EVALUATION

Ministry for Foreign Affairs of Finland

JOINT EFFORTS FOR A GREEN FUTURE: EVALUATION ON FINLAND'S DEVELOPMENT COOPERATION IN ENVIRONMENT AND SUSTAINABLE USE OF NATURAL RESOURCES, AND PRIVATE SECTOR OPPORTUNITIES

Volume 2c • Energy, Circular Economy and Critical Minerals

Evaluation on Finland's Development Policy and Cooperation

2026/1

This report can be downloaded through the home page of the Ministry for Foreign Affairs
https://um.fi/development-cooperation-evaluation-reports-comprehensive-evaluations

Contact: EVA-11@gov.fi

ISBN 978-952-281-850-8 (PDF)
ISSN 2342-8341

Layout: Grano

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JOINT EFFORTS FOR A GREEN FUTURE: EVALUATION ON FINLAND'S DEVELOPMENT COOPERATION IN ENVIRONMENT AND SUSTAINABLE USE OF NATURAL RESOURCES, AND PRIVATE SECTOR OPPORTUNITIES

ENERGY, CIRCULAR ECONOMY AND CRITICAL MINERALS SUB-SECTOR EVALUATION REPORT

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2026/1

This evaluation was commissioned by the Ministry for Foreign Affairs of Finland to Particip GmbH. This report is the product of the authors, and responsibility for the accuracy of the data included in this report rests with the authors. The findings, interpretations, and conclusions presented in this report do not necessarily reflect the views of the Ministry for Foreign Affairs of Finland.

This report incorporates the use of Artificial Intelligence (AI) technologies to support wider contextual research, including targeted searches. AI tools were also applied for language support, including proof-reading and enhancing clarity, coherence, and readability. The AI tools or techniques utilised in this report adhere to EVA-11's requirements, ensuring ethical and responsible use, transparency, validation of results, and compliance with relevant internal regulations. For details on the specific AI methodologies and tools used and details regarding the validation of AI-generated results, refer to section/Annex 1 of this report.

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Acronyms and Abbreviations

ACEF	African Circular Economy Facility
ADB	Asian Development Bank
AFRY	ÅF Pöyry
AI	Artificial Intelligence
BIWASE	Binh Duong Water – Vietnamese Environment Joint Stock Company
CEYEP	Circular Economy Youth Empowerment Programme
COVID	Coronavirus disease
DEP	Danish Energy Programme
EBRD	European Bank for Reconstruction and Development
EEP	Energy and Environment Partnerships
EFSD+	European Fund for Sustainable Development Plus
EQ	Evaluation Question(s)
EU	European Union
EUR	Euro
EVA-11	Development Evaluation Unit (MFA)
FUTF	Finland-Ukraine Trust Fund
GTK	Geological Survey of Finland
GW	Gigawatt
GWh	Gigawatt-hour
HIPCA	European Bank for Reconstruction and Development High Impact Partnership on Climate Action
HQ	Headquarters
ICI	Institutional Cooperation Instrument
IDB	Inter-American Development Bank
LAC	Latin America and the Caribbean
MFA	Ministry for Foreign Affairs (Finland)
MW	Megawatt
NEFCO	Nordic Environment Finance Corporation
NGO	Non-Governmental Organisation(s)
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PAGE	Partnership for Action on Green Economy
SAEE	State Agency on Energy Efficiency and Energy Saving
SDG	Sustainable Development Goal(s)
Sitra	Finnish Innovation Fund Sitra
tCO2e	Tonnes of CO_2 equivalent
TWh	Terawatt-hour
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
USD	United States Dollar
VTT	Technical Research Centre of Finland

1 Summary

This evaluation report examines Finland's development cooperation in the Energy, Circular Economy and Critical Minerals sub-sector within the Ministry for Foreign Affairs' Environment and Natural Resources policy priority area. The rationale for this evaluation lies in the need to assess Finland's contribution to global sustainability transitions in areas where financial needs are great and where Finnish expertise and catalytic instruments have the potential to add significant value. Its purpose is to provide MFA and stakeholders with an independent and evidence-based assessment of the achievements, added value, and challenges of interventions undertaken between 2015 and 2024. Its objectives are both summative (to capture results, impacts, and lessons), and formative (to identify opportunities, models, and entry points for strengthening private sector engagement. This includes improving policy coherence and enhancing Finland's delivery on a range of Sustainable Development Goals (SDG) – primarily related to Affordable and Clean Energy (SDG 7), Responsible Consumption and Production (SDG 12), Climate Action (SDG 13), and Partnership for the Goals (SDG 17).

