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Key opportunities and challenges of the European Green Deal policy for Ukraine

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Abstract. *The European Green Deal (EGD) sets a long modernization trajectory for Ukraine: from Fit for 55 and CBAM to Farm to Fork and Biodiversity 2030. It opens access to EU markets and capital, while imposing requirements for MRV capacity, decarbonization, and sustainable land use. A portfolio of actions is proposed: Cadastre/Grids/Industry 2.0, CBAM preparedness, "green" agri-food policy, and a national MRV/KPI 2025–2030 package; the expected effects are lower compliance costs, preserved export competitiveness, and productivity growth.*
Keywords: *European Green Deal; CBAM; bioeconomy; agroecology; MRV system; sustainable agriculture; decarbonization; agri-food value chains; biodiversity strategy.*

Introduction. The EU Green Deal is understood as a growth strategy aiming at climate neutrality by 2050 [1]. The legislative backbone, *Fit for 55*, sets 2030 targets by aligning energy, transport, and industry [2]. For partner countries, the Carbon Border Adjustment Mechanism (CBAM) becomes a key channel of influence, translating a carbon price into external trade relations [3]. For the agri-food pillar, *Farm*

to Fork (greening of production, traceability, healthy diets) [4] and *Biodiversity 2030* (restoration of ecosystems, soils, and landscapes) [5] are particularly salient. Ukraine's implementation framework is the approved NECP to 2030, which sets an integrated plan of reforms in adjacent sectors [6].

Ukrainian scholarship emphasizes the need to balance market incentives with institutional capacity and socio-ecological constraints. A prospective analysis of the "green" economy in agriculture sketches ten-year trajectories for policy and investment [7]; work on the ecologization of agricultural production provides the methodological basis for integrating water/soil footprints, reclamation, and soil fertility into management practice [8; 9]. In political economy terms, results on global bioethanol/biodiesel trends and Ukraine's role in the EU context are valuable [10; 11], as are approaches to measuring the competitiveness of the agricultural sector [12]. Research on contemporary agricultural policy in transition economies helps avoid institutional distortions when adopting EU instruments [13], while empirical assessments of transaction costs for agricultural producers reveal "cost nodes" in the shadow environment – critical for practical Green Deal implementation [14]. Entrepreneurship models in an innovation- and knowledge-driven economy outline the human-capital and organizational requirements for agri-business transformation [15]. In addition, methodological foundations for shaping a national "green economy" concept clarify the logic of goals, indicators, and instruments [16], and experience with green principles in the forest sector shows how sectoral policies can combine decarbonization with ecosystem restoration and sustainable resource use [17].

This opens new opportunities for agrarian Ukraine, as the Green Deal creates a "sustainability premium." Bioeconomy and biofuels. Global demand trends for bioethanol and biodiesel – especially amid transport decarbonization – create a window for Ukraine's agri-food sector as a supplier of sustainable feedstocks and higher-value products [10]. Rapeseed oil and processing by-streams stand out as a biodiesel base; if sustainability criteria are met, this combines energy security with rural development [11]. In tandem with the Green Deal, such diversification yields an export premium for low carbon intensity – conceptual approaches to the green economy can serve as a framework for designing bioeconomy support programs [16].

Agroecological practices and processing. Farm to Fork and *Biodiversity 2030* promote a shift to agroecological approaches (precision application, cover crops, no-till or strip-till, integrated pest management) [4]. For Ukraine, this implies expansion of organics, development of processing (from protein concentrates to biopolymers), short supply chains, and quality labeling – all of which raise the share of value added retained locally [7; 12]. Related experience from the forest sector illustrates "green" resource-management practices relevant for integrated agro-forestry landscapes and biodiversity [17].

Integration into EU markets and capital. The NECP opens access to investment in network infrastructure (electrification of elevators/logistics, energy storage for farmer cooperatives), while *Fit for 55* brings efficiency standards that directly affect the cost of agri-food products [6]. Early adopters of MRV-based product carbon footprints gain an edge in contracts with European traders.

