



## 1.05 Launch clean energy information and coordination platforms

**The Solution:** The proposed solution is national **Clean Energy Information and Coordination Platforms** complemented by international information sources to expand clean, affordable, and reliable energy access along food supply chains. Data platforms combining available secondary data with new national-level analyses will identify and match synergies between the business case of energy companies interested in expanding clean electricity grids and food chain actors that could pay for energy costs, if given access to it, by growing their businesses. This currently missing intelligence can de-risk and optimise investments in clean energy for food system transformation based on agreed-upon payment terms and conditions contracts between clean energy suppliers and food supply chain actors. Simultaneously, it will provide a living example of how such a platform could be used (i.e., a ‘use case’) that brings together all relevant stakeholders.

*Mapping:* Building on existing pilots, the platforms will map areas where energy expansion would be most effective in stimulating economic growth and food supply chain efficiency. The information and collaborative planning will lower risk for investors, especially private-sector ones, while contributing to improved functioning and growth of food supply chains. Additional information on potential use of food chain residue for bioenergy production will further contribute to scaling clean energy.

*Comprehensive Cost-Benefit Analysis:* The platform will provide robust, comprehensive (social, environmental, economic, and financial) costs-benefit analysis of clean energy investments for food supply chains; this could be done using existing methodologies (e.g., FAO INVESTA) in as little as three months. Gender analysis/markers will provide information on: ensuring gender equality in energy access; where efforts can facilitate women’s economic integration into a lucrative energy sector (e.g., training in hardware installation, maintenance or sales; female engineers); and how to focus expansion on women’s businesses in food supply chains. Similarly, information on climate change and conflict risks will identify risks and invite alignment with preparedness and response efforts (e.g., types of clean energy solutions used, proximity to displacement locations to avoid wood-cutting).

**Source of the Solution:** There is a need to pool investment across public and private entities to decrease energy poverty.<sup>1</sup> The platform solution is based on FAO’s ‘Energy-Smart Food’ Programme (ESF), which aims primarily to ensure adequate access to sustainable, reliable and affordable energy in food chains through (i) better energy efficiency, (ii) gradual use of renewable energy, (iii) sustainable bioenergy, and (iv) a water-energy-food nexus approach, and the obstacles investors face due to lack of information and coordination.

**Problem addressed within food systems:** Lack of reliable, affordable, and sustainable energy access increases food loss and limits the efficient use and growth of food supply chains and, in turn, food availability and access, especially in low-income countries. Energy access has also been shown to have positive impacts on household income and business growth—and thus on addressing poverty, a driver of hunger.<sup>2</sup> This lack of reliable sustainable energy stems from various other problems:

*Missed investment opportunities:* Global commitment to energy expansion falls far short of needs and focuses largely on high-income countries instead of those with highest energy poverty and hunger levels.<sup>3</sup> The energy sector’s interest in market expansion exists, and their investments are needed to finance clean energy access in underserved areas. Yet, insufficient or lacking data and stakeholder coordination means investments in economically profitable expansion opportunities are missed.

<sup>1</sup> <https://sustainabledevelopment.un.org/content/documents/17480PB8.pdf>

\* [FAO 2015 on opportunities for food chains to become energy smart, Power for All Fact sheets](#)

<sup>2</sup> <https://www.adb.org/documents/systematic-review-impact-access-electricity-household-welfare>

<sup>3</sup> For every \$1 of Multilateral Development Banks or Direct Foreign Investment resources invested in high income countries only \$0.37 private finance in low-income countries (ODI, 2019)). [Source](#)



*Lack of reliable, affordable energy access limits food supply chains' efficiency and growth:* Developed countries use about 35 gigajoules/person/year for food and agriculture while developing countries use only 8 gigajoules/person/year (largely for cooking). Adequate access to sustainable clean energy in food chains is key to ensure availability, access, and proper use of food.<sup>4,5,6</sup>

*Underutilised food supply chain residue potential for biomass energy:* There are growing opportunities and demand for the use of biomass to provide additional renewable energy sources. Biomass from cellulosic bioenergy crops is expected to play a substantial role in future energy systems.<sup>7,8</sup>

*Energy poverty perpetuating poverty:* Countries with high levels of poverty tend to have lower access to sustainable clean energy services, especially in Sub-Saharan Africa and South Asia. Lower-income people cannot afford modern energy services, meaning fewer income-generation opportunities.<sup>9</sup>

**How this solution will address that problem:** If stakeholders (governments, food supply, energy sector, international organisations, data science leads) commit to establishing improved data platforms to inform comprehensive cost-benefit analyses, sound businesses cases will be identified that will de-risk energy expansion investments. Investments need to be aligned with productive energy use in food supply chains, which hold the potential for economic growth in rural areas of LMICs (i.e., the productive use case). This business case is that more livelihood opportunities and higher profit can arise from value chain development, but this is constrained by energy availability. Food supply chain actors will increase profits due to improved production and transformation, distribute value addition across the value chain, reduce food losses, and improve quality of products due to better sustainable clean energy access. Their increased demand equals increased payment capacity, paying for lower-risk clean energy expansion while sustainably and innovatively transforming these chains. Major energy companies, e.g., ENGIE and ENEL, have significant investment interest in food supply chains along a water-energy-food nexus approach, due to the potential market opportunity for them,<sup>10</sup> yet developing and sustaining this information goes beyond the capacity of single actors, as the nature of energy expansion in food chains cuts across many sectors, policies, and areas of expertise; investing as a single actor in expansion may be infeasible. Therefore, a coordinated public-private effort is needed to inform, plan, and implement clean energy access expansion.

