

UNTAPPED OPPORTUNITIES FOR CLIMATE ACTION

An assessment of food systems in
Nationally Determined Contributions



COUNTRY ASSESSMENT

EUROPEAN UNION (FRANCE, GERMANY, SPAIN)



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PREFACE

Integrating food systems transformation into the Nationally Determined Contributions (NDCs) – the national climate actions at the heart of the Paris Agreement, is critical to delivering on interconnected ecological, biodiversity, health, economic, social, and cultural goals. Taking a food systems approach builds climate resilience and results in a diversity of context-specific solutions for food production, distribution, consumption, and waste. Yet, food systems are rarely prioritized in climate policy.

This country assessment is part of a suite of publications that are designed to centre food systems transformation in future climate policy:

- 1. Untapped Opportunities for Climate Action: An Assessment of Food Systems in Nationally Determined Contributions**: A summary report providing a synthesis of the 14 country assessments with recommendations and priority actions for policymakers and climate policy advisors
- 2. A Practical Guide to Assessing Food Systems in Nationally Determined Contributions (NDCs)**: A guide with a framework designed to enable users to take a food systems approach to developing future NDCs and implementing climate policies.
- 3. A set of 14 country assessments** examining the latest NDCs of 14 countries from around the world, outlining areas of improvement and opportunity

Users are also encouraged to read **Confronting the climate crisis with food systems transformation: Stories of action from 14 countries**, which provides a catalogue of global case studies that complement the suite of materials for policymakers, advisors, and advocates of climate action.

OVERVIEW OF THE EUROPEAN UNION'S FOOD SYSTEMS

The food sector of the European Union (E.U.) contributes to economic production and employment but is also associated with negative impacts on human health and the environment. Agriculture accounts for 1.3% of the E.U.'s collective GDP,¹ while the food and drinks sector accounts for an additional 7%.² In 2018, the food sector accounted for nearly 33% of total professional employment across the E.U.³⁴ Notwithstanding its economic importance, the E.U.'s food system is also linked to various health and environmental challenges. In 2019, 53% of adults in the E.U. were considered to be overweight or obese.⁵ This is a risk factor for various non-communicable diseases, increases healthcare expenditure, and reduces productivity across the population.⁶ In turn, agriculture and food production are major drivers of environmental degradation in the E.U., with 970 million tons of soil lost annually, and more than 11% of the E.U.'s territory affected by moderate to high soil erosion.⁷ Moreover, agriculture accounted for more than 10% of the E.U.'s greenhouse gas (GHG) emissions in 2018.⁸ A 2021 report also finds that the E.U. was responsible for 16% of global deforestation in 2017 — totalling 116 million tons of CO₂ — associated with the consumption of imported goods, most notably food such as soy, palm oil, and beef.⁹

The Common Agricultural Policy (CAP) — the main longstanding E.U. policy in the food sector — has important implications for the E.U.'s food systems. The CAP was originally developed in 1962 to address issues of nutrition, food accessibility, and agricultural productivity in Europe. The current CAP provides incentives that are more likely to hamper rather than encourage a transition to healthy and sustainable food systems. More specifically, subsidies provided through the CAP disproportionately (and indirectly) incentivize the production of (food containing) beef, sugar, and milk, while fruits and vegetables receive the least support through the CAP.* As a result, foods with high saturated fat content are relatively more affordable in Member States than healthier foods,¹⁰ and some studies suggest that the CAP has indirectly contributed to an increase in non-communicable and cardiovascular diseases across Europe.¹¹ In addition, CAP subsidies are associated with negative environmental externalities by providing incentives for the wasteful management of natural resources, increased water use, over-intensification of agriculture, and increased use of chemicals and pesticides.¹² The latest calls for reforms have been formalized into new objectives for the 2021–2027 CAP to be more strongly aligned with the global agenda on sustainable development, in which food systems transformation is considered as one of the necessary transformations for achieving the Sustainable Development Goals.¹³ For example, 20 to 25% of CAP expenditure will go toward so-called “eco-schemes” — which encourage the adoption of sustainable farming practices such as organic agriculture, agroforestry, and precision farming.¹⁴ However, interviewed experts argue that it is questionable how effective these measures will be designed and implemented.¹⁵

Nevertheless, the E.U. takes action to shift to sustainable agriculture production and promote consumer demand for sustainable products. As part of the E.U. Green Deal, which seeks to make Europe climate neutral by 2050, the “farm to fork” strategy has been developed to address food production, transport, and waste and make food systems across the E.U. fair, healthy, and environmentally friendly. One of the primary targets of this strategy is to increase agricultural land used for organic farming from 7.5 to 25% in 2030, which is

* This is because subsidies are determined on a per hectare basis.

supported by new E.U. legislation that should support farmers transitioning from conventional to organic agricultural practices. Another aspect of the strategy is to support global transitions toward sustainable food production and consumption through trade policies and international cooperation instruments.¹⁶ Furthermore, it also seeks to improve the availability and price of sustainable foods and to promote healthy diets and sustainable consumption across the E.U.¹⁷

In November 2021, the European Commission adopted a legislative proposal preventing the import of commodities linked to deforestation.¹⁸ Under the proposed legislation, soy, beef, palm oil, wood, cocoa, and coffee can only be imported if they are deforestation-free and accompanied by a due diligence statement from the importing company. If the proposed bill becomes law, it could have a significant impact on the sourcing of commodities with a high deforestation risk. However, the scope of this regulation does not cover other key ecosystems such as peatlands and savannahs — ecosystems particularly impacted by conversion driven by palm oil and soy production.

The E.U. shows effort in building policy coherence between climate change, food consumption, and health. Exemplary here is the previously adopted “Europe’s Beating Cancer Plan.”¹⁹ This sets out a new E.U.-wide approach for cancer prevention, which includes a campaign for promoting healthy diets and physical activity.²⁰ Furthermore, the adoption of the plan has also initiated internal discussion on how action on climate change under the E.U. Green Deal that addresses air pollution can further contribute to the prevention of cancer.²¹

NDC OF THE EUROPEAN UNION

The E.U.'s NDC puts forward an economy-wide emissions reduction target of 55% that has complete sectoral and GHG coverage. The NDC's overarching target is a E.U.-wide emission reduction of 55% by 2030 compared to 1990. Agriculture and Land Use Change and Forestry (LULUCF) are both covered by the NDC target, as are other sectors. In turn, the E.U.'s NDC covers carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆), and nitrogen trifluoride (NF₃).

The E.U.'s NDC requires Member States to develop integrated National Energy and Climate Plans (NECPs) and National Long-Term Strategies (LTSs) to implement the NDC at national level.²² Regulation (E.U.) 2018/1999²³ under the E.U.'s NDC sets out most of the governance arrangements for climate change policy in the E.U. that adheres to the Paris Agreement, and requires Member States to develop NECPs and LTSs. These describe, respectively, the short- and long-term national measures that countries envision to take to contribute to the E.U.'s climate targets and NDC. The NECPs, in particular, describe Member States' climate and energy objectives, targets, policies, and measures to be implemented and achieved between 2021 and 2030 — and are required to deliver on a minimum ambition level. Both the NECPs and the LTSs must be submitted to the European Commission for review. The NECPs have to be updated on a 10-year basis from 30 June 2024 onward,²⁴ with a progress report to be submitted every 2 years.²⁵ The same requirement is set for the LTS, with January 2020 as baseline, and update every 5 years, if necessary.²⁶

In the following we present a high-level assessment of the E.U.'s NDC. The updated version of the E.U.'s first NDC was submitted to the UNFCCC by Germany and the European Commission (EC) on behalf of all Member States in December 2020. The NDC sets a joint target to reduce GHG emissions by at least 55% by 2030 compared to 1990 levels. This represents an increase in ambition from the previous version submitted in 2015, which advanced a collective emission reduction target of 40% by 2030.

Subsequent sections provide a more granular assessment of the climate policies that France, Germany, and Spain have developed to contribute to the delivery of the E.U.'s NDC. For this, the focus is largely on the NECPs and LTSs — climate policies that Member States develop and implement to contribute to E.U.-wide climate targets — which are described in further detail below.

NDC DEVELOPMENT PROCESS

KEY FINDINGS

While not stated in the E.U.'s NDC, the European Commission coordinated the Union's NDC development process. The Directorate-General for Climate Action (DG CLIMA) of the European Commission leads the E.U.'s efforts to fight climate change and, as such, is responsible for formulating and implementing E.U. climate policies, including efforts to meet the goals of the Paris Agreement.^{27, 28} For the E.U.'s NDC, the European Commission — and in particular DG CLIMA — appears to have led the process of developing feasible economy-wide emission reduction targets.²⁹

The E.U.'s updated NDC target is based on an extensive impact assessment.³⁰ In December 2019, after the submission of the E.U.'s first NDC, the European Council endorsed a target to become carbon neutral by 2050. The initial emissions reduction target of 40% by 2030 put forward in the first NDC was not aligned with a gradual transition toward carbon neutrality by 2050, and would have required relatively more ambitious efforts to reduce emissions in the two decades following 2030. To address this incongruence, an extensive impact assessment was conducted to analyze policy options that would enable the E.U. to increase its climate ambition over the period between 2020 and 2030. This assessment put forward an emissions reduction target of 55% by 2030, which after consultation was ultimately included in the E.U.'s updated NDC.

Submitted NECPs and LTSS are reviewed and centrally coordinated by the European Commission, with support from the Climate Change Committee, to ensure policy coherence among climate plans of Member States. The Commission reviews the NECPs and LTSS that are developed and submitted by Member States, with an eye to ensure that targets and contributions of Member States are sufficient for the collective achievement of the E.U.'s climate change mitigation goals. If needed, the European Commission issues country-specific recommendations for improving the NECPs and the LTSS. The Climate Change Committee, which is composed of Member States' representatives, assists the European Commission in the submission and review process.

The development of the E.U.'s NDC, as well as the NECPs and LTSS, are underpinned by widespread public participation and consultation. This is because E.U. legislative procedures require all legislation to be subject to public consultation before adoption. As a result, the level of the emission reduction target ultimately included in the NDC was consulted on between March and June 2020, with a total of 4,032 responses received predominantly from E.U. citizens.³¹ The NECPs and LTSS are also required to undergo multilevel public participation and consultations before adoption. This includes providing early and effective opportunities for the public to participate in the policy cycle of the NECPs and LTSS; consulting the public on the draft versions; including a summary of the public's views as an attachment when submitting these documents; and generally maintaining the public informed while allowing reasonable timeframes for their participation.

The E.U.'s NDC states that it has been developed in accordance with the E.U.'s commitment to gender equality and other cross-cutting priorities. This includes commitments made under the European Pact on Gender Equality³² and the U.N. Declaration on the Rights of Indigenous Peoples.³³ The NDC also highlights that the E.U. is committed to maximizing synergies between social, environmental, and

economic co-benefits through its NDC. In addition, it also states that human rights and gender equality dimensions should also be integrated into the national plans of Member States. Finally, the NECPs are required to highlight how their implementation will contribute to the promotion of human rights and gender equality.

CONTENT OF THE NDC

KEY FINDINGS

The E.U. has adopted three main pieces of legally binding legislation for achieving the E.U.'s initial NDC emission reduction target of 40%, and the NDC mentions that further legislation will be required to meet the updated 55% target. More specifically, the following three pieces of legislation have been adopted to deliver the initial 40% emission reduction target:

- **The E.U. Emission Trading System (ETS) Directive**, or Directive (E.U.) 2018/410,³⁴ which puts forward an emissions reduction target of 43% for the sectors covered under the E.U. ETS. These sectors include energy-intensive industries and commercial aviation within the European Economic Area;
- **The Land Use, Land Use Change, and Forestry (LULUCF) Regulation**, or Regulation (E.U.) 2018/841,³⁵ which specifies the mitigation efforts and accounting approach Member States are required to adopt for the LULUCF sector — including that LULUCF emissions should not exceed removals for any Member State; and
- **The Effort Sharing Regulation**, or Regulation (E.U.) 2018/842,³⁶ which advances national emission reduction targets for sectors such as buildings, agriculture, waste, and transport (excluding aviation and international shipping) that are not covered under the E.U. ETS. To achieve the initial 40% E.U. emission reduction target, each Member State was assigned an emission reduction goal that, in line with effort sharing, ranged from 0% in Bulgaria and 2% in Romania, to 40% in Luxembourg and Sweden. The emission reduction targets for the Member States considered in this assessment are: 37% for France, 38% for Germany, and 26% for Spain.

In addition to the above-mentioned legislation, the E.U. has revised and strengthened existing regulation toward achieving the initial NDC target. The following legislation is particularly relevant to food systems, as they may address food waste, storage, and transport:

- Directive (E.U.) 2018/851 covers waste management, including food and packaging waste from households, offices, restaurants, wholesalers, canteens, caterers, and retail premises. The Directive requires Member States to ensure that biowaste (including household food waste) is disposed of and collected separately, recognizing their biodegradability and composting-ability.³⁷
- Directive (E.U.) 2018/852 covers packaging and packaging waste, including packaging for food products. The Directive requires Member States to take measures to increase the share in reusable packaging and sets minimum targets for recycling specific materials in packaging (for example, plastic, aluminum, paper).³⁸
- Regulation (E.U.) 2019/631 specifies performance standards for new passenger cars and light commercial vehicles but does not make specific references to food systems elements.³⁹

- Regulation (E.U.) 2019/1242 specifies CO₂ emission performance standards for new heavy-duty vehicles, including tractors.⁴⁰
- Regulation (E.U.) 517/2014 covers fluorinated GHG emissions, including hydrofluorocarbons (HFCs) that may be used for refrigerators and cool storage of foods.⁴¹

While the E.U.'s NDC explicitly mentions the agricultural and LULUCF sectors, it does not include any explicit mention of food, diets, or food loss and waste. Rather, the NDC refers to the above mentioned biowaste legislation, which covers food waste, transportation, and refrigeration — although no explicit links between the legislation and food systems are identified in the E.U.'s NDC. This may be reflective of the fact that E.U.-level legislation is not intended to be very prescriptive about actions and measures, rather allowing space for Member States to develop policies that are suited to their national circumstances to implement E.U.-level targets.

The E.U.'s NDC describes the method that will be applied to account for emission reductions and removals under the LULUCF sector — which includes agricultural production — but does not seem to holistically account for food systems. The NDC pays particular attention to the accounting methodology applied to the LULUCF sector. In contrast, the NDC does not specify how it will account for other food systems emissions, such as emissions associated with the transport, processing, consumption, and disposal of food.

