Current EU climate policy: An optimality assessment

This policy brief contains insights from an evaluation of the current EU climate policy mix, against a newly developed **definition of optimality**. In this context, optimality is taken to include three core criteria (climate) **effectiveness**, static and dynamic (economic) **efficiency** as well as political, administrative and legal **feasibility**.

The new starting point provides a scale representative of real-world situations by which to measure Europe's existing and future climate policies as well as the relationships among them – subsequently providing more meaningful and relevant results than previous policy evaluation methods.

Central conclusions on the current policy mix

Overall, the current EU climate policy mix is **short of optimal** – based on the criteria used in this exercise. The analysis shows the same result for national level policy mixes. Some individual policies are closer to optimality in that they score (relatively) well for all three main criteria types.

1. **Effectiveness** of the instruments observed varies per main objective and policy landscape
    a. There is significant progress in terms of observable emission reductions and renewable energy deployment. However, GHG reductions are in part due to structural change and the economic crisis and thus not a result of the policies deployed.
    b. Regarding specific policy landscapes, carbon pricing instruments generally do not fare as well as could be expected:

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the ETS, fraught with an excessive supply of allowances and hence low prices, has lost relevance; only modest tax rules at the EU level and few initiatives for carbon taxes at national level), and energy efficiency policies have not delivered sufficient progress overall, where as renewables support have generally proven to be effective. Non-CO2 related measures (including in the waste and agriculture sector) receive less attention and show mixed results.

   c. On the level of individual instruments, a number of measures are identified as particularly effective (incl. renewables support, national level pricing tools, building renovation support), with potential lessons for future policy design.

2. **Cost-effectiveness** (efficiency) is low overall, with regard to both static and dynamic efficiency. Most prominent among the reasons are:

   a. many nationally differentiated approaches prevail, with little EU-wide harmonisation,

   b. as a consequence, the explicit or implicit carbon price set by the different policies, and by implication the abatement costs of different emitters, vary widely,

   c. with few exceptions, countries rely on regimes and instruments for individual sectors, with divergent levels of ambition,

   d. There is a lack of dynamic incentives over the longer term even in policies that are otherwise deemed to be effective (such as Ecodesign product standards).

   However, in some policy landscapes (such as renewables support and energy efficiency) and specific policies within them, dynamic efficiency can be observed and is having an impact.

3. **Feasibility:** since the exercise is looking backwards, feasibility is a given for the measures concerned: they exist, hence they must have been feasible. Yet of course the outcomes of past debates are reflected in the design of policies, and some of their shortcomings and deficiencies have been necessary to make the measures feasible. Also, acceptance of and support for certain types of policies and/or their level of stringency can change and has changed, and in the case studies observed this has led to adjustments in policy – often under (perceived) public pressure to soften the policies (especially in the aftermath of the economic crisis). In other cases, such as for the EU ETS, policy learning can be observed and

improvements have been made over time, facilitating among others also legal and administrative feasibility.

Economic and political background

The European Union and its Member States are currently debating the shape and substance of its future climate policy. The EU has set for itself the long-term target to reduce emissions by 80-95% by 2050 (from 1990 levels), which implies in essence a decarbonisation of most economic sectors in just over three decades. The current policy framework is largely geared towards the year 2020 and so the time horizon must now be extended to focus on to how the current instrument mix should change to produce the 2050 goals.

This is taking place against the following background:

- **Progress so far is encouraging**: emissions have come down by 18% (2012) since 1990 already (the EU 2020 target likely to be met ahead of time, according to EEA projections), renewable energy deployment has increased to 13% (2011) and energy consumption is stabilising and projected to go down (energy intensity of the economy has certainly been lowered significantly).
- In the EU Emissions Trading System, the EU's declared flagship climate policy instrument, rules for access to offset credits and the impact of the economic crisis have combined to create an excess of allowances in the system and hence a slump in permit prices. Thus, the **ETS has suffered a loss in perceived relevance** for emission reductions. The political debate over changes to the system to alleviate the situation has been controversial.
- Renewable energy support policies have been successful in driving down prices of technologies towards market maturity. Yet the pace of deployment is now creating challenges for further market integration in the electricity sector. Moreover, the costs of the support measures have led to **a renewed debate on the cost burden for households and energy-intensive industries**. While renewable electricity has actually driven down wholesale electricity prices considerably, the consumer prices have increased nonetheless because of the growing volume of feed-in-tariffs.
- At the same time as public budgets are low on funds, and financial support to green initiatives is seemingly restricted, significant **opportunities for green economic development through climate policy exist** that could be beneficial to EU prosperity.