However, implementing the Green Deal also entails a set of challenges.

CBAM as a new "carbon price" in supply chains. Even agri exporters feel CBAM indirectly – via the cost of fertilizers, energy, logistics, and packaging. The transition to the paid phase will require calibrated accounting of embedded emissions and EU-compatible reporting methodologies [3].

Farm-level MRV capacity. Green Deal implementation critically depends on field data and transparent verification methods. In Ukraine, weak standardization and "seams" between registries increase transaction costs and thus delay "green" investment. Experience measuring costs in the shadow environment shows where additional bottlenecks arise –from documentation to enforcement [14].

Policy–institutional fit. Adopting EU norms without accounting for the specifics of a transition economy can generate institutional traps – when formally sound instruments fail because they misalign with productive forces and production structures [13]. This affects land relations, the lease market, SME finance, and innovation-driven entrepreneurship [16].

Exit vectors (policy actions):

1. *CBAM-ready agri-food value chains.* Create an internal carbon "contour": accounting for emissions from field to warehouse, aggregated at batch/lot level, with digital certificates of origin [3]. This reduces compliance transaction costs and eases access to EU contracts.

2. *Bioeconomy as a channel of rural decarbonization.* Strategies for bioethanol/biodiesel must rest on agronomically sustainable feedstock bases, logistics, and processing by-streams; scenario analysis to 2030 should reflect global trends and Green Deal requirements [10; 11]. This includes farmer cooperation in feedstock supply, sustainability guarantees, and local employment.

3. *Green agronomy and processing.* Adoption of precision farming, agroecological practices, and processing (protein/biopolymers/biogas) lowers the carbon intensity of products and raises margins [8].

4. *Institutional design for competitiveness.* Update state-aid rules with a results focus (export value added, GHG intensity reduction, innovativeness) and support SMEs via low-cost "green" credit, insurance, and grants for MRV/digitalization [12].

5. *Data and infrastructure.* Invest in "the networks": electrification of processing/logistics, storage for cooperatives, smart metering, and ag-data platforms linking on-farm accounting with trader requirements [2].

MRV/KPI 2025–2030 for agriculture: how to measure progress

Climate/energy. Carbon intensity of key crops (tCO_2e/t and tCO_2e/ha); share of "green" electricity in elevator/processing costs; specific energy use per ton of output [2; 6].

Soils/biodiversity. Dynamics of soil organic carbon; erosion vulnerability index; share of area under cover crops; share of organic farmland [4].

Agri-production and inputs. Nitrogen/phosphorus balance; pesticide-use index; yields and yield stability under climate stress [8].

Value chains. Share of processing in agri-food exports; "price cleanliness" (reduction of informal top-ups) as an indicator of lower transaction costs [12].

MRV/institutions. Share of batches with a complete digital footprint; time/cost to produce a product environmental profile; share of contracts with open "green" clauses [16].

Roadmap 2025–2030: sequence of steps.

Phase 1 (2025–2026). Harmonize MRV methodologies with CBAM/EU; pilots in grain–oilseed and livestock chains; launch a beta agri-carbon registry and digital batch certificates [3].

Phase 2 (2026–2028). Scale bioeconomy projects (ethanol/biodiesel, biogas); integrate energy/logistics networks for cooperatives; targeted regional processing programs [10].

Phase 3 (2028–2030). Full integration of MRV into exporters' contracts; shift to higher-value products; building a "green" brand of Ukrainian agri-exports [16].

Conclusions. The EGD is not merely a set of requirements, but a "grand contract" for modernizing the agrarian economy. Combining CBAM-ready chains, bioeconomy, agroecology, network infrastructure, and robust MRV removes key institutional and cost bottlenecks, opening access to EU markets and capital without sacrificing socio-ecological balance.

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