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Κωνσταντίνος Καρτάλης

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Towards climate neutrality in the European Union

Dr. Constantinos Cartalis, Professor,

National and Kapodistrian University of Athens, member of the European Scientific Advisory Board on Climate Change, ckartali@phys.uoa.gr

Abstract

The European Union (EU) has significantly reduced its net greenhouse gas (GHG) emissions since 2005. However, the pace of reductions must accelerate substantially—more than doubling the average annual rate observed between 2005 and 2022—if the EU is to achieve its 2030 target of at least a 55% net reduction in GHG emissions compared to 1990 levels, and climate neutrality by 2050. Additional efforts are needed across all sectors, i.e. energy, transport, industry, buildings and others. In addition, attention is needed regarding the land use, land-use change, and forestry (LULUCF) sector, where the carbon sink has sharply declined since 2015. Achieving the 2030 target depends on the effective implementation of the Fit for 55 package, especially at the national level. This paper¹ provides a brief overview of the EU's climate ambition and presents key findings and recommendations of the European Scientific Advisory Board on Climate Change (hereinafter referred to as the Advisory Board) on the consistency of EU and national measures with the overarching climate neutrality objectives.

Keywords: European Climate Law, climate ambition, climate neutrality, greenhouse gas emissions, just transition

Οδεύοντας προς την κλιματική ουδετερότητα στην Ευρωπαϊκή Ένωση

Δρ. Κωνσταντίνος Καρτάλης, Καθηγητής,

Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, μέλος της Ευρωπαϊκής Επιστημονικής Συμβουλευτικής Επιτροπής για την Κλιματική Αλλαγή

Περίληψη

Η Ευρωπαϊκή Ένωση (ΕΕ) έχει μειώσει σημαντικά τις καθαρές εκπομπές διοξειδίου του άνθρακα από το 2005. Ωστόσο, ο ρυθμός των μειώσεων πρέπει να επιταχυνθεί σημαντικά – υπερβιτασσάζοντας τον μέσο ετήσιο ρυθμό που παρατηρήθηκε μεταξύ 2005 και 2022- εάν η ΕΕ θέλει να πετύχει τους τον στόχο για το 2030 για τουλάχιστον 55% καθαρή μείωση των εκπομπών σε σύγκριση με τα επίπεδα του 1990 και την κλιματική ουδετερότητα έως το 2050. Απαιτούνται επιπλέον προσπάθειες σε όλους τους τομείς όπως ενέργεια, μεταφορές,

¹ This paper contribution is based on the report of the European Scientific Advisory Board on Climate Change entitled “Towards EU climate neutrality: progress, policy gaps and opportunities”, 2024. The full report is provided at <https://climate-advisory-board.europa.eu/reports-and-publications/towards-eu-climate-neutrality-progress-policy-gaps-and-opportunities>.

βιομηχανία, κτήρια, κ.α. Επιπρόσθετα χρειάζεται προσοχή στον τομέα χρήσης γης, της αλλαγής χρήσης γης και της δασοκομίας όπου η απορρόφηση άνθρακα έχει μειωθεί απότομα από το 2015. Η επίτευξη του στόχου για το 2030 εξαρτάται από την αποτελεσματική εφαρμογή του νομοθετικού πακέτου 'Fit for 55' ειδικά σε εθνικό επίπεδο. Το κείμενο που ακολουθεί παρέχει μια σύντομη επισκόπηση των στόχων της ΕΕ για το κλίμα και παρουσιάζει βασικά ευρήματα και συστάσεις από την Ευρωπαϊκή Επιστημονική Συμβουλευτική Επιτροπή για την Κλιματική Αλλαγή σχετικά με τη συνέπεια των μέτρων της ΕΕ και των εθνικών μέτρων με τους γενικούς στόχους κλιματικής ουδετερότητας.

Λέξεις Κλειδιά: Ευρωπαϊκός Κλιματικός Νόμος, κλιματική φιλοδοξία, κλιματική ουδετερότητα, εκπομπές αερίων του θερμοκηπίου, δίκαιη μετάβαση.

1. The European Union's Climate Ambition

The EU's climate ambition to achieve net-zero greenhouse gas emissions by 2050, followed by net-negative emissions, is based on a comprehensive road map for transitioning to a sustainable, competitive, and climate-resilient economy. Central to this road map are several key components designed to drive the EU towards its 2050 goals:

(a) the European Climate Law adopted in 2021, establishing an intermediate target of reducing greenhouse gas (GHG) emissions by at least 55% by 2030 compared to 1990 levels and requiring regular assessment of progress by the European Commission and adjustments to ensure compliance. The target for the reduction of GHG emissions by 2040 is not yet legislated, whereas the Advisory Board has recommended that the target be set at 90-95% relative to 1990 levels (Scientific advice for the determination of an EU-wide 2040 climate target and a greenhouse gas budget for 2030-2050; 2023).

(b) the European Green Deal, namely the strategic framework launched in 2019 to make Europe the first climate-neutral continent by means of measures in such sectors as energy, transport, agriculture, industry, and finance and in close alliance to such initiatives as the Circular Economy Action Plan, Farm to Fork Strategy, and Biodiversity Strategy.

(c) the Fit for 55 Package, namely a legislative package designed to align the EU's climate, energy, and transport laws with the 2030 reduction target. Key elements include:

(c1) the strengthening of the EU Emissions Trading System (ETS), also introducing a separate system for buildings and road transport,

(c2) increasing the share of renewables to at least 42.5% by 2030 and boosting energy savings across sectors and

(c3) preventing carbon leakage by imposing tariffs on imports of carbon-intensive products (the so-called Carbon Border Adjustment Mechanism - CBAM).