It is against this backdrop, that the assessment of the current climate policy mix in the EU and its Member States has taken place and against which its insights must be understood – and possibly applied in the design of post-2020 policies.

Box 1: Stocktaking exercise: methodology – part 1

The CECILIA2050 team produced **reports on eight EU Member States** (Czech Republic, France, Germany, Italy, Netherlands, Poland, Spain, and the United Kingdom), and the EU as whole, which serve as a 'stock-take' of current policies and their performance. **Fifteen key policy instruments** were identified for each Member State and the EU level, representing instrument of different types, economic scope and objectives. These selected instruments are then **divided into four 'policy landscapes'** (carbon pricing, efficiency, renewables, non-CO2). Each report contains a description of each of the 15 instruments identified, along with an assessment of performance in terms of the optimality criteria. The **interactions between instruments** within each of the four policy landscapes are then identified, leading to an assessment of the optimality of each policy landscape, as a summary of the instruments contained therein and their interactions. Finally, interactions between the policy landscapes are described and an **assessment of the overall optimality** of the climate policy instrument mix for the Member State in question (or EU-wide) is given.

Specific findings from the case studies

Overall assessment of optimality

- None of the nine case studies assessed the respective policy mix in place at present as being optimal – they all had significant drawbacks in terms of effectiveness and cost-effectiveness. Feasibility was referenced largely in terms of changes in perception by policy-makers.
- However, qualitative differences could be observed between the assessments of some Member States policy mixes. In the Netherlands, the overall climate policy mix was evaluated as being more coherent and more comprehensive than, for example, in the Czech Republic. Despite a prevalence of EU wide measures, there is apparently significant scope for optimising climate policy at the national level.
- The number of instruments in one specific policy landscape does not seem to necessarily determine overall optimality. In Energy efficiency, for example, many measures exist and work towards similar goals but for different subsectors, whereas in carbon pricing at EU level only two

instruments exist (ETS and Energy Tax Directive) with somewhat contradictory effects.

- Individual instruments can score well on all three main criteria – insights from their shared main characteristics are incorporated into the conclusions. There are three types of individual instruments that were identified as having been most "optimal": 1) renewables support schemes, 2) investment support for energy efficiency and 3) general pricing tools (mainly taxes).

Box 2: Stocktaking exercise: methodology – part 2

Each report divides its selected instruments into the following four 'policy landscapes' and analyses interactions within and between them.

(1) **Carbon Pricing:** includes policies that price CO_2 emissions or otherwise change the relative prices of fuel use, depending on the carbon intensities of fuels. Next to carbon taxes and emissions trading this would also include the reform or removal of fossil fuel subsidies;

(2) **Energy Efficiency and Energy Consumption:** includes measures targeted at either increasing the efficiency of the energy sector (such as power generation, transmission and end-use efficiency), or at reducing overall energy consumption (demand-side management, energy saving, sufficiency);

(3) **Promotion of Renewable Sources of Energy:** this includes policies aimed at increasing the share of energy from renewable sources (solar, wind, hydro, biomass, geothermal);

(4) **Non-Carbon Dioxide Greenhouse Gases:** this covers policies geared at reducing non-CO_2 greenhouse gas emissions, typically from sectors other than the energy sector (e.g. methane emissions from landfills or animal husbandry, N_2O emissions from agriculture etc.).

Interactions within and between policy landscapes

One of the key debate points in the current discussion on post-2020 policies is the question whether the parallel deployment of policies for similar objectives or sectors is creating conflicts or whether it is beneficial for a more optimal approach. The case studies analysed the interactions between policies in each of the four policy landscapes identified and also between the landscapes. A discussion of interactions must take into account that the three headline targets of EU climate policy – greenhouse gas emission reductions, the promotion of renewable energy and energy efficiency – are interlinked, and that the achievement of either one may depend on progress made with the other targets.

