

## How much climate action is offered in the first pillar of the CAP?

### An analysis and policy recommendations

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### Summary

The goals set out in the Federal Climate Change Act (*Bundes-Klimaschutzgesetz – KSG*), which was revised in 2021, include reduction commitments for the agriculture and land use sectors (LULUCF). The next funding period of the Common Agricultural Policy (CAP) from 2023 onwards also adopts climate goals, and offers tools and funds for reducing greenhouse gases in both pillars of the CAP.

This paper examines the question of what additional potential can be expected from the measures of the first pillar (GAEC standards and eco-schemes) in terms of greenhouse gas savings. The results presented in this paper are based on a study that will be published in the first half of 2022. The analysis is based on the laws and regulations adopted in 2021 for the implementation of direct payments and conditionality. The paper goes on to examine the extent to which the CAP funds used contribute to climate action. The European Commission has laid down that 40% of CAP funds must be climate-relevant. The Strategic Plans Regulation stipulates how the Commission is to evaluate the climate contribution of the CAP funds. This short paper<sup>1</sup> uses the example of the eco-schemes to examine whether and to what extent the CAP funds actually contribute to climate change objectives.

The first step was to quantify greenhouse gas reductions: additional reductions totalling approx. 0.9 million t CO<sub>2</sub>e (CO<sub>2</sub> equivalents) can be achieved in the agricultural sector through the measures of the first pillar. The results show that the first pillar only makes a minor contribution towards achieving the targets set by the Federal Climate Change Act for agriculture. Only roughly 7.8 percent of the greenhouse gas reduction of 11.9 million t CO<sub>2</sub>e required compared to 2019 will be achieved in the agricultural sector. Nevertheless, it becomes evident that the introduction of the eco-schemes, if appropriately designed, is a step in the right direction for the future, given that this involves making more money available for climate action and environmental protection overall. The total impact, however, remains limited, as virtually none of the measures envisioned in the first pillar explicitly address climate change. In fact, the measures help meet other environmental goals. The reduction effect achieved is therefore almost exclusively due to the synergy effects between climate and other environmental goals such as biodiversity.

<sup>1</sup> The detailed results can be found in the unabridged version of the expert report entitled “The contribution of the CAP to climate action 2023-2027: taking Germany as an example” (Klimaschutzbeitrag der GAP 2023-2027 am Beispiel Deutschlands – to be published).

The second step involves identifying the CAP funds that have made these greenhouse gas reductions possible using the example of the eco-schemes. The European Commission has defined a method for assessing the climate effectiveness of the CAP expenditure, and this is described in the Strategic Plans Regulation. According to the regulation, 100% of the funds from the eco-schemes are counted as being climate effective.

The measure-specific calculation carried out for this paper shows that the eco-schemes are not 100 percent effective, as stipulated by the European Commission, but only roughly 20 percent. Similarly to the greenhouse gas reductions, this is due to the fact that a large portion of the funds flows into measures which primarily pursue other environmental goals. In view of the overestimation of the funds made available for climate action in the eco-schemes, it is not clear whether the goal of using 40% of all CAP expenditure for climate action can still be achieved. Without knowing the individual measures to be assessed, the method used is not precise enough, and is thus not suitable for making sure that the funds are used for combatting climate change. In the final analysis, the blanket allocation of the Rio marker method leads to a lack of financial resources for climate action in agriculture, as the climate relevance of the established CAP tools is very much overestimated.

The European Commission has introduced a new tool for policy management in the shape of the national strategic CAP plan. A more precise evaluation of the strategic CAP plans with regard to their climate effectiveness therefore offers the opportunity to already make adjustments within the current funding period 2023-2027, and to choose a more effective policy design with regard to the next CAP funding period after 2027. The analysis of the implementation shows that the first pillar is not particularly ambitious. At the same time, greater climate effectiveness could be achieved within the existing CAP framework. The low climate relevance of the first pillar implies that the German federal states (*Länder*) should make greater use of the Agri-environment-climate Measure (AECM) of the second pillar for high-impact measures in order to achieve the sector targets. Overall, an expansion of the climate-relevant CAP measures and funds (regardless of the choice of instruments) is recommended. The promotion of peatland wetting, making more efficient use of nitrogen, and reducing livestock numbers at regional levels, could contribute to a significantly more favourable climate balance in the agriculture and land use (LULUCF) sectors, as well as to existing funds being put to more effective use. The more effectively and efficiently existing CAP funds are used for climate action and other environmental goals, the less need there will be for additional national funds.

# 1 Introduction and the aims of the study

In the recent past, the climate target has been tightened up and embedded in law at both national and EU level (Federal Government 2021 and European Commission 2021). The Federal Climate Change Act, revised in 2021, contains more ambitious targets up to 2030 for the sectors agriculture as well as land use, land-use change and forestry (LULUCF). In order to achieve the agricultural sector's target of 56 million t CO<sub>2</sub>e (CO<sub>2</sub> equivalent) by 2030, agricultural greenhouse gas emissions need to be reduced by approximately 11.9 million t CO<sub>2</sub>e compared to 2019<sup>2</sup>. Emissions from the LULUCF sector are also to be reduced from -16 million t CO<sub>2</sub>e in 2019 (cf. UBA 2021c) to -25 million t CO<sub>2</sub>e by 2030 (Federal Climate Change Act 2021). Although the Act does not set a separate target for reducing land-use-related emissions, e.g. from peatlands, the Federation-Länder target agreement and the Ministry of the Environment's recently-published National Peatland Protection Strategy establish a reduction target of 5 million t CO<sub>2</sub>e by 2030 (BMU 2021). Ambitious measures need to be implemented in order to achieve these targets.

Numerous proposals have come from the scientific community for improving the sectors' climate balance (see German Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection [WBAE] 2016, Grethe et al. 2021, and German Advisory Council on Global Change [WBGU] 2020, Tanneberger et al. 2020). These studies suggest that in order to achieve the climate targets in Germany, agricultural policy should introduce the long-term changes today in order to prevent structural breaks later on.

