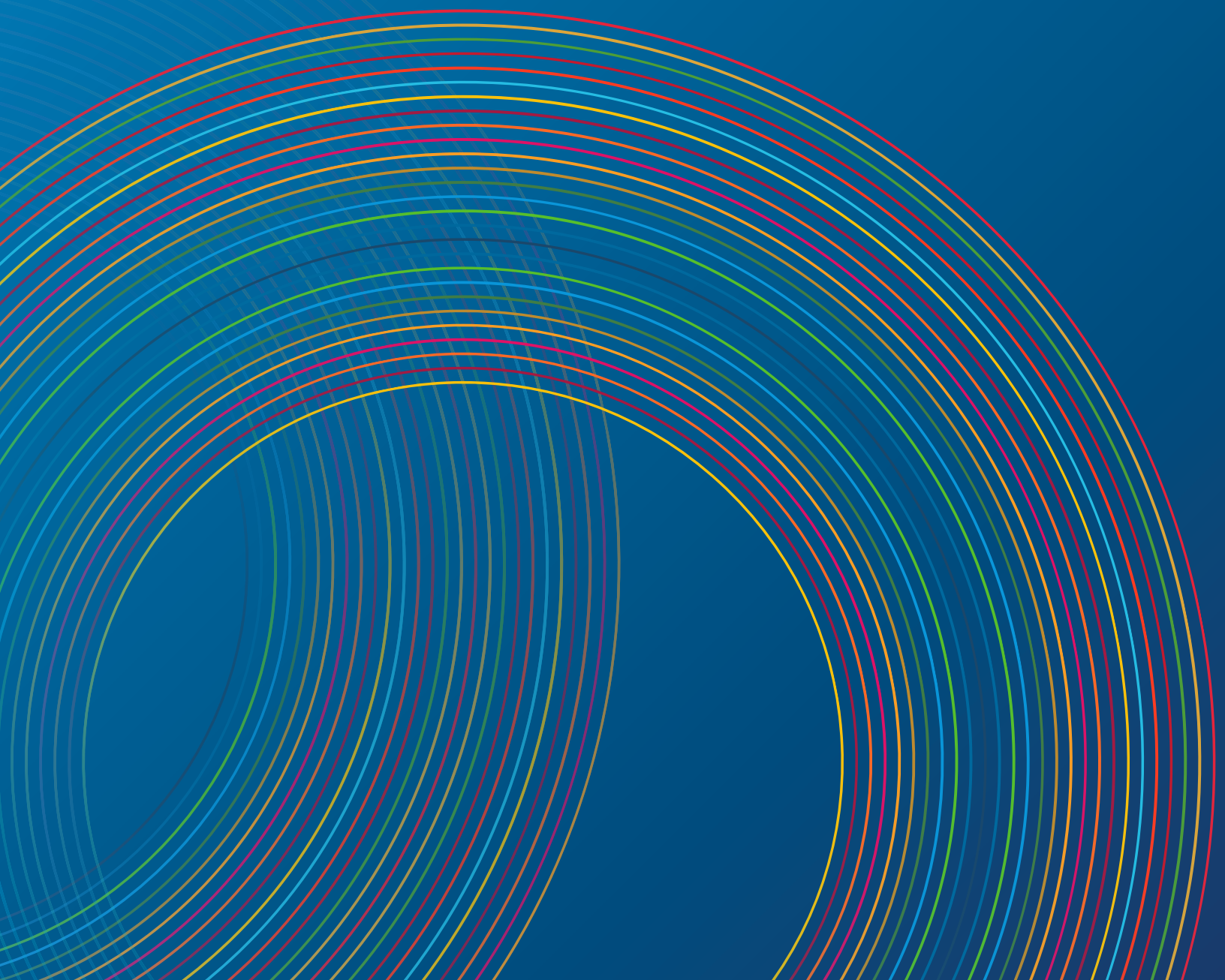




POLICY BRIEFS IN SUPPORT OF THE UN HIGH-LEVEL POLITICAL FORUM 2026

# Interlinkages Between Energy and Zero Hunger: SDG7 and SDG2



## SDG7 POLICY BRIEFS IN SUPPORT OF THE UN HLPF 2026

This document is part of a series of policy briefs compiled by the multistakeholder SDG7 Technical Advisory Group (SDG7 TAG) in support of the review of SDG7 at the High-level Political Forum (HLPF) 2026. Convened by UN DESA, the SDG7 TAG is composed of over 40 experts from governments, UN organizations, international organizations and other stakeholders. The HLPF is the central United Nations platform for the follow-up and review of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) at the global level. More information on the SDG7 TAG, including previous editions of the annual SDG7 Policy Briefs, is available [here](#).