Key insights from this exercise are:

- Overall, the case studies revealed only very few instances in which instruments had a direct negative impact on each other. Positive interactions prevail, while some simply have no significant interaction (neutral relationships).
- The analysis shows that also directly overlapping instruments can be mutually supportive and thus benefit one another. One example is as the suite of energy efficiency related measures at EU level, which differ in scope (small sector vs. economy as a whole) and nature (framework, educational, standards) but do not work against one another, and do not duplicate each other's efforts.
- In several instances, regulatory overlaps are in fact integrated into the design of (especially newer) policy instruments (such as the EED and the RED – see box), demonstrating the possibility of making a conscious choice in favour of facilitating a supportive relationship of parallel policies through smart design.
- Not surprisingly, instances of negative interactions were more common among instruments designed with different purposes in mind (e.g. with direct focus on carbon (such as the EU ETS) and indirect one (such as the Energy Tax Directive)).
- A possible interaction of carbon pricing tools with other tools that is often disregarded is the possibility to generate revenues that can be used to help implement other policies (such as is the case for ETS auctioning revenues in Germany, Czech Republic and Italy, among others).

Box 3: Example for interactions #1

Mutually supportive policy design connects renewables and efficiency instruments
The instruments in the area of energy efficiency and promotion of renewables are highly supportive of each other. This lies in the significant overlap of instruments and the integration of the respective objectives into the design of the key instruments. National Renewable Energy Action Plans under the Renewable Energy Directive, for example, must consider planned and pre-existing energy efficiency measures – including those introduced under the Energy Efficiency Directive. This support is reciprocal; the Energy Efficiency Directive requires the installation of smart meters in new buildings and those undergoing significant refurbishment, which enable micro generators to supply power to the grid. This has obvious befits for the Renewable Energy Directive, which provides guaranteed access to the grid for renewable installations, alongside mandating the development of transmissions and intelligent grid infrastructure to enable the management of increasing centralized and distributed renewable electricity generation.

Box 4: Example for interactions #2

Relationship between renewables and emissions trading - avoiding conflict through smart design
A key point of contention in the current debate on instrument interaction is the relationship between the EU Emissions Trading System (ETS) and the support for clean energy under the Renewable Energy Directive (RED). A key fact with regards to climate effectiveness is that specific support for renewable electricity deployed under the cap of the ETS does not produce additional emission reductions. What it does do is make progress against the renewable energy target – as a separate objective. A concern with regard to the interaction between the two instruments is the impact of such progress in renewables on the prices in the EU ETS, which have been much lower than anticipated. The question being: does the RED have a negative impact on the carbon price signal of the ETS? Historically, this issue had, however been integrated into the policy design, showing that this possible negative impact can be avoided. The Impact Assessment carried out by the European Commission for the ETS and the RED as part of the 2008 package showed that expected reductions from renewables were calculated into the cap setting. More specific analyses of the reasons for low prices in the ETS identify the impact of the economic crisis and the use of offset credits as main contributors. These aspects could be addressed in a reform of the Directive itself.

Instances of clear sub-optimal policy design

The case studies revealed a few instances in which policies suffered from deficiencies that can be categorised as follows:

- As anticipated, **trade-offs** can be observed between (political) feasibility and both effectiveness and efficiency. Not surprisingly, the analysis showed that a lack of political decisiveness (in favour of strong climate protection measures) stands in the way of more effective and efficient policies. Specific instances of this are the following:
    1. **Exemptions from compliance** (especially regarding payments) for specific industries are often built into policies (e.g. In NL, UK, F, DE)
    2. **Abrupt policy changes** lower effectiveness and cost-effectiveness of policies. Recent changes in support for renewable energies (NL, CZ, ES) seem to have negative effects. Adjustments may have been required in these cases (to control renewable deployment speed), but the changes to the respective laws appear to have been too severe and too abrupt.
- **Contradictory incentives** exist in some cases, especially stemming from policies not designed for climate reasons (e.g. Landfill Directive vs. Renewable Energy Directive, Energy Taxation Directive vs. EU ETS).
- At some levels (national or sectoral) there is **no coherent vision** or strategy for how to achieve climate and energy targets – which means that policy design is lacking direction (e.g. CZ).
- There are **gaps in the policy mix**: sectors with sources of non-CO2 gases are less well covered with policies. In the agricultural sector, for example, current projections do not indicate additional emission reductions in the EU28 by 2020. This has a negative impact on both effectiveness and cost-effectiveness of the mix as a whole.

