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European Environmental Bureau

BirdLife INTERNATIONAL
EUROPE AND CENTRAL ASIA

RECOMMENDATIONS ON THE FUTURE CAP AND CLIMATE POLICIES

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The project "An unavoidable step after Paris: Cutting emissions from farming" aims to raise public and political awareness around the need for an ambitious legislative framework on climate and agriculture (national plans, governance and CAP) through publications, workshops and other activities targeting multi-level decision-makers, industry, civil society and academia.

The project is led by the European Environmental Bureau (EEB) in Brussels. BirdLife Europe is an implementing partner in Brussels and national affiliated partners in the target countries are: IIDMA (ES), Birdwatch Ireland (IE), Germanwatch (DE), CEEweb (HU) and France Nature Environnement (FR).

This report is written by Asger Mindegaard (EEB), Celia Nyssens (EEB) and Harriet Bradley (BirdLife Europe) with contributions from the national affiliated partners

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SUMMARY

Agriculture is a crucial, yet often neglected, piece in the puzzle of limiting global warming to 1.5 degrees Celsius, as defined in international agreements. Emissions related to livestock, mineral fertilisers and land management are adding greenhouse gases to the atmosphere while intensive agriculture and land use changes limit the land's capacity for absorbing and storing atmospheric carbon. Furthermore, considerable emissions driven by agriculture and food demand are hidden in other sectors and in imports.

Agriculture is central to global agreements such as the UNFCCC Paris Agreement and the UN Sustainable Development Goals. Within the EU, the sector is mainly governed by the common agricultural policy (CAP) but is also influenced by the National Energy and Climate Plans (NECPs). Sustainable finance and green public spending is also important for climate action in agriculture, and while, in theory, a considerable part of the CAP budget is earmarked for climate action, the flawed accounting methodology means this spending is so far not resulting in emissions reductions.

Policy change is needed to ensure the agricultural sector contributes to global, EU and national climate action. On the one hand, GHG emissions from farming must be reduced as much as possible and the natural carbon sinks on agricultural land must be enhanced. On the other hand, improved governance is key to improving participation in policymaking and ensuring accountability through clear and science-based definition and monitoring of goals. Finally, climate action must be integrated as a cross-cutting priority in all policies, including trade, and synergies should be sought and prioritised between climate and other environmental and societal objectives, such as biodiversity conservation.

INTRODUCTION

Agriculture is both threatened by, and a major contributor to the environmental crises we are facing. With regards to climate, the focus of this report, this interrelationship is crystal clear.

An increasingly unstable and extreme climate will deeply undermine European agriculture. Higher temperatures and more frequent extreme weather events are already wreaking havoc for European farmers. In addition, agriculture is part of the problem: it is commonly said to contribute up to 10% of the EU's total greenhouse gas (GHG) emissions.

This is sizeable, and yet, it is a glaring underestimation of the sector's total carbon footprint. It does not include emissions related to agricultural production which are accounted under different sectors: land use and land use change (LULUCF), industry, and energy. Neither does it take into consideration the emissions embedded in inputs for the agricultural sector which we import into the EU. We take a closer look at those different emission sources in the first section of this report.

The European Union (EU) is officially committed to limiting climate change to an increase in global average temperatures of 1.5 degrees Celsius through the Paris Agreement. This is an ambitious objective, and to accomplishing it takes equally ambitious policies. In the second section, we explore the policy landscape driving climate action in agriculture.

Farmers themselves hold the keys to many solutions. They have an array of agronomic practices and technologies at their disposal to mitigate and adapt to climate change. In the last section of this report, we present our recommendations for how policymakers should enable and support the agriculture sector to become part of the solution to the climate crisis.

1 AGRICULTURE'S CONTRIBUTION TO CLIMATE CHANGE

1.1 EMISSIONS FROM AGRICULTURAL ACTIVITIES AND LULUCF

Unlike most sectors which primarily emit carbon dioxide, agriculture emits three different greenhouse gases, with different warming impact and different lifetimes in the atmosphere: carbon dioxide, methane and nitrous oxide. Carbon dioxide (CO_2) has the lowest warming impact but stays in the atmosphere for hundreds of years while methane (CH_4) has 25 times higher warming impact but only stays 12 years in the atmosphere. Nitrous oxide (N_2O) has a warming impact 298 times more potent than CO_2 and stays in the atmosphere for around 114 years.[1]

The emissions attributed to agriculture in the GHG inventory are nitrous oxide emitted by agricultural soils when fertilisers are used, methane emissions from ruminant livestock's digestion, and methane and nitrous oxide from the manure of farm animals. This adds up to 439 Mt CO_2eq, or 10.15% of EU total emissions in 2017.[2] As they are caused by biological processes inherent to food production, methane and nitrous oxide emissions cannot be fully eliminated, but significant reductions are possible and necessary. Nvertheless, it is the only sector where emissions have been increasing in recent years, despite reductions in per-unit emissions[3] (*i.e.* efficiency improvements).

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1 EPA: Overview of Greenhouse Gases

2 These and following emissions figures are from: European Environmental Agency GHG Emissions reporting to UNFCCC 2019

3 CAP reform: The GHG emissions challenge for agriculture

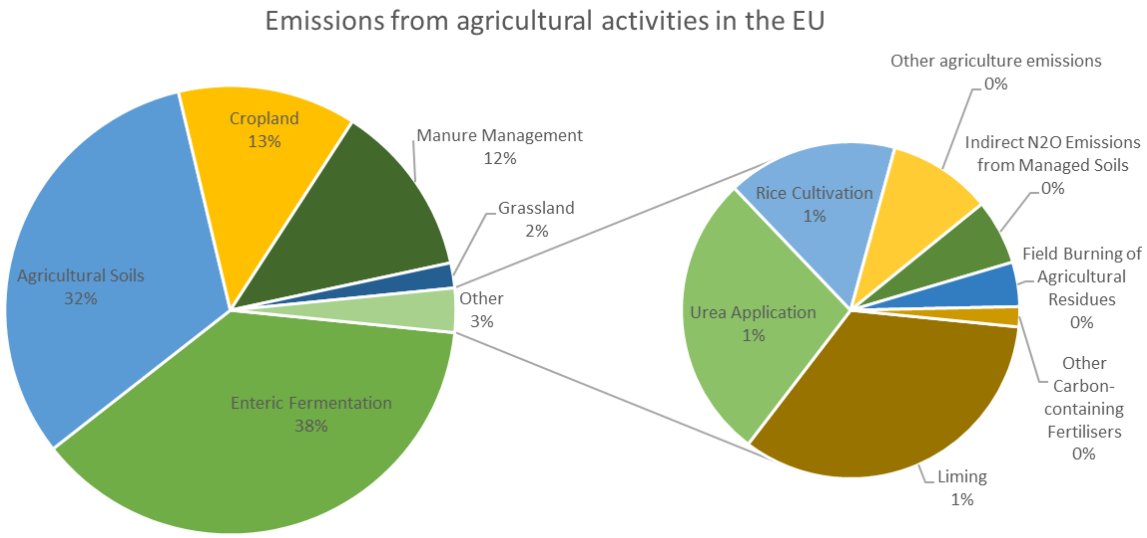

Figure 1. *Distribution of GHG emissions from agriculture and related land-use in CO_2eq for the year 2017. Based on data from the European Environment Agency (2019).*

Land use, land use change and forestry (LULUCF) is usually not counted as agriculture emissions but are a part of the EEA data in figure 1. While they have the potential to be carbon sinks, on balance, EU grasslands and croplands currently emit CO_2: 75 Mt CO_2eq in 2017, accounted under LULUCF. These emissions are caused when grassland is converted to cropland, when organic soils (peatlands) are drained, releasing the carbon accumulated in the soils, and when land is managed too intensively. Overgrazing, ploughing, and excessive applications of nitrogen fertilisers are practices which can cause carbon emissions from land or at least inhibit carbon sequestration and storage.[4] Permanent grasslands, although commonly thought to be natural carbon sinks, are currently on average net sources of CO_2 emissions for the EU as a whole. They are a net source of emissions in Germany, Ireland and the Netherlands, but a net carbon sink in France, Italy and the UK.

There has been a reduction in the emissions from grasslands and croplands in the EU since 1990, where the total emissions from these two sources were 107 Mt CO_2eq. Over the coming decades, farmers and land managers have a key role to play in making European grasslands and croplands carbon neutral, or even carbon sinks (see subsection 1.4).

However, looking only at the emission sources mentioned above gives an incomplete image of agriculture's real impact on climate change. The following sections elaborate on agriculture's many other contributions to GHG emissions.

1.2 EMISSIONS FROM AGRICULTURE ACCOUNTED IN OTHER SECTORS

Several other sources of GHG emissions are directly driven by agricultural activity but are accounted for in other sectors and therefore do not appear on agriculture's carbon footprint. The production of nitrogen fertilisers, for example, is a highly energy-intensive industrial process, causing 29 Mt CO_2eq[5] per year. Fuel combustion in agriculture is also a significant source of GHG emissions, however emissions are not reported for agriculture alone in this case: together, agriculture, forestry and fisheries account for 81 Mt CO_2eq. Emissions from the manufacture of machinery, the processing of livestock feed, or the heating and cooling of farm buildings are not accounted separately and therefore extremely hard to estimate. However, they can be expected to be significant, especially in countries where electricity generation still depends heavily on fossil fuels.

The emissions from production of nitrogen fertiliser have decreased significantly from a level of 83 Mt CO_2eq in 1990.[6] The fuel combustion in the agriculture, forestry and fisheries category has also decreased, though not as steeply, as in 1990 it accounted for 98 Mt CO_2eq. The other related emissions mentioned above, can be expected to have been higher historically as well, considering the heavier reliance on fossil fuels, the looser environmental regulations of the industry and the improvements of building insulation achieved since then.

4 IPCC: Land and Climate Change (chapter 4)
5 Emissions from ammonia and nitric acid production in the EU. Source: see footnote 1
6 EU Agricultural Market Briefs: Fertilisers in the EU

1.3 HIDDEN (IMPORTED EMISSIONS

In a globalised world where raw and processed agricultural products are constantly shipped and airfreighted around the globe, it is hard to justify looking exclusively at the emissions produced within our borders without looking at the carbon footprint of the goods produced elsewhere for our own consumption. In 2018, the EU imported €138 billion worth of agricultural products (covering primary products as well as processed foods, beverages and non-edibles),[7] a large share of which comes from countries with laxer climate and environmental regulation than the EU, such as Brazil and China.

Although Europe is a major producer and exporter of agricultural products, we also import a lot of food. In 2018, the EU imported agricultural products worth €138 billion and exported for €137 billion. In 2017, the most exported products were beverages and vinegar, pastry cooking products, dairy products, meat and mixed edible products. For import, the largest categories were fish and sea food, fruits and nuts, oil seeds and fruits, prepared animal fodder and coffee, tea and spices.

In 2018 alone, 341,053 tonnes of beef and veal (with a value of €1.88 billion) was imported to the EU, primarily from Brazil, Argentina and Uruguay.[8] The emission intensity of beef production in countries outside the EU is difficult to assess, however, it is well documented that cattle production is by far the largest driver of deforestation in the world.[9] In Brazil, cattle ranching drives approximately 80% of deforestation in the Amazon and 60 million hectares of the Cerrado savannah are under pasture.[11]

Yet another aspect of the hidden emissions is livestock feed imported for our herd. In the trade year 2017/2018 the EU imported 32.4 million tonnes of soy in the form of whole beans and soya bean meals, mostly from the United States and Brazil, and most of this is used for animal feed.[12] Apart from the direct emissions from production, soy production is the second largest driver of global deforestation[13] which means that imported soy is often associated with considerable additional emissions from land use change.

Finally, a commonly underrepresented aspect of emissions, especially from the land use sector, is the 'opportunity cost' of alternative land uses, or 'foregone carbon sequestration'. For example, only accounting for the emissions produced or sequestered in the production of crops, ignores what carbon could have been sequestered if that land had been put to other uses, such as restoration of natural habitat.[14]

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7 The numbers on agricultural imports and exports in the following two paragraphs come from EUROSTAT's article on trade in agricultural goods
8 Meat Market Observatory – Beef and Veal: EU Bovine Trade
9 UCSUSA: Beef Cattle
10 Global Forest Atlas: Cattle Ranching in the Amazon Region
11 UCSUSA: The Importance of Brazil's Cerrado
12 EU Feed Protein Balance Sheet
13 UCSUSA: What's Driving Deforestation?
14 Assessing the efficiency of changes in land use for mitigating climate change; Correcting a fundamental error in greenhouse gas accounting related to bioenergy

Amazonian rainforest and bordering agricultural land, Uwe Bergwitz (stock.adobe.com)

	CROPLAND		GRASSLAND	
	Mineral soils	Organic soils	Mineral soils	Organic soils
Area (Mha)	125	2	85	3
Total Soil Emission ($MtCO_2$)	27	33	- 41	41

Table 1. *EU agricultural soil emissions in 2016. Based on data from the European Commission*[15]

1.4 SOIL CARBON: PAST LOSSES AND FUTURE OPPORTUNITIES

Soils are major stores of carbon, which we have historically been releasing in massive quantities into the atmosphere. It is estimated that between 1870 and 2017, 31% of global cumulative CO_2 emissions have come from soil carbon (also known as soil organic matter or soil organic carbon) lost through land use change[16] (deforestation, the expansion of arable agriculture, and urbanisation) or unsustainable land management practices (such as intensive agriculture leading to soil erosion and depletion, or the draining and exploitation of carbon-rich peatlands).

Peatlands, which globally contain 20-25% of soil carbon,[17] are carbon sinks in their natural, wet, state but become large emissions sources when they are drained for agriculture or forestry. Countries such as Finland, Germany, and Poland have the highest concentration of peatlands, but these soil types are present throughout the EU. Although peatlands only represent 2% of EU grasslands and croplands, they are responsible for 55% of cropland emissions and completely 'offset' carbon sequestration in grasslands with mineral soils.