IMPLEMENTATION OF THE NDC

KEY FINDINGS

Member States take the lead on the implementation of the E.U.'s NDC and must report regularly to the European Commission, who monitors their progress. With binding E.U. legislation prescribing the level of climate ambition required, Member States have the responsibility of delivering on this ambition through their own climate policies, notably their NECPs. As mentioned earlier, Member States must submit progress reports to the European Commission every 2 years. Progress on the E.U.'s NDC is thereafter monitored by the European Commission — with assistance of the Energy Union Committee — who, in turn, reports to the European Council and the European Parliament on the implementation status of these plans. In this way, the European Parliament and Council maintain oversight on the overall progress on the achievement of the E.U.'s collective goals. Similar to the Climate Change Committee, the Energy Union Committee consists of representatives of Member States.

The E.U.'s NDC states that climate policies and programs are to be financed under the Multinational Financial Framework (MFF). A climate target has been applied to the expenditure of the MFF for the 2021–2027 period to earmark 30% of expenditure to climate action. In addition, the NDC highlights that all E.U. expenditure should be aligned with the goals of the Paris Agreement as well as the “do no harm” principle put forward in the European Green Deal. The E.U.'s NDC also makes mention of the commitment to create a Just Transition Fund as part of efforts to become climate neutral by 2050. Finally, the E.U.'s NDC mentions an intention to apply an effective financial monitoring methodology, with the European Commission providing annual expenditure reports on climate finance.

OVERVIEW OF FRANCE'S FOOD SYSTEMS

The food sector is an important component of the French economy. More than 50% of France's land area was used for agricultural production in 2018.⁴² In the same year, agriculture accounted for 1.7% of GDP⁴³ and 2.5% of employment.⁴⁴ In turn, France's agri-food industries, craft commerce, and wholesale commerce in foodstuffs accounted for 2.2% of France's GDP, and 2.8% of employment.⁴⁵

While France imports some of its food needs, the country is a net exporter of food. The majority of food imports are from Spain, followed by Morocco, Belgium, and The Netherlands. Imports are particularly important for fruits and vegetables, exceeding 40% for tomatoes, cucumbers, peaches, and grapes, while fruits such as citrus and bananas are fully imported. France also imports large quantities of fish, meat, and animal feed. In turn, France is a major exporter of food, exporting 50% of domestically produced cereal and 33% of domestically produced dairy, respectively. As a net exporter of food, France has a positive GHG emissions balance from food trade* of 9.3 MtCO₂e.⁴⁶

Despite considerable effort to make the French food system more sustainable, it still generates significant health and environmental impacts. According to France's 2019 Country Health Profile, obesity is prevalent among 15% of adults and 14% of children.⁴⁷ This is predominantly due to poor nutrition: 40% of adults report not eating fruit on a daily basis, while 30% report not eating any vegetables on some days.⁴⁸ Consequently, as many as 13% of all deaths in France may be attributable to dietary risk, here understood as high consumption of fat and salt saturated foods compared to low intake of fruits and vegetables.⁴⁹

Overall meat consumption is slightly decreasing, but consumption of particular meats is growing. Consumption of red meat is mainly in decline, however, there is an increase in demand and consumption of poultry and processed meat, which is associated with significantly increased risk of cardiovascular disease. Domestic consumption patterns, however, are not merely a result of domestic production, but are also influenced by France's meat imports.⁵⁰

Land use contributes significantly to France's carbon footprint. In 2016, France's agricultural sector emitted 75 MtCO₂e, or 17% of the country's total emissions.⁵¹ Food processing and food transport contributed an additional 9 MtCO₂ and 22 MtCO₂, respectively.⁵² The consumption of meat and dairy products is an important driver of these emissions. While animal products account for only one-third of the food consumed in France, their production utilizes more than 80% of the country's agricultural land area and is responsible for 85% of agricultural GHG emissions.⁵³ Moreover, the agricultural sector is responsible for 48% of water consumption in France.⁵⁴

Over the coming decades, the French food system must address a number of challenges. In its Long-Term Strategy for low-carbon development, the French government identifies key issues for the agricultural sector

* A country's GHG emissions balance from food trade is calculated by subtracting the carbon content of imported food products from the carbon content of exported food products. A positive balance of GHG emissions from food trade thus suggests that the GHG impact of exported food is larger than that of imported food. For the metric cited here, emissions from land-use change and forestry are not included.

that include securing sufficient domestic production, ensuring sustainable land management and biodiversity conservation, meeting economic demand, and coping with increased pressures on the land.⁵⁵ In addition, the country's food systems must manage its climatic vulnerabilities, which include increases in extreme weather events — such as heat waves and droughts — as well as a decreased water budget in the summer and more precipitation in the winter.⁵⁶

FRANCE'S CONTRIBUTION TO THE E.U.'S NDC

France's contributions to global climate action are covered by the E.U.'s NDC. As part of its commitments under the E.U.'s NDC, France prepared an integrated National Energy and Climate Plan (NECPs) as well as a Long-Term Strategy (LTS), both of which were submitted to the European Commission in March 2020. In addition, France has prepared an addendum to the E.U.'s NDC,⁵⁷ in which it presents emission reduction targets for a number of its overseas countries and territories (OCTs) that are not covered by the E.U.'s NDC. The following assessment is largely based on France's NECP, with supplemental information from the LTS, the addendum covering France's OCTs, and interviews with key stakeholders.

The following assessment was conducted between June and November 2021, and is mainly based on France's NECP, including the Multiannual Energy Plan (MEP) and the Stratégie National Bas-Carbone (SNBC), and LTS, as well as interviews with four key stakeholders.

KEY FINDINGS FROM FRANCE

NDC DEVELOPMENT PROCESS

TABLE 1: FRANCE NECP DEVELOPMENT: KEY FINDINGS AT A GLANCE

Key Findings

- The National Energy and Climate Plan (NECP) of France consists of the National Low-Carbon Strategy (stratégie nationale bas-carbone, SNBC) and the Multiannual Energy Plan (MEP).
- The development process of the NECP was led by the Ministry of Ecological Transition.
- The development of the NECP included participation from diverse stakeholders from within and outside government, covering different sectors and parts of society.
- The consultation process benefited from multiple platforms for public engagement, including sectoral working groups, workshops, public debates, and online questionnaires.
- The NECP includes an impact analysis that took account of several food system elements.
- France developed an addendum for its overseas countries and territories that are not covered by the NDC of the European Union.

Areas of improvement

- Clarify how France's NECP and the addendum were developed, aiming to enhance transparency and access to information by third parties.
- Foster a more inclusive and participatory development process by promoting cross-ministerial collaboration and by making technical discussions more accessible to non-specialized audiences.
- Strengthen the impact of citizens assemblies in policy-making and limit the influence of lobby groups in agriculture and food industries.
- Carry out a holistic assessment of the national food system — in a manner that accounts for positive and negative externalities — to inform the next review of the NECP.

The NECP of France consists of the National Low-Carbon Strategy (stratégie nationale bas-carbone, SNBC) and the Multiannual Energy Plan (MEP). The SNBC is France's climate change mitigation roadmap and provides guidelines for a low-carbon transition over the short and medium term, with the aim of facilitating the achievement of carbon neutrality by 2050. In turn, the MEP establishes France's energy priorities over the period between 2019 and 2028. Interviews suggest that the targets of the E.U.'s NDC were not strongly considered in the development of the NECP, as the latter aspired to having more ambitious targets and measures than required by the former.⁵⁸ In the following, we focus on the SNBC as the most relevant policy in relation to food systems.

While the NECP does not specify the exact process by which it was developed, interviews reveal that the development process was led by the Ministry of Ecological and Inclusive Transition.⁵⁹

The NECP states that the drafting and implementation of energy and climate change policies is the responsibility of the Directorate-General for Energy and Climate (DGEC), operating under the Ministry for Ecological and Inclusive Transition. Rather than providing detail on the development processes, the NECP describes how the SNBC and MEP were updated. The updating process of the SNBC was led by the Steering Committee, which is comprised of representatives of business, civil society, and trade unions, as well as Members of Parliament. It appears, however, from both the NECP, SNBC, and interviews, that, while some external communication informed the progress of drafting the SNBC and NECP,⁶⁰ other ministries were not formally part of the development process.

The development of the NECP included participation from diverse stakeholders from within and outside government, covering different sectors and parts of society. Agricultural and forestry experts, civil society representatives, and members of the general public were offered opportunities to participate in the revision process of the SNBC as part of the development process of the NECP. For maintaining a level of policy coherence across the E.U., Member States were consulted in 2019 to inform on policy development and exchange ideas. In addition, the NECP draft was subjected to review from different governmental bodies, including the Environmental Authority and the National Council for Ecological Transition. Scientists, among which were food systems experts, were engaged in the NECP development process, especially in developing the initial scenarios that guided the development of policies.⁶¹ It is unclear, however, if any health experts were consulted.⁶² Furthermore, interviews indicate that the consultation process lacked adequate representation from downstream food industries, such as food processors and retailers.⁶³

The consultation process benefited from multiple platforms for public engagement, including sectoral working groups, workshops, public debates, and online questionnaires. The NECP was developed through a series of sectoral stakeholder workshops, which were attended by the Steering Committees for both the MEP and SNBC. After these workshops, separate consultations took place for the MEP and SNBC. As a diverse group of stakeholders was able to exchange ideas and express their views during the development of the NECP and associated policies, it is likely that local knowledge was considered and accommodated during the process. In fact, interviews indicate that the NECP consultation process for external stakeholders was open and accessible, and that there was good communication with the Ministry of Ecological Transition.⁶⁴ Notwithstanding, interviews also indicate that some stakeholders, including NGOs, could not participate actively in the consultation process due to their limited capacities to attend and adequately understand the rather technical meetings — which may indicate that the process was not broadly accessible.⁶⁵ Interviewees do further indicate, however, that the Ministry of Ecological Transition was genuinely interested in the inputs received from participating stakeholders, with stakeholders feeling that their inputs were reflected in the final document.⁶⁶

The NECP includes an impact analysis that took account of several food systems elements.

The impact analysis involved modelling projections and considered the economic, social, and environmental impacts of planned policies and measures. To start, the impact analysis estimated the projected emission reductions and removals of the measures under the SNBC and MEP by comparing them with a business-as-usual scenario. These estimates were computed on a sectoral basis. For the agricultural sector, the projections considered the impact of improving production practices, promoting alternative production

methods, shifting diets, and promoting bio-based energy. For the forestry sector, the projections considered the role of standing forests as carbon sinks, the replacement of high-emission materials with bio-based materials from forests, and the use of biomass for wood energy. In addition, a strategic environmental evaluation of the SNBC revealed that its measures will likely have the following environmental benefits: reduced GHG emissions, increased resilience to climate change, reduced resource depletion, the development of the circular economy, and the preservation of soil and water quality. The latter benefit is especially due to measures in the agricultural and forestry sectors. At the same time, however, the environmental evaluation also revealed that special attention must be paid to biodiversity conservation as agricultural and forest production systems extend and intensify, which is addressed in the Biodiversity Plan mentioned below.

France developed an addendum for its overseas countries and territories that are not covered by the E.U.'s NDC. The addendum covers New Caledonia, French Polynesia, Saint Barthelemy, Saint Pierre and Miquelon, and Wallis and Futuna* — which together represent 1.55% of France's total GHG emissions. It was developed by aggregating the individual contributions of these respective overseas countries and territories. While the addendum does not specify the exact process by which it was developed, the existence of the addendum indicates that France took an inclusive approach in determining its national climate contribution. Notably, other European Member States with overseas countries and territories — such as The Netherlands and previously the United Kingdom — have not put forward such contributions.⁶⁷

AREAS FOR IMPROVEMENT

Clarify how France's NECP was developed, aiming to enhance transparency and access to information by third parties. The NECP does not include many details about its own development and consultation process, and instead describes the processes whereby the policies that underpin it were developed. While stakeholder interviews reveal that the process was largely participatory and inclusive, it is difficult to assess to what degree the requirements put forward in E.U. legislation regarding the development process were met. It would therefore be important to specify in future iterations of the NECP whether there was a coordination mechanism involved, which actors bore final responsibility for the decision on what to include in the NECP and how the NDC targets and measures informed the development of the NECP.

Clarify how the addendum was developed. Similar to the NECP, the French addendum does not provide information about the process by which it was developed and whether this process was participatory and inclusive. While the existence of the addendum may indicate a level of inclusivity, this could be strengthened if local communities in the French OCTs were given an active participation role in the development of the addendum.

Foster a more inclusive and participatory development process by promoting cross-ministerial collaboration and by making technical discussions more accessible to non-specialized audiences. As indicated above, the development of the SNBC did not generate broad support from participating ministries. Some interviews indicate that more communication and a strong collaboration between ministries

* The E.U.'s NDC covers the emissions of the E.U. outermost region that are part of France: Guadeloupe, French Guyana, Martinique, Mayotte, Reunion, and Saint Martin.

in the development process would have been beneficial for building support.⁶⁸ This should be addressed in future updates of the SNBC through efforts to build consensus and promote wide sectoral support. For instance, through a Climate and Food Taskforce that should at the very least comprise members of the Ministry of Agriculture and Food, the Ministry of Health, and the Ministry for Ecological Transition. In addition, technical consultations should be organized in a way that guarantees the meaningful participation of all relevant stakeholders, but especially those that will be tasked with implementing the policy, such as ministries and farmers. This may involve the development and dissemination of factsheets or other media material to brief less specialized audiences on the topics being discussed.

Strengthen the impact of citizens assemblies in policy-making and limit the influence of lobby groups in agriculture and food industries. The recommendations developed by the citizens assembly* that took place in France in 2019 and 2020 included ambitious targets and measures to transition to more sustainable diets, signalling a growing interest from the wider public for more climate-friendly and healthy diets. However, the recommendations developed by the citizens assembly were largely watered down in parliament and not fully taken on board in the Climate Change Law (2021).⁶⁹ The powerful lobby of large agri-food should also be restricted by limiting their participation in policy-making (or at least balancing the playing field for other, less powerful stakeholders).