**Solution's alignment to the 'game changing and systemic solution' criteria:**

*Impact potential at scale:* Such cross-sectoral platforms do not exist at national levels yet could be the key driver for energy expansion and thus lasting transformation and improved efficiency of food supply chains. The methodology is applicable across contexts and can thus be scaled to any country.

*Actionability:* Pilot projects have shown the approach's feasibility and can function as demonstrations for stakeholders. Political will and clear investment interest from the private sector are needed, as are financial commitments to information gathering and platform development on the part of a national government. Especially for governments with a clear vision/policy for energy access expansion, this solution provides an innovative tool to act on their plans. Per food chain, the analysis takes about 3-5 months and costs USD 50,000-75,000.

*Sustainability:* The information platform can be incorporated into national energy access expansion plans and timelines, funded through related resources. In addition, stakeholder interest in investing in sustainable clean energy for food chains exists and will contribute multiple funding streams. The benefit

<sup>4</sup> <http://www.fao.org/3/an913e/an913e01.pdf>

<sup>5</sup> [https://read.oecd-ilibrary.org/agriculture-and-food/improving-energy-efficiency-in-the-agro-food-chain\\_9789264278530-en#page7](https://read.oecd-ilibrary.org/agriculture-and-food/improving-energy-efficiency-in-the-agro-food-chain_9789264278530-en#page7)

<sup>6</sup> <https://sustainabledevelopment.un.org/content/documents/17480PB8.pdf>

<sup>7</sup> <https://www.sciencedirect.com/science/article/pii/S1364032114000677>

<sup>8</sup> <http://www.fao.org/3/a-i5125e.pdf>

<sup>9</sup> <http://documents1.worldbank.org/curated/en/364571494517675149/pdf/114841-REVISED-JUNE12-FINAL-SEAR-web-REV-optimized.pdf>

<sup>10</sup> <https://www.powerforall.org/insights/dre-technologies/global-local-building-energy-smart-local-food-systems-post-covid-era>



of de-risking investments based on evidence and comprehensive data analyses will increase investment confidence. Once an information base is established, continuous information gathering will be less complex, costly, and thus more sustainable.

The solution will also have positive environmental and cross-cutting effects. The energy used in food supply chains currently represent 20-25% of GHG emissions. Any food supply chain scaling based on fossil fuels will contribute to higher levels and further natural resources degradation, whereas decarbonisation can contribute to goals of AT 3 and 5, and SDG 13. Moreover, a lack of energy access negatively impacts other services (health, education, vet services)<sup>11</sup> and affects women and men differently, a reality often disregarded, and as a highly male dominated sector energy access decisions tend to lack women's perspectives<sup>12</sup>. Promoting equitable energy access can support livelihoods development (AT 4/5, SDG 8) and improve service delivery (SDGs 4 & 6).

**Existing evidence:** Since such platforms do not exist, rigorous meta-analysis evidence is not available. Yet individual projects have proven the approach. For example, [Power for All](#) has recently illustrated this regarding several crops in Uganda. FAO has developed a methodology through the [INVESTA project](#), which has so far applied environmental, social, economic and financial cost-benefit analysis in three food chains in five countries; economic analyses of individual projects underpin the sustainability of so-derived business models.<sup>13</sup>

**Current/likely political support:** Expansion of renewable energy is part of a multitude of political and private-sector agendas; this specific idea is being supported by FAO by scaling piloted efforts. Potential partners include: ENEL/Italy, ENGIE/France, FMO, Rabobank, PROPARCO, AfDB, WB, UAE, WBCSD, IRENA, German government, Rockefeller Foundation, OPEC Fund for Development, USAID, REEEP, Power for All, Alliance for Rural Electrification, Google, WRI, and KTH. Funds for pilots have come from donor governments but should be expanded by having private sector and other investors contribute.

**Contexts for which this is well suited:** Locations with high gaps in rural energy access yet significant economic growth of specific food chains; protracted crises settings where energy for food is required by refugees/host communities; contexts where food chain residues are not currently used for other food chain-related purposes (e.g., animal feed) but can contribute to scaling biomass energy access; and locations where land-based food production is limited by natural factors and high-tech production is needed (e.g., hydroponics, vertical farming in the Gulf States), requiring increased energy needs.

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<sup>11</sup> *ibid*

<sup>12</sup> <http://documents1.worldbank.org/curated/en/463071494925985630/pdf/115066-BRI-P148200-PUBLIC-FINALSEARSGenderweb.pdf>

<sup>13</sup> <https://www.powerforall.org/resources/fact-sheets/research-powering-agriculture-ebooklet>