What works - examples of individual policies

The case studies showcased a number of individual policy instruments that were deemed to be superior to others in terms of their "optimality" as defined by this project. There were three types of measures that stood out in that respect:

1. feed-in tariff systems for renewable energy support (e.g. DE, ES)
2. loan schemes to support energy efficiency improvements (e.g. CZ, F)

3. pricing tools, such as environmental taxes (e.g. UK)

The country specific instances of where a policy was working particularly well had a number of characteristics that could inform future policy design:

- In most examples, the measures enjoy fairly broad political and public support. This is partly achieved by involving a broad range of stakeholders in the policy implementation, for instance as investors (as in the case of renewable feed-in in Germany), or by providing specific economic incentives for homeowners, as in the energy efficiency support schemes. However, support schemes require a source of funding. Political support for such policies is easier when a specific revenue stream exists, such as proceeds from the sale of AAUs (CZ) or from the auctioning of EUAs (CZ, DE). Some of these policies have suffered from the lacking stability and predictability of the funding streams.
- Taxes and levies (which have been traditionally hard to agree at the EU level) seem to have worked at the national level (e.g. UK) as they also create a revenue stream that can be used to win political support (increase feasibility) and enhance cost-effectiveness, if the revenues are used to promote low-carbon-investments.
- The long-term nature of some feed-in tariff systems (e.g. DE) were also identified as success factors, which have helped build up investor confidence and spurred technology deployment at a scale that brought them into the market and facilitated innovation and lower prices.

Possible solutions to current shortcomings – implications for policy design going forward

Bringing together the results from the case studies, the CECILIA2050 researchers have distilled the insights that are most widely applicable and relevant to the debate on future policy design.

Lesson 1: Optimal policies need acceptance and buy-in to enhance feasibility

Political feasibility was treated largely as a given in the backward looking analysis of the current policy mix – and many instruments showed deviations from a more efficient design as trade-offs for political acceptability. Ideally, policy design elements that facilitate feasibility should be integrated in a way that does not hamper effectiveness or cost-effectiveness and vice versa.

Those instruments that stand out in the analysis often managed to marry environmental effectiveness and political feasibility, by creating incentives that generated both a direct economic rationale for the target audience (such as support for building renovation) and visible results (increase in renewables deployment).

A big issue for the feasibility of many policies is the cost burden. In this context, it is often not so much the overall economic impact that matters, but rather the cost burden on particular groups (export-oriented industries, low-income households). Some of the more successful examples were able to combine revenues from environmental taxes of the ETS to pay for policy initiatives, making them also more palatable for public budgets.

The balancing act to find the right price signal remains a delicate one. An efficient climate policy mix needs to balance the need to increase energy prices as a driver for change (and new investment) while ensuring that disproportionate burdens on low-income household and export-oriented businesses are avoided. Looking forward, much would be won if the dedicated support measures managed to target the most vulnerable groups, based on clear and transparent criteria, rather than the broad-brush exemptions currently found in much of European climate policy.

Feasibility enhancements (also with regard to the administrative element of feasibility) could also be garnered through early integration of relevant stakeholders, especially for successful implementation at the national level.

Lesson 2: Optimality in a changing world requires both stability and flexibility to learn

> Managing the low-carbon transformation requires a delicate balance between flexibility and rigidity. Policies have to be flexible in order to learn and adapt, and rigid to send out a long-term signal, especially for sectors with a long investment horizon.

Few policies are adopted are ideally designed from the outset. Changed circumstances or new insights from implementation can create the need to revise and adapt instruments. What is deemed effective, efficient or feasible can change, sometimes drastically so. Again, there is a balancing act: policies need to provide a clear long-term commitment that allows firms and households to build up stable expectations, and plan their investment and consumption accordingly. And at the same time, policies need to keep some flexibility to incorporate new insights and address observed shortcomings.

A number of individual instruments in the case studies were found to be in need of reform, with the EU ETS as a prominent example. As a knock-on effect some support mechanisms that relied on ETS auctioning revenues did not have the required funding to work as planned. At the same time, having too much flexibility can also threaten the success of a policy: arguably, a main success factor or renewable support schemes was that they gave long-term certainty to investors – at the cost of locking rate payers into costly long-term commitments.

In principle, policy learning – learning from past mistakes and correcting them – is institutionalised in many EU policies in the form of review processes. The EU ETS has undergone significant design improvements over the years, and also the current RED is improved over its predecessor. However, these processes often take years to complete, and occur with a substantial time lag – as the old problems have been fixed, new ones have already arisen.

The lesson here is therefore derived from the need to combine two aspects: 1) the need for changes being made in the short-term (but without undermining investor confidence) and 2) greater resilience, to shield them from the impact of changes in external factors. Accordingly, policies could have smart flexibilities built in, that protect the core objectives and yet allow quick adjustments to the measure in controlled ways and within pre-defined bounds, without dismantling the fundamental mechanism.