Carry out a holistic assessment of the national food system in a manner that accounts for positive and negative externalities, to inform the next review of the NECP. While the NECP is underpinned by a thorough impact assessment, this does not include a holistic and systematic assessment of the French food system. As food systems consist of many interdependent elements, efforts to reduce emissions in one place in the system are likely to have spill over effects in other places in the food system. It is therefore important to assess the expected impacts of measures using a food systems perspective that seeks to minimize trade-offs and maximize synergies. This food systems assessment could well be an extension of the current modelling and scenario analyses that have been used for the NECP. Importantly, external stakeholders should either be involved in or be presented the different scenarios, also as a means to further build public support for measures that address climate change and food systems in particular. Such an assessment would align well with the commitment put forward in the E.U.'s NDC to maximizing social, environmental, economic, and health co-benefits and would form a welcome complement to the impact analysis of the next revision of the NECP.

* The French citizen climate assembly was established in response to the Yellow Vests protest. The assembly gathered 150 randomly picked citizens from various backgrounds who were then tasked with setting the country's climate agenda. See, for instance, <https://www.dw.com/en/frances-citizen-climate-assembly-a-failed-experiment/a-56528234>.

CONTENT OF THE NDC

TABLE 2: FRANCE NECP CONTENT: KEY FINDINGS AT A GLANCE

Key findings

- The NECP makes direct reference to efforts to promote a healthy, sustainable, and accessible food system.
- The NECP promotes a transition toward more sustainable food production, mainly through the Agri-Environmental Plan.
- The NECP includes measures aimed at reducing food loss and waste and producing biofuel from food waste.
- The NECP includes measures to address refrigerant HFCs through taxation.
- The NECP refers to the Biodiversity Plan, which includes several policies and measures to increase conservation practices within forestry and agriculture.
- The NECP mentions that it will seek to influence food demand and consumption through the National Food Nutrition Program.
- The SNBC sets targets for livestock production as a means to limit GHG emissions.
- The NECP recognizes the importance of imported emissions.
- The NECP recognizes that its measures are not sufficient for achieving France's 2030 climate target, which at the time of its development required emission reductions of 37%.

Areas for improvement

- Put forward more ambitious food system measures in future iterations of the NECP to strengthen alignment with the increased level of ambition in recent European Union (E.U.) targets.
- Expand the measures that aim to influence diets to also raise awareness about the environmental and health risks of excessive meat consumption.
- Develop comprehensive measures and targets for degrowth in livestock and agriculture, integrating the commitments made in the context of the Global Methane Pledge and the Glasgow Leader's Declaration on Forests and Land Use.
- Introduce actionable measures that aim to reduce emissions from livestock production.
- Beyond HFCs, introduce legislation to tax industrial and conventional agricultural inputs.
- Introduce efforts to increase supply chain efficiencies to address food loss and waste.
- Consider imported food system emissions, particularly those linked to deforestation.
- Strengthen public procurement measures by improving the stringency of certification programs.

The NECP makes direct reference to efforts to promote a healthy, sustainable, and accessible food system. In 2017, the French government held a National Foodstuff Meeting, whose recommendations were incorporated into Law No 2018-938⁷⁰ in 2018, also known as EGALim. The law is included in the NECP and has three overarching objectives: 1) ensuring fair prices are paid to food producers to allow them to have a decent living; 2) reinforcing the health, environmental, and nutritional quality of food products; and 3) promoting healthy, safe, and sustainable food for all.⁷¹ It includes measures that link different food system actors; for

example, by requiring food service operators to use at least 50% of locally sourced or organic products from January 2022 onward. In addition, the law introduces mandatory food waste assessments for all food service operators. Interviews suggest, however, that procurement policies developed under this law to promote the consumption of more sustainable foods are generally weak. The criteria applied that should ensure foods are produced sustainably are not sufficiently stringent, with the result that some procured food products may not have actually been produced in a sustainable manner. Moreover, the law fails to consider the food-processing industry as part of the solution for making the French food system healthier and more sustainable.⁷²

The NECP promotes a transition toward more sustainable food production mainly through the Agri-Environmental Plan. The Agri-Environmental Plan⁷³ aims to improve the economic and environmental efficiency of agricultural production systems based on agroecological approaches and incorporates the Vegetable Protein Plan, the Organic Plan, and the Teaching to Produce Alternatives Plan. The Vegetable Protein Plan mentioned in the NECP ran until 2020 and had the objective of promoting pulse crops. A new Plant Protein Strategy,⁷⁴ not mentioned in the NECP, was launched in December 2020. While the strategy includes a target of dedicating 40% of agricultural land to the production of protein-rich crops by 2022, critics point to the fact that much of this protein is actually intended to feed animals and may therefore have adverse impacts on the climate and human nutrition.⁷⁵ The Organic Plan 2022,⁷⁶ in turn, has the objective of ensuring that 15% of agricultural land is used for organic production by 2022. The plan has a budget of 1.1 billion euros (EUR) (1.26 billion USD),* with additional funding from the Major Investment Plan, which is discussed further below. Finally, the Teaching to Produce Alternatives Plan,⁷⁷ which was under revision during the drafting of the NECP, focuses on agricultural education and was published in January 2020.

The NECP includes measures aimed at reducing food loss and waste and producing biofuel from food waste. This includes the earlier mentioned measure introducing mandatory preliminary food waste assessments adopted at the National Foodstuffs Meeting. In addition, the NECP mentions the Roadmap for the Circular Economy,⁷⁸ published in 2018, which also seeks to reduce food waste. Finally, the NECP considers that approximately half of the country's food waste resources could be used for anaerobic digestion to produce biofuels. While not included in the NECP, it is notable that France is the first country in the world to pass legislation that forbids supermarkets from throwing away unsold food, instead requiring them to redistribute it to charities serving low-income communities.⁷⁹ In addition, companies that generate organic waste are required to recycle it, or risk fines of up to EUR 75,000, and consumers are encouraged to recycle food waste through various local initiatives.⁸⁰ Notwithstanding, there is scope to do more to address food loss and waste in France: the current law sets a requirement for food retailers to have a connection to a charity but does not set requirements for a minimum proportion of unsold food to be donated.⁸¹ In fact, food retailers that donate as little as 1% of surplus food to charities, while still wasting substantial amounts of food, are formally in compliance with the anti-food waste law.⁸²

The NECP includes measures to address refrigerant HFCs through taxation. The HFC tax is provided for in the 2019 Finance Bill and will be progressive, ranging from 15 to 30 EUR (17 to 34 USD) per ton equivalent of CO₂. The implementation of the tax has continually been delayed, however, and is now expected in 2023.⁸³

* Conversions based on February 8, 2022, exchange rates.

The NECP refers to the Biodiversity Plan, which includes several policies and measures to increase conservation practices within forestry and agriculture. While the Biodiversity Plan has broader goals beyond agriculture and food production, it also seeks to promote and reinforce plans promoting agroecology and organic farming, and also includes measures to improve knowledge and management of soil biodiversity for agriculture. These plans also contribute to France's long-term commitment to expand agroforestry and develop more agroecological cultivation practices in agriculture, as included in the LTS.

While the NECP mentions that it will seek to influence food demand and consumption through the National Food Nutrition Program, no concrete action points are included to this end. This may be because diets are a sensitive issue in France, and freedom in food choices is strongly embedded in French culture.⁸⁴ Although not mentioned in the NECP, France recently adopted the Climate and Resilience Law, which requires school canteens to offer a vegetarian meal option every day.^{85, 86} The law does not put forward a meat-free day, however, and interviews indicate that this and similar campaigns do not promote plant-based diets but rather the consumption of more vegetables in addition to meat.⁸⁷ A move in February 2021 to temporarily stop serving meat in school canteens due to supply chain disruptions caused by the pandemic proved to be controversial among different layers of the French government.⁸⁸

While the SNBC sets targets for livestock production as a means to limit GHG emissions, the NECP only mentions livestock in relation to measures for producing biogas from manure. The omission of measures that would require more profound changes to livestock production in the NECP is notable given the SNBC target to reduce emissions from livestock production but may be driven by political sensitivities around meat production and consumption in France, as well as strong livestock lobby groups in the country.⁸⁹ The French government has attempted to prevent any external communication that suggests that the number of livestock in France has to decrease, and has suggested that the current level of livestock farming will be maintained for the next NECP and SNBC as well. In addition, recent large-scale investments have been made by downstream industries to improve production efficiency, operating under the expectation of further growth in livestock and agricultural production.⁹⁰

The NECP recognizes the importance of imported emissions but does not include measures or targets to this end. More specifically, the NECP mentions that the SNBC includes guidelines for controlling the carbon content in imported products. The NECP does not further specify what these guidelines are, however. In 2018, France adopted a National Strategy to Combat Imported Deforestation, not mentioned in the NECP, which aims to end deforestation caused by importing forestry and agricultural products into France by improving traceability, corporate action, public information, and public procurement in these supply chains.⁹¹ In implementing this strategy, in November 2020 the government launched and distributed the "zero deforestation public purchasing guide" to public purchasers across deforestation risk sectors to help them choose from sustainably sourced products.*

The NECP recognizes that its measures are not sufficient for achieving France's 2030 climate target, which at the time of its development required emission reductions of 37%. In that light, the NECP

* See 'S'engager dans une politique d'achat public <zéro déforestation>': https://www.ecologie.gouv.fr/sites/default/files/Guide_politique_achat_public_zero_deforestation_18nov2020.pdf.

highlights the need to develop additional measures. However, if France aims to meet the recent E.U.-wide mitigation targets of reducing emissions by 55% by 2030, more ambitious policies will need to be adopted in the near future.⁹²

AREAS FOR IMPROVEMENT

Put forward more ambitious food systems measures in future iterations of the NECP to strengthen alignment with the increased level of ambition in recent E.U. targets.

While France was a big proponent of increasing the ambition of E.U.-wide targets,⁹³ the measures put forward in France's current NECP fall short of the climate action required to deliver on these ambitions. This ambition gap can be filled with more ambitious food systems measures and targets, such as those recommended below. Such measures should be developed in a manner that seeks to maximize economic, environmental, and social synergies; for example, by promoting the creation of green food systems jobs and improving public health.

Expand the measures that aim to influence diets by promoting healthy and sustainable diets.

The NECP currently includes efforts to promote the consumption of organic products as well as vegetable protein. These can be extended into broader campaigns that promote sustainable, whole-food, and plant-based diets and increase awareness about how legumes can replace animal protein for some meals to reduce the risks associated with meat consumption. For instance, current marketing material by the public health agency in France that aims to improve diets suggests that a side dish of potatoes should be replaced by vegetables, but meat quantities remain the same. There is a missed opportunity here to display images of meals that slightly reduce the portion of potatoes but also that of meat, partially replacing both with vegetables and legumes. In addition, promotional material could highlight more creative, diverse, and locally grown vegetables, raising awareness on the diversity in flavour and texture that vegetables offer and that can inspire changes in food consumption.

Develop comprehensive measures and targets for degrowth in livestock and agriculture, integrating the commitments made in the context of the Global Methane Pledge and the Glasgow Leader's Declaration on Forests and Land Use.

France endorsed key pledges and initiatives that were announced during COP26 in Glasgow (but outside the official UNFCCC regime). These pledges, if fully and adequately implemented, have the potential to accelerate France's shift toward sustainable food systems. Moreover, measures could be developed building on past experience with wine production. France experienced the downsizing of domestic vineyards and wine production, mainly prioritizing production quality over quantity, which ultimately led to higher prices for fewer goods.⁹⁴ This experience could have valuable lessons for reducing livestock production, while making production more sustainable, focusing on the quality of meat, and raising prices. Developing measures to reduce livestock production also requires efforts to ensure a just transition for all stakeholders involved in the livestock industry. Addressing trade-offs, such as retiring farmers who will not be able to sell their land when production size is shrinking, is important.⁹⁵

Introduce actionable measures that aim to reduce emissions from livestock production. This could involve, for example, reducing the subsidies for conventional livestock farming that are provided under the E.U. Common Agricultural Policy (CAP), while increasing the subsidies for sustainable (livestock) farming provided under the same policy.⁹⁶ Additionally, the French government can collaborate with the French

farmer's association (FNAB) to encourage and support livestock farmers to transition to the production of other, more sustainable food products.⁹⁷ Such an approach would also reduce the amount of land needed to produce animal feed in France, and could therefore allow space for the Plant Protein Strategy to be updated to focus more on the benefits of plant protein for human nutrition rather than animal feed.

Beyond HFCs, introduce legislation to tax industrial and conventional agricultural inputs. While the NECP takes a first step in using taxation on HFCs as a means to address CO₂ emissions within the food system, this should be extended further to agricultural inputs such as synthetic fertilizers, pesticides, herbicides, and fungicides. While these inputs are essential for agricultural production, they are rarely regulated. A tax could be a crucial instrument to incentivize a shift to more sustainable practices in conventional agriculture if accompanied by public support and incentives for adopting sustainable farming practices.⁹⁸

Introduce efforts to increase supply chain efficiencies to address food loss and waste. While the NECP includes several measures that aim to reduce food waste at the end of food supply chains, no efforts are put forward to systematically reduce food loss. Potential measures could include awareness-raising campaigns to incentivize consumers to purchase food that may be visually unappealing but otherwise healthy and nutritious,⁹⁹ or improvements to guidelines that result in unnecessary loss of edible food, including exaggerated expiration dates.¹⁰⁰ In addition, current efforts to address food waste should be strengthened. For example, the law requiring supermarkets to establish relationships with charities can be extended to actually include a specification of the minimum proportion of unsold foods that should be donated to charities.

Consider imported food system emissions, particularly those linked to deforestation. While the NECP recognizes the importance of imported emissions, it does not include measures or targets to this end. In fact, while research indicates that France has a positive emissions balance from its food trade, this does not consider deforestation associated with imported products, and is therefore an underestimate of the actual climate impact of France's food imports.¹⁰¹ There is, however, indication of the government being willing to address imported deforestation. Recently, the French government opposed the signing of the E.U.-Mercosur trade agreement, criticizing it for lacking more stringent safeguards against environmental degradation and deforestation. Moreover, as part of the Global Methane Pledge and the Glasgow Leader's Declaration on Forests and Land Use, France commits to promote sustainable trade and address embedded methane emissions and deforestation in food imports.¹⁰²

Strengthen public procurement measures. As indicated earlier, interviews suggest that recently adopted procurement policies are rather weak due to the limited stringency.¹⁰³ It is important to strengthen these procurement policies such that they can be applied as a tool to catalyze a transition toward a healthier and more sustainable food system. This should mainly be pursued by developing more stringent and comprehensive criteria for sustainable and climate-friendly products that include actual assessments of sourcing and cultivation practices of food producers, processors, and retailers. Alternatively, France could also adopt the E.U.'s Green Public Procurement Guidelines for food and catering¹⁰⁴ to harmonize its approach according to E.U. standards and contribute to policy coherence across Member States.

