Policy Brief for 2030 policy in the EU

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The Low Carbon Economy Roadmap published by the European Commission in 2011 has defined a GHG emission pathway for the EU until 2050 which is consistent with climate change mitigation objectives. The pathway requires an almost linear reduction of emissions from today's levels to a level that is 80% lower than 1990 levels by 2050.

The relevance of the AMPERE FP7 project for the consultation on the 2030 climate and energy framework

The AMPERE research project using numerous mathematical models which follow different methodologies has confirmed that the EU emission reduction is technically and economically feasible based on technologies that are known today. The detailed model-based results also confirmed that the energy system of the EU will have to undergo profound structural changes emphasising energy efficiency and electrification in the demand sectors combined with full decarbonisation of power generation using a variety of low carbon technologies among which renewables predominate.

Using the various models, AMPERE quantified in depth the impact of various possible deviations from an optimal decarbonisation strategy, which may arise as a result of either limited availability of certain decarbonisation options, such as nuclear and CCS, or delays in implementing the required policies in the decade before 2030.

Targets for 2030

The scenario results suggest emission reduction targets for 2030 to be at least 40% below 1990 levels and ETS emissions reducing post 2020 close to 3% per year which is significantly faster than the current stipulation of 1.74% per year. In this context both renewable penetration and energy efficiency progress must accelerate considerably beyond the 2020 commitment date.

The AMPERE results using a large variety of models have clearly shown that meeting by 2030 targets consistent with the longer term optimal decarbonisation pathway implies very small additional energy system and GDP costs in the time period until 2030 relative to a reference scenario (which includes 2020 objectives but does not involve new policies after 2020). If the EU does not pursue such targets and policies for 2030 and still aims at strong emission reductions after 2030, high costs and GDP impacts after 2030 would be borne, compared to scenarios with climate actions optimally configured over the entire time period.

Coherence of Policy Instruments

The AMPERE scenarios have considered carbon pricing as the main driver of emission reduction post 2020. Without significant carbon pricing, limiting effectively the deployment of clean energy technologies in all sectors, no significant emissions reductions can be expected. Carbon pricing has to be not only at a sufficient level but also stable so as to be positively anticipated. Carbon pricing discloses the true marginal emission abatement costs, helps efficient distribution of abatement effort among sectors and being a price can be well taken into account in project investment analyses.

The analysis confirmed the considerable importance of developing policies and infrastructure in the decade before 2030 in addition to the strong policy commitments for the year 2020. Delaying such policies and generally failing in delivering the necessary changes until 2030 would seriously undermine the EU system possibilities to reduce emissions in the remaining time period 2030-2050 to the extent needed for meeting cumulative emissions constraint until 2050 (carbon budget of the EU low carbon economy Roadmap). In this context, a failure in the next decade would entail very significant additional costs for energy consumers until 2050.

To be consistent with a cost-effective decarbonisation strategy, the next decade needs to ensure positive anticipation about future carbon price signals, to remove policy/regulatory risks concerning climate policy, and to implement policies aiming at facilitating structural changes both in demand and in supply of energy. The structural changes as simulated in the AMPERE modelling results, include ambitious energy efficiency progress in the demand sectors, transport electrification, bio-energy supply, carbon capture and storage and smart grid systems (both centralised and decentralised) allowing for further deployment of renewables, more efficient balancing and coupling of electricity systems across the EU and demand management. It is of utmost importance that 2030 policies focus on overcoming non-market barriers (relevant to energy efficiency and renewable energy), and on ensuring market coordination for timely development of infrastructure (grids, smart systems, CCS, recharging infrastructure, etc.).

The delay scenarios quantified using the AMPERE models have confirmed that these policies will have to be implemented mainly in the decade 2020-2030 in order to allow for cost-effective completion of the structural changes in the longer term. Delaying or failing to do so in the next decade would imply significantly higher costs and even failure to complete the structural changes in the time period 2030-2050 to the extent required in order to meet the carbon budget.

The models have also assumed strong technological progress resulting in reduced costs of existing technologies through commercialisation at a large scale (learning effect); the technologies span the entire spectrum of the energy system, including appliances, demand-side equipment, electric vehicles, smart systems and grids, renewables and CCS. Unlocking the technology progress potential requires effective policy-driven market coordination between infrastructure developers, consumer perception and technology manufacturers. Succeeding high performance in terms of energy efficiency in houses and buildings implies overcoming non-market barriers and distributional impacts as effectiveness depends on a large variety of non-homogeneous consumers with unequal access to cash-flow and technology. The implementation of the decarbonisation scenarios in the models illustrate that carbon pricing alone would not be sufficient, unless complemented by energy, economic, agricultural and infrastructure policies aiming at unlocking the potentials for energy efficiency and for large diffusion of advanced technologies.

Competitiveness and international cooperation on climate policy

Some of the macroeconomic models involved in the AMPERE exercise are also analysing the possible economic benefits for the EU economy stemming from technology progress and infrastructure development as implied in the decarbonisation pathways. Pursuing strong targets for 2030 and implementing the infrastructure policies can effectively deliver technological achievements tapping on learning potentials. Positive multiplier effects on activity by sector and on employment are found in this context especially in the time period until 2030 as energy system costs are kept low compared to reference scenario developments. The ongoing model-based analysis in AMPERE indicate positive prospects of first-mover advantage of the EU through technology development within a global context where the rest of the world pursues climate action later.

The AMPERE models have also focused on the impacts on industrial sectors which are energy intensive and are strongly exposed to foreign competition. Pursuing cost-efficient strategies including the actions envisaged for the time period until 2030 minimises cost impacts on these industries. The negative impacts of higher energy costs are found to be offset to a significant extent by increasing domestic demand for equipment, goods and services which enable the transition to a low carbon economy. The analysis has also found significant benefits in terms of costs in case the EU succeeds in developing climate action in partnership with emerging economies such as China. In this context emission leakages through the industry channel are drastically reduced.

EU climate policy will only deliver a tangible outcome in terms of mitigating climate change, if major emitters outside the EU (in particular China and the USA) also adopt stringent climate policies. There will be a substantial benefit if EU leadership in international climate negotiations can secure such an outcome. The choice of EU 2030 targets will have significant implications about the ability of the EU to provide such leadership in international negotiations.

International cooperation on climate policy is also critical to stabilize investment expectations globally, but also inside the EU, reduce distortionary effects, and sustain investments in a green economy in the long run.