Lesson 3: Optimal policies require a long-term perspective

The analysis produced several examples where the current policy mix lacks long-term forward thinking. In fact, sense of uncertainty over the steadfastness of the EU's commitment to decarbonisation by 2050 is at present the main obstacle to optimising the current policy mix for 2030 and beyond. There is, at current, a perceived mismatch between the (fairly ambitious) long-term climate objectives, and the (fairly modest) short-term targets and existing policy instruments. This mismatch creates uncertainty among investors and consumers.

> The transformation to a low-carbon economy needs a long-term view, including on costs. To minimise costs in the longer term, it will be necessary to incur some short-term transition costs. Rather than trying to avoid these costs, the question is how to distribute them in a fair and equitable manner.

Clear direction and a sense of leadership can do away with such uncertainties. However, integrating the longer term direction into policy objectives and design will require an element of leadership that is willing to test, and if necessary to push, the limits of what is considered politically feasible.

Political feasibility is often associated with the price tag of policies, and here particularly the cost burden on well-organised interest groups. Yet a narrow focus on static efficiency (cost "as of today") runs the risk of a technological lock-in. In the interest of dynamic efficiency, it can be advisable to pursue options that are statically inefficient at present - provided there is a clear perspective for future cost reductions.

Opportunities exist. Many instruments currently neglect the dynamic efficiency potential that could be integrated into their design, even those that are effective (such as standards in the energy efficiency landscape). They could support a more long-term innovation drive with tightening schedules over longer periods of time (e.g. CO2 intensity for cars, Ecodesign Directive). One encouraging finding in this respect is that the costs of climate policies are routinely overestimated, and the potential for cost-cutting innovations underestimated.

Lesson 4: Carbon pricing is not a panacea, but it needs to be a crucial part of the policy mix

A clear carbon price should be the cornerstone of any climate policy mix. The fundamental arguments in favour of carbon pricing remain unaltered: Unless prices reflect the cost of carbon emissions, climate policies will need to regulate against the dynamics of the market. Setting a carbon price can help to shift innovation, investment and consumption patterns into the direction of low-carbon development.

> Carbon pricing tools are currently underutilized in their potential to induce emission reductions. The EU ETS needs strengthening and national tax schemes could be expanded. However, other targeted policies are required as flanking tools to induce behavioral change and transformational innovation.

But in the current European climate policy mix, carbon pricing tools do not play a strong, central role. This is largely due to the performance of the ETS, where an exceptional surplus of allowances depresses prices for the foreseeable future, and which is therefore not seen as a strong driver of change. To assume a stronger role, a structural reform of the ETS appears inevitable, including greater flexibility for adjusting the ETS cap. In terms of taxes, the main dynamic can be found at the national level, since direct tax measures are hard to agree at EU level. Yet, with the exception of the UK and a few smaller EU Member States, there have been few successful initiatives in recent years to introduce new carbon taxes, or to ramp up existing ones. In the majority of Member States, there have not been major amendments to the tax levels for energy use and/or carbon emissions, which therefore do not reflect the increased level of ambition in terms of climate policies.

At the same time, there needs to be a realistic assessment of what carbon pricing can, or cannot, deliver. Thus, while a clear carbon price signal can support a change in the dynamics of innovation and investment, and influence consumption behaviour, the carbon price only should not be relied upon as the single instrument to achieve all these. Rather, the carbon price needs to be complemented with other, targeted policies – promoting behavioural change or technology development – as part of an integrated, balanced policy mix.

Lesson 5: EU level harmonisation can improve efficiency, but must not stifle regional and local action

> While policy harmonisation promises greater efficiency, there should also be room for national and regional climate leadership, so that the diversity of European countries and regions can serve as a laboratory for new policy approaches.

Harmonisation across Member States and EU-wide rules enhance efficiency and administrative feasibility and possibly enhance political feasibility: the legal and institutional framework on which climate policies build is largely Europeanised, including the single market for energy, and EU-level action is less affected by concerns that climate policies will jeopardise the competitiveness of domestic industries. Yet, at the same time, there are also strong arguments why the diversity of European countries and regions should be reflected in its climate policies: to begin with, a non-harmonised set of national and regional policies can also be a driver of policy innovation, a testing ground for new approaches that allows for intra-EU policy learning. Also, while economic efficiency mandates that there should ideally be one level of climate policy ambition across Europe, and the resulting abatement effort only distributed on the basis of abatement cost, there is also the political argument that countries where electorates demand stronger climate policies should act as frontrunners, even though this entails that they shoulder a larger part of the cost.