The evaluation applied a mixed-methods approach designed to generate credible and triangulated findings across multiple evidence streams. It combined a portfolio-level analysis of financial commitments (EUR 246.65 million), portfolio review of 16 interventions, including bilateral projects, multilateral funds, blended finance mechanisms, and innovation instruments such as Energy and Environment Partnerships (EEP) Africa and Finnpartnership, with 'moderate' and 'intensive' desk studies of project documentation, theories of change, and MFA reporting systems. Evidence was further strengthened by approximately 45 semi-structured interviews: 17 with policy-level stakeholders (including MFA staff and representatives of international financial institutions), 17 with intervention-level actors (implementing partners, fund managers, and local stakeholders), and 11 with private sector knowledge-holders (Finnish companies, investors, and business support organisations). Some of these interviews were conducted in Ukraine. Additional sources included a like-minded peer country review, market analyses of private sector engagement opportunities, e-survey, and supportive use of natural language processing for document navigation. Together, these methods ensured that conclusions were robust, evidence-based, and reflective of diverse perspectives across the Energy, Circular Economy and Critical Minerals sub-sector. Key findings are set out below.

KEY RESULTS	RELATED SDG
Answers to Evaluation Questions 1.1 (a, b, c) and 1.2 on results and impacts, induced changes and benefits/beneficiaries The Finnish development cooperation portfolio delivered tangible results across energy, circular economy, and critical minerals. The development policy investment portfolio at end of 2024 (four investments totalling EUR 224 million) was expected to mobilise EUR 1.5 billion of other financing. The IFC fund investments are expected to avoid an estimate 8.5 million tCO2 annually. Through EEP Africa, over 5.7 million people gained modern energy access and, by 2021, EEP had created 11,000 jobs; 40% of them held by women (Finland contributed a third of overall EEP financing). Finnfund-supported companies sustained more than 300,000 jobs worldwide. In the circular economy, Sitra's toolkits and Finland's convening role in World Circular Economy Forum supported policy uptake in more than ten countries, while GTK's mineral mapping informed responsible mining governance in Mozambique, Zambia, and Tanzania. Finnish support made a meaningful contribution to advancing renewable energy, circular economy, and critical minerals outcomes, though its relative weight was smaller than that of larger donors. In blended finance, Finland's EUR 114 million International Finance Corporation partnership mobilised over USD 2 billion – a catalytic role. In circular economy, Finland shaped global frameworks and provided policy toolkits, but financial scale remained modest compared to multilateral funds. In critical minerals, GTK provided globally respected technical expertise, but without the leverage of major mining financiers. Overall, Finland was most effective in shaping agendas, piloting innovations, and de-risking early markets, while systemic reach and scale of finance came more from other donors. In addition to the intended greenhouse gas reductions, energy access, and improved resource efficiency, some unintended environmental impacts were observed. Positive effects included ecosystem benefits from circular initiatives (e.g. soil fertility gains from waste-to-fertiliser projects in Mozambique, reduced deforestation from biogas and clean cookstoves). However, negative impacts also emerged: in Kenya's Lake Turkana Wind Power project, supported indirectly through Finnfund, local concerns were raised about land use and exclusion from benefits. Some landfill gas and waste-to-energy projects raised risks of lock-in to incineration rather than advancing higher-order waste reduction. Similarly, reliance on grant-funded pilots created small-scale gains without addressing long-term cumulative environmental risks, such as e-waste leakage where recycling systems lacked scalability. Finnish support benefited a diverse set of stakeholders, from rural households and underserved energy users to small and medium-sized enterprises, women, youth, and international investors. Households saw improved safety, health, and productivity from solar, mini-grids, and clean cooking technologies, while over 11,000 direct jobs were created under EEP Africa, 40% of them for women. Small and medium-sized enterprises received seed capital, mentoring, and technical assistance, enabling entrepreneurs to innovate in energy, waste, and recycling. National governments benefitted through policy toolkits, capacity-building, and institutional partnerships, while Development Finance Institutions and Multilateral Development Banks leveraged Finnish concessional finance to expand into riskier markets. The delivery model was particularly effective where community inclusion, gender mainstreaming, and capacity-building were deliberately embedded, showing that Finnish support generated both direct social dividends and indirect systemic benefits.	**Primary relevance**  **Secondary relevance** 

