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Future climate and energy policy - a Strategy for long-term EU greenhouse gas emissions reductions

The European Union is working on new “cost-efficient ways to make the European economy more climate-friendly and less energy-consuming” and its low-carbon economy roadmap suggests that by 2050, the EU should cut greenhouse gas emissions to 80% below 1990 levels. At this time, all globally roadmaps agree that this goal would be reached with an effective energy mix in which Energy Efficiency, Renewable Energy and the deployment of the Carbon Capture, Utilization and Storage technologies (**CCUS technologies**) can work together.

As we can assume, the deployment of the CCUS technologies will be fundamental in the coming years and this is well-known for all Scientifics. The most recent example can be found inside the new report launched by the IPPC, “Global Warming of 1.5°C” on October 8th. This document says that “Limiting global warming to 1.5°C would require rapid, far-reaching and unprecedented changes in all aspects of society” and regarding the deployment of CCUS says that “The energy demand sector comprises behavioural responses, fuel switching and efficiency options in the transport, industry and building sector as well as carbon capture options in the industry sector. Options assessed in the energy supply sector comprise biomass and non-biomass renewables, nuclear, CCS with bio-energy, and CCS with fossil fuels”.

Even in this low emissions future, it will be hard to decarbonise totally the economy and the society where isolated communities, some sectors (i.e. aviation) or GHGs from natural sources (i.e. agriculture) will be hard to decarbonize and emissions cannot be totally avoided. There will be a need for negative emissions to compensate. This type of technologies will require the development of Capture, Transport and Storage operations which are exactly the ones implemented for CCUS.

So, the European Union needs to act now. The transition to a low- emissions society, a circular economy and higher levels of digitization will, under the right conditions, enable new business models or structures. These new business models or structures can potentially further strengthen existing value chains by filling in existing business gaps, deeper integration with customer value chains, creating new, dynamic links leading to entirely new value chains, and fostering innovation and employment generation.

Industry is part of the solution, but there is **need for EU support**. The gestation time of breakthrough technologies is long, and many have not reached industrial scale demonstration level yet. It is important that all the technology pathways get their fair chance in view of the wide range of economics, technology readiness and development stages in the context of policy choices and financing strategies.

Some key “rules of the game” in order to allow the transition to a low emission future with the low cost for the society has to be fulfilled. Technology neutrality and cost effective measures are key in any public decision and policy. In order to launch a clear signal to investors safeguarding the industry competitiveness at the same time, policy also should provide regulatory security guaranteeing stability within a clearly defined timeframe.

Moreover, **much higher levels of final electricity demand are to be expected in the medium term, if industrial low-CO₂ technologies are deployed across the EU.** Transition to higher levels of electrification can create a virtuous cycle between the EU's renewable energy and industrial transition under the right conditions. In addition, natural gas + CCUS can be the perfect partner of renewables, providing firm power and grid stability and being able to respond to fluctuating consumer demand, not just diurnal but winter / summer variability as well. The main goal should be access to competitively priced, abundant and reliable low-CO₂ electricity on the one hand and identification of new or enhanced roles the energy intensive industries can play in facilitating the energy transition on the other hand.

Further efforts must be made to lower regulatory costs related to electricity consumption on a level playing field basis across the EU and also vis-à-vis international competitors. To carry out this, there is an urgent need to strategically map the infrastructure needs in relation to an industrial low- emissions transition. It will be crucial to ensure not only supply security but that the new electricity supply is low-CO₂ and competitively priced.

A large and ambitious mission-oriented **R&D and innovation support program is needed** to accompany the most promising low-CO₂ technologies to industrial scale demonstration level by 2030 at the latest and help achieve cost reductions in key enabling low-CO₂ processes. It's necessary **development of adequate financing mechanisms** to face the high cost that comes with low-CO₂ process investments including support for replacement of existing and productive assets with low-CO₂ processes and a **new state aid regime** that acknowledges the size and scope of the industrial low-CO₂ transition.

At this moment, the R&D gap towards demonstration and commercialization of low-CO₂ technologies is not fully addressed and there remain major challenges to bring down cost of new technologies. Infrastructure that could enable the roll out of new processes across Europe is barely present and the **financing instruments at EU and Member State levels to facilitate investments are insufficient.**

The scenario of achieving low-CO₂ economy within the Union by 2050 has direct implications on the EU carbon budget that needs to be included to identify appropriate, cost-efficient EU implementation measures.