The IPCC special report on land and climate change[18] found that soils under conventional agriculture have a 40-75% decline in soil carbon content relative to nearby native vegetation (indicative of pre-cultivation levels). Bringing carbon, or organic matter, back into agricultural soils is an important part of climate mitigation and adaptation in agriculture: this can both improve the productivity of the land and place farmers at the heart of one of our best solutions to mitigate climate change.

Land management practices are key to turn land from a net source to a net sink of carbon while also reducing impacts on, or contributing to, other goals such as biodiversity conservation and food security. While many management practices that preserve and enhance soil carbon sequestration are already well tested, there is still a great need for additional research, mapping, and dissemination of knowledge. Currently, there is a high uncertainty and variability in the quality of available data on soil carbon, making it hard to make a qualified assessment upon which to base policy.

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15 European Commission: A Clean Planet for All
16 Global Carbon Project: Global Carbon Budget 2018
17 CAP specific objectives explained: Agriculture and Climate Mitigation
18 See footnote 4

2 THE CURRENT POLICY FRAMEWORK

The EU and all member states have signed the 2015 Paris Agreement on Climate Change, committing to keep global mean temperature increases below 1.5 degrees relative to pre-industrial levels. The EU has also committed to implementing the UN's Sustainable Development Goals (SDGs), adopted in September 2015 as part of the United Nations' Agenda 2030. The SDG 13, Climate Action, is aligned to the goal of the Paris Agreement.

In October 2018, the IPCC released a special report on how the 1.5 degrees Celsius goal could be achieved.[19] Agriculture was an essential part of the pathways leading to no or limited overshoot, with a particular focus on reducing methane emissions. The IPCC report on Climate Change and Land found that agriculture, forestry and other land use (AFOLU) accounts for 23% of total man-made GHG emissions.

In the EU, the Effort Sharing Decision and the Climate Action Regulation (CAR) regulate climate action in the agriculture, transport, buildings and waste sectors. The principle of common but differentiated responsibility is applied, leading to different reduction targets for each member state. For the EU as a whole, the targets are: 10% emissions reduction by 2020 and 30% by 2030, compared to 2005. In the LULUCF sector, climate action is regulated separately, and it is based on the "no debit rule": positive and negative emissions in that sector should compensate each other to maintain net zero emissions for the sector at the national level. In each member state, the LULUCF and the CAR sectors can compensate for each other's underachievement: e.g. if LULUCF breaks the no debit rule it can be balanced out if the CAR sectors overachieved on their targets, or vice versa.

Various policy instruments offer options to deliver climate action in agriculture – climate mainstreaming, National Energy and Climate Plans (NECPs), and the Common Agricultural Policy (CAP).

19 IPCC: Global Warming of 1.5 Degrees C
20 Factsheets on the European Union: Financing of the CAP
21 ECA: Spending at least one euro in every five from the EU budget on climate action
22 IEEP: CAP 2021-27: Proposals for increasing its environmental and climate ambition

2.1 MAINSTREAMING CLIMATE ACTION IN ALL EU FUNDING

The EU has a commitment to 'mainstream climate action' in all EU policies and in its budget, with a target of 20% of all EU spending to contribute to climate action. As the CAP is the single largest share of the EU budget, accounting for 36.1% of total EU spending (€58.4 billion) in 2019,[20] and represents 97% of the EU's budget for natural resources, the sector is very important for achieving this goal.

In the current budget period, more than half of "climate mainstreaming" was claimed through the CAP: 29% through the European Agricultural Fund for Rural Development (EAFRD) – Pillar 2 of the CAP, and 23% through the European Agricultural Guarantee Fund (EAGF) – CAP income support and 'greening' subsidies. For the new budget (2021-2027) and CAP, the European Commission set an expectation that 40% of CAP funding should count as climate spending, to contribute to a climate mainstreaming target of 25% of the EU budget. This would mean that 46% of 'climate spending' will be spent through agriculture.

However, there are significant issues with the way 'climate spending' is tracked in the CAP. The methodology used to calculate how much CAP funding contributes to climate action is flawed and has been strongly criticised by the European Court of Auditors.[21] 40% of the subsidies meant as 'income support' for farmers and 40% of compensation payments for farmers in areas with natural constraints (e.g. mountains) is tagged as "climate spending". Yet, official evaluations have concluded that no evidence exists that these measures contribute to GHG reductions at all.[22]

In addition, 100% of funding for environmental measures under the CAP is tagged as "climate spending", regardless of whether climate mitigation is a primary aim of the specific measures or not. This methodology allows the Commission to reach its mainstreaming targets without changing the way funding is distributed under the CAP. It also ignores the net effect of CAP spending, by not counting or estimating spending that could increase emissions, such as intensive meat and dairy production subsidies. A more robust tracking methodology based on actual results (i.e. demonstrated GHG emissions reductions) must be developed to ensure that climate mainstreaming delivers real climate action.

2.2 CLIMATE ACTION IN AGRICULTURE THROUGH NECPs

The National Energy and Climate Plans (NECPs)[23] are envisioned in the energy union and climate action rules of December 24, 2018, requiring MS to develop a national plan for the period 2021-2030. The NECPS are an attempt to align EU and national policy with international climate commitments. The plans are based on a common template and foresee a transparent and participatory process where civil society and other stakeholders are invited to provide substantial feedback to the NECP drafts. The emphasis on public participation and regional cooperation has potential to enhance engagement and broad ownership of climate action in the EU.

However, based on our analysis (see below), the draft NECPs published in January 2019 clearly lack in detail and are not on track to reach the targets set in the Paris Agreement. When it comes to the agricultural sector, most member states did not set any emissions reduction targets, and many do not even put forward new measures to reduce GHG emissions. The feedback on the drafts provided in June 2019 by the European Commission was overall very vague and did not oblige the member states to make amendments to get them on track towards net zero emissions by 2050. MS are now reviewing the feedback from the Commission and from the public hearings (in the countries where such were conducted) and adjusting the drafts before the deadline for the final plans at the end of 2019.

23 European Commission: Nation Energy and Climate Plans (NECPs)

2.2.1 Benchmarking of climate ambitions of five NECPs

In the EUKI project 'An unavoidable step after Paris: Cutting emissions from farming', the climate change mitigation ambitions in agriculture in the NECPs of five target countries were assessed. The assessment focused on a. *scope*, b. *transparency*, c. *measures in the agricultural sector*, d. *consistency and credibility* and e. *trade-offs*. In the following paragraphs, the assessment of the draft NECPs of Ireland, Germany, Spain, France and Hungary are summarised. The full assessments are in the appendices of this report.

- The assessment of the **Irish NECP** draft did not reveal any major issues with *scope* and *transparency*, apart from a very low score on the indicator "Multilevel dialogue" concerning the broad inclusion of various stakeholders. This is problematic, as it indicates that the ambitions of broad participation have not been achieved. Regarding *measures in the agricultural sector*, all the scores were very low apart from a moderate score on the "Infrastructure" indicator. The same is true for *consistency and credibility* and *trade-offs*. In sum, the Irish draft NECP is assessed as lacking consistently on almost all the assessed parameters.

- The assessment of the **German NECP** draft showed poor performance in *scope*, apart from the "Deadline" indicator. In *transparency*, the draft scored medium on "Public participation", high on "Publication" and very low in "Multilevel dialogue". The assessment on the drafts performance on *measures in the agricultural sector* was very negative on all seven indicators apart from "Inclusion of long-term strategy" which was rated as moderate. Similarly, the rating was negative in all indicators of *consistency and credibility* and in *trade-offs* apart from the moderately rated indicators of "Climate" and "Job creation" trade-offs.

- In the case of the **Spanish NECP** draft, *scope* was rated between moderate and great, apart from the "Deadline" indicator which reported a considerable delay. The assessment of the *transparency* was mostly moderate with one negative score in "Public participation" while the various indicators of measures in the agricultural sector were distributed over the whole scale. As for *consistency and credibility*, indicators were ranked both very positive and very negative and the "Use of loopholes" indicator could

not be properly assessed due to ambiguity in the draft text. In terms of *trade-offs*, the Spanish draft was assessed to bring several positive co-benefits for "Air quality", "Soil quality", "Energy consumption" and "Job creation".

- The **French NECP** draft has very variable scores in *scope* and moderately positive scores for *transparency*. In terms of measures in the agricultural sector, the French NECP was very weak which is also the case for *consistency and credibility*. Few positive *trade-offs* were identified but on the negative side, the ambitions for first-generation biofuels might have negative trade-offs with GHG emissions through indirect land use change.
- The **Hungarian NECP** draft scored low or moderate in all indicators in *scope* and moderate in all the *transparency* indicators. For the measures in the agricultural sector, the assessment found that agriculture is absent from the draft and all indicators scored the lowest or second lowest mark. *Consistency and credibility* were assessed with the lowest score in two indicators and with the highest in one and *trade-offs* ranked between lowest and moderate scores.

Based on this analysis, and unless considerable improvements are made before the final plans are published, this first generation of NECPs is likely to be a missed opportunity for addressing agricultural GHG emissions. Although the five assessed draft NECPs from the five target countries are not representative of all member states, they are indicative of the general picture, which is one of lack of attention to agriculture and absence of specific targets for mitigation in the sector. This is a loss for the EU, considering the urgency and magnitude of the challenge of complying with the Paris Agreement. Far-reaching change needs to occur in all parts of our society and economy, and the NECPs provide a useful framework to discuss the distribution of efforts between sectors and plan climate action in a holistic, fair, and effective way.

2.3 CLIMATE ACTION THROUGH THE COMMON AGRICULTURAL POLICY

The 2014-2020 CAP was envisioned to contribute to the sustainability of European agriculture through measures in both Pillar 1 and Pillar 2. However, evaluations of the environmental performance of the CAP have been rather sceptical of its environmental and climate performance.

In 2019, the European Commission published an evaluation of the 2014-2020 CAP's impact on the climate.[24] The main finding was that while climate action was one of the key objectives of the CAP, the voluntary nature of most climate and environmental measures left ample room for maintaining the status quo. The report also pointed to the lack of CAP tools for farmers to tackle methane emissions from ruminants and nitrous oxide emissions from soil management, the two single largest sources of GHG in agriculture.

Already in 2016, the European Court of Auditors published an assessment of climate action in the EU budget,[25] concluding that the agricultural sector, amongst others, had failed to significantly shift towards climate action. They further observed that agriculture is one of the major barriers to the EU reaching its overall target of 20% reduction of GHG emissions by 2020.

2.3.1 Pillar 1: Direct payments, coupled payments, and greening

Pillar 1 of the CAP, which provides 'income support', or direct payments, to EU farmers, is by far the largest part of the total CAP budget, covering 76% (€44.44 billion) in 2018.[26] 30% of the direct payments are dedicated to greening measures (crop diversification, ecological focus areas and permanent pasture) which were envisioned to contribute to environmental objectives (climate, biodiversity, and sustainable management of natural resources). Farmers in receipt of direct payments are mandated to comply with basic rules for good agronomic and environmental condition (GAEC) in cross-compliance. On that basis, the European Commission deems that 19.5% of direct payments contribute to climate mitigation objectives. However, the ECA found that that this percentage is not properly justified and propose that 10% would be more accurate.

In an assessment of the current CAP, the Institute for European Environmental Policy (IEEP)[27] found that

24 European Commission: Evaluation study of the impact of the CAP on climate change and greenhouse gas emissions
25 See footnote 19
26 European Commission: The common agricultural policy at a glance
27 See footnote 20

the greening measures predominantly were used by MS to consolidate already common practices rather than introducing new environmental and climate ambitions. The assessment found that environmental protection was rarely a priority for MS in designing and implementing greening measures.

In addition, the CAP currently funds practices or farming models that directly contribute to climate change. The majority of coupled support (paid by level of production) goes to the meat and dairy sectors,[28] and per-hectare payments are also paid for drained peatlands used for agriculture, carbon emissions hotspots. A report by Greenpeace estimated that overall between €28.5 billion and €32.6 billion of the CAP budget goes to livestock farms or farms producing fodder for livestock – between 18% and 20% of the EU's total annual budget.[29]

2.3.2 Pillar 2: Rural Development Programmes

Pillar 2, supporting rural development, makes up the remaining 24% (€14.37 billion) of the CAP budget in 2018. The national rural development programmes (RDPs) were reformed with the current CAP according to six core priorities of which one is environmental, and one relates to climate. The RDPs became more result-oriented and focused on achieving maximum added value.

The most important environmental tool in Pillar 2 is the agri-environment-climate measure (AECM). Through payments, these encourage farmers or groups of farmers to change or maintain their agricultural practices to contribute to climate change mitigation and adaptation, protection and improvement of environment and landscape, natural resources, soil and genetic resources. Yet, the ECA found that the European Commission was overestimating the Rural Development Fund's contributions to climate action by over 40%.

In the report 'Analysis of climate ambition of the Rural Development Programs in targeted countries'[30] published by the EEB, the Pillar 2 RDPs of five MS were analysed. It found that agricultural emissions are projected to grow steadily until 2030 and that it is unlikely that current climate measures will lead to effective emissions reduction. The report identified four common weaknesses of the RDPs:

- The absence of clear targets and quantifiable outcomes linked to specific measures.
- The absence of independent scientific assessment of the measures after a certain number of years or the absence of the obligation to report their impacts when scientific assessments exist.
- The absence of strategic planning ensuring coherence between the objective pursued with certain measures of the RDPs and other policy instruments.
- The voluntary nature of measures and the limited available funds for them.

Much of this criticism is echoed by the IEEP, in particular the lack of clear targets and indicators to guide and assess the climate and environmental measures. The CAP needs to improve significantly to deliver the important contributions to the climate and the environment that is required of the agricultural sector.