KEY RESULTS	RELATED SDG
Answers to Evaluation Question 1.3 on most effective approaches The Finnish MFA portfolio demonstrates a mix of approaches tailored to scale and context, and to identify one approach as most effective for all purposes would be misleading. Blended finance platforms proved most effective at promoting economic development and jobs creation where risk-sharing, stable regulation, and credible off-take agreements created investor confidence for utility-scale renewables. Leverage also boosted cost-effectiveness. Smaller challenge funds, often aimed at promoting off-grid innovation, inclusion and social empowerment, were most effective when flexibility, trusted local entrepreneurs, and community engagement were in place. Finnfund's patient equity model and small and medium-sized enterprise support mechanisms enabled gradual market entry but faced scaling barriers due to limited follow-on finance and Finnish small and medium-sized enterprise capacity. Toolkit and convening approaches, such as Sitra's roadmaps and the World Circular Economy Forum, built coherence between global frameworks and national policies, but required sustained political buy-in and long timelines to succeed. Across themes, enabling factors included predictable policy environments, strong local ownership, and coordination with partner institutions, while barriers ranged from rigid concessional instruments and slow disbursement in fragile contexts to fragmented institutional roles, grant dependency, and weak mechanisms for translating pilots into commercial pipelines. Effectiveness did not always translate into impact and sustainability; e.g. in the area of climate and environmental governance, toolkits and convening platforms were effective in embedding circular economy principles into national policies and expanding global coalitions, but systemic impact and sustainability were constrained by the long policy reform timeline, short project cycles and institutional coordination gaps.	
Answers to Evaluation Question 1.4 on Finnish added value Finland's added value is strongest in energy, circular economy, and critical minerals, where institutions like the Technical Research Centre of Finland (VTT), GTK, and Sitra provide internationally recognised expertise in renewables (e.g. distributed energy), waste valorisation, and responsible mining practices. Finland has brought technical leadership (both in institutions and innovation) and expertise. Finnish innovations have supported solar deployment, district heating, circular economy roadmaps, and Environmental, Social, and Governance-compliant mineral governance across Africa, Asia, and Eastern Europe, while Sitra's toolkits and the World Circular Economy Forum have positioned Finland as a thought leader. GTK's geological mapping and governance frameworks, combined with Finnfund's blended finance and NEFCO's recovery investments, show Finland's ability to integrate technical capacity with catalytic finance. Finnish programmes also embed social inclusion, job creation, and gender equity, reinforcing Finland's credibility as a rights-based and context-sensitive partner. However, systemic influence is constrained by modest financial scale, limited commercial presence of Finnish firms, and fragmentation between MFA's development mandate and business-focused agencies such as Business Finland, Finnvera, and Finnfund. Despite efforts through Team Finland, structural and mandate differences hinder coherence, leaving Finland's technical leadership under-leveraged relative to its potential impact.	