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## CONTRIBUTING ORGANIZATIONS



Food and Agriculture Organization of the United Nations

Food and Agriculture Organization (FAO)



United Nations Environment Programme (UNEP)



UNITED NATIONS ESCAP  
Economic and Social Commission for Asia and the Pacific

United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP)



United Nations Children's Emergency Fund (UNICEF)



International Energy Agency (IEA)



United Nations Industrial Development Organization (UNIDO)



IRENA  
International Renewable Energy Agency

International Renewable Energy Agency (IRENA)



UNITAR  
United Nations Institute for Training and Research

United Nations Institute for Training and Research (UNITAR)



United Nations Development Programme (UNDP)



The World Bank



United Nations Economic Commission for Africa (UN ECA)



World Food Programme (WFP)



United Nations Economic Commission for Europe (UN ECE)



Modern Energy Cooking Services (MECS)

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## KEY MESSAGES

Globally, the energy and agrifood systems are deeply interlinked. Producing the world's food and getting it from farm to fork currently accounts for around 30 percent of all the energy consumed, worldwide. At the same time, a third of the total, anthropogenic greenhouse gas (GHG) emissions come from agrifood systems.<sup>1</sup> Within this share, 33 percent is accounted for by energy use – most of which is fossil fuel-based.<sup>2</sup>

If the world is to meet its current and future food and energy needs, the energy and agrifood systems must be transformed in a fair, sustainable and inclusive manner. Achieving Sustainable Development Goal 2 (SDG2)<sup>3</sup> and agrifood system transformation will not be possible without ensuring agrifood systems have access to reliable, affordable and renewable energy. That energy is also essential at every stage of the agrifood value chain. Without sustainable energy solutions, agrifood systems will not be able to meet growing global demand for food – particularly in those regions most vulnerable to food insecurity. At the same time, balancing energy security and food security must be carefully managed through sustainability considerations and integrated approaches.

Given the high fossil-fuel dependency of agrifood systems, a shift towards renewable energy is a critical step in accelerating those systems' transformation and decarbonization. At the same time, this shift is also crucial in enabling production to meet the demands of a growing population. Achieving this shift requires improved access to sustainable modern energy. It also requires more energy efficiency measures – such as improved cold storage and processing – and an improved transport infrastructure. A transition to clean cooking solutions – such as biogas, ethanol or electric cooking – is also central to achieving food security. In addition, the adoption of these solutions requires comprehensive sustainability assessments. These should take economic, social and environmental considerations into account in order to ensure the delivery of context-specific and optimal solutions.

Despite their climate mitigation potential, agrifood system solutions remain underfunded. In the 2021-2022 period, they received only 7 percent of tracked global climate finance.<sup>4</sup> Scaling up investment in these systems and providing innovative financing mechanisms for them are therefore crucial steps in expanding clean energy adoption in agriculture and unlocking opportunities for small-scale farmers. These measures are especially crucial for youth and women in emerging economies, who often rely heavily on agriculture.

To accelerate the achievement of the SDG7 and SDG2 goals, there is a need for improved intersectoral cooperation between agriculture, energy, climate, land and water stakeholders. This cooperation must also be at the national and international levels. Clear, integrated policies, incentives and regulatory frameworks are all important in driving the adoption of renewable energy in agrifood systems. They are also key to prioritizing the food-energy nexus and developing energy-smart agrifood systems. In addition, a robust monitoring and evaluation system is needed to better capture the synergies between SDG7 and SDG2, track progress, and measure impacts. This will also ensure that the transformation of agrifood systems is aligned with global climate and development goals.

Small-scale producers – including family farmers, women and young farmers, fisher folk, forest users, and Indigenous Peoples – are fundamental to achieving efficient, inclusive, resilient and sustainable agrifood systems. Raising awareness and strengthening capacities on energy-smart agrifood systems, as well as improving quality, access to and use of reliable data, evidence and analysis is vital in the transformation of agrifood systems.