IMPLEMENTATION OF THE NDC

TABLE 3: FRANCE NECP IMPLEMENTATION: KEY FINDINGS AT A GLANCE

Key findings

- Indicators to track progress during implementation of the NECP have been developed.
- Efforts to transition toward a more sustainable food system are financed under the agricultural pillar of the government's Major Investment Plan.
- Under the NECP, farmers will participate directly in the implementation of agricultural measures through a training program to improve their practices.

Areas for improvement

- Further clarify how the SNBC will be implemented and how progress toward its targets will be monitored.
- Recognize the importance of and detail specific roles for key stakeholders under agroecology and regenerative measures.
- Include a holistic financing approach in the Major Investment Plan and mobilize additional investments to catalyze a transition to a healthy and sustainable food system, including for measures to address food waste and dietary changes.
- Make the food system targets and measures included in the NECP more actionable through enforceable legislation.
- Include in the NECP, specific actions that directly address smallholder farmers, women, or other marginalized groups engaged in the French food system.

While indicators have been developed to track progress during implementation, a detailed approach on how the measures outlined in the NECP will be implemented and monitored is missing. According to E.U. legislation, Member States have to provide annual or bi-annual reporting to the European Commission on the progress toward achieving the targets of their NECP. The SNBC outlines national, regional, and local indicators covering different targets and sectors to track progress on implementation. Moreover, the policy indicates that these indicators are to be reviewed annually in cooperation with the High Council on Climate (HCC). However, further information is not provided on implementation and adaptation plans. For instance, it is unclear whether a coordination mechanism is in place, or which actors have responsibilities to support the process of implementation and monitoring.

It is unclear to what extent ministries intend to meet the targets and implement the measures outlined in the NECP, in particular the SNBC. According to interviews, communication with ministries did not sufficiently emphasize the significance of the SNBC, unintentionally downplaying it as merely a set of suggested policies.¹⁰⁵ This has had the direct result that many ministries — including the Ministry of

Food and Agriculture — refer to the SNBC as a reference scenario or suggestion, rather than as the climate mitigation roadmap it intends to be. As a consequence, not all ministries endorse the NECP or take its targets into account when developing their policies. In particular, the Ministry of Food and Agriculture appears to be refraining from strongly committing to the targets of the NECP especially those that relate to livestock production; potentially due to fear of backlash from the agricultural lobby. There appears to be pressure applied at the Ministry to appease the lobby given that the rural vote is expected to be important in the upcoming general elections in France.¹⁰⁶

Efforts to transition toward a more sustainable food system are financed under the agricultural pillar of the government’s Major Investment Plan. More specifically, the Plan dedicates 5 billion EUR (5.7 billion USD) to accelerate the adaptation of tools and practices in agriculture, fisheries, agri-food, and the forestry sector in France, which fall under the ecological transformation priority of the Plan. This is done by transforming upstream sectors, increasing the competitiveness of downstream sectors, and promoting innovation and sectoral organization. The NECP also indicates that additional investments will be needed to meet France’s climate targets, estimated at between 25 and 40 billion EUR (28.5 and 45.6 USD). The NECP does not specify, however, for which sectors these investments are required.

While farmers will participate directly in the implementation of agricultural measures through a training program, the NECP includes no further actions that directly address smallholder farmers, women, or other marginalized groups engaged in the French food system. Under the Teaching to Produce Alternatives Plan, farmers will receive training that supports them in their transition to new and more sustainable production systems. It is unclear from the NECP whether farmers will participate directly in the design and implementation of these trainings, or whether they will only be participating as students. Beyond that, engagement with smallholder farmers, women, and other marginalized groups is not mentioned anywhere in the NECP. Interviews reveal, however, that there are several initiatives in the country to support farmers to improve the sustainability of their production.¹⁰⁷

AREAS FOR IMPROVEMENT

Clarify how the NECP will be implemented and how progress toward its targets will be monitored. This should specify, at the very least, how the monitoring process is structured, which actors are involved, and how the process will be coordinated. It is crucial that the monitoring process be inclusive and participatory, such that feedback from a diverse range of stakeholders can be accommodated and addressed during NECP implementation.

Recognize the importance of and detail specific roles for key stakeholders under agroecology and regenerative measures. Engagement with smallholder farmers, women, and other marginalized groups is not explicitly mentioned in relation to the implementation of the measures included in the NECP. This is a notable omission, as farmers in France have been rather vocal about how climate policies can impact their livelihoods.¹⁰⁸ It is therefore important to detail specific roles for smallholder farmers, among others, to ensure that the implementation of these policies do not impact negatively on their livelihoods. This can be done, for example, in the context of the Organic Plan 2022 as well as in the multiple plans developed for promoting conservation practices.

Allocate funds beyond those currently under the Major Investment Plan and mobilize additional investments to catalyze a transition to a healthy and sustainable food sector. While the Major Investment Plan will cover agriculture, forestry, and fisheries, it is unclear how other food system measures, such as those that address food waste and diets, will be financed. In addition, the NECP specifies that further finance will be needed to achieve its targets. Such finance can fund the measures recommended above, for instance by investing in infrastructure to address food loss along the supply chain and complement France's existing efforts to address food waste. In addition, investments could fund awareness-raising campaigns toward the country's long-term ambition to raise awareness about healthy and sustainable diets.

Make the food system targets and measures included in the NECP more actionable through new legislation. Binding legislation is key for achieving climate targets, especially in cases where voluntary efforts are likely to be insufficient, such as food loss and waste. An important priority is ensuring that the SNBC is given the same importance for policy-making as the MEP: as an actionable roadmap for achieving climate targets.

CASE STUDY SUMMARY

City of Dijon, France

“Sustainable Food 2030” is the City of Dijon’s flagship sustainability initiative, an ambitious and innovative 10-year plan to achieve a healthy and sustainable food system within 10 years. The city aims to demonstrate, to other cities nationally and internationally, that it is possible to transform food systems and achieve a range of positive sustainability (reduced GHG emissions, improvements to biodiversity), economic (employment opportunities, more income for local producers), and social impacts (health and other community benefits).

The city government has placed stakeholder engagement and citizen participation at the heart of its Sustainable Food 2030 Strategy and transition process. Over 50 private and public organizations are involved in preparing and delivering the strategy through 24 specific actions, with a budget of 46 million EUR (52.5 USD), 10 million EUR (11.4 USD) of which was provided by the French government with the rest being provided by the private sector. Their approach includes engaging with vulnerable populations and other disadvantaged groups (these represent 15% of the Dijon population and include families on low incomes, old people, ethnic, and other minority groups) working closely with the Dijon Social Services Department (CCAS -Municipal Social Action Centre). The establishment Citizen Panels has given citizens and other disadvantaged groups a voice and direct link to local decision makers. A new digital platform also aims to facilitate greater citizen participation in the initiative and help citizens navigate the complexity of food choices that impact health and sustainability.

The project team recognize that there is a need to take a systemic approach addressing multiple levers of action, combining information and educational initiatives with a range of economic tools to address the issues of affordability and access. For example, a food coupon distribution scheme is being established targeting the purchase of fruit and vegetables for single-parent families visiting community grocery stores within the city. Research and innovation are also key priorities with the establishment of a “living food lab” to experiment on new production and consumption models that will facilitate the transformation of the agri-food system at local levels. Research centres, higher education and training institutions, agri-food, and environmental organizations are working collaboratively pooling their knowledge through the living food lab. For example, recognizing the importance of leguminous crops (peas, field beans, lupines, lentils, etc.) from a human health and a climate perspective, the project team have established the first laboratory focusing on the promotion and development of leguminous crops within France.

“We have a vision to develop a new model of agro-ecological production, linked to the provision of healthy and nutritious diets, with high environmental performance and the virtuous sharing of resources between the city and the rural areas.” —Philippe Lemanceau, Vice-Président Dijon Métropole

Further information and access to the detailed case study can be found [here](#).

OVERVIEW OF GERMANY'S FOOD SYSTEMS

Germany's food systems are an important part of the country's economy. The food systems* in Germany account for 6.5% of the national GDP, and 12% of Germany's professional employment.¹⁰⁹ More than half of Germany's land area — 16.7 million hectares — is used for agricultural purposes.¹¹⁰ In fact, Germany is considered to be Europe's largest food producer.¹¹¹ Wheat is the most important crop, followed by barley, rye, and corn, while dairy production is also substantial.¹¹²

Germany is both the world's third-largest exporter and the third-largest importer of foods and foodstuffs, while overall being a net importer. Around one-third of foodstuffs produced by the food and agriculture industry is exported, 77% of which is destined for E.U. Member States.¹¹³ Top exports include coffee, wheat, pork, and cheese.¹¹⁴ The largest share of arable land in Germany (40%) is used for the production of animal feed.¹¹⁵ Domestic production therefore accounts for only one-fifth and one-third of the demand for fruits and vegetables, respectively.¹¹⁶ As a consequence, fruits and vegetables are the most highly imported foods in Germany.¹¹⁷

Organic farming has been increasing in relevance in Germany for decades. Germany currently has the second-largest demand for organic products after the United States, and the sales of these products is expected to continue to grow in the future. The government has promoted organic farming practices since 1989 through legislation and awareness-raising campaigns. In 2002, the Organic Farming Act was adopted to improve governance and coordination of organic farming in Germany.¹¹⁸ More than 10% of agricultural holdings in Germany are currently dedicated to organic farming, with a target to increase this share to 20% by 2030.¹¹⁹ To this end, there are continuous efforts by the government to further facilitate and improve conditions for organic farming, as well as strengthening research to improve organic farming practices. In fact, efforts are expected to be enhanced by the new government coalition of 2021, which has declared its intention to increase the 2030 target of the share of organic farming land to 30% and restructure livestock farming.¹²⁰

There is an urgent need to address diet-related health problems in Germany. The prevalence of obesity has risen starkly since the early 2000s, with current estimates suggesting that around 22% of adults are obese. More broadly, around 65% of male adults were found to be overweight in the 2017 Global Nutrition Report, as well as nearly 45% of female adults. The prevalence of diabetes, however, has remained relatively low in the last two decades, at approximately 5% among adults.¹²¹ As a response to Germany's malnutrition challenges, the German government has recently put more focus on developing national policies to prevent increases in the share of the population that is considered overweight and promote healthier diets.¹²² Most important in this regard was the previous launch of IN FORM or the National Action Plan.¹²³ The initiative aims to prevent poor dietary habits, lack of physical activity, and overweight and related diseases. It furthermore includes a platform for dialogue between stakeholders and experts from politics, science, businesses, and civil society to collectively develop plans and actions for better health. Additionally, the federal government has announced it

* The food system in Germany includes agriculture, agriculture wholesale, food crafts, food processing, food wholesale and retailing, and the hospitality industry.

will raise efforts to support states in providing healthier and more sustainable school food. The decision to act on the latter, however, remains with the German states.¹²⁴

Food production in Germany both contributes to, and is impacted by, climate change. German agriculture produces considerable volumes of GHG emissions, notably methane due to the extent of livestock farming in the country. Yet, while the sector currently accounts for 7% of total national GHG emissions, emissions from agriculture have declined by 18% since 1990, mainly due to a decrease in the number of livestock animals,¹²⁵ although since the mid-2000s the reduction rate has stagnated.¹²⁶ Regarding impacts, climate change may affect agriculture both positively and negatively. On one hand, warmer temperatures can result in shorter growing and ripening times for crops, enabling vegetable farmers to harvest multiple times per year. On the other hand, mild winters will allow plant-damaging fungi, viruses, and insects to spread more widely.¹²⁷ Furthermore, agriculture is likely to be negatively affected by changing rainfall patterns, rising temperatures, variability in seasonality, and extreme weather events.¹²⁸ Of special concern to Germany are prolonged periods of drought, which are projected to cause substantial harvest losses.¹²⁹

GERMANY'S CONTRIBUTION TO THE E.U.'S NDC

Germany's contributions to global climate action are covered by the E.U.'s NDC. As part of its commitments under the E.U.'s NDC, Germany has prepared an integrated National Energy Climate Plan (NECP),¹³⁰ which was submitted to the European Commission in June 2020, as well as a Long-term Strategy (LTS),¹³¹ which was submitted in November 2016. The LTS — also called “The Climate Action Plan 2050” — is considered the main climate policy document of the country, whereas the NECP specifies measures to operationalize these goals until 2030.¹³²

The following assessment was conducted between June and November 2021, and is largely based on Germany's NECP, as well as its LTS and interviews with five key stakeholders.

KEY FINDINGS FROM GERMANY

NDC DEVELOPMENT PROCESS

TABLE 1: GERMANY NECP DEVELOPMENT: KEY FINDINGS AT A GLANCE

Key Findings

- While the National Energy Climate Plan (NECP) development process was a collaborative effort between the Ministry of Economic Affairs and the Ministry of the Environment, Nature Conservation, and Nuclear Safety, engagement with the Ministry of Food and Agriculture and the Ministry of Health was limited.
- The NECP development process sought to be participatory and transparent.
- The NECP indicates that its development process is supported by policy and knowledge exchange with other E.U. Member States.

Areas of improvement

- Ensure the participation of all relevant stakeholders in the development of the NECP.
- Conduct a holistic assessment of Germany's food systems to inform future updates of the NECP.

While the NECP development process was a collaborative effort between the Ministry of Economic Affairs and Energy (BMWi) and the Ministry of the Environment, Nature Conservation, and Nuclear Safety (BMU), engagement with the Ministry of Food and Agriculture (BMEL) and the Ministry of Health (BMG) was limited. The BMWi and the BMU were responsible for drafting the NECP and ensuring policy coherence. The BMWi mainly focused on energy policy, with the BMU looking at climate policy. However, the apparent limited participation of the BMEL may suggest shortcomings in the extent to which policy coherence may have been safeguarded for measures that impact the German food system, even more so considering the position on policy-making from the Ministry, as described earlier.