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28 European Commission: Review by the Member States of their support decisions applicable as from claim year 2019

29 Greenpeace: Feeding the Problem: the dangerous intensification of animal farming in Europe

30 EEB: Analysis of climate ambition of the Rural Development Programs in targeted countries

JürgenBauerPictures (stock.adobe.com)

3 WHAT WE RECOMMEND

3.1 REDUCING GHG EMISSIONS

3.1.1 Reduce farm animal numbers in Europe and help farmers transition

When talking about agricultural GHG emissions, methane and nitrous oxide are by far the most important. According to the EU Agricultural Outlook 2017-2030 by the European Commission,[31] most non-CO_2 emissions originate from animal production, directly or indirectly. The livestock sector is projected to account for 72% of total non-CO_2 emissions by 2030. While there is a growing focus on improving genetics, feed, facilities etc., technological innovation is not enough to deal with this problem. The evidence is unequivocal that reducing production levels, i.e. decreasing livestock numbers and the consumption and export of meat and dairy, will be required to achieve climate-neutrality by 2050. Furthermore, a reduction of the livestock herd is the only way to bring air and water pollution (from nitrates, ammonia and methane) below the legal thresholds in areas with intensive livestock production – i.e. high concentrations of animals in very small areas.

In a world with a growing population, it is furthermore unimaginable that Europe would continue to use as much arable land as we currently do to grow feed for our livestock: 128.9 million ha of agricultural land in the EU (72% of total)[32] was in 2016 used to grow feed crops or grass for feed. Yet, only 35% of the EU's agricultural area is permanent pasture. This must be supplemented by the large areas used to grow imported feed, as presented in chapter 1.3.

For those reasons, the EU must support our farmers to move away from intensive livestock production towards extensive systems. This will require lower production of meat, dairy and eggs (but of higher quality) since extensive production requires more land. Lower production and consumption levels would also allow Europe to reach self-sufficiency in livestock feed and fodder. This could be done through transition payments from the CAP's investment funds or sector-specific subsidies linked to farm transition plans developed with support from farm advisory services. This should be combined with strategic policies aiming to reduce demand for meat and dairy, both by fighting food waste and by promoting a shift to healthier and more sustainable diets (e.g. through green public procurement). In addition, our trade policies should support, rather than hinder, this goal (see chapter 3.4). This in in order to avoid a simple shifting of production to other parts of the world.

3.1.2 Promote EU-wide adoption of agroecological farming practices

Intensive agricultural practices are increasingly recognised to be linked to erosion and the degradation of soils.[33] In such conditions, soils are net sources of CO_2 emissions and rely on fertilisers and pesticides to remain productive. The CAP must mainstream agroecological practices that build soil health and fertility. Crop rotation with leguminous crops, landscape features, and the reduction of the use of inputs should be promoted. This will allow for higher carbon sequestration in agricultural soils and lower emissions from machinery and fertilisers production. Organic farming, agroforestry and conservation agriculture can be examples of agroecological farming systems when done well.

Agroforestry is a land use system where woody perennials (such as trees and shrubs) are integrated with crop and/or livestock production. When trees are introduced to the farm in a well-informed and well-planned agroforestry system, they can provide important functions such as water and soil conservation, better nutrient management, improved biodiversity and enhanced resilience of the farm. Furthermore, agroforestry often requires a landscape approach to the farm and, thus, promotes a more comprehensive and integrated way of farming which can benefit the environment and the farmer.[35]

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31 European Commission: EU agricultural outlook: European emissions linked to agriculture set to decrease by 2030
32 RISE Foundation: What is the Safe Operating Space for EU Livestock?
33 See footnote 4
34 FAO: Agroforestry
35 World Agroforestry: What is agroforestry?

Conservation agriculture, also known as regenerative agriculture, is based on three core principles which together promote soil health by increasing the organic matter content and microbial life of soils: no till, constant soil cover, and complex crop rotations including legumes. When implemented well, this system has shown to maintain or increase yields with significantly lower agro-chemical inputs, leading to more profitable farm businesses.[36] While no-till systems which do not respect all three principles of conservation agriculture have been associated with high use of herbicides, increasingly non-chemical no-till methods are being developed with positive results.[37]

Agroecological systems are based on farm-level diversification of production, which can also enhance the agronomic and socio-economic resilience of the farm. Diversified systems are generally more resistant towards disease, pests and weeds and are better suited for the climatic conditions in a warmer future with more extreme weather events. Diversification also brings co-benefits for water quality and conservation and for biodiversity. These agronomic benefits strengthen the socio-economic resilience of the farmer, as production becomes less vulnerable to natural risks. Furthermore, the farm business becomes less vulnerable to global market fluctuations if the entire revenue does not depend on one single crop.

The CAP should seek to mainstream agroecological practices through a combination of conditionality rules and well-funded environmental schemes in both pillars, in close collaboration with farm advisory services.

3.1.3 Enforce best practice in nutrients management

Nutrients availability (especially nitrogen and phosphorus) is a key factor for plant growth. Organic fertilisers (animal manure or composted plant residues) and mineral (mined or manufactured) fertilisers are therefore used to boost yields; however, when more nutrients are applied than crops can take in, they escape to the environment and cause pollution; including GHG emissions. Nitrogen fertilisation boosts the production of nitrous oxide (N_2O) by agricultural soils:[38] around 1.25 kg of nitrous oxide is produced per kg of nitrogen applied to a field[39] which is particularly problematic since nitrous oxide has a global warming potential of 298 times that of CO_2. In the EU, the average excess nitrogen (or agricultural nitrogen balance) was around 51kg N/ha[40] in 2015 and total nitrous oxide emissions from agricultural soils were 164 Mt CO_2eq[41] in 2017. In addition, the production of synthetic nitrogen fertilisers is a highly energy-intensive process.

CAP measures should be put in place to close the nutrients loop by improving the recycling of nutrients from manure, food waste and sewage and drastically reducing new inputs of synthetic nitrogen. This needs to be done at farm-level and at local level through collaboration between farmers and with other actors (for example schools composting their food waste with local farmers). In addition, best practice in the storage and application of fertilisers is key to prevent avoidable losses to the environment. Fertilisation needs can also be reduced through the adoption of agroecological practices which enhance fertility through improved soil health.

Achieving a fully circular and local economy for nutrients can also create socio-economic opportunities in rural communities by improving living conditions (less air and water pollution), by tackling nitrates and ammonia pollution, by providing local sources of energy (for instance through manure biogas plants) and by creating new markets (labour and knowledge for new technologies).

3.2 INCREASING CARBON SINKS

3.2.1 Protect and manage permanent grasslands for climate and biodiversity

Protecting grasslands as part of extensive livestock systems has considerable emissions mitigation potential.[42] This requires a complete ban on ploughing or converting permanent grasslands, and an effective mix of conditionality rules and environmental funding schemes to maintain and restore species-rich grasslands, protect and enhance landscape features such as trees and hedges, and to bring stocking density in line with biodiversity requirements.

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36 Growing a Revolution, Bringing our Soil back to Life. (2018) David R. Montgomery, WW Norton & Co, New York.
37 Arc 2020: Agroecology Europe Forum – Focus on No-Till
38 FAO: Global database of GHG emissions related to feed crops
39 How does fertilizer use affect GHG emissions?
40 EEA: Agriculture: nitrogen balance
41 EEA GHG Inventory
42 See footnote 22

This will provide win-win benefits for carbon storage, adaptation to climate change, biodiversity, and soil protection. In addition, there can be economic benefits for farmers. Research in England showed that upland farmers improved their farm profitability by reducing their inputs and herd size, and by taking a more nature-friendly approach relying primarily on the farm's natural assets.[43]

Conditionality rules should be designed to maintain the permanent grassland ratio at a regional level relative to historical references. Under the eco-schemes of the new CAP, payment for additional permanent grassland could also be structured as competitive bidding based on environmental criteria. Such an approach has been used successfully in the USA, to ensure cost-effective achievement of environmental objectives.[44]

3.2.2 Ensure the conservation and fund the restoration of wetlands, peatlands, and forests

Wetlands, peatlands, and forests are massive carbon sinks that have been significantly degraded over the past decades. European peatlands are estimated to contain five times more carbon than forests.[45] These soils have formed under permanently waterlogged conditions, preventing the complete decomposition of dead biomass and resulting in the accumulation of carbon rich soil organic matter. When the area is drained, this organic matter decomposes rapidly. The solution is therefore simple: peatlands must be rewetted. When the water table is restored to pre-drainage levels, emissions are drastically reduced or even stopped.[46] While wet peatlands can be managed productively, a production system known as paludiculture, this land management is not typically as profitable as traditional agriculture or forestry uses, and should therefore be incentivised and funded through the CAP. Furthermore, studies at the global level suggest that restoring peatlands requires almost 3.5 times less nitrogen and far less land compared to mineral soil carbon sequestration.[48]

European forests should also not be forgotten. Although around 40% of the EU is forested,[49] corresponding to 182 million ha and just exceeding the arable area of 179 million ha, all is not well in the woods. Significant deforestation is embedded in imported crops, meats and biofuels. Despite pledges to stop deforestation, EU imports' contribution to global deforestation is projected to increase by as much as 25% by 2030.[50] Furthermore, the quality of European forests is low, with a predominance of low-biodiversity monocultures of pine and other industrially utilised species. Management practices such as clear-cutting large areas of forest is threatening climate and the environment and plantations are sometimes planted on drained peatland which might cause them to be net emitters.[51]

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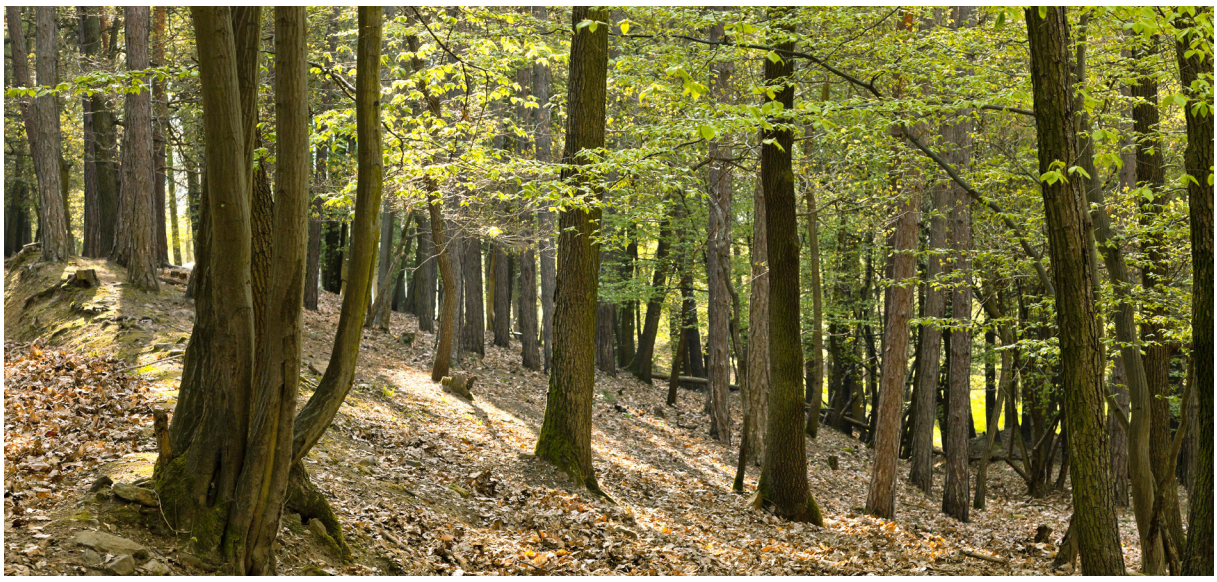
43 RSPB: Nature friendly hill farms can be more profitable
44 Cost-effective design of agri-environmental payment programs: U.S. experience in theory and practice
45 BBC: Climate Change: Widespread dying of European peatlands
46 Greifswald Mire Centre: Reporting greenhouse gas emissions from organic soils in the European Union
47 Wetlands International: Paludiculture presents the necessary paradigm shift toward sustainable peatland use with global climate benefits
48 The underappreciated potential of peatlands in global climate change mitigation strategies
49 Eurostat: Over 40% of the EU is covered with forest
50 The Guardian: Europe's contribution to deforestation set to rise despite pledge to halt it
51 META: Europe's forestry policy is not yet out of the woods



kropic (stock.adobe.com)

3.3 ENSURING ACCOUNTABILITY THROUGH GOVERNANCE AND MONITORING

3.3.1 Inclusive governance for good policymaking

Close collaboration between environmental, climate and agricultural authorities is crucial to develop coherent and effective policies, and so is the involvement of all stakeholders in the process. Policymakers should empower societal actors, including farmers and environmental experts, to contribute meaningfully to the design of policies. This must involve efforts to build consensus and engage in constructive dialogue with all actors.

According to the Partnership Principle of the ESIF European Code of Conduct, member states are required to involve all relevant stakeholders in all stages and levels of EU activities. This is a way to ensure that EU funds deliver on environmental objectives and on sustainability in general. Environmental authorities and NGOs should be fully involved in the development of the national/regional CAP programs and be able to contest decisions that are not in compliance with relevant legislations and frameworks. Yet, the experience of environmental NGOs under the current CAP is that only the British government involved them in the drafting of the common monitoring and evaluation system. This should be required under the post-2020 CAP, so that environmental NGOs can help make the climate measures more targeted and effective while also providing expertise and support to agricultural authorities.

3.3.2 Science-based and result-oriented monitoring

To ensure that the schemes are delivering the intended results, 2% of the budget of each agri-environment scheme needs to be ring-fenced for independent scientific monitoring of schemes, based on a robust sampling methodology. Spending must also be justified ex ante in relation to identified needs (such as priority farmland species at national level) and backed up with scientific evidence.

To ensure policy instruments deliver actual results, quantitative targets and robust indicators are key to plan and monitor progress or the lack thereof. Current policies and regulations, e.g. the CAP and the NECPs, are too often based on vague objectives and weak indicators so that decisionmakers cannot easily be held accountable for the lack of progress. Agricultural climate action needs to be guided by transparent targets monitored by clear, quantified indicators.