# 1. SDG7 and SDG2: Linking Energy and Zero Hunger

Hunger and food insecurity continue to be major global challenges. In 2023, around 733 million people – 9.1 percent of the world’s population – faced hunger and undernourishment. That year, too, some 2.33 billion people faced moderate or severe food insecurity, worldwide. Although agrifood systems are currently capable of producing enough food to address this crisis, nearly one-third of all food produced is lost or wasted each year. In addition, agrifood systems face mounting pressure from extreme weather conditions and the impacts of climate change.<sup>5</sup>

Agrifood systems require energy at every stage and account for around 30 percent of global energy consumption. In the crop, livestock and fishery value chains, about a quarter of the total energy consumed is at the production stage. Approximately 45 percent is then consumed in food processing and distribution, while retail, preparation and cooking account for the remainder. In developing countries, the highest share of energy consumed is related to cooking activities, while on-farm energy use is more limited. This particularly affects rural women, who are disproportionately responsible for fuel collection and cooking. However, agrifood systems also remain heavily dependent on fossil fuels, generating around 34 percent of all human-induced GHG emissions.<sup>6</sup> In addition, productivity is limited by poor access to energy and inefficiency along agrifood value chains, which stretch from food production to storage, distribution and use. Lack of energy access and inefficiency also increase food loss and waste while threatening food security and rural development.

Feeding a global population of nearly 10 billion by 2050, while not exceeding the 1.5 degrees threshold of global warming, requires a radical transformation of our agrifood systems to make them more efficient, sustainable and resilient in the face of climate change. Decarbonization by mid-century is simply not possible without considering energy used in agrifood systems.

Indeed, renewable energy has the potential to transform agriculture. Renewable energy sources such as solar, wind, hydropower and sustainable bioenergy can be used all along the agrifood value chain to power agricultural activities. They can be deployed to provide energy for irrigation, transport, processing and storage. They can also be used to power cold chains and refrigeration technologies. These deployments help to reduce GHG emissions and reliance on fossil fuels. They also reduce food waste along the agrifood value chain, contribute to rural development and improve livelihoods. This is particularly important in remote areas with limited energy access. There, food loss and waste is particularly prevalent due to insufficient cold chain infrastructure. Renewable energy solutions can enable decentralized energy access, helping farmers preserve their produce, increase their sales and boost their incomes.

Improving energy efficiency along agrifood value chains is equally vital for the decarbonization and transformation of agrifood systems. Solar-powered pumps, drip irrigation, LED lighting, efficient refrigeration, waste heat recovery, cogeneration of heat and power and other technologies can all improve productivity. They can also reduce costs for producers, minimize food loss and waste, reduce the sector's GHG emissions and help tackle food insecurity and hunger.

Clean cooking solutions are also potential game changers.

Currently, 2.1 billion people worldwide – mostly in developing countries – still rely on traditional energy sources, such as firewood and charcoal, for cooking. This not only drives deforestation, but also contributes to severe health risks via indoor air pollution. This also disproportionately affects women and children.

One potential solution is sustainable bioenergy, which can be produced directly from and for agrifood systems. It has the potential to improve agricultural productivity and thus increase farmers' incomes, create jobs, boost gender equality, eradicate poverty and strengthen resilience. It can also contribute to energy security, improve access to clean energy and the overall achievement of climate change mitigation and adaptation strategies. Other important clean cooking solutions include electric cooking, which can also play a critical role in reducing the negative health and environmental impacts of traditional cooking methods.

The application of renewable energy and bioenergy is, however, very context-specific. There should not be a 'one-size-fits-all' approach to ensuring that this application can be managed in a sustainable way. Instead, it should be evaluated on a case-by-case basis, taking into account the local and national circumstances.

### Assessing the change needed

Progress in addressing the links between SDG7 and SDG2 is critical for the transformation and decarbonization of agrifood systems – yet several challenges currently hinder this.