The EU's Common Agricultural Policy (CAP) can be used as a major steering instrument for rewarding climate measures in the agricultural landscape. A total of EUR 55 billion is available annually for the CAP throughout the EU, and EUR 6.1 billion is available in Germany (Lakner 2021), which, if used appropriately, could significantly promote climate action in agriculture. The European Commission has declared climate action to be a key policy objective as part of the Green Deal, and intends to increase the CAP's role in combatting climate change in the new funding period 2023-2027. The European Commission announced at the start of the CAP reform process in 2018 that 40 percent of CAP expenditure was expected to be climate-relevant. This target is verified with the help of the "Rio marker method", i.e. with blanket values of potential climate impact for specific expenditure items. The Member States are to implement the stipulation from Article 100 of the CAP Strategic Plans Regulation, and spend 40 percent of the CAP funds on climate objectives. In Germany, this would correspond to a volume of EUR 2.44 billion per year. Germany has formulated the conditionality (by means of the Good Agricultural and Environmental Conditions (GAEC) and the Statutory Management Requirements (SMR)) and the eco-schemes in the first pillar for the implementation of the CAP reform in 2021. The CAP Direct Payments Act (*GAP-Direktzahlungen-Gesetz*) and the CAP Conditionalities Act (*GAP-Konditionalitäten-Gesetz*) were passed by the *Bundestag* and the *Bundesrat* in July 2021 (Federal Ministry of Food and Agriculture [BMEL] 2021a, b), and the CAP Direct Payments Ordinance (*GAP-Direktzahlungen-Verordnung* – GAPDZV) was adopted in December 2021 (BMEL 2021c, d).

This paper examines the question of what additional greenhouse gas savings potential can be expected to ensue from the first-pillar measures (GAEC standards and eco-schemes). The analysis is based on the laws and ordinances that were adopted in 2021 for the implementation

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<sup>2</sup> The new climate reports (UBA 2022) significantly reduced greenhouse gas emissions for the agricultural sector compared to the 2021 report (UBA 2021a). Emissions from the agricultural sector for 2019 are reported at 62.97 million t CO<sub>2</sub>e (UBA 2022) instead of 67.9 million t CO<sub>2</sub>e (UBA 2021). The change is based on an adjustment of the emission factor for nitrogen. If the target value of the Climate Change Act 2030 is not adjusted, this leaves a shortfall via-à-vis the target of 6.97 million t CO<sub>2</sub>e. However, the greenhouse gas reduction effect of the measures aimed at reducing nitrogen fertilisation is also reduced by the change in the emission factor. The analysis that was carried out here was based on the 2021 reports. It was not possible to take into account the changes in the 2022 reports as part of the analysis.

of direct payments and conditionality (BMEL 2021a, b, c, d). It also discusses the extent to which the measures of the first pillar satisfy the requirements of climate relevance according to the Rio marker method. Using the eco-schemes as an example, it examines whether this method is suitable for representing the climate relevance of the CAP. The second-pillar Agri-environment-climate Measures (AECM) cannot be assessed at the current time, as the measures had not yet been conclusively defined by the federal states at the time of editing. The calculations contained in this paper are based on a more comprehensive study which will be published in the first half of 2022. The European Commission can use these calculations as important reference points for reviewing the final strategic plan submitted at the beginning of 2022.

## 2 Little climate action provided by the national design of the CAP

Additional greenhouse gas reductions totalling approx. 1.0 million t CO<sub>2</sub>e can be achieved in 2023 through the measures of the first pillar (implementation of the GAEC standards and eco-schemes). The reduction effect of the first pillar can be increased to approx. 1.4 million t CO<sub>2</sub>e by 2026 by expanding the land used for agroforestry systems and making further savings through the ban on converting grassland on organic soils to cropland (see Table 4). The eco-schemes are, however, voluntary, and it is unclear to what extent the measures will be adopted and implemented. The first pillar mainly promotes measures focusing on biodiversity, such as non-productive land (fallow land and flower strips), or extensive grassland use. Alongside fertilisation, the largest sources of agricultural greenhouse gas emissions are livestock farming and agricultural use of drained peatlands. The first pillar does not, however, directly promote reductions in the high emissions from livestock farming and the agricultural use of organic soils. This means that the vast majority of the emissions from the agriculture and LULUC (i.e. the LULUCF sector without forestry) sectors are not addressed by the current regulations of the first pillar of the CAP. The first pillar makes a limited contribution towards achieving the targets of the Federal Climate Change Act up to 2030 (see Figure 1). The remaining shortfall vis-à-vis the statutory climate targets must therefore be closed by adapting the measures of the first pillar, or by implementing further measures, e.g. via the second pillar of the CAP, but also via tools outside the CAP.

Figure 1 shows the current emissions from the sectors agriculture and land use and land use change (LULUC), as well as the additional reduction effects of the first pillar. Additional reductions of approx. 0.9 million t CO<sub>2</sub>e can be achieved in the agricultural sector by implementing the GAEC standards and eco-schemes<sup>3</sup>. Given the current shortfall vis-à-vis the target of the Climate Change Act for the agricultural sector, amounting to 11.9 million t CO<sub>2</sub>e, the first pillar only contributes 7.8 percent towards achieving the target. The greenhouse gas reductions in the agricultural sector largely stem from the decrease in the use of mineral fertilisers as a result of extensification measures. It is primarily only the ban on converting grasslands on organic soils to cropland, and the expansion of agroforestry systems, which have an additional impact on the climate in the LULUC sector. The reduction effect increases up to 2026 as a result of the cumulative impact of the ban on converting grassland on organic soils to cropland (from 0.03 million t CO<sub>2</sub>e in 2023 to 0.13 million t CO<sub>2</sub>e in 2026), and of the expansion of agroforestry systems from 25,000 ha in 2023 to 200,000 ha in 2026<sup>4</sup> (from 0.04 million t CO<sub>2</sub>e to 0.35 million t CO<sub>2</sub>e). The two measures (GAEC 2 and agroforestry systems) contribute a total of 0.5 million t CO<sub>2</sub>e by 2026. 5 million t CO<sub>2</sub>e are to be saved by 2030 under the current Peatland Protection Strategy and the Federation-Länder target agreement on climate action through the protection of peatlands (2021). The contribution made by the first pillar via the implementation of the GAEC 2 standards (protection of wetland) is approx. 0.13 million t CO<sub>2</sub>e by 2026. No further measures to protect organic soils are included in the first pillar. The first pillar of the CAP thus contributes approx. 2.5 percent to the fulfilment of the Peatland Protection Strategy target. The greenhouse gas reduction achieved by implementing the CAP cannot be shown in relation to the sector target of the Federal Climate Change Act for LULUCF, given that the latter includes forest, which is not considered here (cf. explanations regarding Figure 1).

