Union project. We believe that it would offer:

- A strong but flexible system for the development and monitoring of national strategies to implement core quantitative goals of the Energy Union/2030 Framework goals by 2030 (module 1);
- A thorough and transparent reporting and information sharing system that builds on and preserves crucial parts of the existing EU acquis while streamlining non-essential and repetitive elements and respecting the competencies of Member States on implementation of their national climate and energy strategies (module 2);
- A realistic alternative to top-down modelling processes to create coherence between short-term and long-term climate policy objectives out to 2050.

Figure 2. Visual Summary of New P&R Architecture Proposal & Relation to Existing P&R requirements



Source: IDDRI

For the new EU climate and energy governance system based on a stronger role for Member State competencies and circumstances to work, the EU must create a new governance "dynamic". This dynamic must create the conditions for Member State "buy-in" and commitment to the Energy Union's goals. It must allow flexibility while enabling transparency based on what is good in the existing energy and climate acquis. Finally, it must find a means of enabling Member States and national stakeholders to be the motor of increasing ambition in specific sectors where nationally binding targets set at EU level no longer exist. In this context, soft-governance approaches based on broad participation and revealing of critical barriers to ambition (such as *via* the development of concrete 2050 strategies) are essential. National climate and energy plans and the surrounding governance tools and processes must therefore serve to create this new dynamic. But this means avoiding a one-size-fits-all approach.

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APPENDIX

Annex 1. 2050 sector dashboards for transport and power sectors

Power generation mix inputs & indicators		2010	2020	2030	2040	2050	2050/2010	Ave.Ann Change	2050 Shares
Coal	TWh	98	62	0	0	0	-100%	-21%	0%
Coal w/ CCS	TWh	0	0	0	0	0			0%
Natural gas	TWh	163	115	14	1	4	-98%	-9%	1%
Natural gas w/ CCS	TWh	0	0	50	84	187	1872979%	28%	30%
Nuclear	TWh	62	67	115	202	277	345%	4%	45%
Hydro	TWh	1	6	6	6	6	452%	4%	1%
Wind-Onshore	TWh	7	20	33	33	31	339%	4%	5%
Wind-Offshore	TWh	3	39	73	51	33			5%
Solar PV	TWh	0	0	0	0	0	583%	6%	0%
Solar thermal	TWh								0%
Biomass	TWh	14	10	24	25	36	150%	2%	6%
Geothermal	TWh	0	0	0	0	0			0%
Other	TWh	11	12	11	10	44	301%	4%	7%
Share of intermittent renewables	%	2%	6%	10%	8%	5%	71%	2%	

Aggregate electricity inputs		2010	2020	2030	2040	2050	2050/2010	Ave. ann. change
Electricity generation	TWh	363	337	340	419	622	71%	1,35%
Electricity consumption	TWh	333	315	319	397	588	77%	1,43%
Electricity CO_2 emissions	$MtCO_2$	160	103	12	-5	-18	-111%	
Aggregate electricity indicators								
Electricity consumption % FEC	%	19%	18%	20%	25%	40%	105%	1,94%
Average net CO_2 emission factor	$kgCO_2$/ kWh generated	0,441	0,306	0,035	-0,012	-0,028	-106%	

Transport sector inputs and indicators								
Passenger transport inputs		2010	2020	2030	2040	2050	2050 *vs.* 2010	Ave. annual change
Total passenger kilometers traveled (PKT)	Gpkt	1	1	1	1	1	30%	0,68%
Passenger transport FEC	EJ	1,18	1,16	0,93	0,65	0,50	-58%	-2,15%
Passenger final electricity	TWh	6	5	17	45	64	941%	6,04%
Passenger non-electricity FEC	EJ	1,16	1,14	0,87	0,48	0,27	-77%	-3,61%
Passenger hydrogen	EJ	0,00	0,00	0,01	0,05	0,14	1262%	
Passenger biofuels	EJ	0,03	0,01	0,00	0,02	0,02	-58%	-1,48%
Passenger liquid fossil fuels	EJ	1,13	1,13	0,86	0,41	0,11	-90%	-5,61%
Passenger pipeline gas	EJ							
Passenger non-electricity CO_2 emissions	$MtCO_2$	86	76	51	29	6	-93%	-6,36%
Passenger total CO_2 emissions	$MtCO_2$	89	77	52	28	4	-95%	-7,36%
Passenger transport indicators								
PMT per capita	pkm/cap	13	14	14	14	14	7%	0,18%
Passenger energy intensity	TJ/Mpkt	1428,8	1255,1	920,9	617,6	455,8	-68%	-2,82%
CO_2 intensity of passenger FEC	tCO_2/TJ	75,16	66,52	55,43	44,07	8,43	-89%	-5,32%
Non-electricity CO_2 emission factor	tCO2/TJ	74,08	66,12	58,47	59,99	23,33	-69%	-2,85%

Source: IDDRI

Designing planning and reporting for good governance of the EU's post-2020 climate and energy goals

Oliver Sartor, Michel Colombier, Thomas Spencer (IDDRI)

IDDRI'S PUBLICATIONS

- Sartor, O. *et al.* (2015). "What does the European power market need to decarbonise? The Role of the EU ETS and complementary policies post-2020", Climate Strategies, Final Report July 2015.
- Sartor, O. *et al.* (2015). "Enhanced flexibility in the EU's 2030 Effort Sharing Agreement: issues and options", Climate Strategies, Final Report April 2015.
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