KEY RESULTS	RELATED SDG
Answer to Evaluation Question 2.1 on market conditions affecting Finnish private sector engagement Across the MFA portfolio, the private sector has been a central delivery channel, taking roles as implementers, innovators, financiers, advisors, and policy enablers across energy, circular economy, and critical minerals. Demand for Finnish expertise is evident, with firms delivering landmark infrastructure under concessional credit in Vietnam, piloting off-grid innovations through EEP Africa, and supporting district heating in Ukraine. Yet opportunities have often been underexploited: blended finance facilities and circular economy platforms aligned strongly with Finnish strengths but lacked matchmaking, follow-up, and financing for small and medium-sized enterprises to scale beyond pilots. Finnish companies hold a clear niche in modular, decentralised, Environmental, Social, and Governance-compliant solutions – from off-grid solar to responsible mining – but face stiff competition from larger multinationals, local firms, and peer donors, compounded by weak export finance and fragmented Team Finland coordination. Global demand for clean energy, circular solutions, and traceable critical minerals is set to grow rapidly, presenting strong opportunities for Finland's technology offer. However, without stronger institutional integration, aftercare, and positioning within large blended finance platforms, Finnish firms risk remaining confined to pilots while others capture scale.	
Answer to Evaluation Question 2.2 (a, b) on potential gains for Finnish businesses and development cooperation Finnish companies could secure substantial benefits in the Energy, Circular Economy and Critical Minerals, circular economy, and critical minerals sectors, ranging from direct revenues through contracts for clean-tech solutions to indirect gains in reputation and strategic positioning in global value chains. Even modest market shares in rapidly expanding sectors like renewable energy and critical minerals could generate hundreds of millions of euros. However, realising these opportunities depends on overcoming key constraints. Access to finance is crucial, as many Finnish small and medium-sized enterprises lack the capital to scale, while stronger localisation, aftercare, and partnerships are needed to sustain market presence. Coordination between Finnish institutions, leveraging Finland's Environmental, Social, and Governance reputation, and the ability to participate in large, bankable projects will determine whether companies move beyond pilot initiatives. Without progress on these fronts, Finland risks remaining a niche actor while competitors dominate growing global markets.	
Answer to Evaluation Question 2.3 on promising models for Finnish private sector engagement MFA instruments that combined risk-sharing with structured entry points have been the most effective in embedding Finnish firms and supporting their participation in developing markets. Concessional credit schemes, such as the Binh Duong Solid Waste Treatment Plant in Vietnam, tied Finnish companies like Ferroplan and Doranova directly into delivery, giving them large reference projects and reputational gains. Similarly, the Finland-Ukraine Trust Fund ensured Finnish content in over 30 projects, providing visibility and early market access. Challenge funds like EEP Africa allowed small and medium-sized enterprises such as Solar Water Solutions and Tespack to pilot innovations in off-grid energy, while Finnfund's equity model engaged Finnish firms in long-term ventures across energy and mining. Yet despite these successes, systemic barriers persist. A 'missing middle' in finance leaves small and medium-sized enterprises without the EUR 1–10 million needed to scale, aftercare mechanisms to support follow-up contracts are weak, and institutional fragmentation within Team Finland often prevents coordination between MFA, Finnfund, Business Finland, and embassies. As a result, Finnish companies frequently secured valuable references but struggled to translate them into lasting market footholds or commercial continuity. Strengthening coordination and bridging financing gaps remain critical to maximising the value of these instruments.	

Conclusions

1. Finland's blended finance model successfully expanded renewable energy access and infrastructure, but market sustainability and Finnish firm involvement remain limited.
2. Circular economy programming generated policy innovation and local pilot success, but systemic impact was constrained by fragmentation and limited scaling.
3. Finland built strong governance foundations in critical minerals, but under-leveraged private sector expertise reduced commercial outcomes.
4. Finnish-supported interventions yielded substantial environmental co-benefits, but biodiversity and ecosystem results were poorly captured.
5. Finland's institutional capacity-building efforts were transformative in some cases, but short-term planning and weak transition strategies often undermined durability.
6. Innovation and inclusion were effectively promoted through catalytic support to entrepreneurs, but scaling and systematic integration remain weak.
7. Fragmented coordination among Finnish institutions undermined strategic coherence and reduced system-wide impact.
8. Finland's partnership instruments were underutilised and disconnected from larger financing and programming channels.
9. Finland has demonstrated strong global leadership in energy, critical minerals and circular economy governance, but local-level translation of these norms into implementation has been weak.
10. Finland achieved greatest impact where innovation, long-term institutional partnerships, and systemic programming were combined, but this model remains inconsistently applied.
11. The limited participation of Finnish firms in the Energy, Circular Economy and Critical Minerals portfolio reflects missing strategies, unclear pathways, and a lack of firm-level support.