Furthermore, while the European Commission claims that the proposal for the future CAP is a result-based model, results will be measured by the uptake rate of schemes. The percentage of farmers enrolled in a certain scheme or of hectares under a certain management practice does not make it a result-based model, as member states are not held to account for the actual environmental performance of those schemes. To be truly result-based, the new CAP must include mechanisms to monitor the performance of schemes and if a scheme is shown not to deliver on its stated objective, it should be adapted or terminated.

3.4 INTEGRATING CLIMATE IN ALL POLICIES

Close collaboration between environmental, climate and agricultural authorities is crucial to develop coherent and effective policies, as is the involvement of all stakeholders in the process. Policymakers should empower societal actors, including farmers and environmental experts, to contribute meaningfully to the design of policies. This must involve efforts to build consensus and engage in constructive dialogue with all actors.

3.4.1 EU trade must be climate-proof

While climate action in EU agriculture may cause some carbon leakage (meaning that reductions in emissions through reduced production in Europe are offset by increased production and emissions in third countries), this should not prevent us from reducing our own GHG emissions by limiting or reducing the production and consumption of carbon-intensive products. Rather, the answer is to ensure clear climate regulation and tracking of our trade. EU trade must contribute to the supply and consumption of low carbon products. This requires, as a start, putting an end to the export orientation of livestock and dairy farming. In addition, the EU should define robust standards for monitoring GHG emissions embedded in agricultural imports, then ensure that these do not increase the carbon footprint of our consumption, compared to EU production. This way, the EU can mitigate its own agricultural emissions while making sure that these do not leak to other countries.

3.4.2 Leveraging public and private funds for climate action in agriculture

As explained previously, the EU is committed to mainstreaming climate action in its policies and budget. In addition to improving the methodology applied to track the 20-25% of 'climate spending', it is key that no EU money is spent on programmes or projects that are counter to our climate and environmental objectives.

Furthermore, private investments should also be harnessed to contribute to finance climate action in all sectors, including agriculture. By developing an evidence-based taxonomy setting strict standards for what constitutes 'green activity' for all sectors, including agriculture, the EU can help channel private money away from climate-harming activities and towards programmes and projects that contribute to mitigation and adaptation.

3.5 DELIVERING JOINTLY FOR CLIMATE AND BIODIVERSITY

Mass extinction and climate breakdown are the two main environmental challenges of modern society. And the challenges are intertwined: climate change is, and will increasingly be, one of the main direct drivers of biodiversity loss,[52] while biodiversity loss reduces nature's resilience to climate change. This will have (and already has) a huge negative impact on biodiversity (e.g. through droughts, loss of habitat through forest fires, loss of general ecosystem coherence as migration patterns and other behaviours are put out of sync), so reducing emissions from agriculture is crucial for biodiversity. Adaptation measures to climate change will also affect biodiversity. If, for example, farms increase irrigation use in response to drought, this could lead to wetlands being drained and groundwater sources being over-exploited. Or if trees are planted in inappropriate habitats, especially, drained peatlands, it can be harmful for both biodiversity and carbon storage.

At the same time, there are a range of different mitigation options that will have different impacts on biodiversity. Europe must strive for win-wins and avoid a situation where climate change mitigation measures have negative trade-offs with other environmental dimensions. An example of a win-win is the establishment or maintenance of quality hedgerows and other landscape elements, which provides habitats and contribute to carbon sequestration. Similarly, the rewetting of peatlands will involve huge gains for both biodiversity and climate, as peatlands are the largest source of agriculture emissions.

There are also lose-lose interventions that may be pursued in the name of climate change, namely the cultivation of crop-based bioenergy and biofuels, or the burning of wood for bioenergy. While concerns about such products originally related mainly to biodiversity due to their huge land-footprint, it has now become clear that such products are also not beneficial from a climate perspective. They could even increase emissions compared to fossil fuels,[53] even before the opportunity cost of 'missed carbon sequestration' is considered.[54]

Other measures, namely restoration of tree cover and livestock reduction, will depend on how these land use changes are implemented and managed, and the trade-offs may not always be between climate-biodiversity but between species too. In the case of livestock, it is crucial to concentrate reductions in intensive sectors, and shift towards predominantly plant-based diets. At the same time, some extensively grazed habitats (density depends on purpose and perspective and should be further researched) like species-rich semi-natural grasslands must be maintained (to benefit certain wild species) and will provide a small amount of high-quality meat and dairy products. A holistic and fully science-based land planning perspective is therefore crucial to restoring the right kinds of woodlands and maintaining the right kinds and levels of grazed habitats in the process of shifting towards predominantly plant-based diets.

Applying certain biodiversity safeguards to climate measures will help to mitigate potential negative trade-offs between biodiversity and climate objectives. Any policy incentivising land use changes (e.g. afforestation) must include biodiversity in its objectives and must be based on an assessment of the pre-existing biodiversity value, either at planning or at project level. Schemes should be monitored not only in terms of GHG emission but also on their impact on other environmental dimensions.

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52 IPBES: Global assessment

53 Carbon balance effects of U.S. biofuel production and use; EU bioenergy

54 World Resources Institute: Ensuring Crop Expansion is Limited to Lands with Low Environmental Opportunity Costs

CONCLUSION

Understanding agricultural GHG emissions is more complex than many other sectors, as they primarily consist of non-CO_2 gases with different warming impacts and atmospheric lifetime. This report has highlighted the importance of widening the understanding of agricultural GHG emissions to also include emissions from land use, land use change and forestry (LULUCF), emissions normally ascribed to other sectors (such as energy and transport) and emissions hidden in imported products. It also puts soil carbon sequestration in context: a great opportunity for farmers and land managers to play a positive role in climate mitigation and adaptation, although they will be merely undoing centuries of soil carbon depletion by agricultural activities.

The report has called attention to the lack of climate ambition in the common agricultural policy (CAP) and the lack of attention to agriculture in the National Energy and Climate Plans (NECPs). Not only are many measures too weak, they are also lacking a robust monitoring and evaluation framework, with science-based targets and indicators. There is also a well-documented discrepancy between the claimed climate action driven by the policies and the actual situation on the ground. There is a serious concern that these inconsistencies and loopholes might be replicated or even expanded in the future CAP currently under negotiation.

In the report, five clusters of policy recommendations are outlined. The first relates to reductions of GHG emissions, which require a transition for the livestock sector towards more extensive systems, a wide-scale adoption of agroecological practices, and drastic improvements to nutrients management. The second focuses on increasing carbon sinks, arguing for the protection and management of permanent grasslands and the conservation and restoration of wetlands, peatlands and forests. The third targets governance and monitoring, covering a focus on inclusive governance for policymaking as well as robust and result-oriented monitoring. The fourth focuses on integration of climate into all EU policies and calls for climate-proof trade policies and a leverage of public and private funding for climate action. The fifth cluster brings attention to the importance of considering synergies and trade-offs between climate action and biodiversity objectives.

The report taps into the growing debate on the role of agriculture in tackling the climate challenge facing our society. The challenge is tremendous, and our response must be comprehensive and ambitious: all sectors must play their part and agriculture is no exception. This understanding is particularly important in this very moment, as the negotiations about the future CAP are still ongoing, providing an extended window of opportunity to convince decision-makers about their responsibility and the potential of turning the CAP into a powerful lever for climate action.

romaniamissions (pixabay.com)

Appendix 1: NECP assessment description

Summary Governance Regulation

The Regulation for the Governance of the Energy Union is a regulation that entered into force on December 28, 2018. It sets out the main planning and reporting duties on energy and climate targets for all Member States. Revised in 2018, the Governance Regulation has been designed to check whether the EU is on track to meeting its commitments under the Energy Union Strategy and the Paris Agreement. Whereas previously responsibilities for climate and energy policies were accounted for under different laws such as the Renewables Directive and the Energy Efficiency Directive, this Regulation aims to bring all of these actions together under one roof.

National Energy and Climate Plans

National Energy and Climate Plans (NECPs) are required under the governance system and are designed to help Member States plan and report on how they will achieve their climate and energy targets . Bringing all energy and climate targets into one strategy, the NECPs cover targets for GHG emissions, renewable energy and energy efficiency.

In particular, NECPs should clearly show Member States' contribution to achieving the EU collective key targets for 2030:

- reducing greenhouse gas emissions (GHGs) by 40% below 1990 levels by 2030;
- achieving a share of at least 32% for renewable energy sources (RES) of the total final energy consumption;
- increasing the energy efficiency by at least 32.5% compared to the 2007 PRIMES projection for 2030.

NECPs will first cover the period 2021-2030 and then every 10 year period after that.

The deadline for Member States to finalise their NECPs is December 31, 2019. NECPs will have to be updated every 5 years after that.

Appendix 2: Assessment of Irish NECP draft

Scope

Indicator	Indicator description	Scale
Consistency with Energy Union governance regulation	Does the plan follow the mandatory template as outlined in the Governance Regulation?	4 = to a great extent
	Explanations: Includes something on the majority of necessary elements in the Governance regulation template.	
Sectors/policies coverage	Does the plan include policies covering all required sectors including the agricultural sector?	3 = to a moderate extent
	Explanations: The Plan incorporates the necessary sectors into the Plan, however the detail of relevant policies is often lacking and not quantitative, particularly for agriculture.	
Deadline	Has the plan been published on time/respecting deadline?	4 = yes, no delay
	Explanations: The draft plan was published for consultation in December 2018 before the due date.	

Transparency

Indicator	Indicator description	Scale
Public participation	Does the plan include early and effective opportunities for public participation?	0 = no opportunities/form of consultation 1 = no only limited and not public 2 = no, public consultation but too short time 3 = yes, several opportunities 4 = yes, several opportunities and ample time to participate
	3 Explanations: An initial public consultation was held in October-November 2018. This consultation explained the NECP template and process and asked a series of open questions. Over 60 responses were received. These were considered as the draft NECP was being compiled. There was a second public consultation in early Spring 2019 as well.	
Publication	Is the (draft) plan publicly available?	4 = yes, plus summary in English
	Explanations: Original written in English, the draft Plan is accessible from the EU Commission website and Irish government website https://www.dccae.gov.ie/en-ie/energy/consultations/Pages/Ireland%E2%80%99s-Draft-National-Energy-and-Climate-Plan-2021-2030.aspx	

Multilevel dialogue	Does the plan cater for a multilevel dialogue where local authorities, NGOs, business, investors and the general public can actively engage and discuss the climate and agriculture policy scenarios, and review progress?	2 = only limited to very few stakeholders
	Explanations: No specific plan for multi-level stakeholder input going forward has been laid out. Public consultation was undertaken in the form of a call for written submissions. In addition, so far there is relatively little focus on complimentary measures between sectors and working together with a wide range of stakeholders to achieve climate goals.	

Measures in the agricultural sector

Indicator	**Indicator description**	**Scale**
Alignment with 2030 goals	Are agricultural policies included in the plan plausible to achieve 2030 climate goals? (even the effort shall be based on prorate based it should be 30% reduction target from 2005 agricultural emissions)	0 = not at all
	Explanations: Despite listing policies and actions under the CAP to reduce agricultural emissions, there is no quantitative breakdown of agricultural emissions, or emissions reductions that will be achieved or the reductions each policy is expected to achieve. The National Policy Position for agriculture is 'an approach to carbon neutrality in the agriculture and land-use sector, including forestry, which does not compromise capacity for sustainable food production' but this is not clearly spelled out in the draft NECP. Nor is there a breakdown of the gap to meeting the 2030 emissions target. Emissions from Agriculture (corresponding to IPCC Sector 3.) are projected to increase by 9.3% and 9.8% by 2030 and 2040 respectively compared to 2005 levels. The Draft's data projections show no reduction in annual GHG emissions from agriculture and land use to 2035 – methane and nitrous oxide emissions from livestock and nitrogen fertiliser use **increase**. Therefore no approach to carbon neutrality in this sector is shown nor any contribution from it to overall decarbonisation as required by the National Policy Position. The Plan effectively says that Ireland cannot reduced agricultural emissions to this extent, potentially increasing, relying on offsetting from other sectors (ETS/LULUCF).	

Inclusion of long-term strategy	Do plans include agricultural policies that go beyond 2030?	1 = to a small extent
	Explanations: There is a lack of specific agricultural focused policies, with only 'key measures in the Agriculture and Forest sector' provided, which could be long term solutions. Only the current actions under CAP 2014-2020 are provided.	
Consistency with EU legislation	Are agricultural policies consistent and in line with the LULUCF Regulation?	0 = not at all
	Explanations: Based on the LULUCF regulation *EU Member States have to ensure that greenhouse gas emissions from land use, land use change or forestry are offset by at least an equivalent removal of CO_2 from the atmosphere in the period 2021 to 2030* The LULUCF rules are specified but LULUCF emissions are expected to increase by 2040, particularly due to forest harvest rates exceeding the relevant previous planting rates and due to ongoing carbon loss from land due to drainage of organic soils and large-scale extraction of peat for energy and horticultural use. Emissions from Agriculture (corresponding to IPCC Sector 3.) are projected to increase by 9.3% and 9.8% by 2030 and 2040 respectively compared to 2005 levels. Emissions from LULUCF are projected to increase by 21.5% and 19% by 2030 and 2040 respectively compared to 2016 levels. Draft NECP, p197	
Consistency with agricultural legislation	Is the relevant agricultural legislation (e.g. Rural development programmes / echo schemes) addressed in the plan	1 = to a small extent
	Explanations: Rural Development is noted in the current policy landscape and *The multi-annual Rural Development Programme (RDP) which is co-funded by the European Union is worth €4 billion over 7 years and is strongly targeted towards environmental benefits* is mentioned as a key measure.	