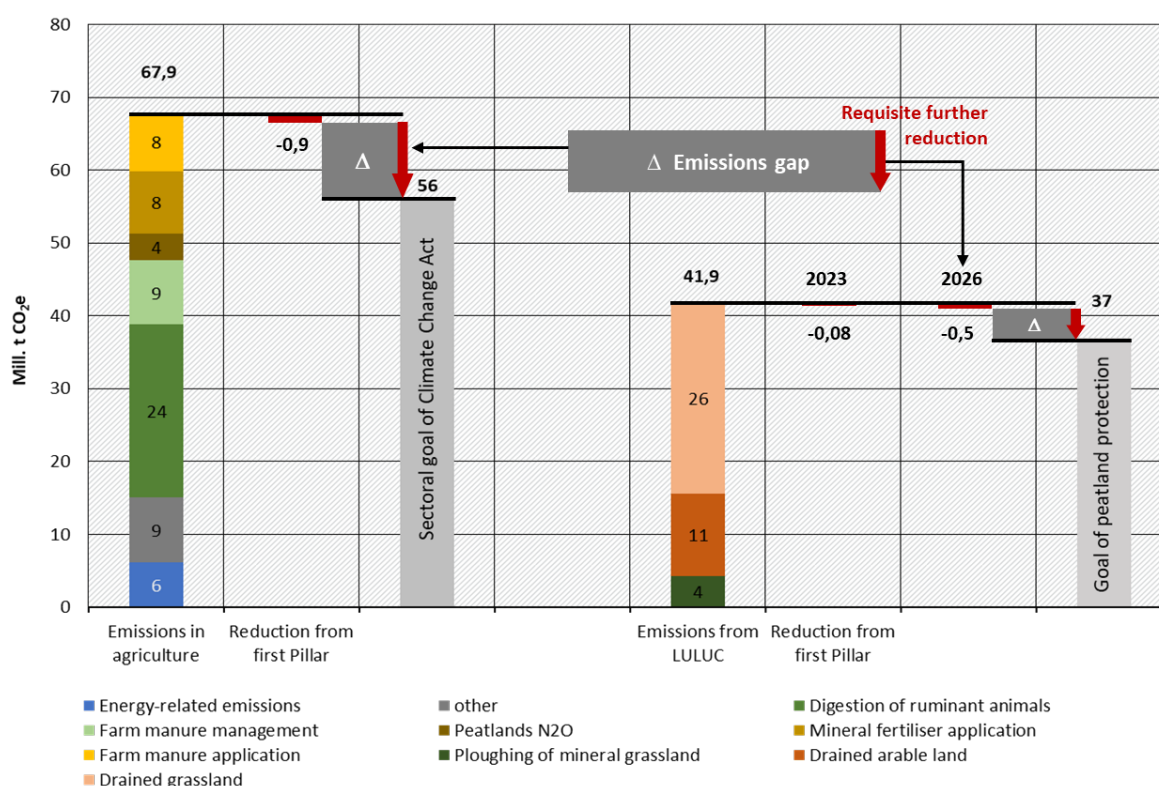
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<sup>3</sup> These reduction effects will be achieved every year if the measure is maintained on the current land area. The reduction effects cannot be added up over the years, as the land share for which they account, and thus the amount of fertiliser and fuel saved, does not change.

<sup>4</sup> Achieving an area of 200,000 ha agroforestry will only be possible, if additional funding for establishing the agroforestry systems is paid. the latter is planned via the framework plan of the Joint Task for the Improvement of Agricultural Structures and Coastal Protection and funds from the second pillar, no decisions have yet been published here either.

Figure 1 shows the emissions from the agricultural sector and the LULUC sector in 2019, and the respective mitigation effect of the climate measures of the first pillar of the CAP. It amounts to roughly 0.9 million t CO<sub>2</sub>e in the agriculture sector, and 0.08-0.5 million t CO<sub>2</sub>e in the LULUC sector. It also shows the shortfall between the impact of measures and the targets (grey blocks) of the Federal Climate Change Act 2030 for the agricultural sector (left-hand pair of columns), and of the Peatland Protection Strategy for 2030 (right-hand pair of columns).

**Figure 1: Current greenhouse gas emissions from agriculture and land use and additional greenhouse gas mitigation contribution of GAEC and eco-schemes**



The current emissions of the sectors refer to 2019 (UBA 2021a). The sub-division of nitrous oxide emissions (N<sub>2</sub>O) from agricultural soils into mineral fertiliser application, farm manure application and N<sub>2</sub>O from peatlands is based on the inventory (CRF Table 3.D). The remaining emissions are added up at Other. The LULUCF target for 2030 is -25 million t CO<sub>2</sub>e, and includes carbon storage by forests. This means that the balance of the forest sink *plus* emissions from land use (and the use of drained peatlands is dominant here) must meet the LULUCF sector target contained in the Federal Climate Change Act. The development of the sink effect of the forest is thus decisive for the requisite additional reduction from land use, and is subject to considerable uncertainties. The diagram shows emissions from the LULUC sector (not including forestry), minus the targets from the Peatland Protection Strategy (-5 million t CO<sub>2</sub>e by 2030).