First, despite the sector's significant mitigation potential, agrifood systems receive only a small fraction of global climate finance. Between 2021 and 2022, for example, agriculture, forestry and other land use accounted for a third of global GHG emissions, yet received only 7.2 percent of the world's total climate finance.<sup>8</sup>

Second, insufficient infrastructure and limited access to energy services for agrifood systems reduce agricultural market opportunities. These obstacles also hinder food storage and processing capacities, while contributing to food loss and waste. Indeed, about a third of the food produced worldwide is lost or wasted after leaving the farm gate – implying that around a third of the energy used to produce that food is also wasted. Annually and globally, it is estimated that approximately 12 percent of the total food lost or wasted (526 million tonnes) could be avoided only with effective refrigeration.

Third, agricultural residues and by-products from food processing that could be used as sustainable bioenergy sources to replace fossil fuels remain largely underutilized. A major reason for this is that the collection, processing and transportation of these residues involves significant economic and logistical complexity. Ensuring sustainability in sourcing is also critical in avoiding any negative impact on soil health and food security.

Fourth, persistent gender inequality further delays progress. In the agrifood sector, women experience a disproportionately lower level of access to clean energy solutions, financial resources and decision-making. The adoption of renewable energy solutions in agrifood systems therefore needs to take into account the barriers that prevent vulnerable populations from accessing and benefiting from these solutions.

In addition, other barriers to adopting renewable energy technologies in agrifood systems include: high upfront costs; fragmented policy frameworks across the energy, agriculture, climate, and water sectors; insufficient financial support; and limited awareness and technical expertise among farmers, local stakeholders and service providers. The introduction of large-scale renewable energy installations can also potentially compete with productive land use, if not assessed and managed sustainably. This raises concerns in areas with limited arable land in particular – underscoring the importance of spatial planning and integrated land-use strategies.

## 2. Policy Implications and Recommendations

To meet the SDG7 and SDG2 targets by 2030, transformative changes in the energy and agrifood systems will be necessary.

These changes include the following:

- **A scaling-up in the financing of renewable energy solutions in agrifood systems**

In tackling climate change and ensuring food security, the full potential of renewable energy needs to be tapped. Innovative financing mechanisms – such as blended finance and results-based financing – present opportunities to bring private sector investments. National strategies and policies that ensure the financial inclusion of smallholder farmers through subsidies, loans and microfinance programmes need to be sustained and enhanced.

- **The prioritization and integration of energy-smart agrifood systems within national policies and Nationally Determined Contributions (NDCs)**

Clear policies, incentives and regulatory frameworks can accelerate the adoption of renewable energy in agrifood systems, while also strengthening the interlinkages between food and energy. This will help to align these sectors with the fulfilment of the SDGs and the Paris Agreement targets, and provide a springboard for mobilizing resources. Recognizing this interrelation between energy and agrifood systems is critical in unlocking synergies that can accelerate climate action across sectors, while also achieving transformative and cross-cutting outcomes.

- **Prioritization of the integration of decentralized energy solutions within the regulatory frameworks of national energy policies**

Such solutions include solar-powered irrigation and mini-grids. Their deployment – and the deployment of decentralized energy-efficient cold storage, processing and transport infrastructure – should be encouraged by providing financial incentives and regulatory support for them.

- **The sustainable use of agricultural residues and food processing by-products for sustainable bioenergy generation**

The use of these resources can contribute to improved energy access, food security, increased agricultural productivity, improved farmer incomes, gender equality, poverty eradication, climate change mitigation and adaptation. In using these resources, however, appropriate sustainability assessments are key to ensuring that soil health, biodiversity conservation and food security are not compromised. The implementation of sustainability indicators is necessary to ensure sustainable bioenergy development.

This aims to foster both food and energy security, contribute to improved well-being, rural development and the achievement of climate goals.

- **A transition to modern, renewable, clean cooking solutions**

This transition is crucial to achieving the SDG7 and SDG2 goals. Promoting clean cooking in national strategies, policies and NDCs can enhance food security and access to energy. It can also improve health outcomes while addressing gender inequalities related to fuel collection and hazardous cooking conditions. Scaling up institutional clean cooking – including a focus on this in the procurement policies of schools, food distribution and humanitarian relief agencies – should be prioritized in national agrifood and food security strategies.

- **A strengthening of the generation, sharing and use of timely, disaggregated and geospatially integrated data**

This includes data on smallholder energy use, food-loss hotspots and renewable energy potential. Such information is necessary to guide policy making, accelerate the transformation of agrifood systems and promote renewable energy investments. In this context, it is vital to map the optimal locations and value chains for renewable energy interventions. This should be complemented by comprehensive cost-benefit analyses that consider the environmental, social, economic and gender aspects of those investments.