Potential action points

1. Finland should systematically embed private sector engagement across the entire Energy, Circular Economy and Critical Minerals project lifecycle, ensuring clear pathways, risk-sharing, and sustained aftercare to translate Finnish innovations into lasting development impact.
2. Finland must shift from short-term, fragmented grants toward long-term, market-driven programmes that align Energy, Circular Economy and Critical Minerals industrial strengths with country-specific development transitions.
3. Finland should institutionalise joint planning and delivery platforms across MFA, Finnfund, Business Finland, GTK and embassies for Energy, Circular Economy and Critical Minerals interventions to overcome fragmentation and achieve unified, credible international engagement.
4. Finland needs to adopt 7–10-year adaptive financing models with flexibility, transition planning, and resilience measures to ensure durable and context-responsive development outcomes for long term energy sector transition
5. Finland must convert its global leadership on sustainability in the Energy, Circular Economy and Critical Minerals sector into concrete national outcomes by embedding technical assistance, regulatory support, and institutional partnerships in partner countries.

2 Introduction

2.1 Scope and purpose

This document reports the findings and conclusions of three primary thematic areas under the Environment and Natural Resources (Environment and Natural Resource) policy priority area of the Ministry for Foreign Affairs of Finland (MFA): (i) Energy (including renewable energy generation, energy access) (ii) Circular Economy (including resource and energy efficiency, reuse and recycling); and (iii) Critical minerals and wider mining governance. These are areas which form a significant part of the MFA portfolio. This report is part of a larger Environment and Natural Resource evaluation that also encompasses three other sub-sectors: Forests, Ecosystems and Biodiversity, Disaster Risk Reduction and Meteorology, and Water as a Natural Resource. This, and the other sub-sector evaluations are ultimately intended to be used in support of a synthesis report which will present findings, conclusions and recommendations from the Environment and Natural Resource evaluation as a whole.

The purpose of this evaluation is to provide the MFA and its stakeholders with an independent assessment of the achievements, merits and worth of Finnish development cooperation interventions implemented under the Energy, Circular Economy and Critical Minerals sub-sector of the Finnish Environment and Natural Resource policy priority area (see Terms of Reference, in the synthesis report). The evaluation will offer evidence-based insights to inform MFA's strategic and operational choices when engaging with the Energy, Circular Economy and Critical Minerals theme from a long-term perspective. It also seeks to support learning among stakeholders by harvesting results, identifying enabling and constraining factors, and documenting practical lessons. In doing so, the evaluation will strengthen the MFA's capacity to design, scale and sustain impactful interventions that deliver on policy commitments. The evaluation also aims to deepen understanding of Finland's contributions to the 2030 Agenda, particularly in relation to Sustainable Development Goal (SDG) 7 (Affordable and Clean Energy), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), and SDG 17 (Partnerships for the Goals).

The portfolio under review encompassed MFA bilateral and multilateral contributions, Finnfund investments, and selected instruments and facilities co-financed with international financial institutions (e.g. International Finance Corporation, European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IDB), African Development Bank), as well as innovation-oriented instruments such as Energy and Environment Partnerships (EEP) Africa and Finnpartnership. The evaluation examined contributions to policy, investment mobilisation, private sector engagement, and capacity building across these thematic areas, with a view to assessing Finland's added value, results, and positioning in the global Energy, Circular Economy and Critical Minerals landscape.

This sub-sector evaluation has both summative and formative dimensions. The specific objectives are to:

1. To harvest and evaluate results (obtained and sustained), successes and challenges in achieving the objectives of the policy priority area and its sub-sectors (summative).
2. Present a synthesis of results and impacts, including early/emerging impacts (summative)
3. To identify and analyse opportunities, means and measures for engaging Finnish private sector actors into this work in the future (formative).

To provide realistic evidence-based policy and operational recommendations for the future, with due attention to the limitations in financial and human resources available (formative). This also includes documenting practical lessons on, and any opportunities for, applying geo-referencing and geospatial data for future monitoring and evaluation purposes to partly address reporting challenges. As noted above, this sub-sector evaluation examines Finland's contributions to the Energy, Circular Economy and Critical Minerals sub-sector under the Environment and Natural Resource policy priority area, covering years 2010 to 2024. The sub-sector is informed by Outcome 2 of Finland's Climate and Natural Resources theory of change adopted in 2023, namely: *All people have improved and equitable access to affordable and clean, sustainably produced renewable energy (SDG 7, supports also SDG 13.1 and 13.3),* as adapted in the evaluation-specific theory of change (see section 2.2 for the sub-sector theory of change with further explanation and findings in Section 4).