The minor role of the BMEL may not be surprising, as it has been run by the party with the closest ties to farmers,¹³³ while livestock and chemical industry sectors also have had a strong presence in politics,¹³⁴ ensuring the Ministry maintained a business-as-usual agenda and refrained from any mitigation action.¹³⁵ ¹³⁶ Additionally, the BMG appears to have lacked engagement, suggesting further possibility for better policy integration as well as developing climate policy that generates co-benefits for health. However, policy coherence is expected to improve due to the composition of Germany's new coalition government, in which the same party will be in charge of the Ministry of Economy and Climate Protection; the Ministry of Environment, Nature Conservation, Nuclear Safety and Consumer Protection; as well as the Ministry of Food and Agriculture.¹³⁷

The NECP development process sought to be participatory and transparent. The German federal government regularly published information on the NECP development process online, which was freely accessible to all and allowed for feedback from stakeholders. In addition, an online survey was conducted to collect feedback on the NECP draft. Approximately 200 responses were received that included representatives from businesses, NGOs, academia, civil society, as well as private individuals. However, the NECP does not detail any efforts to ensure the participation of specific stakeholders such as food and health experts, women, and representatives of marginalized groups during the NECP development process. Interviewees also suggest that the meaningful participation of civil society organizations that advocate for more sustainable food consumption is also missing.¹³⁸ Additionally, interviewees suggest that the development process of the NECP was difficult to access for non-governmental stakeholders,¹³⁹ including citizens,¹⁴⁰ limiting public participation.¹⁴¹

The NECP indicates that its development process is supported by policy and knowledge exchanges with other E.U. Member States. For example, numerous treaties were signed between Germany and France between 2018 and 2019 to forward collaboration between these two countries on climate and energy policies. In 2017, the BMU launched the European Climate Initiative to further bilateral and multilateral climate projects to share best practices in all relevant sectors, including agriculture and land use.

It is unclear from the NECP whether any and, if so, which research was conducted to inform its development. The NECP does not holistically consider the impacts of transitioning to a sustainable food system, but rather discusses emission reduction potentials from measures for agriculture. It is therefore unlikely that a holistic assessment of the German food system underpins the NECP. Notwithstanding, the NECP calls for the further consolidation and development of research, specifically in the context of promoting organic farming.

AREAS FOR IMPROVEMENT

Ensure the participation of all relevant stakeholders in the development of the NECP. It is particularly important to secure the involvement of both the BMG and the BMEL in developing actions and measures. This could be done through a food and climate taskforce, which should include representation from both of these ministries, as well as the BMWi and the BMU. Such a taskforce could come together regularly to discuss priorities, policies, and legislation that further explores the linkages between Germany's food systems and climate and sustainable development goals and priorities, and would improve policy coherence and promote alignment between the NECP and other food systems policies. This taskforce could be an extension of or build on the Commission on the Future of Agriculture.¹⁴² This Commission is composed of farmers' associations, civil society, and NGOs; and it was recently established to formulate a long-term vision for agriculture in Germany. The Commission was able to build consensus across diverse groups of stakeholders, who agreed on a progressive long-term strategy for Germany's agriculture and food sector. The strategy included recommendations to reduce livestock numbers and meat consumption.¹⁴³

Furthermore, it is important to engage regional and local representatives at the E.U. and national level in the NECP development process, as well as to consult local communities and institutions. More specifically, the online survey can be complemented with in-person consultations with external experts and stakeholders from different parts of society.

Finally, in its knowledge exchange with other E.U. Member States, Germany would do well to increase focus on the food trade relationships between itself and these countries. Knowledge exchanges could regularly include discussions of how the production and consumption of food products within the E.U. can become, as a whole, less carbon-intensive, thereby ensuring greater coherence between supply- and demand-side food systems policies. In this way, the climate benefits achieved through ambitious food systems measures introduced in one E.U. Member State are not watered down through contradictory or weaker food system policies in another Member State.

Conduct a holistic assessment of Germany's food systems to inform future updates of the NECP.

The NECP development process does not seem to have considered food systems in a holistic manner. This means that important mitigation opportunities from the food systems — which tend to come with many economic, environmental, and social co-benefits — may have been missed. A recent scientific report¹⁴⁴ by Stiftung Klimaneutralität, which presents mitigation potential in food systems through comprehensive yet feasible measures, demonstrates how a careful analysis of the food systems can inform and provide opportunities for developing measures that mitigate climate change. Carrying out a holistic assessment of Germany's food systems can thus serve as a basis for increasing the climate ambition of the NECP. Such an assessment can also further elevate Germany's food systems within national climate policies. Most importantly, such an assessment can broaden the understanding of environmental impacts beyond GHG reductions, which would align well with the commitment put forward in the E.U.'s NDC to maximize social, environmental, and economic synergies.

CONTENT OF THE NDC

TABLE 2: GERMANY NECP CONTENT: KEY FINDINGS AT A GLANCE

Key findings

- The NECP puts forward a regenerative and ecological approach to agriculture.
- The NECP includes measures to promote energy efficiency in agriculture.
- The NECP includes several measures to promote conservation.
- The NECP includes a guideline to reduce emissions through the use of non-halogenated refrigerants.
- The NECP includes a commitment to promote sustainable food consumption and includes several measures to this end.

Areas for improvement

- Evaluate the design of measures that address livestock to maximize co-benefits and ensure compliance.
- Include measures to promote equitable access to sustainable and healthy food for all.
- Further develop a comprehensive and fair strategy for influencing consumer behaviour.
- Introduce measures to reduce food loss and waste.
- Translate the long-term ambition under the Long-term Strategy (LTS) to conserve peatlands into tangible measures under the NECP.
- Create green employment opportunities that are aligned with sustainable and healthy food systems.
- Include commitments made in the context of the Global Methane Pledge, Glasgow Leaders' Declaration on Forests and Land Use, and the Policy Action Agenda for Transition to Sustainable Food & Agriculture.

The NECP puts forward a regenerative and ecological approach to agriculture. This includes a measure to promote the accumulation of humus — the dark organic matter from dead plants — in agricultural land through the planting of hedges, hedgerows, and tree avenues. In addition, the NECP suggests more action is needed to reduce GHG emissions from livestock farming and simultaneously improve animal welfare by limiting the number of livestock units per hectare. Most importantly, organic farming is central to Germany's approach to climate change mitigation through agriculture and has enjoyed a strong lobby that has generated public support.¹⁴⁵ The NECP promotes organic farming through measures such as the implementation of the organic farming strategy, calling for the promotion of research on organic practices, and the extension of financial support. These measures are in line with the target set under the German LTS to increase the share of organic farming within national agricultural activities to 20% by 2050. While organic

farming holds clear co-benefits beyond mitigation for improving biodiversity and soil quality,¹⁴⁶ there is a need to examine the potential in Germany for expanding these practices more closely.¹⁴⁷ Additional measures to make agriculture in Germany more broadly sustainable will also be needed for building a more sustainable and resilient food sector.¹⁴⁸

The NECP includes measures to promote energy efficiency in agriculture. More specifically, the NECP puts forward efforts to increase the share of renewable energy for heating and cooling, although no specific target is mentioned. Additional measures include reducing emissions from the transport sector through increased funding for e-mobility; training to improve energy efficiency in the operation of heavy agricultural machinery; and providing climate and energy advice to agricultural companies on energy consumption issues.

The NECP includes several measures to promote conservation. This includes extensive measures to conserve and protect forests, grasslands, moorlands, and soils. For example, in the NECP, the German government expresses the intention of developing a strategy for safeguarding the country's grasslands. In addition, the German NECP puts forward measures to promote the addition of forested strips to agricultural lands for soil protection and CO₂ containment. Interestingly, rewetting peatlands as a conservation measure is not included in the NECP but is mentioned as an important conservation strategy in Germany's LTS. Rewetting and conserving peatlands may be considered a very cost-effective, strong impactful solution for addressing climate change.¹⁴⁹ The current gap in including and implementing measures for this type of conversation under the NECP may be explained by limited public funding for conservation practices in Germany.¹⁵⁰

The NECP includes a guideline to reduce emissions through the use of non-halogenated refrigerants. The measure, which covers funding to promote energy efficiency for both refrigeration and air conditioning, is expected to result in energy savings of 18 petajoules (PJ) between 2021 and 2030, equal to nearly 1% of Germany's annual domestic electricity consumption.¹⁵¹

The NECP includes a commitment to promote sustainable food consumption and includes several measures to this end. Measures include expanding the education and guidance that is provided on sustainable, climate-friendly, and healthy nutrition. In addition, labelling efforts are put forward to describe the farming technique used for the production of animal products, which is intended to improve awareness about animal welfare. Furthermore, the NECP includes a commitment to developing a master plan for sustainable and healthy nutrition that takes account of the Paris Agreement and Sustainable Development Goals. In this context, the NECP also includes an intention to conduct research on food consumption and develop pricing instruments to address unhealthy dietary behaviour. Influencing diets is challenging in Germany, as there may be resistance to the idea of the government interfering with dietary choices.¹⁵²

AREAS FOR IMPROVEMENT

Evaluate the design of measures that address livestock to maximize co-benefits and ensure compliance. While the NECP does include measures that aim for emission reductions from livestock, interviews suggest that such measures need to be carefully designed to prevent loopholes that allow farmers to circumvent any requirements for adjusting their livestock activities.¹⁵³ It is, therefore, important to reflect on whether these measures are stringent enough to result in actual emissions reductions. Furthermore,

interviewed experts note that the most important measure that should be included is to reduce the number of cattle in the livestock sector and improve nutrient management.¹⁵⁴

Include measures to promote equitable access to sustainable and healthy food for all. While the NECP mentions the impact of its measures at a high level, it is not clear whether there are any efforts in place to ensure access to sustainable and nutritious food for all. A first step in developing such a holistic approach in Germany is to build the narrative that the government ultimately holds the responsibility for ensuring the provision of sustainable and healthy food. The approach taken to address energy poverty can be extended to also cover food and nutritional security. For example, when conducting the food systems research recommended above, assessments should also be made of the impacts that different food systems measures have on the ability of different societal groups to access healthy and sustainable food. Doing so could prevent a food systems transformation that disproportionately impacts or disrupts food and consumption patterns of certain socio-economic or ethnic groups or cultural beliefs.¹⁵⁵ The results of this research could, in turn, inform the development of measures for sustainable and healthy food.

Further develop a comprehensive and fair strategy for promoting a shift in consumer behaviour toward more diverse and healthy diets. In researching and developing pricing instruments (as indicated in the NECP), it is important to consider externalities such as imported emissions and deforestation.¹⁵⁶ It is also essential to avoid disproportionately impacting different income groups with these pricing instruments. The strategy should span income groups or include a compensation scheme for the lowest income earners in Germany.¹⁵⁷ Furthermore, adding to the consideration of pricing instruments in the NECP, procurement policies may also provide a feasible approach for shifting diets in Germany. The key here, however, is not to ban certain foods but rather facilitate access to healthier foods. Such an approach could initially be adopted for hospitals and (school) canteens.¹⁵⁸

Introduce measures to reduce food loss and waste. The NECP does not include measures to reduce food loss and food waste. This is a missed opportunity, as 11 million tons of food are wasted annually in Germany.¹⁵⁹ Germany published a National Strategy for Food Waste in February 2019 that, while not included in the NECP, covers actions by the federal government, federal states, industry, civil society, and the scientific community across entire food supply chains.¹⁶⁰ These measures should be included in the next version of Germany's NECP. Given that food service providers, such as food retailers and restaurants, procure larger quantities of foods and food products compared to individual households, it is recommended that initial efforts to reduce food loss and waste start with these organizations.¹⁶¹

Translate the long-term ambition under the LTS to conserve peatlands into tangible measures under the NECP. As discussed earlier, conserving peatlands has high climate change mitigation potential, and although it is included in Germany's LTS, it is currently not part of conservation measures under the NECP. As a first step in translating this conservation practice into action, additional funding should be allocated, and additional research should be conducted, to examine how peatland conservation may impact farmers.

Create green employment opportunities that are aligned with sustainable and healthy food systems. While the NECP includes several mentions of job creation, these are all related to the energy

sector. It is imperative to also address employment as part of a just transition to sustainable and healthy food systems. The Commission on Growth, Structural Change and Employment could be assigned the responsibility for developing such measures to inform the next revision of the NECP. These could include efforts to increase employment in organic farming in Germany, as well as in the food services industry.

Integrate the commitments made in the context of the Global Methane Pledge, Glasgow Leaders' Declaration on Forests and Land Use, and the Policy Action Agenda for Transition to Sustainable Food & Agriculture. Germany endorsed several pledges and initiatives announced during COP26 in Glasgow (but outside the official UNFCCC regime). These pledges, if fully and adequately implemented, have the potential to accelerate Germany's shift toward sustainable food systems, in particular through measures that promote sustainable trade and address embedded methane emissions and deforestation in food imports, as well as through repurposing public policies to support regenerative agriculture practices while improving overall food systems resilience. But to ensure progress, transparency, and accountability, it is crucial that these international commitments and respective actions be fully integrated and anchored in Germany's NECP and LTS.

IMPLEMENTATION OF THE NDC

TABLE 3: GERMANY NECP IMPLEMENTATION: KEY FINDINGS AT A GLANCE

Key findings

- The NECP provides information on the governmental stakeholders included in the implementation process.
- The NECP specifies the monitoring approach for certain specific measures.
- The NECP details that funding will be provided for a range of food systems measures and includes a broader commitment to remove harmful subsidies.

Areas for improvement

- Clarify how the NECP will be implemented and monitored.
- Extend the MRV tool to cover food systems and external stakeholders.
- Detail roles for specific stakeholders for the implementation and monitoring of food systems measures.
- Act on the long-term ambition to end harmful subsidies.
- Strengthen and ensure funding for implementing measures that target food systems.

Other than governmental stakeholders, the NECP does not provide any information on the actors that will be involved in implementing its food system measures. It is also unclear from the NECP whether its implementation will be centrally coordinated and, if not, who bears the ultimate responsibility for each of the measures and commitments put forward in the plan. Similarly, while the LTS states that the 20% organic farming target will be implemented in a participatory manner, the exact way this will take place is not further specified.

While the NECP specifies the monitoring approach for certain specific measures, there is no dedicated plan of how progress toward the implementation and achievement of the NECP in its totality will be monitored. The MRV of the NECP is limited to the actions and measures put forward for the energy sector and, as such, does not appear to cover Germany's food systems. In addition, the NECP does not address whether and, if so, how stakeholders will be engaged in its monitoring process and whether input from local communities, smallholder farmers, and other marginalized groups will be considered through the data collection process.