Source: Oeko-Institut's own calculations based on CAP Direct Payments Ordinance (GAPDZV) and Ordinance on the Conditionality Applicable within the framework of the Common Agricultural Policy (GAPKondV)

The indicative area data, i.e. planning data from the aforementioned CAP Direct Payments Ordinance, were used to calculate the greenhouse gas reduction potential of the measures (BMEL 2021c). GAEC standards 2 and 8 (protection of wetland and non-productive land), as well as measures of the eco-schemes, are taken into account, based on the environmental report by Entera (2021), and on the statements made for the BMEL by Röder et al. (2021a). In particular, the non-productive areas of arable land (eco-scheme 1a), unmown grass strips (eco-scheme 1d), agro-forestry measures (eco-scheme 3), and extensive grassland management (eco-scheme 4), were included in the analysis. Minor effects result from the measures diversified crop rotation (eco-scheme 2), as well as avoidance of synthetic chemical pesticides (eco-scheme 6), and these are not included in the quantification. GAEC standards 1, 6 and 7 do not bring about any directly-

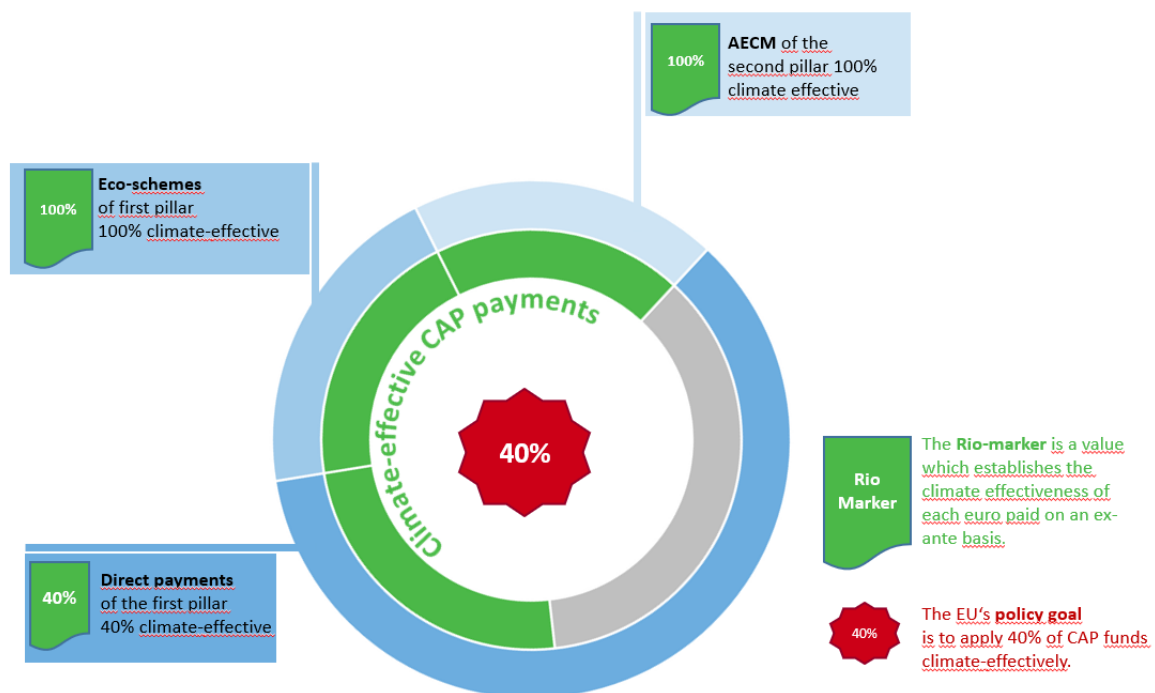
quantifiable and/or additional effect, and are therefore not included when calculating the potential reduction.



### 3 Climate tracking with no added value

It was shown in the previous section that the first-pillar measures only have a very limited impact when it comes to greenhouse gas reduction. In view of this minor contribution, the question arises as to how many of the financial resources made available actually help achieve climate targets. The CAP Strategic Plans Regulation (European Commission 2021, recital 94) states that 40 percent of CAP spending is expected to be climate-relevant. The same regulation also stipulates how climate-related spending is tracked, i.e. as part of “climate tracking” (Article 100). Based on the OECD Rio marker method, a weighting factor is assigned to the individual elements of the CAP, depending on whether they make a significant or a moderate contribution towards achieving climate protection targets. The climate effects of the eco-schemes, and those of the Agri-environment-climate Measures (second pillar), were estimated at 100 percent, and those of the direct payments at 40 percent, compare Article 100(2) (see Figure 2).

**Figure 2: The principle of the Rio markers for tracking the climate impact of CAP payments**



Source: Oeko-Institut's own calculations based on European Commission (2021)

In view of the CAP's multifunctional goals (biodiversity, soil, air, water, climate), it is implausible from the outset to assume all the funds expended are climate-relevant<sup>5</sup>. In addition, the eco-schemes for the new CAP funding period were designed at national level, and will not be announced to the Commission until the National Strategic Plan is sent out. Consequently, the Commission had to assess the climate relevance of the funds for both the eco-schemes and for the AECM, as a “pig in a poke”.

The eco-schemes measures and the financial resources that were made available were announced when the CAP Direct Payments Ordinance was adopted in December 2021<sup>6</sup>. If the Rio

<sup>5</sup> In accordance with Article 31(4) of the Strategic Plans Regulation (European Commission, 2021), each eco-scheme in principle covers at least two areas for measures benefiting the climate, the environment, animal welfare and combatting antimicrobial resistance.

<sup>6</sup> Thünen Institute and Entera have previously commented on the implementation of the CAP reform in several statements (Röder et al. 2021, Entera 2021). The climate relevance of the eco-schemes was evaluated on this basis by the authors of this policy paper by way of example. Details will be provided in the final report, which is expected to be published in Q2 2022.



markers are applied at the level of the individual measures that are now known, only around 20 percent of the funds can be assessed as having a climate impact. This means that, under the eco-schemes, only roughly 212 million EUR are used for climate action, instead of 1 billion EUR as in the case of the 100 percent determined in advance by regulation.