	Also included is: *The Green, Low-Carbon, Agri-Environment Scheme (GLAS) scheme supports low carbon agriculture through a range of cross-cutting measures, and promotes the delivery of targeted environmental advice and best practice at farm level.* However there is no connections drawn between relevant schemes and carbon removal that is quantified.	
Completeness	Are policies and measures covering for ALL agricultural GHG sources (methane, nitrous oxide, carbon dioxide) included in the plan?	0 = not at all
	Explanations: GHG sources are not differentiated	
Infrastructure	Are proposed investments aligned with the long-term climate goals?	3 = to a moderate extent
	Explanations: Investment is mentioned a lot in the text of the Plan and a lot is associated with climate and energy goals. What is lacking is clear assessment of how the investment will actually contribute to emissions reductions or other climate goals. For example - *The National Development Plan (NDP) 2018-2027 sets out investment priorities of €21.8 billion for climate action for the 10 year period of which €7.6 billion is to come from the Exchequer. In addition, the NDP contains a commitment to establish a new €500m Climate Action Fund to leverage investment by public and private bodies to contribute to the achievement of Ireland's energy and climate targets.*	
Policies beyond or additional to EU requirements	Does the plan include policies that are additional or go beyond EU requirements? .(nitrate directive etc..)	0 = not at all

	Explanations: No, there is just not the detail in any forward looking policy or measures which suggest actions will exceed EU requirements.

Consistency and Credibility

Indicator	Indicator description	Scale
Adaptation plan	Has an adaptation plan been devised for the agricultural sector? Is it reflected in the NECP?	1 = no, unclear adaptation strategy
	Explanations: A sectoral climate change adaptation plan has been prepared for agriculture but no measures from this plan are included within the NECP.	
Use of loopholes	Does the plan include use of loopholes in the agricultural sector in achieving GHG emission targets? Such as, offsetting from land use, land use change and forestry (LULUCF) activities	0 = yes, full use/no alternative sought
	Explanations: The plan does not detail exactly how the agricultural sector will reduce emissions in a quantitative way, however it is noted that in order to achieve any targets the agricultural sector will have to use transferable credits from the ETS and LULUCF.	
Policy projections Impact assessment	Does the plan use a strong and effective model used for the impact assessment of planned policies and measures in the agricultural sector?	0 = not at all

	Explanations: No environmental impact assessment included in the NECP. Strategic Environmental Assessment and Appropriate Assessment should also be undertaken but has not been done.

Trade offs

Indicator	Indicator description	Scale
Climate	Is there a risk that the policy or measure actually increases emissions? *(For instance, afforestation or growing biofuels on peatland (histosols) can release more carbon dioxide from the soil than is saved by biofuels or sequestered by afforestation. (insufficient spatial targeting). Likewise, a focus on efficiency (emission intensity) can cause an overall increase of emissions due to an increase of production (rebound effects).)*	3 = To a great extent
	Explanations: Most measures aim to increase efficiency, which from an energy stand point could increase production. There is very little mention of on-farm carbon sinks and most carbon removal measures in the sector would be through afforestation (including for bioenergy), which can lead to increased emissions. Domestic biomass from agricultural crops is foreseen to considerably increase by 2030.	
Air quality	Do proposed policies impact air quality?	1 = no effect
	Explanations: Some of the measures would look to improve air quality due to more efficient/renewable energy use e.g. Targeted Agricultural Modernisation Scheme (TAMS) provides support for energy efficiency measures and adoption of renewable energy technologies across the sector; the projected rise in the use of bioenergy (through both agricultural biofuels and forestry biomass) could lead to reduced air quality. In addition, the increase in ammonia emissions has resulted in Ireland being in breach of the National Emissions Ceiling Directive. With projections of increased emissions and increased fertiliser use, it is highly likely that ammonia emissions will also increase impacting on air quality.	
Water	Do proposed policies impact water quality? Measures such as - efficient use and recycling of nutrients which optimise nitrogen use efficiency and reduce losses of reactive nitrogen to the environment - feeding strategies	2 = small improvement

	Could see reduction in runoff and thus water quality improvements. However multi-purpose buffer zones which promote biodiversity, hold carbon and absorb nutrients could be more actively added to policy. Land use changes can also impact water quality, forestry operations can lead to increases in both nutrients and debris running off land, which if not managed can lead to decreased water quality.	
Soil quality	Do proposed policies improve soil quality?	2 = small improvement
	Explanations: For the measures below to work well, soil quality has to be a key priority. Furthermore, from an economic standpoint, measures to at least maintain soil quality will need to be implemented to maintain production. - *Engage with the DCCAE led cross departmental working group to analyse the feasibility of including 'Wetland Draining and Rewetting' in the national inventory; - The Green, Low-Carbon, Agri-Environment Scheme (GLAS) scheme supports low carbon agriculture through a range of cross-cutting measures, and promotes the delivery of targeted environmental advice and best practice at farm level. - Undertake research to further elaborate the concept of carbon neutrality from an Irish agriculture and land use perspective, and develop pathway scenarios;*	
Biodiversity	Do proposed policies impact biodiversity? Explanations: 1. Greenhouse gas emissions from agriculture are projected to increase to 2030 and beyond in Ireland. Fertiliser use is also projected to increase significantly and hence ammonia emissions will also increase impacting on habitats and thus on species. 2. Afforestation is needed in Ireland as we have a very low tree cover and it is also important as part of our plans to tackle climate change. Afforestation can be a significant threat to biodiversity, especially ground nesting birds, if previously biodiversity-rich farmland is planted. Currently there are insufficient safeguards within the policies and processes for afforestation making it a significant pressure and threat on biodiversity and High Nature Value Farmland. In addition emissions from Emissions from LULUCF are projected to increase by 21.5% and 19% by 2030 and 2040 respectively compared to 2016 levels. 3. The GLAS scheme may be very beneficial to biodiversity but the evaluation of this scheme will reveal all.	0 = yes negatively

Energy consumption	Do proposed policies reduce energy consumption?	2 = small improvement
	Explanations: There is the potential for measures to decrease overall energy consumption (or at least the carbon footprint per unit of energy due to efficiency) however as many of the measures are for production driven efficiency, this could also have the impact of actually increasing energy use. e.g *Provision of sustainable biomass materials for renewable energy generation, the improvement of energy efficiency at farm level and adoption of RE technologies at farm level & Support of Information Communication Technology (ICT) in agriculture to aid the delivery of sustainable intensification.*	
Job creation	Does the plan include investments in local industries, thus promoting job creation in these industries?	1 = almost insignificant increase 2 = small increase
	Explanations: Rural development is featured in the plan. However specific support programmes to labour intensive farms or local industry investment is not broken-down. With land use change, for example to biofuel crops, traditional farming systems are displaced for large scale enterprises which potentially will require less human labour. The multi-annual Rural Development Programme (RDP) which is co-funded by the European Union is worth €4 billion over 7 years and is strongly targeted towards supporting farmers financially.	

Appendix 3: Assessment of Spanish NECP draft

Scope

Indicator	Indicator description	Scale
Consistency with Energy Union governance regulation	Does the plan follow the mandatory template as outlined in the Governance Regulation?[55]	**3 = to a moderate extent**
	Even if the draft NECP mostly follows the template required under Annex I of the Governance Regulation, it does not contain information on all subheadings required. **Some important sections have not been included, like section 1.1.iii (Overview table with key objectives, policies and measures of the plan), 1.3 (Consultations and involvement of national and Union entities and their outcome), or 1.4 (Regional cooperation in preparing the plan).**	
Sectors/policies coverage	Does the plan include policies covering all required sectors including the agricultural sector?	**4 = to a great extent**
	The draft NECP includes policies covering all required sectors including the agricultural sector. However, **some policies are insufficiently developed**, and more detail should be provided in the final version of the NECP, as noted by the European Commission in its recommendations issued on 18 June 2019 (SWD (2019) 262).	
Deadline	Has the plan been published on time/respecting deadline?	**1 = considerable delay**

[55] http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

	Spain was the last EU country to send its draft NECP to the European Commission on 22 February (**almost two months delay**). The delay in its preparation has been marked by the country's political instability. In June 2018 Spain suffered an unexpected change of government due to a no confidence motion filed by the Socialist Party, which began working from scratch on the draft text only from that date.

Transparency

Indicator	**Indicator description**	**Scale**
Public participation	Does the plan include early and effective opportunities for public participation?[56]	**2 = no, public consultation but too late**
	Although a public consultation process took place, it started after the draft NECP was sent to the European Commission, i.e. on 22 February, being contrary to Article 7 of the Aarhus Convention. This article requires public participation in the preparation of plans relating to the environment, as is the case with the NECP. To this end, it requires measures to ensure that such participation "begins at the beginning of the procedure, i.e. when all options and solutions are still possible and when the public can exert a real influence". Although the draft NECP has been subject to public information and consultation, such participation has started at a late stage - once the government had already notified it to the European Commission - which prevents the public from exerting a real influence on its content as not all options are open. Article 10 of the Governance Regulation lays down obligations for public consultation in the process of preparing the NECP. However, the wording given by this article is contrary to Article 7 of the Aarhus Convention, as it does not require a public participation process from the beginning of the NECP preparation procedure covering the period 2021-2030, i.e. of the draft plan before its submission to the European Commission. In any case, regardless of what the Governance Regulation establishes, Spain must	

[56] Art. 10 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

	comply with its public participation obligations in accordance with the Aarhus Convention, to which it is a party, and must have subjected the PNIEC to public participation from its initial drafting stage. Nevertheless, the text indicates that, for the drafting of the NECP, meetings with different stakeholders took place, which, however, were not generally open to stakeholders from all sectors and from society. These meetings were bilateral and did not offer significant opportunities to discuss or influence the preparation of the draft. Finally, nothing is specified about the outcome of these meetings or the information provided to stakeholders.	
Publication	Is the (draft) plan publicly available?[57]	**3 = yes**
	The draft NECP was published on Ministry for Ecological Transition website on 22 February and is available at the following link: https://www.miteco.gob.es/es/cambio-climatico/participacion-publica/marco-estrategico-energia-y-clima.aspx On the same page, a summarized version is also available for ease of use. A summary in English is not available on this website.	
Multilevel dialogue	Does the plan cater for a multilevel dialogue where local authorities, NGOs, business, investors and the general public can actively engage and discuss the climate and agriculture policy scenarios, and review progress?[58]	**3 = yes, some effort in including multiple stakeholders and gather input**
	Section 1.3 (Consultations and involvement of national and Union entities and their outcome) required under Annex I of the Governance Regulation has not been included in the draft. However, some references to multilevel dialogue are made throughout the draft text.	

[57] Art. 3.4, 9.4 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf
[58] Art. 11 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

	The draft NECP mentions coordination between the central government and regional authorities through the existing Climate Change Policies Coordination Commission in order to identify links between the NECP and regional policies and involve both administration levels in achieving the targets. The Strategic Environmental Assessment and a second phase of the public consultation process are also mentioned as platforms for gathering inputs from business entities, social and environmental organisations and energy companies.

Measures in the agricultural sector

Indicator	Indicator description	Scale
Alignment with 2030 goals	Are agricultural policies included in the plan plausible to achieve 2030 climate goals?[59] (even the effort shall be based on prorate based it should be 30% reduction target from 2005 agricultural emissions)	**3 = to a moderate extent**
	According to the measures contemplated in the draft NECP, diffuse sectors will contribute with a reduction of 38% in 2030 compared to 2005 levels. This value is much higher than the national target of 26% and is therefore in line with the overall EU reduction target of 30% for diffuse sectors. However, it should be underlined that the **agriculture and livestock sector only contribute with a reduction of about 18% compared to its 2005 levels.** In addition, it should be taken into account that the current 40% GHG reduction target in 2030 compared to 1990 set at EU level is insufficient to keep the temperature increase well below 1.5°C and would not even allow the 2°C scenario to be met. This is indicated by the IPCC in its special report published in October 2018, which contemplates that the reduction path not to exceed the temperature increase of 1.5 °C requires global emission reductions of around 45% (between 40-60%) by 2030 with respect to 2010 emissions. The EU should make a greater contribution to achieving the	

[59] https://ec.europa.eu/clima/policies/effort/proposal_en

	1.5°C target, as it is unrealistic to expect developing economies to reduce their emissions faster. In concrete, the EU would have to reduce its GHG emissions by 65% by 2030 compared to 1990 and this would imply a greater contribution from Spain as well.	
Inclusion of long-term strategy	Do plans include agricultural policies that go beyond 2030?	**0 = not at all**
Consistency with EU legislation	Are agricultural policies consistent and in line with the LULUCF Regulation?[60]	**3 = to a moderate extent** **4 = to a great extent**
	The draft NECP underlines Spain's obligation to ensure that in the 2021-2030 period emissions from the LULUCF sector do not exceed absorptions. Anyway, it also states that the set of measures to be implemented will allow Spain to obtain, as far as possible, a positive balance of absorptions so that up to 29.1 MtCO2 (limit established for Spain in Annex 3 of Regulation (EU) 2018/842) can be used over the period 2021-2030 to meet the objectives in diffuse sectors. Among the measures related to forest sinks are: the regeneration of grazing systems, the promotion of poplar trees to replace agricultural crops in flood plains, the creation of wooded areas. In addition, there are other measures aimed at preventing forest fires, such as carrying out forestry work or controlled grazing.	