The NECP details that funding will be provided for a range of food systems measures and includes a broader commitment to remove harmful subsidies. Without specifying any sector, there is a broad ambition in both the NECP and LTS to end environmentally harmful subsidies at the national, European, and global level. The NECP further indicates that a subsidy will be introduced to cover the above-mentioned labelling scheme that promotes animal welfare. In addition, the NECP aims to expand funding for planting of

trees and forest strips and supporting agroforestry systems. The NECP also states that it will “optimize legal and financial support” for promoting and increasing organic farming and introduce subsidies to incentivize a shift to organic farming. It was noted in one interview, however, that current funding for expanding organic farming practices may not be sufficient for a large-scale transformation.¹⁶²

AREAS FOR IMPROVEMENT

Clarify how the NECP will be implemented and monitored. It is not fully clear from the NECP how it will be implemented nor how its implementation will be monitored. An important aspect of ensuring inclusive and participatory governance in the NECP implementation would therefore involve being more transparent. In addition, and in the benefit of ensuring policy coherence, it is particularly important to clarify how the NECP monitoring process is aligned with the E.U.’s NDC monitoring process.

Extend the MRV tool to cover food systems and external stakeholders. While reports suggest that the NECP includes annual monitoring of emissions in the energy, transport, industry, and agricultural sector,¹⁶³ when it comes to implementation, the current MRV process only covers the energy sector. As such, the MRV should be extended to cover other sectors under the NECP, and especially those measures and targets that address the food system. In extending its scope, external stakeholders beyond government could be engaged to provide progress reports, data, and information on implementation in specific sectors (for instance, agriculture). This not only supports developing more detailed, low-level data on implementation, it may also help facilitate support from stakeholders beyond government for the implementation of the NECP.

Detail roles for specific stakeholders for the implementation and monitoring of food systems measures. The NECP does not put forward any platforms for the engagement of non-governmental actors in the implementation and monitoring of its measures. In addition, while the LTS states that the 20% organic farming target will be implemented in a participatory manner, the exact way this will take place is not further specified. It is thus important to outline concrete actions to ensure that implementation is truly participatory. This can be done, for example, by detailing specific roles for women, local communities, farmers, and other stakeholders in the implementation of organic farming and conservation measures. Furthermore, these groups can be assigned responsibilities in the monitoring process — for example, for the collection and use of inputs — which can further ensure that local knowledge is integrated.

Act on the long-term ambition to end harmful subsidies. While both the NECP and LTS include a long-term commitment to end harmful subsidies at the national, European, and global level, no concrete actions are put forward. This is particularly worrisome, given the large volumes of agricultural subsidies that encourage business-as-usual agriculture in Germany.¹⁶⁴ A first step would therefore involve identifying harmful subsidies per sector on a national level, and redirecting these to catalyze a transition to sustainable land use and a sustainable and healthy food system. Such an identification process has already been initiated by the German Federal Environment Agency, which have listed eight different agricultural subsidies in Germany that are harmful to the environment, two of which derived through the E.U. Common Agriculture Policy.¹⁶⁵

Strengthen and ensure funding for implementing measures that target the food system. It is important to research and develop compensation schemes for farmers to implement conservation

practices, as some farmers may be disproportionately impacted when they incidentally own land designated for conservation.¹⁶⁶ Moreover, converting and maintaining agricultural lands for organic practices requires substantial financial capital. In order to reach the 20% targets, there needs to be a strong guarantee on finance.¹⁶⁷

CASE STUDY SUMMARY

City of Nuremberg, Germany

Germany is one of Europe's largest producers and suppliers of organic foods within Europe, with 10% of farmland under organic production. A growing awareness of environmental issues (climate change, biodiversity loss) and health impacts of food systems continues to fuel the demand for organic foods throughout Germany.

The country's National Energy Action Plan put forward a regenerative and ecological approach with targets to double organic agricultural production by 2050. Within this context, the German Federal Ministry of Food and Agriculture, within the framework of the Federal Programme for Organic Farming, has been supporting the "Deutschlands Biostädte," a country-based Organic Cities Network (OCN), which works with city authorities, municipalities, and districts across Germany to promote organic farming and organic food.

The City of Nuremberg is one of the original co-founders of the OCN and is often viewed as one of the leading city champions of the organic food movement within Germany. Nuremberg has set itself the goal of further expanding the production and consumption of organic foods to reduce its emissions. A package of support, consisting of 5 lines of action, underpinned by 24 key actions, is being implemented in support of the strategy. These include:

1. A viable and coherent legislative framework that incentivizes organic/sustainable agriculture; for example, by supporting organic farming measures within the Common Agricultural Policy;
2. Facilitating and improving access to organic farming; for example, by providing advisory services to conventional farmers who want to convert to organic agricultural practices;
3. Encouraging the demand for organic agricultural produce; for example, by supporting labelling or public sector food procurement policies (in canteens, etc.) using organic produce;
4. Improving the productivity of organic agricultural systems; and
5. Providing financial incentives to farmers who improve the ecology of farmed landscapes.

One of the city's priorities is bringing back traditional and indigenous nutrient-rich crops. The city runs the "Hersbruck Fruit Initiative," which aims to bring back and improve access to traditional fruit varieties within the region, which are more resilient to changes in climate. Growing more fruit locally (versus importing it from overseas) also has the benefit of reducing GHG emissions. The Initiative has mapped 1,800 fruit trees over the last 2 years and rediscovered some lost varieties, which they are now replanting. The local fruits are then turned into organic apple juice and ciders, and are marketed as bottles of "Pom200" throughout regional markets. In addition, the city works in collaboration with other national and local organizations to promote heritage cereal grains (traditional wheat varieties such as einkorn, emmer, and champagne rye).

Further information and access to the detailed case study can be found [here](#).

OVERVIEW OF SPAIN'S FOOD SYSTEMS

The Spanish food system is an important part of the country's economy. Spain's agri-food sector — including agricultural activities, the industries and services providing inputs to agriculture, food and beverages manufacturing, transport, retail, and distribution — accounts for 13.8% of national employment and 8.9% of GDP (2018).¹⁶⁸ In 2020, the agri-food industry alone (excluding agriculture) generated over €129 million in sales.¹⁶⁹ Moreover, as of 2018 more than half of the Spanish land area — approximately 26.2 million hectares — is dedicated to agricultural production.¹⁷⁰ As a result, Spain is Europe's fourth largest agri-food producer and ranks tenth in the world.¹⁷¹ Vegetables, meat, and fruit make up the most important agricultural outputs, followed by cereals and milk.¹⁷²

Spain is both a major exporter and importer of food, ranking fifteenth and sixteenth in the world, respectively. In 2020, Spanish exports of agricultural products were worth €51.4 million and accounted for over 15% of the country's total exports.¹⁷³ Two-thirds were exported to E.U. countries, of which France was the top importer, followed by Portugal, Italy, and Germany.¹⁷⁴ Outside of the EUROPEAN UNION, most food was exported to China.¹⁷⁵ Spain primarily exports pork, olive oil, wines, and vegetable preserves.¹⁷⁶ In turn, Spain's main food imports are mollusks, corn, and shellfish.¹⁷⁷ In 2020, food imports were reported at 11.92% of total merchandise imports with a value of €35.2 million.¹⁷⁸ Spain's most important food import partners are Germany, France, the Netherlands, Italy and Portugal are the most important import partners of Spain.¹⁷⁹

Spain has the largest total land area devoted to organic agriculture in the EUROPEAN UNION, and ranks third in the world in organic agricultural area.¹⁸⁰ Spain's total organic agricultural area has increased steadily over the last 10 years, accounting for approximately 2.4 million hectares in 2020. This represents an increase of over 34% as compared to 2012.¹⁸¹ The market size of organic production doubled in the period 2014 to 2018, exceeding €2 billion in value.¹⁸² Similarly, the number of organic operators increased by 6% between 2017 and 2018.¹⁸³ An increase in global demand for organic agriculture is expected for the period 2019 to 2024, estimating a market size of over €300 million by 2024.¹⁸⁴

The prevalence of obesity in Spain is high and increasing among both adults and children. Approximately 21.6% of adults in Spain were considered obese in 2015, and only half of the adult population was following a healthy diet in 2019.¹⁸⁵ Of children aged 2 to 17, as much as 41% were considered overweight or obese in 2015, which indicates a slight decrease in prevalence since 2006. Yet, obesity and overweight prevalence in Spanish children remains to rank second-highest in the European Union.¹⁸⁶ In 2008, the then Spanish Ministry of Health, Social Services and Equality introduced food-based dietary guidelines for the Spanish population in an effort to address public health issues.¹⁸⁷ The 2021 multi-partner project *Mediterranean Lifestyle in Pediatric Obesity Prevention* (MELI-POP) will investigate the causes of childhood obesity and how to prevent it by examining the consumption patterns and physical activity levels of children in the areas of Zaragoza, Córdoba, and Santiago de Compostela.¹⁸⁸ The hypothesis here is that the consumption of a traditional Mediterranean diet can, together with increased physical activity, contribute to the prevention of childhood obesity. In recent years, adherence to a Mediterranean diet has decreased, leaving significant parts of the Spanish population prone to diet-related chronic diseases.¹⁸⁹ Against this backdrop, government efforts to tackle food-based health issues have increased and the Spanish Government is engaging food industry actors in its efforts to

promote healthy diets. One example of such public-private partnerships was the introduction of voluntary nutrition labels on food products operational since the first quarter of 2021.¹⁹⁰

As much as 7.7 million tons of food are wasted or lost along the Spanish food supply chain every year.¹⁹¹ As such, Spain ranks seventh among E.U. countries in terms of food loss and waste.¹⁹² Most food loss and waste occurs at the household level. Data suggests that food loss and waste on the household level averaged 31 kilograms per capita in 2020. At the national level, household food waste totalled approximately 1.34 million tons in 2020, with vegetables and fruits making up the largest part.¹⁹³ These high levels may be attributed to a general lack of national awareness on the topic, exacerbated by high temperatures in the spring and summer.¹⁹⁴ In October 2021, a national bill on the Prevention of Food Loss and Waste was presented for public consultation. The bill aims to tackle food loss and waste from the economic, environmental and moral perspectives. This makes Spain the third European country to legislate against food loss and waste, together with France and Italy.¹⁹⁵

Food production in Spain both contributes to, and is impacted by, climate change. The agricultural sector accounts for 12% of total national GHG emissions as of 2019.¹⁹⁶ Spain has expressed the ambition to decrease emissions from the agricultural sector by 18% by 2030, as compared to 2005 levels. Until 2019, only a moderate 4.6% decrease in emissions, as compared to 2005 levels, has been achieved.¹⁹⁷ Extreme weather events and increasing climate variability will likely have negative impacts on the Spanish agricultural sector, which already suffers from yield variability due to unstable weather conditions.¹⁹⁸ At the same time, the agricultural sector has the potential to abate 10 million tons of CO₂ equivalent — around 28% of national agricultural emissions in Spain. This mitigation potential is calculated on the basis of a set of measures which include land and livestock management, manure application, and reducing the demand for livestock products.¹⁹⁹ In an effort to unlock this mitigation potential by influencing dietary patterns, the Spanish Minister of Consumer Affairs recently made a call to reduce the consumption of red meat to decrease associated methane emissions.²⁰⁰

SPAIN'S CONTRIBUTION TO THE E.U.'S NDC

The E.U.'s NDC covers Spain's contributions to global climate action. As part of its commitments under the E.U.'s NDC, Spain has prepared an integrated National Energy and Climate Plan (NECP),²⁰¹ submitted to the European Commission in April 2020, as well as a Long-Term Strategy (LTS).²⁰²

The following assessment is largely based on Spain's NECP and LTS, as well as interviews with six key stakeholders.

KEY FINDINGS FROM SPAIN

NDC DEVELOPMENT PROCESS

TABLE 1: SPAIN NECP DEVELOPMENT: KEY FINDINGS AT A GLANCE

Key Findings

- The National Energy and Climate Plan (NECP) development process was led by the Ministry for Ecological Transition and Demographic Challenge (MITECO), and coordination bodies were established for inter-ministerial collaboration and coordination with Autonomous Communities.
- The NECP was developed through a participatory process, which included a public consultation, meetings with key stakeholders, and public events.
- While it is clear that the NECP was developed through a participatory process, it is unclear how stakeholders were selected and in which way their inputs were considered during policy drafting.
- While the Long-Term Strategy (LTS) also appears to have been developed in a participatory way, the exact process by which it was developed is unclear.
- MITECO received technical support from academia and research centres for developing the NECP.
- The NECP recognizes the economic, environmental, social, and health impacts of its proposed measures, providing estimates for some of its agricultural measures.

Areas of improvement

- Increase transparency in the NECP development process by making information publicly available and clarifying processes, as well as ensure participation of all relevant stakeholders to avoid unbalanced representation.
- Conduct a holistic assessment of the Spanish food system to inform future updates of the NECP.

KEY FINDINGS

The NECP development process was led by the Ministry for Ecological Transition and Demographic Challenge (MITECO), and coordination bodies were established for inter-ministerial collaboration and coordination with Autonomous Communities. MITECO — with competences in climate change, energy, and environment — is responsible for climate policy in Spain, including the development and update of the NECP. To develop the NECP, MITECO engaged with other ministries through bilateral meetings and by leading the Interministerial Commission on Climate Change and Energy Transition, which is composed of representatives from all ministries, including the Ministry of Agriculture, Fisheries and Food (MAPA), and the Ministry of Health.²⁰³ MAPA played a crucial role in the development process, and the measures related to food production in the NECP result from collaboration and agreement between MAPA and MITECO.²⁰⁴ In addition, MITECO coordinated with Autonomous Communities (CC.AA) — Spain's administrative regions — through the Climate Change Policy Coordination Commission. The Commission includes representatives from each of Spain's three levels of government — with representatives from the National Government, one representative from each CC.AA (each of the cities of Ceuta and Melilla), and one member representing Local Entities.²⁰⁵ According to an interview, collaboration with CC.AA also occurred through climate change mitigation working groups and other informal mechanisms. According to the same interviewee, coordination and collaboration at the local level is mainly carried out between local entities and CC.AA, which are in turn in contact with the National Government.²⁰⁶ A public body that seems to not have been consulted with during the development process of the NECP is the National Climate Council, whose role is to inform and facilitate the participation of different agents in the development and monitoring of climate change policies, and is composed of representatives from the National Government, CC.AA, the Spanish Federation of Municipalities and Provinces, Academia, civil society, and NGOs.²⁰⁷

The NECP was developed through a participatory process, which included a public consultation, meetings with key stakeholders, and public events. The draft of the Spanish NECP was subject to public consultation, and feedback was received from 159 actors, including associations, companies, individuals, public administrations, NGOs, foundations, and academia. Almost half of the participants were associations — mainly from the energy, industry, and transport sectors — and approximately 10% of the associations were from the agriculture, livestock and forestry sectors. Additional space for discussion was created through public events, as well as meetings with companies and social and environmental organizations. For instance, through the Environmental Advisory Council, the government consulted key stakeholders, including the five largest NGOs,* worker and farmer unions, and consumer and business associations.²⁰⁸ Moreover, MITECO conducted a Strategic Environmental Assessment of the NECP, which was also developed through a participatory process consisting of two rounds: a consultation with public administrations and “interested persons” was carried out first, and then a wider consultation was accessible to the public.