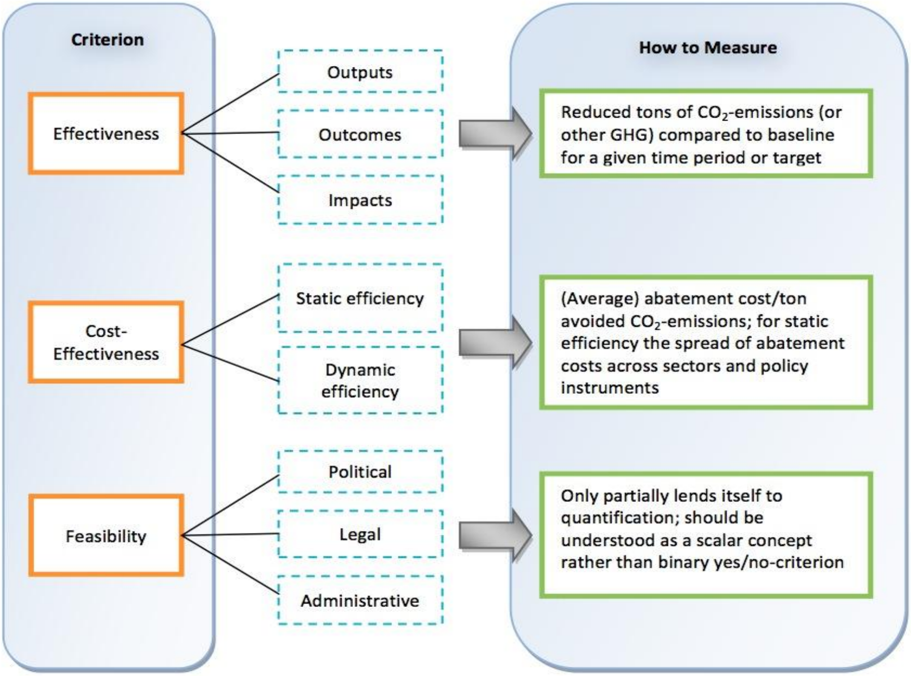
Background: the CECILIA2050 concept of optimality

In economics, 'optimality' is generally understood to be the most favourable relationship between an outcome and the resources necessary to achieve it, and the outcome itself. If the outcome itself is not predefined, an assessment of optimality would determine the level of both the outcome and resource input, as would occur in a cost-benefit analysis. In determining the optimality of EU climate policy, however, the output is already given in the form of the EU's short and long-term GHG emission reduction targets. Optimality therefore becomes a discussion of achieving these targets with the least cost to society.

Such a task is not straightforward. Finding the 'least-cost' pathway to meeting these targets involves inherent uncertainty and a long-term view; many technological, organisational, social or other changes required to decarbonise are still yet to be identified and developed. The capacity to absorb any changes must also be considered; public acceptance, economic and social impacts and the legal and procedural requirements of existing, expanded or new policy instruments must be considered. As such, the CECILIA2050 project has developed a broad definition of 'optimality' that extends beyond the purely economic, and considers real-world constraints.

A comprehensive literature review determined that no universally agreed upon set of criteria exists for judging the optimality of a policy instrument or mix of instruments, however there is broad overlap between different approaches. Criteria may be broadly arranged into three categories and subcategories, as in the **Figure below**.

Figure: Broad Definition of 'Optimality' – Key Criteria



The CECILIA2050 project has been set up as a three-year research project, funded by the European Union's 7th Framework Programme for Research. Running until August 2015, it brings together ten leading research institutions from eight EU countries to assess the performance of the existing climate policy mix, and to map pathways towards future climate policy instrumentation for the European Union, with a prime focus on economic instruments.

CEILIA2050 Policy Briefs – this policy brief is part of a series that discusses the results of the CECILIA2050 project. Here, we focus on initial but fundamental steps, namely the establishment of a working definition for policy 'optimality', and the assessment of the current climate policy landscape at EU level and selected Member States, their interactions and optimality, as measured against the newly-developed definition.

All underlying reports can be accessed at: www.cecilia2050.eu.

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