The European Commission attributes a blanket climate relevance of 40% to direct payments. The calculations, however, show that only GAEC 2 and 8 have a direct connection to the climate, and that a saving of 0.4 million t CO<sub>2</sub>e can be anticipated <sup>7</sup>. If the slight additional greenhouse gas reduction of the conditionality obligations is taken into account, this Rio marker also appears unrealistic, and the climate relevance of the direct payments seems to have been overestimated. The total figures for Germany clearly show that the blanket assessment system used by the European Commission leads to the climate impact of the planned funds for the eco-schemes being overstated. The analysis also reveals that the current eco-schemes principally support biodiversity conservation or soil protection objectives rather than climate action. The induced climate effects are in fact indirect, and result from synergies with the other environmental goals. The Rio marker method proves to be generally unsuitable to realistically depict the actual climate effects of the CAP.

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<sup>7</sup> The climate effect of maintaining the status quo is among the aspects relevant for assessing the climate impact of the conditionality obligations. This assessment has not yet been finalised.

## 4 More climate action is necessary and achievable

The EU's 2021 CAP reform initiates extensive tools for financing climate measures, but without making any binding stipulations as to how they are to be fleshed out (Pe'er et al 2019). In Germany, for example, roughly EUR 2 billion is available for voluntary environmental measures in both pillars from 2023 to 2027. In overall terms, however, there are few concrete stipulations for the further implementation of the climate goals within the CAP. Only the Rio marker values laid down for the individual funding elements provide any indication of where the Member States are expected to make special climate action efforts in agriculture (100 percent climate relevance of the eco-schemes and of the Agri-environment-climate Measures in particular).

The calculations show that the Rio marker method is not sufficient to ensure the envisaged climate impact of the CAP. For the CAP to make a greater contribution to climate action, it is necessary for Germany (as well as other EU Member States) to ambitiously implement the tools and introduce measures which primarily aim to bring about a greenhouse gas reduction. The associated synergy effects for other resources such as biodiversity, soil and water must furthermore be taken into account. Sections 4.1 and 4.2 below show the scope for action existing in both pillars, and section 4.3 describes effective measures for reducing greenhouse gas. The measures are presented without any detailed recommendations concerning the tools which are to be used in order to implement them. Individual measures can be achieved with the aid of different tools. A detailed debate on tools is beyond the scope of this paper.

### 4.1 Using the limited possibilities offered by the first pillar

The first pillar offers some starting points for more climate action at national level.

#### ► Conditionality:

The conditionality obligations and the GAEC standards which they contain are regulated first and foremost by the CAP Strategic Plans Regulation (European Commission 2021). There is considerable latitude when it comes to implementing some of the GAEC standards at national level. GAEC 8 (non-productive land) was implemented with the designation of a mandatory 4-percent share of fallow land in arable land. Together with the promotion of eco-scheme 1a (fallow land), a significant increase in fallow land of the first pillar can be expected, namely from 170,000 ha (2021, as part of the ecological priority area) to approx. 475,000 ha (cf. Entera 2021: pp. 32/33). If the planned fallow land is not achieved via eco-scheme 1a, the policy could be adjusted, for example at the end of the two-year learning phase of the eco-schemes, from 2025 onwards.

With its designation of an area of organic soils, GAEC 2 (protection of wetland) represents a good approach for developing more ambitious measures (e.g. eco-schemes or AEEM) specifically for these areas. There are, however, no further management requirements beyond the ban on converting grasslands on organic soils to cropland (e.g. ban on replanting, creation of new drainage or deepening of drainage, restriction of cropland use) in order to make a concrete contribution to climate objectives.

#### ► Eco-schemes

The impact of these voluntary support measures is only short-lived, and may therefore be limited, given that the duration of the eco-schemes in Germany is restricted to one year and farmers have to reapply for them every year. It is not impossible to take part in the same measure for several years, but this cannot be ensured as part of the current implementation (Entera 2021). The national and European legal bases allow the eco-schemes to be adapted at

any time. The Federal Government could therefore modify this tool over the next (shortened) funding period 2023-2027, including at short notice, making it more ambitious and supporting it with additional funds from the first pillar. That being said, the short duration is a problem when it comes to effective climate measures, given that many ambitious or efficient climate measures (especially the rewetting of organic soils) can only be implemented over a period of several years. The short-term nature of the eco-schemes could be made attractive here by increasing the premium amount in the following year.

## 4.2 Promoting effective climate action via the second pillar

Several existing measures from Agri-environmental-climate Measures within the second pillar will be funded via the eco-schemes of the first pillar in the funding period 2023-2027. At the same time, the second-pillar budget will increase from approximately EUR 715 million to at least EUR 1 billion per year (Lakner 2021, DBV 2021). This would enhance the use of second-pillar funds for more ambitious climate action. The federal states should therefore develop climate-efficient measures for the second pillar, or expand existing ones. The AECMs in the second pillar could become an important building block for climate-smart agriculture, as they can also be used to programme multi-year funding for running costs and investment measures for long-term measures. This particularly applies to peatland protection and livestock husbandry conversion measures, which, in the interest of combatting climate change, should be linked to a reduction in livestock numbers.

In the interaction between the two pillars, it is also important for sufficient financial resources to be available in the funds in order to achieve the desired goals. One way of relieving the financial burden on the *Länder* might be to shift funds from the first pillar to the second which do not require national co-financing (cf. Art. 91(3)c of the Strategic Plans Regulation), thus enabling longer-term measures to be financed (flexibility between the pillars, in accordance with Art. 103).

## 4.3 Concrete approaches

### ► Measures to reduce nitrogen emissions

The CAP uses a wide range of policy instruments in this area<sup>8</sup>, but the evaluation of the efficiency of nitrogen use on the farm as a whole is lacking. Particularly low-loss or efficient use could be rewarded financially within the context of the eco-schemes. Such a measure requires a nutrient tool to be introduced and used as a basis for determining the farm-related nitrogen balance. The design should depend on the implementation of the German Nutrient Flow Balance Ordinance (*Stoffstrombilanzverordnung*), and be compatible with EU law. Were ambitious farm-specific upper limits for nitrogen surpluses per hectare to be introduced, remaining below these surpluses could be rewarded under the eco-schemes (see proposal UBA 2021b). Remuneration for a blanket percentage reduction in fertiliser application compared to the stipulations of the German Fertiliser Ordinance (*Düngeverordnung*) could also be implemented with less effort. It would furthermore make sense to supplement the eco-scheme “diversified crop rotation” to include a ban on nitrogen fertilisation in legume cultivation. The application of nitrogen is currently permitted, and the Fertiliser Ordinance also indicates a fertiliser requirement for nitrogen in grain legumes and green fodder with a legume component<sup>9</sup>.