While it is clear that the NECP was developed through a participatory process, it is unclear how stakeholders were selected and in which way their inputs were considered during policy drafting.

* The focus of these NGOs is the protection of the environment and the promotion of sustainable development. The NGOs members of the Environmental Advisory Council are Friends of the Earth, Ecologists in Action, Adena (Association in defense of nature), Greenpeace, and the Spanish Society of Ornithology.

Although the government seems to engage informally with several organizations and experts,²⁰⁹ it does not appear to have the intention to carry out an inclusive policy development process that considers the input of food systems experts, health experts, women, and underrepresented groups in a meaningful way. Interviewees suggest a potential unbalanced representation of actors in the development process, with farmer unions and large producers being involved most closely in the consideration of policy targets and measures than other stakeholders.²¹⁰ In addition, local and smaller specialized NGOs that do not fall under the largest and most famous NGOs in Spain are often left out of consultations.²¹¹ It is also unclear how NGO-led workshops on the NECP fed into the development of the policy.²¹²

While the LTS also appears to have been developed in a participatory way, the exact process by which it was developed is unclear. Like the NECP, the LTS was subjected to public consultation. No further details on the development or consultation process are provided in the LTS, however. The more systemic approach applied to the food systems measures in the LTS — not only focusing on the production stage but including a broader approach that also took into consideration diets — required active participation of more ministries. Consequently, as one interviewee suggested, collaboration between ministries in the development of the LTS was more challenging than the NECP.²¹³ Still, it seems that the collaboration between ministries, different levels of administration and stakeholders was similar to that of the NECP.²¹⁴

MITECO received technical support from academia and research centres for developing the NECP. Data on current agricultural emissions and estimations of the mitigation potential of measures in the agricultural and LULUCF sectors served as input in the development of the NECP. According to an interview, all the content of the NECP that relates to modelling was carried out by external technical experts.²¹⁵ Beyond this, however, the components of this technical support are unknown, and it is unclear if other research outcomes fed into the development of the NECP. Furthermore, there is no general consideration of holistically transforming food systems in the development of the NECP, and the policy does not mention whether local knowledge and traditions have been considered during its development process.

The NECP recognizes the economic, environmental, social, and health impacts of its proposed measures, providing estimates for some of its agricultural measures. The NECP presents an impact analysis that includes the effect of the proposed agricultural measures, which are explained below, on GDP and employment. Additionally, for measures related to the agricultural and LULUCF sectors, the NECP often highlights environmental co-benefits, for instance, in terms of water and soil quality and biodiversity, as well as positive impacts on health and climate adaptation. However, the NECP does not holistically assess the impacts of transitioning to a sustainable food system.

AREAS FOR IMPROVEMENT

Increase transparency in the NECP development process and ensure participation of all relevant stakeholders. Transparency could be enhanced by regularly publishing progress updates, making them available to public bodies and the public, as well as by standardizing and clarifying the processes for selecting key stakeholders and incorporating their inputs during the drafting and revising of the policy. Interviewees reveal that a large part of the engagement with stakeholders took place informally²¹⁶ — it is crucial to keep record of these meetings and how they inform policy for the sake of transparency and

accountability. Interviewees also suggest that the public administration could engage more in discussions with underrepresented stakeholders.²¹⁷ In particular, it is recommended they actively seek the participation of food systems and health experts, women, local communities and institutions, as well as smallholder farmers and local NGOs.²¹⁸ This can help ensure fair representation and consideration of different viewpoints and interests during policy-making.

Conduct a holistic assessment of Spain's food systems to inform future updates of the NECP. In order to identify currently untapped mitigation potential within Spain's food systems, it is important to conduct a comprehensive analysis of the activities at the various stages of Spain's food production and supply processes; consumers' habits and preferences; the economic and technological status of the agriculture and food sector; as well as the social, cultural, and economic environment in which these activities are developed. Additionally, such an assessment could reveal multiple co-benefits; for instance, concerning biodiversity conservation and recovery,²¹⁹ national health, as well as economic development. If this is complemented with a quantification of the mitigation potential and an in-depth assessment of co-benefits, the relevance and importance of food systems within Spain's climate actions and broader domestic issues could be significantly enhanced.

CONTENT OF THE NDC

TABLE 2: SPAIN NECP CONTENT: KEY FINDINGS AT A GLANCE

Key findings

- The NECP includes measures to promote sustainable practices and reduce energy consumption in agriculture.
- The NECP includes several measures to promote the conservation and recovery of ecosystems.
- The NECP aims to reduce food waste along the food supply chain and promotes sustainable organic waste management. The Draft Bill for the prevention of food loss and waste complements NDC measures.
- While the NECP does not include the promotion of nutritious, sustainable, whole-food diets, the LTS considers some measures that could encourage more sustainable consumption.
- The NECP proposes internalizing negative externalities by aligning taxation with environmental impact and identifies perverse subsidies within the energy sector, including one such subsidy supporting agricultural production.

Areas for improvement

- Include commitments made in the context of the Global Methane Pledge, Glasgow Leaders' Declaration on Forests and Land Use and the Policy Action Agenda for Transition to Sustainable Food and Agriculture. In particular, include measures to address methane emissions associated with livestock farming beyond manure management.
- Include measures to provide farmers with information and means to foster sustainability in food production.
- Develop comprehensive measures for promoting a shift in consumer behaviour toward healthier, sustainable diets.
- Develop a systemic approach to tackle food waste that emphasizes production losses and children's education to prevent food waste.
- Identify perverse incentives that encourage the perseverance of unsustainable food systems and include plans for their elimination.

KEY FINDINGS

The NECP includes measures to promote sustainable practices and reduce energy consumption in agriculture. These measures include promoting conservation agriculture by direct sowing; arable crop rotation on unirrigated land; reducing synthetic fertilizer application by adjusting nitrogen supply to crop needs through the development of fertilization plans, and utilizing slurry for irrigation and compost; promoting the maintenance of plant cover and the incorporation of pruning waste into the soil; and improving slurry management practices (by frequently emptying slurry from pig housing, covering slurry ponds, separating solid–liquid portions of slurry, and producing compost from the solid fraction). The LTS adds as potential measures — applicable depending on technological advances — the improvement of livestock feed and the development of precision agriculture* through technologies that allow optimizing irrigation and fertilization. Additionally, the NECP proposes two measures concerning energy consumption in agriculture. First, it suggests increasing energy efficiency in farms, irrigation communities, and agricultural machinery by investing in modernizing facilities and machinery and/or replacing tractors and seeding machines through grants and financing. Second, the NECP proposes developing off-grid renewable energy stations at irrigation facilities.

The NECP includes several measures to promote the conservation and recovery of ecosystems. These measures consist of the regeneration of silvopastoral systems;** controlled grazing to reduce risk of fire; afforestation, reforestation, and forest restoration; and sustainable coniferous forest management through the development of adequate thinning plans.*** In addition, the LTS includes measures to promote wetland restoration.

The NECP aims at reducing food waste along the food supply chain and promotes sustainable organic waste management. The NECP proposes to reduce food waste through the National Strategy “more food, less waste” by organizing information and awareness campaigns, implementing voluntary agreements, reviewing legislation, promoting research and innovation, and developing guidelines. This strategy primarily targets consumers, while also aiming to align the agendas of private and public actors in combatting food waste. It was launched in two phases, covering 2013 to 2016 and 2017 to 2020, and the new phase has not yet been announced.²²⁰

* Although more complex definitions exist, the simple description of the Precision Agriculture is a way to “apply the right treatment in the right place at the right time.” Source: J. Zarco-Tejada et al., Precision Agriculture: An Opportunity for EU Farmers – Potential Support with the CAP 2014-2020. Joint Research Centre, (2014). Retrieved from: [https://www.europarl.europa.eu/RegData/etudes/note/join/2014/529049/IPOL-AGRI_NT\(2014\)529049_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/note/join/2014/529049/IPOL-AGRI_NT(2014)529049_EN.pdf).

** “Agroforestry land use system in which trees or shrubs are grown and animals graze or browse.” Source: C. Park, *A Dictionary of Environment and Conservation*. London: Oxford, 2007.

*** “Thinning, understood as the reduction of the density of individuals of the same species, is an intermediate forestry intervention that is essential in the management of forest systems. Its objectives include reducing competition, improving the individual vigour of the trees, regulating the specific composition of the forest, bringing forward and maximising production at the end of the cycle, and increasing the value and size of the products.” Source: Government of Spain, “Integrated National Energy and Climate Plan 2021–2030,” (2020). Retrieved from: https://ec.europa.eu/energy/sites/default/files/documents/es_final_necp_main_en.pdf.

Other relevant measures include the separate collection of organic waste for composting and producing biogas, the provision of training to encourage domestic and community composting, and the distribution of composters. Finally, even though not mentioned in the NECP, the Draft Bill for the prevention of food loss and waste finished its public consultation period in December 2021. The scope of the Draft Bill addresses waste generated in the overall food chain, from producers to consumers. It establishes priority actions as a hierarchy, prevention being the number one option, followed by donating food to NGOs, transforming food into other products (such as juices and jam), and using products for animal feed, compost, or biogas. It also mandates the organization of awareness-raising campaigns to enhance responsible food consumption and food waste prevention, and introduces measures to prevent waste associated with the label “best before date” often included in food products.* Breaching the law will imply penalties ranging from 6000 to 1 million EUR (6850 to 1.14 million USD). The Bill also establishes that the Ministry of Agriculture, Fishing and Food will regularly measure and publish quantitative information on food waste on each food chain component.²²¹ Finally, the Circular Economy Strategy sets 2030 targets to reduce consumers and retail food waste by 50%, and food waste generated in production and distribution by 20%.²²²

While the NECP does not include the promotion of nutritious, sustainable, whole-food diets, the LTS considers some measures that could encourage more sustainable consumption. The LTS suggests promoting the Mediterranean diet** and local food consumption. Additionally, the Strategy encourages low-carbon lifestyles by, for instance, aiming to label products according to their carbon footprint. The LTS broadly suggests public awareness and sensitization campaigns to promote sustainable consumption. However, none of these measures are included in the NECP and more detail concerning implementation measures is not provided. Additionally, the Law on Climate Change and Energy Transition — which is also not mentioned in the NECP or LTS — enables public actors to introduce green procurement requirements that prioritize seasonal and fresh products with short distribution chains as a means to mitigate and adapt to climate change while also promoting “high-quality food consumption” — a term likely to mean fresh and seasonal products.²²³

The NECP proposes internalizing negative externalities by “aligning taxation with environmental impact” and identifies perverse subsidies within the energy sector, including one such subsidy supporting agricultural production. The NECP highlights the need to adopt a “new green approach to taxation” to incentivize the transition toward “a low-carbon and climate-resilient economy.” A first measure for

*These measures include: ensuring that actors of the food chain (for example, retailers and suppliers) donate products that are over their best before date or sell with discounts and clearly differentiated from the rest of products; providing training and awareness-raising campaigns on the correct interpretation of the best before date; incentivizing the extension of the best before date to the maximum that guarantees an adequate quality of products; promoting research and innovation to extend the life of products and accurately adjust the best before date.

** “The diet is characterized by a high intake of plant-based foods (fruit, vegetables, nuts and cereals) and olive oil; a moderate intake of fish and poultry; and a low intake of dairy products (principally yoghurt and cheese), red meat, processed meats and sweets (for which fresh fruit is often substituted).” Source: World Health Organization, “Fostering healthier and more sustainable diets — Learning from the Mediterranean and New Nordic Experience,” (2018). Retrieved from: <https://www.euro.who.int/en/health-topics/disease-prevention/nutrition/news/news/2018/5/fostering-healthier-and-more-sustainable-diets-learning-from-the-mediterranean-and-new-nordic-experience>.

this is included in the NECP, which calls for the Ministry of Finance to carry out a study to identify the elements of the taxation system that need to be adjusted. However, it is still not clear whether the reform of the tax system will cover the food systems. Within the energy sector, the NECP identifies an agricultural fossil fuel subsidy consisting of a partial refund of the diesel tax paid for agriculture and livestock farming. Nevertheless, the NECP does not envisage a plan to eliminate this subsidy, and other perverse incentives related to the LULUCF and the agricultural sectors or other aspects related to food systems are not identified.

AREAS OF IMPROVEMENT

Integrate the commitments made in the context of the Global Methane Pledge, Glasgow Leaders' Declaration on Forests and Land Use, and the Policy Action Agenda for Transition to Sustainable Food and Agriculture. Spain endorsed several pledges and initiatives announced during COP26 in Glasgow (but outside the official UNFCCC regime). These pledges, if fully and adequately implemented, have the potential to accelerate the shift toward sustainable food systems, in particular through measures that promote sustainable trade and address embedded methane emissions and deforestation in food imports, as well as through repurposing public policies to support regenerative agriculture practices while improving overall food systems resilience. But to further ensure progress, transparency and accountability, it is crucial that these international commitments and respective actions be integrated and fully anchored in Spain's NECP and the LTS.