- **A taking into account of the needs and capabilities of women and youth in any action on energy food security links**

Women constitute over half the agricultural labour force in developing countries,<sup>9</sup> but face barriers in accessing productive resources, finance and renewable energy markets. Actions need to take into account the important role women play in food chains. They also need to address the provision of opportunities for women and youth in rural areas so that these groups can improve their livelihoods. Empowering women through the development of gender-responsive policies and targeted support should be prioritized in order to improve their access to land, finance and clean energy markets.

- **A fostering of intersectoral cooperation between the energy, agriculture and climate sectors, and the adoption of new, holistic approaches, such as the water-food-energy-ecosystem nexus**

These measures can leverage synergies, drive efficiency and maximize impact. This is particularly important in ensuring that renewable energy solutions are effectively integrated into agrifood systems, enhancing productivity and resilience. Both nationally and sub-nationally, members of government, the private sector and civil society can play a critical role in promoting inclusive and transformative solutions, designing supportive policies and investing in sustainable technologies.

- **A promotion of South-South cooperation and triangular cooperation**

For energy-smart agrifood systems solutions, this cooperation can facilitate knowledge sharing, technology transfer and capacity-building. This should be prioritized particularly in developing countries that face similar energy and food security challenges.

- **A raising of awareness and capacity-building among smallholders, while strengthening their technical expertise through training programmes and extension services**

This will facilitate the adoption and long-term sustainability of renewable energy solutions in agrifood systems.

- **An increase in investment in sustainable rural infrastructure**

This can reduce food and energy losses after the farm gate. It can also facilitate the scaling-up of renewable energy use. Such an increase should include investment in modern storage facilities and efficient transportation networks, as well as in waste management and recycling systems.

# Endnotes

- <sup>1</sup> See Crippa M. *et al*, "Food systems are responsible for a third of global anthropogenic GHG emissions", *Nature Food*, 2, pp. 198-209, 2021, <https://doi.org/10.1038/s43016-021-00225-9> and Food and Agriculture Organisation (FAO), FAO Statistics (FAOSTAT), 2024, <https://www.fao.org/statistics/highlights-archive/highlights-detail/greenhouse-gas-emissions-from-agrifood-systems.-global-regional-and-country-trends-2000-2022>.
- <sup>2</sup> See International Renewable Energy Agency (IRENA) and FAO, *Renewable energy for agri-food systems – Towards the Sustainable Development Goals and the Paris Agreement*, IRENA and FAO, Abu Dhabi and Rome, 2021, <https://doi.org/10.4060/cb7433en>.
- <sup>3</sup> SDG2 is the goal to end hunger, achieve food security and improved nutrition and promote sustainable agriculture. See <https://sdgs.un.org/goals/goal2> for more details.
- <sup>4</sup> See Climate Policy Initiative (CPI), *Global Landscape of Climate Finance 2025*, CPI, Washington DC, [https://www.climatepolicyinitiative.org/wp-content/uploads/2000/06/compressed\\_Global-Landscape-of-Climate-Finance-2025.pdf](https://www.climatepolicyinitiative.org/wp-content/uploads/2000/06/compressed_Global-Landscape-of-Climate-Finance-2025.pdf).
- <sup>5</sup> See the FAO, International Fund for Agricultural Development (IFAD), United Nations International Children's Emergency Fund (UNICEF), World Food Programme (WFP) and World Health Organisation (WHO) report, *The State of Food Security and Nutrition in the World 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms*, FAO, Rome, 2024, <https://doi.org/10.4060/cd1254en>.
- <sup>6</sup> See endnotes 1 and 2 above.
- <sup>7</sup> See the IEA, IRENA, United Nations Statistics Division, World Bank and WHO report, *Tracking SDG7: The Energy Progress Report*, 2025, World Bank, Washington DC, <https://trackingsdg7.esmap.org/downloads>.
- <sup>8</sup> See endnote 4.
- <sup>9</sup> See the FAO report, *The Status of Women in Agrifood Systems*, FAO, Rome, 2023, <https://openknowledge.fao.org/items/ad0741f-9de2-4d09-ae68-b19cc871601a>.



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