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<sup>8</sup> These include elements of the conditionality obligations such as the minimum share of non-productive land, stipulations on vegetation cover, or the implementation of the Nitrates Directive in combination with regulatory law, as well as subsidies. This includes investments in low-emission technology, as well as extensification, on the whole farm through organic farming, or on individual pieces of land via crop rotation, grassland extensification or ecologically-sensitive reserves, to name a few examples.

<sup>9</sup> The extent to which the application of nitrogen to legumes is still widespread in practice cannot be accurately assessed at present.

### ► Promotion of peatland rewetting

From a scientific point of view, the rewetting of as much farmed peatland as possible is an effective measure to reduce greenhouse gas emissions (Tanneberger et al. 2020). Today's farming as arable land, and intensive grassland use for dairy farming or biogas production, will therefore no longer be possible in future. Alternative options for use are being developed. Since the high greenhouse gas emissions on peatlands are not compatible with the goals of the Green Deal (or with the Farm to Fork Strategy), a change in direct payments is also necessary, and direct payments for land on drained peatlands (organic soils) should be phased out. At the same time, CAP funds from the Federation and the *Länder* can already be used today for preparatory measures for rewetting sites. These include converting arable land on organic soils into grassland, extensifying the use of peat grassland, and reducing livestock in these areas.

If support for extensive permanent grassland (eco-schemes 1d, 4 and 5) is claimed for grassland on organic soils (based on the designated area for peatland as part of GAEC 2), the high support rates for extensive farming on organic permanent grassland should be coupled with mandatory advisory sessions on peatland-friendly farming. The advisory sessions are to be used to exploit existing opportunities for raising water levels and to determine which hydraulic engineering measures are necessary. For this purpose, funds need to be provided in the second pillar to finance investments in structural measures for peatland-preserving reservoir management.

In addition, there are also areas on which, from the farms' point of view, the water level can even be raised today without prolonged preparations. The extended support for permanent grassland on organic soils with high water levels (as part of the AECM in some federal *Länder*) is worth mentioning as an expedient measure in this context. If paludicultures<sup>10</sup> are to be established, investments in hydraulic structures or in the establishment of paludicultures themselves are necessary, even in the second pillar. In addition, maintenance of paludicultures must be supported (e.g. as an eco-scheme, similar to the promotion of agroforestry systems).

### ► Reducing livestock levels

The high greenhouse gas emissions from livestock farming can be reduced via technical measures to a limited extent only. Livestock levels must be cut in order to achieve greater emission reductions. There is an interplay from a climate perspective between the above-mentioned issues and livestock: High livestock densities are a driver for high nutrient losses (Häußermann et al. 2019). This is particularly evident in the intensive livestock farming regions of north-western Germany, where high nitrogen surpluses lead to high levels of nitrate inputs into groundwater (BMU and BMEL 2020). Farms with high animal densities also cultivate drained peatland sites (intensive grassland management for milk production, concentration of poultry and pig farming) in some regions of Lower Saxony and Schleswig-Holstein. In addition, it is important to integrate the debate underway in society concerning the introduction of animal welfare criteria, which should also consider an adjustment of livestock levels (BMWK 2022). Regardless of this, some measures can already be identified that could be expediently added to the existing set of measures.

Area-based livestock farming plays a particularly important role when it comes to creating synergies with other environmental goals (e.g. reducing nitrogen surpluses). The objective of area-based livestock farming should also be increasingly promoted in the CAP, and should become mandatory later. Area-based livestock farming is already stipulated as part of the promotion of extensive permanent grassland. Other suitable measures consist in promoting a high own-fodder quota, but also in promoting a gradual reduction in the number of livestock

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<sup>10</sup> The agricultural use of peatlands (palus = swamp), e.g. through the cultivation of reeds.

units per hectare to a specific target at farm level. This makes sense especially in regions with a high density of animals, and in those with a high proportion of organic soils.

Table 1 shows by way of example a rough estimate of the reduction effects achieved by the above-mentioned approaches. Given the assumptions made, the reduction effects achieved with these approaches go far beyond the previous reduction effects of the first pillar. This shows that the CAP still provides considerable scope for greater climate action, and that there is major reduction potential if the measures are designed accordingly.

**Table 1: Additional measures for more climate action**

	Reducing nitrogen surpluses	Promoting paludiculture	Converting org. arable land into ext. permanent grassland	Total
Maximum reduction effect	0.6m t CO <sub>2</sub> e	1.7m t CO <sub>2</sub> e	3.0m t CO <sub>2</sub> e	5.3m t CO <sub>2</sub> e
Presumption	With reduction of 10 kg N/ha on total fertilised area	If paludiculture is introduced on 10 percent (approx. 95,000 ha) of grassland on organic soils	If 100 percent of arable land on organic soils is converted into extensive permanent grassland	

Source: own calculations based on UBA 2021a

## 5 Conclusions and recommendations

The results of the study show that the first pillar exerts a low impact on the climate protection. On closer examination, the study shows that CAP funds make a smaller contribution to climate protection objectives than is assumed under the Rio marker method. Two aspects lead to this low level of ambition in terms of climate action with regard to the CAP:

1. Germany has not yet addressed the measures that make a major contribution to reducing emissions (livestock and peatlands) within the first pillar, or has not addressed them sufficiently (nitrogen efficiency).
2. The blanket evaluation of the funds for the eco-schemes as being 100 percent climate-relevant leads to the significant overstating of their contribution to climate action. This is mainly because there was a lack of knowledge of the content of the eco-schemes and on the other hand because of the multifunctional goals of the CAP.