In particular, it is recommended to include measures to address methane emissions associated with livestock farming beyond manure management. According to the LTS, the main factors determining emissions from livestock are herd size and type, animal feed, and manure management. While the NECP includes numerous measures to address the latter, it does not address the rest of the mentioned factors even though enteric fermentation is the primary source of emissions from agriculture in Spain. Animal welfare measures, such as limiting the number of livestock units per hectare, are not mentioned in the LTS as potential options toward the 2050 target. However, such measures could reduce methane emissions while also improving animal welfare.²²⁴ The LTS generally considers improving animal feed as one of the main areas of work for reducing emissions in the sector. Nonetheless, no specific measures are proposed, and actions in this regard will be conditional on technological developments in terms of feed additives and animal breeds that emit less methane.

According to one interviewee, these measures are essential but currently absent from policies due to political sensitivities felt by politicians, as well as the powerful influence of the agri-food industry during policy-making.²²⁵ Another interviewee, however, raised the concern that using feed additives in intensive livestock production systems does not solve the broader issue of the unsustainability in the sector.²²⁶ They advocate for the transformation of livestock farming toward extensive farming practices, which can bring several co-benefits, such as reducing the risk of fire by restoring or revitalizing abandoned agricultural land, which could directly benefit biodiversity and the environment.²²⁷ Additionally, extensive farming practices could reduce the dependency on imported animal feed, which is often associated with deforestation.²²⁸ Another measure that could be considered for reducing animal feed imports is to enhance the national production of protein crops, for example by promoting crop rotation with legumes.²²⁹ Moreover, consulted experts call for reducing herd sizes to respect the ecological limits of the land.

Include measures to share knowledge and technologies with farmers in order to improve the sustainability of food production. An interviewee highlighted the importance of enhancing farmers' awareness, access to information and capacity-building to inform farmers in sustainability aspects.²³⁰ For instance, farmers could receive assistance from external advisers to develop annual GHG assessments at farm level. Such an assessment could assist farmers in understanding the climate impact of their practices, identifying their mitigation potential, as well as developing tailored measures to improve the sustainability of their agricultural practices.²³¹ It is also essential to promote technological and digitalization innovation in smallholder farms in order to improve precision agriculture.²³² While the LTS mentions precision agriculture as a potential method to enhance emission reductions in the sector, no specific measures are proposed, and actions in this regard will be conditional on technological developments. Precision agriculture practices cannot only contribute to climate change mitigation by reducing farming inputs, but they can also positively impact farms' productivity and income²³³ and render numerous environmental co-benefits²³⁴. However, experts warn that precision agriculture is not necessarily sustainable and case-specific assessments might be needed.²³⁵ Additionally, interviewees urge that emissions associated with the high technological requirements of this production approach — such as emissions from energy consumption — should be accounted for when discussing the mitigation potential of this measure.²³⁶

Develop comprehensive measures for promoting a shift in consumer behaviour toward healthier, sustainable diets. The NECP and the LST propose a number of measures that could potentially drive food consumption toward sustainable diets. Hence, it is recommended to introduce public awareness and sensitization campaigns to promote sustainable consumption, and implement the green taxation reform to **encourage dietar**

- *Promotion of sustainable consumption:* Healthy and sustainable diets could be promoted as part of public health education and green public procurement, as well as through the creation of regulation concerning the advertising of ultra-processed foods. Considering the importance of animal farming as a source of GHG emissions in the country, and given that Spain has the highest meat consumption per capita in the European Union,²³⁷ such measures could promote dietary shifts toward more plant-based diets, thus reducing methane emissions while also improving population health.²³⁸ Several interviewees highlighted the need to reduce meat consumption,²³⁹ and one of the interviewees emphasized the importance of awareness campaigns in this context.²⁴⁰ Nevertheless, the inclusion of measures aiming to reduce meat consumption will need to be backed by strong scientific evidence and accompanied by concrete plans to alleviate the effects on employment and income in the sector to avoid political and societal opposition.
- *Green taxation reform:* If the reform proposed in the LTS is to include food products in its scope, it will be important to take into account the potential loss of competitiveness of Spanish producers²⁴¹ and ensure a balanced impact distribution within the sector that guarantees a just transition.

Develop a systemic approach to tackle food waste that emphasizes production losses and children's education to prevent food waste.²⁴² An interviewee highlighted the need to further emphasize waste reduction at the production stage. This could build on the example of the pioneering Catalan law on preventing food losses and waste, which made Catalonia the first Autonomous Community in Spain to pass an anti-food waste law in 2020.²⁴³ The law addresses food waste throughout the supply chain, with regulations

covering primary production, retail, and household consumption.²⁴⁴ An innovative element of the Catalan law that could be incorporated in national policies is the recognition and regulation of gleaning at agricultural fields.²⁴⁵ Additionally, the expert suggested that education and awareness campaigns should target children at schools, for example, by providing workshops on food and diets, as well as on root-to-stem or trash cooking. Finally, green procurement at school canteens and catering services, and supporting civil society initiatives that avoid and revalue waste, were also identified as crucial measures.

Identify perverse incentives that encourage unsustainable food systems and include plans for their reform. Given that only subsidies in the energy sector have been identified, it is recommended to carry out a comprehensive assessment of current perverse incentives fostering unsustainable food production and consumption practices. Attention should also be paid to reforming the financial mechanisms of the CAP, which continue to be potent sources of financing for unsustainable practices.²⁴⁶ Efforts should also be considered to address the perverse incentive already identified in the NECP related to the partial refund of the diesel tax for agricultural activities. However, as pointed out in an interview, farmers oppose this type of measure, arguing its incompatibility with the economic viability of farming activities.²⁴⁷

Therefore, if this subsidy is reformed, it is essential for additional measures to be taken to alleviate negative impacts felt by farmers, especially smallholder farmers with fewer capabilities. This, for instance, could be accomplished by redirecting part of the CAP's funding toward sustainable practices and providing special funds for those farmers with the least flexibility to change their production practices. As an example on how to redesign policies to eliminate incentives to unsustainable large-scale agriculture production, one interviewee proposed re-designing subsidies to differentiate according to the type of farm in terms of economic dimension, that is, extensive versus intensive production. An example could be a subsidy designed so that the first hectares of a farm receive a larger subsidy per hectare than the subsequent ones, and up to a limit, to not incentivize large-scale farming with often more significant environmental impacts than smaller farms using more traditional practices.

IMPLEMENTATION OF THE NDC

TABLE 3: SPAIN NECP IMPLEMENTATION: KEY FINDINGS AT A GLANCE

Key findings

- The NECP demonstrates policy coherence and coordinated governance in the planned implementation of the proposed measures.
- The NECP declares an intention to strengthen coordination between public administration bodies for regular monitoring and reporting toward the European Union and UNFCCC. However, the NECP does not provide information about the MRV process for any sector.
- The Just Transition Strategy will be implemented through Just Transition Agreements between MITECO and local authorities to maximize the social gains and mitigate the potential adverse effects caused by the ecological transition.
- The NECP only proposes the promotion of financial instruments to encourage grazing in forest landscapes, while most of the funding is expected to come from European Union (E.U.) funds, especially the Common Agricultural Policy (CAP).

Areas for improvement

- Provide information on how the NECP will be implemented and monitored.
- Establish mechanisms to ensure stakeholders' collaboration during NECP implementation and monitoring.
- Further develop financial instruments to support the implementation of NECP measures related to agroecology and other elements of sustainable food systems.

The NECP demonstrates policy coherence and coordinated governance in the planned implementation of the proposed measures.

The NECP is part of the Energy and Climate Strategic Framework, together with the Climate Change and Energy Transition Bill and the Just Transition Strategy. The medium-term measures presented in the NECP are complemented by the long-term policies established in the LTS. Additional policy coherence is shown in the NECP through the consideration of the interactions with other national and European plans and programs, such as the Spanish Strategic Plan for the CAP, the National Rural Development Programme, and the Spanish Forestry Plan. To ensure governance coordination in the development and implementation of climate and energy policies, the Climate Change Policy Coordination Commission was established in 2005, and the Inter-ministerial Commission on Climate Change and the Energy Transition in 2018.²⁴⁸In addition, the NECP identifies the responsible authorities for each measure, further facilitating coordination in implementation. Nevertheless, the NECP does not explicitly

consider the role of local communities, smallholder farmers, nor women during the implementation of its food-related measures. On the other hand, the LTS includes gender equality as a cross-cutting factor in its policy. It provides a general recommendation to engage with women, gender equality organizations and gender research experts in the formulation, implementation and evaluation of future policies. However, it does not provide any further details.

The NECP declares an intention to strengthen coordination between public administration bodies for regular monitoring and reporting toward the European Union and UNFCCC. This will take place through the National System of Energy and Climate Policies, Measures and Projections, which covers the preparation and update of progress reports. In addition, coordination between different governance levels is facilitated by broadly identifying the responsible bodies for each measure, specifying which local and regional administrations should implement which actions.

The NECP does not provide information about the MRV process for any sector. Even though there seem to be a plan for the monitoring and reporting of the NECP through the National System of Energy and Climate Policies, Measures and Projections, its functioning is unclear. The NECP does not explain the monitoring approach to be used in the different measures and sectors, nor does it explain the approach to track national progress toward the implementation and achievement of the NECP in its totality. Hence, the NECP does not address whether and, if so, how stakeholders will be engaged in its monitoring process and whether input from research, local communities, smallholder farmers, and other underrepresented groups will be considered throughout the data collection process. However, an interview suggests that data collection by the Spanish Emissions Inventory and Projections System involves numerous actors from varying levels. For instance, data on the size of cultivated areas was provided by farmers to CC.AA.²⁴⁹

The Just Transition Strategy will be implemented through Just Transition Agreements between MITECO and local authorities to maximize the social gains and mitigate the potential adverse effects caused by the ecological transition. The Just Transition Agreements will target the most vulnerable areas (including rural areas) and consist of comprehensive territorial action plans to maintain and create economic activities and employment. The Agreements must prioritize activities that foster the ecological transition, for instance, through ecosystem restoration, biodiversity protection and sustainable agriculture, such as organic and rain-fed production and extensive livestock farming.²⁵⁰

The NECP only proposes the promotion of financial instruments to encourage grazing in forest landscapes, while most of the funding is expected to come from E.U. funds. As a mechanism to enhance forest sinks, the NECP promotes public-private financing instruments that stimulate the creation of territorial contracts for encouraging grazing in forest landscapes. Interviews reveal that the implementation of the NECP will mainly depend on E.U. funds, with the CAP as the primary source of financing, and with additional funds provided by the European Union through the Spanish Recovery, Transformation and Resilience Plan.²⁵¹ Nonetheless, the initial version of Spain's Strategic Plan for the CAP Post-2020 does not cover some of the relevant measures included in the NECP, such as the development of fertilization plans.²⁵² An interviewee suggested that there are also funds available under the Ministry of Science and Innovation²⁵³ and the "Climate Projects of the Sustainable Economy Carbon Fund," managed by the Spanish Climate Change

Office of MITECO, that may support the implementation of the NECP.²⁵⁴ Additional sources of financing may also be provided by CC.AA and Local Entities, although these will likely be small in size.²⁵⁵

AREAS FOR IMPROVEMENT

Provide information on how the NECP will be implemented and monitored. Beyond identifying the authorities that need to be involved in the implementation and monitoring of each specific measure, the NECP does not provide information on how the NECP will be implemented and monitored. Hence, clarification is required to understand the MRV process in general, as well as how actors' coordination and engagement will be ensured. The declared intention to strengthen coordination between public administration bodies to meet E.U. and U.N. monitoring and reporting obligations needs to be translated into specific procedures and actions. For compliance with E.U. monitoring requirements, progress reports of Spain's NECP will be regularly prepared. To further increase transparency during this process, the progress reports could be made publicly available.

Establish mechanisms to ensure stakeholders' collaboration during NECP implementation and monitoring. The NECP does not define the role of non-governmental actors during its implementation and monitoring processes. Nevertheless, input from research, local communities, and smallholder farmers could facilitate the process, for instance, by providing data for monitoring. To enable information exchange, the responsibilities of these actors should be determined, and mechanisms and platforms for information sharing and collaboration should be developed. Additionally, platforms could be designed to engage women, smallholders, or underrepresented groups in implementing food systems measures.

Further develop financial instruments to support the implementation of NECP measures related to agroecology and other elements of sustainable food systems. For instance, one interviewee suggested that developing Payments for Ecosystem Services could be an interesting opportunity to explore.²⁵⁶

CASE STUDY SUMMARY

Barcelona Challenge for Good Food and Climate, Spain

“The idea behind the Barcelona Challenge was not to launch another declaration but to focus on commitments linked to practical action and targets which can deliver concrete results.” —Maria Carrascosa, Project Coordinator

The Barcelona Challenge for Good Food and Climate (BCGFC) is a call for cities around the world and their citizens to engage in a series of commitments related to the transformation of their food systems to tackle the climate emergency.

The BCGFC presents a set of core metrics to help grasp the positive impacts these commitments could entail in practical terms for the city, population, and the climate. In addition, the Challenge provides a platform to showcase the commitment and leadership of cities on the food-climate nexus. It addresses two key issues: the mitigation of and adaptation to the climate emergency, through a commitment to transform local agri-food systems to ensure access to sufficient, sustainable, healthy, and nutritious diets for all, therefore preventing food vulnerability and enhancing food justice.

The BCGFC presents metrics, in the form of a toolkit, to help grasp the positive impacts the commitment to action could entail for engaged cities, their citizens, and the climate. The toolkit is then used to estimate the projected magnitude of the reduction of GHG emissions of the food policies adopted by cities committed to the Challenge, based on the current conclusions established in international scientific research. The toolkit allows cities to estimate, record, visualize, and download the potential impacts of achieving the Challenge’s commitments. These refer not only to GHG emissions reduction but also to other social, ecological, or economic impacts (for example, lives saved, jobs created, water saved). The BCGFC aims to become a tool that can be used all over the world to enable city leaders and local authorities, in strong collaboration with residents as key actors, to engage in climate action.

To date, nine cities across the globe have signed up to the Barcelona Challenge and each have specific actions under six specific action categories. A toolkit has been developed that allows cities to estimate, record, visualize, and download the potential impacts of achieving the Challenge’s commitments. Barcelona City, for example, have launched campaigns to raise public awareness and to commit citizens to the “Planetary Health Diet” based on locally produced, sustainable, and healthy food, rich in plant-based foods (fruit, vegetables, cereals, legumes, and nuts), with a reduced consumption of meat and dairy and ultra-processed food high in fat, sugar, and salt.

Further information and access to the detailed case study can be found [here](#).

ENDNOTES

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