(d) the Just Transition Mechanism (JTM) that addresses social and environmental disparities to ensure an equitable transition.

At the same time, the European Union advocates for global climate action under the Paris Agreement, safeguards societal well-being as well as its economic competitiveness while implementing its climate goals. enhances its energy security – especially after the energy crisis that resulted from Russia's war of aggression against Ukraine - to reduce its dependence on fossil fuel imports, seeks to support and renew European industry and make its products more competitive in the global market, and promotes research in cutting-edge sectors where the EU currently lags China and the USA.

2. Remaining on track to meet the climate objectives

To ensure that the EU and its Member States remain on track to meet their climate objectives, the European Climate Law foresees a regular assessment of progress made towards them, together with an assessment of whether EU and national measures are consistent with the climate neutrality objective. Such an assessment was carried out in 2024 by the European Scientific Advisory Board on Climate Change with the main findings and recommendations for achieving the EU's climate objectives being:

Main findings

The EU has substantially reduced its net GHG emissions since 2005 and largely exceeded its 20% reduction target by 2020, compared to 1990. In 2022, the EU reduced its net GHG emissions by 31% compared to 1990 levels. It surpassed the 20% reduction target for 2020, and trends over the past 5 years show an increase of average emissions reductions. However, achieving the EU's 55% objective for 2030, the average annual reductions during the 2022- 2030 period should be more than twice those observed on average in 2005-2022, while more efforts are needed across all sectors and particularly in buildings, transport, agriculture and forestry.

Recommendations

Based on an assessment of more than 80 indicators, the Advisory Board outlined a set of key recommendations for a more effective implementation and design of the EU climate policy framework:

There is an urgent need for Member States to accelerate emissions reductions and reverse the declining EU carbon sink promptly. Given the delays in implementing emission reductions, enforcement actions by the European Commission may become necessary to ensure that national energy and climate plans (NECPs) fully comply with the Governance Regulation requirements.

Adopting pending EU legislative initiatives is critical to supporting the required emissions reductions. One key initiative is the revision of the Energy Taxation Directive (ETD) to align energy taxation with the EU's climate goals. This revision is a cornerstone of the "Fit for 55" package, which seeks to cut greenhouse gas emissions by 55% by 2030. Key measures include phasing out fossil fuel subsidies, setting higher minimum tax rates for fossil fuels, and eliminating environmentally harmful tax exemptions for sectors like aviation, maritime, and professional road transport.

Scaling up renewable energy, particularly wind and solar photovoltaics (PV), is essential. Stable investment conditions must be ensured at both EU and national levels to drive this transition effectively.

Phasing out fossil fuel subsidies across the EU is another pressing priority. Support currently directed at vulnerable households should be reallocated to targeted interventions that mitigate regressive effects while promoting energy efficiency and the transition to renewable energy sources (RES).

EU policies must align more closely with the 2050 climate neutrality goal. This includes reforms in energy infrastructure, such as the Trans-European Networks for Energy, as well as adjustments in financial mechanisms like the EU Taxonomy, industrial emission regulations, and state aid rules. A consistent and climate-neutral policy framework is essential to phase out fossil fuels and achieve long-term objectives.

Improving EU climate governance and compliance frameworks is necessary. National long-term strategies (LTSs) should undergo iterative reviews, and more robust compliance mechanisms should be considered. Particular focus is required on Member States' obligations under the Effort Sharing and land use, land-use change, and forestry sector (LULUCF) Regulations to reduce emissions in sectors not covered by the EU Emissions Trading System (ETS).

The two EU emissions trading systems (ETS and ETS 2) must be made fit to support the net-zero target. Lessons from the initial years of ETS 2, covering buildings, road transport, and other sectors, should support future adjustments. Beyond 2030, a sufficiently high carbon price is essential to drive emissions reductions and ensure convergence between the two systems.

Ensuring a just transition is vital. Policies should systematically assess and evaluate the socio-economic impacts of climate actions to ensure equitable implementation and minimize unintended consequences.

Stronger incentives are needed to drive climate action in the agricultural sector and food systems. Potential measures include setting standalone emissions reduction targets, implementing mandatory practices to reduce methane and nitrous oxide emissions, increasing soil carbon, and shifting Common Agricultural Policy (CAP) support towards lower-emission practices and economic diversification.

Efforts to deploy carbon capture and storage/utilization, hydrogen, and bioenergy should prioritize activities with limited or no alternative mitigation options. These technologies must be targeted to maximize their impact. Furthermore, EU-level incentives for carbon removals should be introduced.

Increasing public and private investments in climate mitigation requires extending the EU's common debt approach under the Recovery and Resilience Facility (RRF) beyond 2026. This would provide certainty to investors and bolster public funding for climate initiatives.

Reducing energy and material demand is essential for achieving climate goals. Strengthened policies should promote energy and material efficiency while encouraging behavioral changes in mobility, housing, material use, and diets. Initiatives such as a legislative framework for sustainable food systems, regulations on railway infrastructure, and mandatory green public procurement requirements should be prioritized.

Expanding the EU's greenhouse gas (GHG) pricing regime to include all major sectors, such as agriculture, food, and upstream fossil fuel operations, is crucial. These actions must account for potential economic and social impacts, particularly on small farms and vulnerable regions, with measures in place to ensure a just and fair transition.

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