[60] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0841&from=EN

Consistency with agricultural legislation	Is the relevant agricultural legislation (e.g. Rural development programmes / eco schemes) addressed in the plan?	**1 = to a small extent**
	The only reference to Spanish RDPs can be found in one of the annexes, specifically in the summary table of existing policies and measures at national level, adopted and/or implemented to date in the fight against climate change. This table only mentions the objective of the RDPs and GHGs being addressed. With regard to eco-schemes, although they are not explicitly mentioned, they are included within the mechanisms of action to encourage the implementation of measures planned for the agricultural sector and agricultural sinks (interventions of the national CAP Strategic Plan).	
Completeness	Are policies and measures covering for ALL agricultural GHG sources (methane, nitrous oxide, carbon dioxide) included in the plan?	**3 = to a moderate extent**
	The draft NECP foresees measures to reduce emissions from crop management (i.e. promotion of dry crop rotations or adjustment of nitrogen inputs to crop needs), emissions from manure management (i.e. covering of slurry ponds, frequent emptying of slurry pits in pig houses, etc.) although, in the latter case, measures to encourage the implementation of anaerobic digesters are lacking. However, the draft NECP lacks measures to address emissions associated with enteric fermentation of ruminants, i.e. precision feeding.	
Infrastructure	Are proposed investments aligned with the long-term climate goals?	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent

Policies beyond or additional to EU requirements	Does the plan include policies that are additional or go beyond EU requirements? (nitrate directive etc..)	**0 = not at all**

Consistency and Credibility

Indicator	Indicator description	Scale
Adaptation plan	Has an adaptation plan been devised for the agricultural sector? Is it reflected in the NECP?[61]	**1 = no, unclear adaptation strategy** **2 = yes, but not clearly reflected in the plan**

[61] Art. 19 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

	In terms of adaptation, the draft NECP only states that Spain will draw up a new National Climate Change Adaptation Plan (PNACC) for the period 2020-2030 as a basic planning instrument to promote coordinated and coherent action against the effects of climate change. This new PNACC will define the objectives, criteria, areas of application and actions to promote resilience and adaptation to climate change. However, the draft NECP includes measures that contribute to the adaptation of the agricultural sector, i.e. promotion of conservation agriculture (direct seeding) and rotation of rain-fed arable crops, including legumes.	
Use of loopholes	Does the plan include use of loopholes in the agricultural sector in achieving GHG emission targets?[62] Such as, offsetting from land use, land use change and forestry (LULUCF) activities	0 = yes, full use/no alternative sought 1 = yes, large use 2 = yes, most opportunities used 3 = yes, but limited 4 = no loopholes used
	The draft NECP does not provide clear information on whether it envisages the use of flexibility mechanisms, although it can be expected that they will be used. For example, the draft recognizes the long-term climate benefits of the LULUCF sector and its contribution to the 2030 emissions mitigation target, stating that the set of measures to be implemented will allow Spain to obtain, as far as possible, a positive balance of absorptions so that up to 29.1 Mt CO2eq (Regulation (EU) 2018/842, Annex 3) can be used over the period 2021-2030 to meet the objectives in diffuse sectors. However, the draft NECP does not include the expected quantitative contributions from the LULUCF sector as the contribution of the measures to the absorption will depend on the Forest Reference Level (FRL), which is currently in the calculation phase and must be submitted to the European Commission no later than 31 December 2019 (for the period 2021 to 2025). The contributions will be incorporated into the final NECP once FRL has been defined.	

[62] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0842&from=EN

Policy projections Impact assessment	Does the plan use a strong and effective model used for the impact assessment of planned policies and measures in the agricultural sector?	**4 = yes, very strong and detailed model used**
	The estimation of projected emissions from the agricultural sector, for which planned policies and measures have been taken into account, has been carried out applying the same calculation model used in the 2018 edition of the National Emissions Inventory. This model is based on the 2006 IPCC methodological guidelines using a TIER 2 approach based on country-specific data.	

Trade offs

Indicator	**Indicator description**	**Scale**
Climate	Is there a risk that the policy or measure actually increases emissions? *(For instance, afforestation or growing biofuels on peatland (histosols) can release more carbon dioxide from the soil than is saved by biofuels or sequestered by afforestation. (insufficient spatial targeting). Likewise, a focus on efficiency (emission intensity) can cause an overall increase of emissions due to an increase of production (rebound effects).)*	**1 = To a small extent**
	Industry (Processes) is the only sector of the economy that should increase very little its emissions (less than 7%) in the NECP period, going from 21,036,000 tonnes of CO2eq in 2015 to 22,428,912 tonnes of CO2eq in 2030.	

Air quality	Do proposed policies impact air quality?	**4 = great improvement**
	The measures contained in the draft NECP succeed in reducing both GHG emissions and emissions of major air pollutants. **Primary PM2.5 emissions are reduced by 31%** as a result of the use of cleaner technologies. In addition, **sulphur dioxide (SO_2) and nitrous oxides (NOx)**, the main pollutants for the formation of secondary PM2.5, **are reduced by 44% and 29% respectively** due to the reduction of coal in the electricity sector, and on the other hand to the improvement of efficiency in internal combustion engines and electrification. The series of measures applied in the Target scenario will allow premature deaths by 2030 to be reduced by 2,222 deaths compared to the Trend scenario. This implies going from 8,951 to 6,729 premature deaths, that is, a reduction of around 25% (17% - 36%).	
Water	Do proposed policies impact water quality?	**2 = small improvement**
	The draft NECP foresees measures that may lead to an improvement in the surface and/or groundwater quality. For example, the adjustment of nitrogen supply to the needs of the crop or the promotion of poplar trees to replace agricultural crops in floodplains (due to their location in transitional areas between agricultural land and riverbanks can act as a natural filter for runoff water and irrigation surpluses with fertilizers and plant protection products). However, bearing in mind the role played in Spain by intensive pig farming (with a constant proliferation of new industrial holdings) with regard to nitrate contamination of groundwater, there is a lack of measures aimed at the progressive reduction of this intensive livestock herd, adapting it to the real carrying capacity of the environment.	

Soil quality	Do proposed policies improve soil quality?	**4 = great improvement**
	The draft NECP foresees different measures that contribute to improving the physical, chemical and biological properties of the soil (fertility, moisture levels, nitrogen content, erosion resistance, biodiversity, etc.) Among them are the promotion of arable crops rotations that include legumes, the adjustment of the nitrogen contribution to the needs of the crop, the manufacture of organic fertilizer from livestock manure, hydrological-forestry restoration in areas with high risk of erosion, maintenance of cover crops, incorporation of pruning remains to the soil in woody crops, direct seeding. Also, given the high frequency of forest fires in Spain and their devastating effects on the soil (erosion, loss of nutrients, reduction of soil biological activity, reduction of infiltration of rainwater, among others), it is important to highlight the importance of the measures provided in the NECP for its prevention. That is, the execution of silvicultural work or controlled grazing in strategic areas.	
Biodiversity	Do proposed policies impact biodiversity?	**3 = moderate improvement**
	Despite the fact that the draft NECP foresees measures for the protection of biodiversity and its habitats against climate change, there is little integration of the NECP with other biodiversity protection policies and instruments to ensure that the development of a new energy model is not done at the expense of the conservation of biodiversity and that the new infrastructures that are developed have the minimum possible impact.	
Energy consumption	Do proposed policies reduce energy consumption?	**4 = great improvement**

	The draft NECP assumes as an energy efficiency improvement target the one set by the Energy Efficiency Directive of 32.5%. However, in the projections of the Target Scenario the reduction in primary energy consumption - compared to the 2007 PRIMES projection for 2030 - is 39.6% in 2030, which will result in primary energy consumption (excluding non-energy uses) of 98.2 Mtoe in that year.	
Job creation	Does the plan include investments in local industries, thus promoting job creation in these industries?	**4 = great investment and substantial job growth**
	The NECP aims to ensure energy transition by ensuring improved competitiveness and employment in the industrial sector, among others. The draft states that the implementation of the NECP will generate significant investment and employment opportunities for Spanish regions and counties that currently have higher unemployment rates and lower levels of economic development. In this sense, the industrial, economic and employment opportunities that are identified and promoted in the NECP deployment in those counties and regions most affected by the energy transition and the decarbonization of the economy will be especially relevant. Employment in the industrial sector is expected to increase by between 48,000 and 53,000 people/year over the period 2020-2030.	

Appendix 4: Assessment of Hungarian NECP draft

Scope

Indicator	Indicator description	Scale
Consistency with Energy Union governance regulation	Does the plan follow the mandatory template as outlined in the Governance Regulation?[63]	0 = not at all 1 = to a small extent **2 = to some extent** 3 = to a moderate extent 4 = to a great extent
	Explanations Although the plan follows the structure foreseen in the Governance Regulation, out of the more than 110 points/aspects provided in the mandatory template, the Hungarian (draft) NECP has almost completely ignored to mention about approximately 40 and even in case of many it mentions, there are serious gaps, missing or not sufficiently detailed information, indications to information to be provided only at a later stage. Objectives, policies and measures are not yet fully developed. Often, concrete data, circumstances are missing, targets are not presented in a quantified way. Required policy steps are frequently not defined. There has been some effort made at least to formally follow the template, if not in the details, contentwise.	
Sectors/policies coverage	Does the plan include policies covering all required sectors including the agricultural sector?	0 = not at all **1 = to a small extent** 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations Policies are generally discussed in the NECP only to a conceptual depth, there are several fields/sectors that are not sufficiently detailed, for example, climate-friendly transportation, the reform of the tax system, changing consumer behaviour and most importantly from our perspective: the	

[63] http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

	greenhouse gas emissions from agriculture. Even when there is mention of sectoral policies, judging them of their depth, we cannot be sure that there have been any previous analyses of feasibility, alternatives or optimum calculations. It is not clear either whether the government already knows the tools, sources of funds necessary for the implementation of the mentioned sectoral policies. Within the government's objective to reduce GHG emissions by 40% (compared to 1990 levels), in relation to the agricultural sector, Hungary intends to limit the increase of GHG emissions at 9.28 million tCO2e maximum, of which 1.59 million tCO2e is from energy- and 7.69 million tCO2e of non-energy related sources. At a later point in the NECP, the government still estimates that agricultural emissions will show an increase of 18% in 2030, primarily as a consequence of increased livestock.	
Deadline	Has the plan been published on time/respecting deadline?	0 = no publication 1 = considerable delay 2 = no, reasonable delay **3 = yes, some delay** 4 = yes, no delay
	Explanations Although the date on the published draft NECP is 2018, the plan itself was publicly available only in May 2019.	

Transparency

Indicator	**Indicator description**	**Scale**
Public participation	Does the plan include early and effective opportunities for public participation?[64]	0 = no opportunities/form of consultation 1 = no only limited and not public 2 = no, public consultation but too short time **3 = yes, several opportunities**

[64] Art. 10 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

		4 = yes, several opportunities and ample time to participate
	Explanations In April 2016, a working group has been set up by the National Ministry of Development with the involvement of various ministerial departments and external stakeholders. There was a sectoral consultation in the summer of 2018. The government invited sectoral associations, sectoral actors, civil society organisations, higher-education institutions, research institutes, consultancies and individual experts. Altogether, 134 stakeholders have been contacted for consultation related to the NECP and in the end, 50 recommendations have been received and evaluated.	
Publication	Is the (draft) plan publicly available?[65]	0 = no 1 = yes, 6 or more months delay 2 = yes, 2-3 months delay **3 = yes** 4 = yes, plus summary in English
	Explanations Although, there are several mentions in various articles to the fact that the NECP has been published by the Ministry of Innovation and Technology, apart from one article, there is no mention of it on any website of the Hungarian government. The document is available on the https://ec.europa.eu website.	

[65] Art. 3.4, 9.4 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

Multilevel dialogue	Does the plan cater for a multilevel dialogue where local authorities, NGOs, business, investors and the general public can actively engage and discuss the climate and agriculture policy scenarios, and review progress?[66]	0 = no provision for dialogue 1 = very limited effort 2 = only limited to very few stakeholders **3 = yes, some effort in including multiple stakeholders and gather input** 4 = yes, effective dialogue and high engagement
	Explanations As previously mentioned, in April 2016, a working group has been set up by the National Ministry of Development with the involvement of various ministerial departments and external stakeholders. There was a sectoral consultation in the summer of 2018. The government invited sectoral associations, sectoral actors, civil society organisations, higher-education institutions, research institutes, consultancies and individual experts. Altogether, 134 stakeholders have been contacted for consultation related to the NECP and in the end, 50 recommendations have been received and evaluated. In addition to the above mentioned stakeholder consultation opportunities, there have been various regional consultations with neighbouring Member States. Public consultation is mentioned in the NECP, but not detailed. There is some indication that public consultation will happen at a later stage.	

Measures in the agricultural sector

Indicator	**Indicator description**	**Scale**

[66] Art. 11 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

Alignment with 2030 goals	Are agricultural policies included in the plan plausible to achieve 2030 climate goals?[67] (even the effort shall be prorate based it should be 30% reduction target from 2005 agricultural emissions)	**0 = not at all** 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations Unfortunately, apart from the previously described general estimates and historical information on agricultural emissions, there is hardly any mention of the farming sector in the NECP. When it is mentioned, it is mostly together with other sectors (like waste) or in relation to renewable energy.	
Inclusion of long-term strategy	Do plans include agricultural policies that go beyond 2030?	**0 = not at all** 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations Unfortunately, apart from the previously described general estimates and historical information on agricultural emissions, there is hardly any mention of the farming sector in the NECP. When it is mentioned, it is mostly together with other sectors (like waste) or in relation to renewable energy.	
Consistency with EU legislation	Are agricultural policies consistent and in line with the LULUCF Regulation?[68]	**0 = not at all** 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent

[67] https://ec.europa.eu/clima/policies/effort/proposal_en

[68] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0841&from=EN

	Explanations Since there are no agricultural policies mentioned in the NECP, the LULUCF Regulation is referred to only in relation to some general estimates of GHG emissions, but not in detail, the indicated numbers are not sufficiently supported by policies or further explanation.	
Consistency with agricultural legislation	Is the relevant agricultural legislation (e.g. Rural development programmes / echo schemes) addressed in the plan	**0 = not at all** 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations In addition to being no agricultural policies mentioned in the NECP, there is no mention at all of the Rural Development Programme nor the Common Agricultural Policy. These might be added at a later stage.	
Completeness	Are policies and measures covering for ALL agricultural GHG sources (methane, nitrous oxide, carbon dioxide) included in the plan?	**0 = not at all** 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations There are no concrete or detailed agricultural policies or measures mentioned in the NECP. The different greenhouse gases are mentioned only in a very general context, stating: “In 2016, agriculture contributed to the total emissions by 11%. Agricultural activities go together with the emission of CH4 and N2O, the largest part (87%) of our N2O emission comes from this sector. Since 2011, agricultural GHG emissions show a continuous increase, primarily due to the use of synthetic fertilizers and the increase in cattle stock and dairy production.”	