### ► Recommendations for action to be taken by the European Commission

The European Commission should assess the climate relevance of the strategic plans in a more differentiated manner, i.e. it should also apply measure-specific markers for the eco-schemes. This would allow for a more realistic picture of the actual climate contribution of the CAP to be conveyed, whilst at the same time avoiding the impression of “cooking the books”. The Rio marker method leads to a de facto shortage of financial resources for climate action in agriculture, as the climate effect of the established CAP tools is significantly overestimated. Applying a more differentiated method would allow weak points to be identified at an early stage and targeted countermeasures to be taken.

In accordance with the Strategic Plans Regulation (cf. European Commission 2021, Art. 100), the option exists to carry out a more detailed evaluation of the strategic plans after 2025. In this regard, a re-assessment of the climate relevance of the financial resources can above all provide indications of the stipulations that are to apply in the future. The EU should particularly use the mid-term review as an opportunity to better anchor climate action in the CAP as quickly as possible.

### ► Recommendations for action at national level

If Germany wishes (or needs) to use agricultural payments from Brussels in the future to make a larger contribution towards establishing climate-smart agriculture, this should be done through the targeted introduction of additional eco-schemes with the assistance of supplementary financial resources within the first pillar. Furthermore, the second pillar should be enhanced in order to promote long-term structural changes in agriculture (conversion of livestock by reducing livestock density, peatland protection). Money could be reallocated for this purpose from the first pillar to the second, and the government could, as an alternative or in addition, extensively co-finance targeted climate measures within the second pillar via the Joint Task for the Improvement of Agricultural Structures and Coastal Protection (GAK). It should be ensured from a national perspective that the tools of the CAP’s green architecture interact as best as possible, and that regionally-appropriate offers for peatland protection and for reducing herd sizes are established in regions with a high livestock density.

Agricultural policy faces various challenges in the future which, in addition to improving the climate footprint of agriculture, also include other goals such as preserving biodiversity, soil and water protection, and converting livestock farming in line with animal welfare criteria. The present policy paper shows that some co-benefits for the climate emanate from typical measures of the eco-schemes, but that targeted climate measures are in short supply. The scarcity of CAP

funds and the ambitious national greenhouse gas reduction path set by the Federal Climate Change Act, raises the question of whether sufficient climate measures can be promoted via the CAP.

A discussion is already underway on policy measures and tools (e.g. purchasing peatland or converting livestock farming) which should be additionally financed, for instance via a national fund, and concerning the amount of this fund. The CAP pursues multifunctional goals, and the results of the study indicate that the current tools of the CAP are suitable for achieving the climate targets to a limited degree only. A higher level of ambition nevertheless appears possible. The more effectively and the more efficiently the existing CAP funds are used for climate action and other environmental objectives, the less need there will be for additional national funds. The task for policy-makers is to find a policy mix between the major challenges and the goals, and to strike a balance with regard to available financial resources.



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## A Appendix

### A.1 Assessment tables

**Table 2: Objective and mode of impact of the GAEC standards**

GAEC No.	Requirement	Climate relevance	Climate protection	Adjustment	Additionality <sup>3</sup>	Result
		Environmental impact <sup>1</sup>				
1	Preservation of permanent grassland	(+)	(+)	o	o	o
2	Protection of wetlands/peatlands	+	+	(+)	o	(+)
3	Ban on burning stubble fields	(+)	(+)	(+)	o	o
4	Buffer strips along watercourses <sup>4</sup>	(+)	(+)	o	o	o
5	Erosion control	+	(+)	+	o	o
6	Soil cover in sensitive times and areas	(+)	o/(+)	(+)	o/(+)	(+)
7	Crop rotation or cropping ratio	(+)	(+)	(+)	(+)	(+)
8	Non-productive farmland (4%)	+	+	(+)	+	+
9	Prohibition of conversion of environmentally sensitive PGL (Natura 2000)	+	+	o	o	o

Quelle: EU Commission 2018; 2021.

<sup>1</sup> Environmental impact: according to Entera (2021: p. 29/30) and Röder et al. (2021a), plus own assessment. + = positive environmental impact; ++ = strongly positive environmental impact (not assigned); o = no significant environmental impact; – = negative environmental impact; – – = strongly negative environmental impact (not assigned); +/- = both positive and negative environmental impact; if the impact is in parentheses, only a weak impact is expected. <sup>2</sup>:

Additionality: For the measures, the effect depends on the respective local reference situation. If the measure is new, positive effects can be expected in many cases. If, on the other hand, the measure continues previous management practices, hardly any positive additional environmental effects are to be expected. o = Participation, if the requirements were already fulfilled beforehand. (+) = some farms meet the requirements before, other farms adapt their management. + = many farms adapt their management practices. <sup>3</sup>: according to Entera 2021. We assume areas with additional climate impact compared to 2014-2020; <sup>4</sup>: different widths are discussed. At a width of 5 m, a slightly positive additional climate impact can be assumed if necessary, which is hardly additional at a width of 3 m, as it is already addressed via existing regulations. In conclusion, therefore, no significant environmental impact is identified.

**Table 3: Objective and mode of action of the eco-schemes**

No	Eco-schemes	Main target	Soil	Climate	Biodiversity	Water	Air	Landscape	Additionality <sup>2</sup>	Result
			Potential environmental impacts <sup>1,2</sup>							
1	Areas for biodiversity improvement	Biodiversity								
a)	<b>Non-productive areas on farmland</b>	<b>Biodiversity</b>	o/+	(+) <sup>3</sup>	+	o/+	(+)	+ <sup>3</sup>	+	+
b)	Flower strips / areas on farmland	Biodiversity	+	o	+	+	o	+ <sup>3</sup>	(+)	o
c)	Flower strips / areas in permanent crops	Biodiversity	+	o	+	+	o	(+)	(+)	o
d)	<b>Waste grass stripes / areas in permanent grassland</b>	<b>Biodiversity</b>	o/(+)	(+)	+ <sup>3</sup>	o/+	o/(+)	+	+	+
2	Variety of crops (with 10% legumes)	Resources	+	o/(+)	o/+	o/+	o	o	o/(+)	o
3	<b>Maintenance of agroforestry on farmland<sup>4</sup></b>	<b>Climate</b>	o/+	+	-/+ <sup>4</sup>	o/+	o/+	+	+	+
4	Extensive use of corporate permanent grassland	Resources	o/(+)	o/(+)	+	o/(+)	(+)	(+)	(+)	(+)
5	Result-oriented ext. farming of permanent grassland	Biodiversity	o	o	+	o/+	o	+	(+)	o
6	No chemical-synth. plant protection	Resources	o/+	o	(+)	o/+	o	o	(+)	o
7	Promotion of Natura 2000 areas	Biodiversity	o	o/(+)	+	o	o	+	o	o

Source: BMEL 2021c

<sup>1</sup> Environmental impact: The assessment of the likely environmental impact is based on Entera (2021: p. 54 ff.) and Röder et al. (2021a), but also on own assessments: + = positive environmental impact, ++ = strongly positive environmental

impact (not assigned); o = no significant environmental impact; - = negative environmental impact; -- = strongly negative environmental impact (not assigned); +/- = both positive and negative environmental impact. If the effect is in parentheses, only a weak effect is expected. <sup>2</sup> Additionality: for the measures, the effect depends on the respective local reference situation. If the measure is new, positive effects can be expected in many cases. If, on the other hand, the measure continues previous management practices, hardly any positive additional environmental effects can be expected. o = participation, if the requirements were already fulfilled before. (+) = some farms meet the requirements before, other farms adapt their management practices. + = many farms adapt their management practices. <sup>3</sup> Effect on landscape: Here, there is a very critical evaluation by TI, our assessment is more positive. <sup>4</sup> Here it is assumed that a parallel investment support for the establishment of agroforestry systems comes via the GAK and entails that the maintenance of agroforestry systems can be supported annually via the eco-scheme.

**Table 4: GHG reductions of the first pillar for the years 2023 and 2026**

		Reduction per hectare	Area	Total reduction	Thereof agriculture	Thereof LULUC
		t CO <sub>2</sub> e/ha	'000 ha	million t CO <sub>2</sub> e		
<b>Total additional reduction effects</b>				<b>0.97 -1.41</b>	<b>0.89-0.93</b>	<b>0.08-0.48</b>
<b>GAEC standards</b>				<b>0.31-0.41</b>	<b>0.28</b>	<b>0.03-0.13</b>
GAEC 2	Protection of wetlands when not converted to cropland (also LULUCF)	8.5	5.9	0.05-0.15	0.02	0.13
GAEC 8	Non-productive areas on farmland	1.0	250.0	0.26	0.26	n.q.
<b>Eco-schemes</b>				<b>0.66-1.0</b>	<b>0.61-0.65</b>	<b>0.04-0.35</b>
No 1	Non-productive areas total	0.9	517.0	0.46	0.46	n.q.
1 a)	Fallow land on 1%	1.0	101.0	0.11	0.11	n.q.
1 a)	Fallow land on 1-2%	0.9	71.0	0.06	0.06	n.q.
1 a)	Fallow land on 2-6%	0.8	140.0	0.11	0.11	n.q.
1 d)	Waste grass 1%	1.0	46.0	0.05	0.05	n.q.
1 d)	Waste grass 1-3%	0.9	80.0	0.07	0.07	n.q.
1 d)	Waste grass > 3%	0.8	79.0	0.06	0.06	n.q.
No 3	Maintenance agroforestry (also LULUCF)	2.0	25.0-200.0	0.05-0.39	0.00-0.04	0.04-0.35
No 4	Extensive permanent grassland	0.3	463.0	0.15	0.15	n.q.

Source: Own assessments Oeko-Institut based on GAPDZV and GAPKondG

**Tabelle 5: Climate effectiveness of CAP funds for eco-schemes for 2023**

Eco-schemes		Reduction per hectare	Premium amount	Funds provided	Weighting climate effectiveness		
					Option 1: Lump sum based on measures	Option 2: Other objectives considered	Option 3: Based on GHG reduction per hectare
		t CO <sub>2</sub> e/ha	€/ha	million €	%		
No 1	Total non-productive area	0.9	631 €	326.3			
1 a)	Fallow land on 1%	1.0	1.300 €	131.3	100%	40%	53%
1 a)	Fallow land on 1-2%	0.9	500 €	35.5	100%	40%	45%
1 a)	Fallow land on 2-6%	0.8	300 €	42.0	100%	40%	39%
b+c	Flower strips	-	150 €	28.3	0%	0%	0%
1 d)	Waste grass 1%	1.0	900 €	41.4	100%	40%	53%
1 d)	Waste grass 1-3%	0.9	400 €	32.0	100%	40%	45%
1 d)	Waste grass > 3%	0.8	200 €	15.8	100%	40%	39%
No 2	Diverse crop rotations*	-	30 €	102.8	0%	0%	0%
No 3	Maintenance agroforestry	2.0	60 €	1.5	100%	100%	100%
No 4	Extensive permanent grassland	0.3	115 €	227.48	100%	40%	17%
No 5	4 identification types permanent grassland	-	240 €	153.75	0%	0%	0%
No 6	Waiver pesticides	-	50 € - 130 €	135.80	0%	0%	0%
No 7	Natura 2000 areas	-	40 €	69.97	0%	0%	0%
<b>Total</b>				<b>1017.6</b>			
<b>Climate-effective funds in million €</b>					<b>527.0</b>	<b>211.7</b>	<b>184.7</b>

Eco-schemes	Reduction per hectare	Premium amount	Funds provided	Weighting climate effectiveness		
				Option 1: Lump sum based on measures	Option 2: Other objectives considered	Option 3: Based on GHG reduction per hectare
Climate-effective share of total funds in %				58%	21%	18%

\* The assessment of the climate impact of the measure diverse crop rotation is fraught with many uncertainties and difficult in view of the current design. Therefore, this measure is assessed as 0%. The difficulties lie in the fact that a large part of the land is cultivated in organic farming which is supported via the 2nd pillar. In conventional legume cultivation, the Fertiliser Ordinance still permits the application of nitrogen. Furthermore, in both forms of cultivation there is a risk of additional nitrous oxide emissions if fertiliser planning is insufficient.

Source: Own calculations Oeko-Institut based on GAPDZV



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