Infrastructure	Are proposed investments aligned with the long-term climate goals?	**0 = not at all** 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations The NECP estimates a 15.66 million tCO2e emission from the transport sector for 2030-ra. This is more than a 50% increase compared to that of 2015, which means that it will not at all proportionally contribute to reaching climate goals. (For that purpose, emissions should be 7% less compared to 2015 levels.) It is not clear how the government intends to make the transport sector sustainable, since the indicated increase in infrastructure development (more roads, more highways) will inevitably lead to more traffic, higher emissions and higher energy consumption, making it even harder to reach climate objectives.	
Policies beyond or additional to EU requirements	Does the plan include policies that are additional or go beyond EU requirements? .(nitrate directive etc..)	0 = not at all **1 = to a small extent** 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations Probably the only additional, ambitious goal in the NECP concerns district-heating, in relation to which, the government sets a 2030 target of 60% based on renewables and waste-incineration. It is not clear whether this target is supported by feasibility and sustainability analyses. Not to mention the fact that without the previous energetic refurbishment of buildings, this ambitious goal could easily become a wasted one.	

Consistency and Credibility

Indicator	Indicator description	Scale
Adaptation plan	Has an adaptation plan been devised for the agricultural sector? Is it reflected in the NECP?[69]	**0 = no** 1 = no, unclear adaptation strategy 2 = yes, but not clearly reflected in the plan 3 = yes, but limited 4 = yes, fully developed and integrated
	Explanations Hungary has a National Adaptation Strategy until 2020, but there is no mention of it in the NECP.	
Use of loopholes	Does the plan include use of loopholes in the agricultural sector in achieving GHG emission targets?[70] Such as, offsetting from land use, land use change and forestry (LULUCF) activities	0 = yes, full use/no alternative sought 1 = yes, large use 2 = yes, most opportunities used 3 = yes, but limited **4 = no loopholes used**
	Explanations The Hungarian NECP does not mention the use of loopholes in the agricultural sector in order to achieve GHG emission targets.	

[69] Art. 19 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

[70] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0842&from=EN

Policy projections Impact assessment	Does the plan use a strong and effective model used for the impact assessment of planned policies and measures in the agricultural sector?	**0 = not at all** 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = yes, very strong and detailed model used
	Explanations Since there are no concrete policies or measures mentioned in the NECP in connection to the agricultural sector, we cannot talk about a strong and effective model either.	

Trade offs

Indicator	**Indicator description**	**Scale**
Climate	Is there a risk that the policy or measure actually increases emissions? *(For instance, afforestation or growing biofuels on peatland (histosols) can release more carbon dioxide from the soil than is saved by biofuels or sequestered by afforestation. (insufficient spatial targeting). Likewise, a focus on efficiency (emission intensity) can cause an overall increase of emissions due to an increase of production (rebound effects).)*	0= Not at all 1 = To a small extent 2 = To a moderate extent **3 = To a great extent** 4 = To a very great
	Explanations Yes, unfortunately, there is great risk of an increase in emissions. Even if there are no agricultural policies or measures in the NECP, the governmental estimates obviously indicate significant increase in emissions. Apart from listing the reasons for this increase (synthetic fertilizers, livestock increase etc.), it is not clear how the government intends to tackle these increasing emissions. They might be added to the NECP at a later stage.	
Air quality	Do proposed policies impact air quality?	**0 = yes negatively** 1 = no effect 2 = small improvement 3 = moderate improvement

		4 = great improvement
	Explanations Since there are no concrete agricultural policies or measures targeting GHG emissions-reduction, only estimates for increased emissions, it can be expected that air quality will be negatively impacted.	
Water	Do proposed policies impact water quality? Explanations Since there are no concrete agricultural policies or measures targeting GHG emissions-reduction, only estimates for increased emissions, it can be expected that water quality will be negatively impacted. Sadly, water pollution is not at all mentioned by the NECP. It might be added at a later stage.	**0 = yes negatively** 1 = no effect 2 = small improvement 3 = moderate improvement 4 = great improvement
Soil quality	Do proposed policies improve soil quality?	**0 = yes negatively** 1 = no effect 2 = small improvement 3 = moderate improvement 4 = great improvement
	Explanations Since there are no concrete agricultural policies or measures targeting GHG emissions-reduction, only estimates for increased emissions, it can be expected that soil quality will be negatively impacted. Sadly, soil degradation is not at all mentioned by the NECP. It might be added at a later stage.	

Biodiversity	Do proposed policies impact biodiversity?	**0 = yes negatively** 1 = no effect 2 = small improvement 3 = moderate improvement 4 = great improvement
	Explanations Since there are no concrete agricultural policies or measures targeting GHG emissions-reduction, only estimates for increased emissions, it can be expected that biodiversity will be negatively impacted. Sadly, biodiversity is not at all mentioned by the NECP. It might be added at a later stage.	
Energy consumption	Do proposed policies reduce energy consumption?	0 = no effect 1 = minimal effect 2 = small improvement **3 = moderate improvement** 4 = great improvement
	Explanations The NECP builds on the increased share of nuclear energy (by the future addition of new blocks) and to some level, renewables, in its estimated reduction of energy consumption. This is an ambiguous tool with its well-known risks (in Hungary: a lower and warmer Danube that is traditionally used to cool reactors, etc.). Since there are no ambitious, holistic measures or policies targeting the tax system and consumption behaviour, even in the best case, we could only talk about a moderate improvement in the reduction of energy consumption.	
Job creation	Does the plan include investments in local industries, thus promoting job creation in these industries?	**0 = no investment** 1 = almost insignificant increase

		2 = small increase 3 = moderate increase 4 = great investment and substantial job growth
	Explanations There are no concrete investments in local industries mentioned in the plan. Job creation is mentioned only once in a rather general context when discussing the future competitiveness of the nation that is built on innovation and growth. The validity of this argument from an environmental and climate perspective is strongly questionable.	

Appendix 5: Assessment of German NECP draft

Scope

Indicator	Indicator description	Scale
Consistency with Energy Union governance regulation	Does the plan follow the mandatory template as outlined in the Governance Regulation?[71]	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	The plan follows the template formaly to a great extent, but with regards to content only to some extent, because following sections [RB1] [GW2] are not filled with content: 1.3, 1.4.i, 1.4.ii, 3.2.v, 3.2.vi., 3.3.iii, 3.4.1.iii, 3.4.2.iii, 4.5.2, 5.1.ii, 5.1.iii, 5.3., 5.4. In many of these cases was the political process to develop measures not yet been completed.	
Sectors/policies coverage	Does the plan include policies covering all required sectors including the agricultural sector?	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	The plan mentions all necessary sectors; it refers to the targets of the National Climate Change Plan 2050. For the agricultural sector, a reduction of 31-34% is planned by 2030, which would lead to an emission of 58-61 million tonnes of CO2. Targets are also set for all other sectors, but the plan lacks viable strategies to achieve these targets by 2030, particularly in the non-ETS sectors, which include agriculture.	
Deadline	Has the plan been published on time/respecting deadline?	0 = no publication 1 = considerable delay 2 = no, reasonable delay 3 = yes, some delay

[71] http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

		4 = yes, no delay
	The plan is to be completed by December 2019. A draft plan should be submitted to the European Commission by 31 December 2018. To date, Germany is following the timetable in relation to the replacement of the plan.	

Transparency

Indicator	Indicator description	Scale
Public participation	Does the plan include early and effective opportunities for public participation?[72]	0 = no opportunities/form of consultation 1 = no only limited and not public 2 = no, public consultation but too short time 3 = yes, several opportunities 4 = yes, several opportunities and ample time to participate
	There was no possibility for the public to participate in the preparation of the draft, as asked for in the governance regulations (Art. 10). After the publication of the draft, there is the possibility of online consultation for the public from 14 July to 2 August 2019. This is not early. The final version of the plan describes the results of the consultation in Chapter 1.3.	

[72] Art. 10 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

Publication	Is the (draft) plan publicly available?[73]	0 = no 1 = yes, 6 or more months delay 2 = yes, 2-3 months delay 3 = yes 4 = yes, plus summary in English
	The draft has been made available on the website of Federal Ministry for Economic Affairs and Energy beforehand the consultation process: https://www.bmwi.de/Redaktion/DE/Textsammlungen/Energie/necp.html	
Multilevel dialogue	Does the plan cater for a multilevel dialogue where local authorities, NGOs, business, investors and the general public can actively engage and discuss the climate and agriculture policy scenarios, and review progress?[74]	0 = no provision for dialogue 1 = very limited effort 2 = only limited to very few stakeholders 3 = yes, some effort in including multiple stakeholders and gather input 4 = yes, effective dialogue and high engagement
	The plan does provide opportunities for cross border multilevel dialogue; for example, the European Climate Initiative EUKI is financed by the German Federal Government. At national level, however, instruments for dialogue are used by the Ministry for Environment for the preparation of the National Climate Plan 2050 but not with regard to the NECP: (https://www.bmu.de/pressemitteilung/buerger-verbaende-laender-und-kommunen-praesentieren-ideen-fuer-den-klimaschutzplan-2050/).	

[73] Art. 3.4, 9.4 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

[74] Art. 11 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

Measures in the agricultural sector

Indicator	Indicator description	Scale
Alignment with 2030 goals	Are agricultural policies included in the plan plausible to achieve 2030 climate goals?[75] (even the effort shall be based on prorate based it should be 30% reduction target from 2005 agricultural emissions)	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	The plan does not describe any measures to achieve the 2030 targets, as the analysis of the European Commission also states: "While Germany's national and sector-wide greenhouse gas emission reduction targets for 2030 are in line with the German long-term strategy (National Climate Plan 2050), these are not always reflected in sector-specific national contributions (e.g. to the EU energy efficiency target) and policies and measures (e.g. in the transport, building and **agriculture sector**)" (European Commission (2019): SWD(2019) 229, Brüssel). The measures published by the Ministry of Food and Agriculture in a 10 point plan are not sufficient to achieve the goals. A study of a broad alliance of civil society[1] shows that the goals can be achieved if the livestock sector is reduced, which is not foreseen by the ministry. [1] Scheffler, M., Wiegmann, K. (2018): Quantifizierungsmaßnahmenvorschläge der deutschen Zivilgesellschaft zu THG - Minderungspotenzialen in der Landwirtschaft 2030, URL: https://www.klima-allianz.de/publikationen/publikation/quantifizierung-von-massnahmenvorschlaegen-der-deutschen-zivilgesellschaft-zu-	

[75] https://ec.europa.eu/clima/policies/effort/proposal_en

	thg-minderungspotenzialen-in-der-landwirtschaft-bis-2030/ (Stand 03.07.2019)	
Inclusion of long-term strategy	Do plans include agricultural policies that go beyond 2030?	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	As stated in the previous paragraph, the plan relies to a great extent on the Climate Plan 2050 which sets the climate goals for 2050 and also presents sector goals for each sector, jet the particular measures to reach this goal are rarely or not named	
Consistency with EU legislation	Are agricultural policies consistent and in line with the LULUCF Regulation?[76]	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	The plan admits the importance of the LULUCF as a net carbon sink. It does not communicate how this no-debit commitment will be achieved. Particularly with regard to the increased use of biomass in the energy sector, the preservation of the sink function is endangered.. Again, it is difficult to assess exactly how the programmes will impact here. For example, nothing is said about how the function of the LULUCF sector will reduce as it will be exploited to achieve the objectives of the agricultural sector.	

[76] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0841&from=EN

Consistency with agricultural legislation	Is the relevant agricultural legislation (e.g. Rural development programmes / echo schemes) addressed int the plan	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	no	
Completeness	Are policies and measures covering for ALL agricultural GHG sources (methane, nitrous oxide, carbon dioxide) included in the plan?	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	The plan does not provide for any such specifications for agriculture. The mentioned plan of the Ministry of Food and Agriculture names all sources of climate-relevant gases. At the same time it fails to correctly identify measures to reduce emissions. Reduction of emissions from livestock farming is to be achieved with reduction of production, consumption and with the reduction of nitrogen surpluses. This emerges from a study of a broad alliance of civil society (Scheffler&Wiegmann 2018).	
Infrastructure	Are proposed investments aligned with the long-term climate goals?	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	The proposed targets are based on the 2050 climate targets. But there are no concrete measures to achieve the 2030 targets. This applies in particular to the agricultural sector	

Policies beyond or additional to EU requirements	Does the plan include policies that are additional or go beyond EU requirements? .(nitrate directive etc..)	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Neither the NECP nor the 10 points plan of the Ministry of Agriculture lead to the achievement of the 2030 goals, nor are any further measures mentioned which go beyond existing demands of the European Union.	

Consistency and Credibility

Indicator	**Indicator description**	**Scale**
Adaptation plan	Has an adaptation plan been devised for the agricultural sector? Is it reflected in the NECP?[77]	0 = no 1 = no, unclear adaptation strategy 2 = yes, but not clearly reflected in the plan 3 = yes, but limited 4 = yes, fully developed and integrated
	The Ministry for Food and Agriculture has elaborated a 10 point plan, which quantifies the contribution of agriculture to the achievement of the climate goals, but these goals are not ambitious enough from the point of view of the German civil society and the implementation and therefore the adaptation of agriculture is not described. However, the NECP does not mention these objectives.	

[77] Art. 19 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

Use of loopholes	Does the plan include use of loopholes in the agricultural sector in achieving GHG emission targets?[78] Such as, offsetting from land use, land use change and forestry (LULUCF) activities	0 = yes, full use/no alternative sought 1 = yes, large use 2 = yes, most opportunities used 3 = yes, but limited 4 = no loopholes used
	The plan does not speak of possible compensation by the LULUSF sector, this is also criticized by the analysis of the European Commission. Therefore, it is difficult to assess possible effects. This can lead to the use of loopholes	
Policy projections Impact assessment	Does the plan use a strong and effective model used for the impact assessment of planned policies and measures in the agricultural sector?	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = yes, very strong and detailed model used
	As no concrete measures of the objectives to be achieved are described in the plan regarding agriculture, the impact assessment in Chapter 5 of the plan is also missing. This is described as follows: "An analysis of the socio-economic and environmental impacts of planned strategies and measures within the framework of an impact assessment is possible as soon as the design of future strategies and measures is known". This is an insufficient result at this stage.	

[78] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0842&from=EN

Trade offs

Indicator	Indicator description	Scale
Climate	Is there a risk that the policy or measure actually increases emissions? *(For instance, afforestation or growing biofuels on peatland (histosols) can release more carbon dioxide from the soil than is saved by biofuels or sequestered by afforestation. (insufficient spatial targeting). Likewise, a focus on efficiency (emission intensity) can cause an overall increase of emissions due to an increase of production (rebound effects).)*	0= Not at all 1 = To a small extent 2 = To a moderate extent 3 = To a great extent 4 = To a very great
	Since the measures have not yet been worked out, it is not possible to quantify the risk. But it may well be that climate damaging processes occur in this area. However, the objective of the Ministry of Food and Agriculture is, to increase manure digestion to 70%, this would not be possible in existing plants and the distances from producers to biogas plants are too long, the transport of manure, which is heavy due to its high water content, contradicts the objectives of the plan both economically and ecologically. In addition, this would maintain the existing system of animal husbandry with all its environmental problems.	
Air quality	Do proposed policies impact air quality?	0 = yes negatively 1 = no effect 2 = small improvement 3 = moderate improvement 4 = great improvement
	The plan mentions a process which has been started on 28 November 2017, the federal government launched the "Clean Air Immediate Programme", This programme mainly deals with air quality in cities and creates measures in the transport sector. A process for a new directive (TA-Luft) on the part of the Federal Government is underway, but this process is repeatedly delayed, while agricultural practices affect air quality continuously in a negative way.	

	However, the overall assessment of the implementation of the plan and the link with air quality is largely absent	
Water	Do proposed policies impact water quality?	0 = yes negatively 1 = no effect 2 = small improvement 3 = moderate improvement 4 = great improvement
Soil quality	Do proposed policies improve soil quality?	0 = yes negatively 1 = no effect 2 = small improvement 3 = moderate improvement 4 = great improvement
	At present, intensive agriculture is contributing to the negative impact on water and soil. Since the NECP does not describe any measures to end or change these effects, it must be assumed that the negative effects will continue. In particular, the lack of water protection regulations and the lack of soil protection rules form the basis for negative environmental developments in these respects	
Biodiversity	Do proposed policies impact biodiversity?	0 = yes negatively 1 = no effect 2 = small improvement 3 = moderate improvement 4 = great improvement

Energy consumption	Do proposed policies reduce energy consumption?	0 = no effect 1 = minimal effect 2 = small improvement 3 = moderate improvement 4 = great improvement
	Since the NECP does not describe any measures to reduce energy consumption in the agricultural sector, it must be assumed that the current trend in energy consumption will continue.	
Job creation	Does the plan include investments in local industries, thus promoting job creation in these industries?	0 = no investment 1 = almost insignificant increase 2 = small increase 3 = moderate increase 4 = great investment and substantial job growth
	The plan assumes that certain measures will result in a moderate increase in the number of jobs in the sectors concerned, but only concrete measures would enable more precise statements to be made.	

Appendix 6: Assessment of French NECP draft

Scope

Indicator	Indicator description	Scale
Consistency with Energy Union governance regulation	Does the plan follow the mandatory template as outlined in the Governance Regulation?[79]	0 = not at all 1 = to a small extent 2 = to some extent X 3 = to a moderate extent 4 = to a great extent
	Explanations: The plan follows the mandatory template. However, it needs to be noticed that France is one of the few countries not to have translated the plan into English for a better European dialogue.	
Sectors/policies coverage	Does the plan include policies covering all required sectors including the agricultural sector?	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent X 4 = to a great extent
	Explanations The agricultural sector is included in the plan.	

[79] http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

Deadline	Has the plan been published on time/respecting deadline?	0 = no publication X 1 = considerable delay 2 = no, reasonable delay 3 = yes, some delay 4 = yes, no delay
	Explanations: The draft plan was published on February 14th, 2019 whereas the deadline was December 31st, 2018. With 1,5 month delay, the French draft plan was one of the last to be published.	

Transparency

Indicator	**Indicator description**	**Scale**
Public participation	Does the plan include early and effective opportunities for public participation?[80]	0 = no opportunities/form of consultation 1 = no only limited and not public 2 = no, public consultation but too short time X 3 = yes, several opportunities 4 = yes, several opportunities and ample time to participate
	Explanations The plan results of a combination of other documents such as the multiannual energy programming (PPE) and the Low Carbon National Strategy (SNBC) but also elements of the financial law 2019 and the mobility law. There was a consultation on each document composing the plan even if there was no consultation on the plan	

[80] Art. 10 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

	itself. However, the results of the consultation were not always taken into account.	
Publication	Is the (draft) plan publicly available?[81]	0 = no 1 = yes, 6 or more months delay 2 = yes, 2-3 months delay X 3 = yes 4 = yes, plus summary in English
	Explanations The draft plan is publicly available on the website of the French Ministry of environment : https://www.ecologique-solidaire.gouv.fr/sites/default/files/2019%2002%2014%20projet%20de%20PNIEC%20France_Version%20consolidee.pdf	
Multilevel dialogue	Does the plan cater for a multilevel dialogue where local authorities, NGOs, business, investors and the general public can actively engage and discuss the climate and agriculture policy scenarios, and review progress?[82]	0 = no provision for dialogue 1 = very limited effort 2 = only limited to very few stakeholders X 3 = yes, some effort in including multiple stakeholders and gather input 4 = yes, effective dialogue and high engagement

[81] Art. 3.4, 9.4 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

[82] Art. 11 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

	Explanations An important consultation process was led on the documents composing the plan, especially on the Low Carbon National Strategy (SNBC). Environmental NGOs were involved in the process. Again, there was no consultation on the plan itself but only on the documents composing the plan.

Measures in the agricultural sector

Indicator	**Indicator description**	**Scale**
Alignment with 2030 goals	Are agricultural policies included in the plan plausible to achieve 2030 climate goals?[83] (even the effort shall be based on prorate based it should be 30% reduction target from 2005 agricultural emissions)	0 = not at all X 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations The agricultural policies mentioned in the plan are not ambitious enough to achieve 2030 climate goals. The plan only recalls already existing measures without settling quantified measures for climate mitigation. For example, the plan refers to the Low Carbon National Strategy which includes the maintenance of permanent pastures but without any quantified target, whereas permanent pastures are declining in France. Moreover, the plan does not include the development of landscape features[AF1] .nor the reduction of the livestock of granivores – pigs and poultry which are the most industrial ones (there is only a target of reduction of the cattle). The plan evokes the development of organic farming using EAFRD, whereas the budget is not sufficient within this fund for the conversion needs. The plan also mentions the remuneration of environmental services through the CAP with no concrete commitment. The agricultural sector plans ("plans de filières") are not ambitious enough as regards environmental and climate issues and there is no climate crosscompliance for the investment plan. The plan	

[83] https://ec.europa.eu/clima/policies/effort/proposal_en

	also maintains the target of 7% incorporation of first generation of biofuels without setting a target of reduction of biofuels production due to their negative impacts on climate and biodiversity. Finally, there is no target for an autonomy in inputs for small agricultural regions. The plan should foresee for agriculture, the ambitious development of pulses : 1) to save nitrogen fertilizers, which are very fossil energy intensive 2) to replace the consumption of animal protein.	
Inclusion of long-term strategy	Do plans include agricultural policies that go beyond 2030?	X 0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations The agricultural part of the plan deals with several existing plans covering the period until 2020 (proteins), 2022 (organic farming), 2027 (CAP) or 2028 (biofuels), etc.	
Consistency with EU legislation	Are agricultural policies consistent and in line with the LULUCF Regulation?[84]	0 = not at all X 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent

[84] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0841&from=EN

	Explanations: The plan includes a target of maintenance of the surfaces in permanent pastures but no development of landscape features (hedges, groves, etc.) whereas these elements are declining in France. It includes a development of agroforestry but without any quantified target. This is why the balance may not be neutral or positive as regards the reduction of greenhouse gas emissions from land use.	
Consistency with agricultural legislation	Is the relevant agricultural legislation (e.g. Rural development programmes / echo schemes) addressed in the plan	0 = not at all X 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations The plan raises only very briefly the issue of the future CAP through the remuneration of environmental services with no concrete commitment. The rural development programs are not mentioned except for the conversion towards organic farming.	
Completeness	Are policies and measures covering for ALL agricultural GHG sources (methane, nitrous oxide, carbon dioxide) included in the plan?	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent X 4 = to a great extent
	Explanations All the GHG sources are included in the plan, especially in the Low Carbon National Strategy.	

Infrastructure	Are proposed investments aligned with the long-term climate goals?	0 = not at all X 1 = to a small extent 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations The big investment plan covers several targets which are not explicitly related to the reduction of GHG emissions. For example, it includes a target on innovation without saying to which extent this innovation will be linked to climate change mitigation. It includes a support for biogas production without specifying if they will be units of reasonable size related to their territories with a focus on the return of carbon to the soil.	
Policies beyond or additional to EU requirements	Does the plan include policies that are additional or go beyond EU requirements? .(nitrate directive etc..)	0 = not at all 1 = to a small extent X 2 = to some extent 3 = to a moderate extent 4 = to a great extent
	Explanations The plan includes for example the development of organic farming with a target of 15% of UAA by 2022 or a target of autonomy in proteins in 2030.	

Consistency and Credibility

Indicator	**Indicator description**	**Scale**

Adaptation plan	Has an adaptation plan been devised for the agricultural sector? Is it reflected in the NECP?[85]	0 = no 1 = no, unclear adaptation strategy X 2 = yes, but not clearly reflected in the plan 3 = yes, but limited 4 = yes, fully developed and integrated
	Explanations A national adaptation plan has been published in December 2018. It is only briefly mentioned in the NECP in the part concerning the forest sector.	
Use of loopholes	Does the plan include use of loopholes in the agricultural sector in achieving GHG emission targets?[86] Such as, offsetting from land use, land use change and forestry (LULUCF) activities	0 = yes, full use/no alternative sought 1 = yes, large use 2 = yes, most opportunities used 3 = yes, but limited 4 = no loopholes used
	Explanations	
Policy projections Impact assessment	Does the plan use a strong and effective model used for the impact assessment of planned policies and measures in the agricultural sector?	0 = not at all 1 = to a small extent 2 = to some extent 3 = to a moderate extent

[85] Art. 19 Governance Regulation: http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/en/pdf

[86] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0842&from=EN

		4 = yes, very strong and detailed model used
	Explanations	

Trade offs

Indicator	Indicator description	Scale
Climate	Is there a risk that the policy or measure actually increases emissions? *(For instance, afforestation or growing biofuels on peatland (histosols) can release more carbon dioxide from the soil than is saved by biofuels or sequestered by afforestation. (insufficient spatial targeting). Likewise, a focus on efficiency (emission intensity) can cause an overall increase of emissions due to an increase of production (rebound effects).)*	0= Not at all 1 = To a small extent 2 = To a moderate extent X 3 = To a great extent 4 = To a very great
	Explanations: The maintenance of the target of incorporation of first generation biofuels at the level of 7% presents a risk of increasing the GHG emissions due to indirect land use change (ILUC).	
Air quality	Do proposed policies impact air quality?	0 = yes negatively 1 = no effect X 2 = small improvement 3 = moderate improvement 4 = great improvement

	Explanations: The main way to reduce air pollution from agriculture would have been to set a target of reduction of all the livestock including pigs and poultry (ammonia emissions). If an objective of cattle reduction has been taken into account in the assumptions of the plan, there are no specific recommendations associated with it and the impacts on air quality are even less detailed.	
Water	Do proposed policies impact water quality? Explanations: There is a target of reduction of the nitrogen surpluses, crop diversification, permanent pastures preservation, development of agroforestery and organic farming, etc. which can have a positive effect on water quality.	0 = yes negatively 1 = no effect 2 = small improvement X 3 = moderate improvement 4 = great improvement
Soil quality	Do proposed policies improve soil quality?	0 = yes negatively 1 = no effect X 2 = small improvement 3 = moderate improvement 4 = great improvement
	Explanations: There is a target of reduction of the nitrogen surpluses, crop diversification, permanent pastures preservation, development of agroforestery and organic farming, etc. which can have a positive effect on soil quality. However, the development of biogas production can have a negative impact on soil fertility.	

Biodiversity	Do proposed policies impact biodiversity?	0 = yes negatively 1 = no effect X 2 = small improvement 3 = moderate improvement 4 = great improvement
	Explanations: There is a target of crop diversification, permanent pastures preservation, development of agroforestery and organic farming, etc. which can have a positive effect on biodiversity. However, this impact will be very limited since there is no target of developing landscape features.	
Energy consumption	Do proposed policies reduce energy consumption?	0 = no effect X 1 = minimal effect 2 = small improvement 3 = moderate improvement 4 = great improvement
	Explanations: The plan includes energy efficiency for the farm buildings and material but is very imprecise as regards the reduction of energy use on the farm (plowing, transport, etc.). Moreover, the Low Carbon National Strategy warns on the fact that the reduction of pesticide use can be accompanied by an increase in the use of energy.	

Job creation	Does the plan include investments in local industries, thus promoting job creation in these industries?	0 = no investment 1 = almost insignificant increase 2 = small increase X 3 = moderate increase 4 = great investment and substantial job growth
	Explanations: The plan includes a big investment plan which can surely create jobs. Yet, the environmental and especially climate content of this plan is not explicit. Moreover, this investment plan is not focused on local industries.	