While the report was not designed as a results-based evaluation against specific indicator targets, the analysis has been informed by MFA's Aggregate Indicators where relevant, especially indicators on renewable energy access, installed capacity, and mobilised private finance. The evaluation has drawn on MFA Finland's portfolio-level results reporting for energy-related interventions. For example, the Development Policy Results Report (2022) reported that Finland's funding contributed to improved access to clean energy for around 94 million people, primarily through multilateral climate and energy programmes to which Finland contributed. However, cumulative impacts are not consistently reported for indicators by MFA.

The evaluation draws from a purposive sample of MFA-funded projects and initiatives within the Energy, Circular Economy and Critical Minerals portfolio (see Table 1). The assessment pays special attention to private sector engagement within the sub-sector and seeks to identify lessons and good practices relevant for shaping Finland's future role.

It should be noted that Finland also makes significant core contributions to a range of global climate and environment funds, including through the Green Climate Fund, the Global Environment Facility, and the Nordic Development Fund. These are large funds but generally pooled and multi-sector, making it difficult to attribute the contribution of MFA finance at the project level, or to understand the share allocated for clean energy, circular economy and critical minerals projects. For the Green Climate Fund and Global Environment Facility, Finland maintains a share of approximately 1% of contribution so overall contribution/attribution is weak. For Nordic Development Fund, it is larger (18%) but still a minority stake. Nonetheless, these funds are substantial contributors to and investors in the relevant Energy, Circular Economy and Critical Minerals sub-sectors. Examples of funding and their relevance to clean energy, critical minerals and circular economy are set out in Table 2.

Table 1 Moderate and intensive studies of MFA-supported projects in Energy, Circular Economy and Critical Minerals sub-sector

NAME OF THE INTERVENTION	INSTRUMENT (CATEGORIES FROM TERMS OF REFERENCE)	MFA FINANCING AND IMPLEMENTING AGENCY	GEOGRAPHY	CONTEXT[1]	DEPTH OF STUDY
Energy and Environment Partnership Southern and East Africa Multidonor Trust Fund	Bilateral support	Implementer: Nordic Development Fund (Phase III) Finnish Contribution: EUR 30.4 million (34%) (all phases) Total Value: EUR 88.2 million	Africa, regional	-	Moderate study
Finland-International Finance Corporation Blended Finance for Climate Program	Multilateral support	Implementer: International Finance Corporation Finnish Contribution: EUR 115.5 million (100%) Total Value EUR 115.5 million. International Finance Corporation report blended finance at ratio of 13:1 (own account plus 3rd party)	Unspecified	-	Intensive study
Nordic Environment Finance Corporation (NEFCO)/ Finland-Ukraine Trust Fund	Multilateral support	Implementer: NEFCO, State Agency on Energy Efficiency and Energy Saving (SAEE) Ukraine Finnish Contribution: EUR 6 million (100%) Total Value: EUR 6 million (EUR 3.8 million disbursed pre-war).	Ukraine	Transitional, conflict	Intensive study
Partnership for Action on Green Economy (PAGE)	Multilateral support	Implementer: United Nations (UN) Agencies (International Labour Organization, UNDP, UNEP, UNITAR, UNIDO Finnish Contribution: USD 1.85 million (4%) Total Value: USD 44.3 million (2016–20)	Unspecified	-	Moderate study
Asian Development Bank (ADB) Ventures	Private sector instruments	Implementer: Ventures Investment Fund Finnish contribution: EUR 20 million (33%) Total Value: USD 60 million	Asia, Regional	-	Moderate study

1 **Context.** Transitions from one context to another are not always clear and consistent. Thus, the MFA definition of 'transitional' focuses on shifting from a development cooperation-based relationship to a private sector-based relationship, while the World Bank uses per-person Gross Domestic Product and the United Nations takes a wider basket of economic and human development indicators into account. Moreover, the dynamism of national economic systems does not always make for a simple progression, an example being Zambia which the World Bank demoted from the lower middle to lower income category in 2022. Comparable ambiguity over economic status affects the status of Lao PDR. And the 'conflictual' context is also subject to radical change since, as seen since 2022 in Ukraine and elsewhere, it depends on military and peace-making initiatives by various stakeholders.

NAME OF THE INTERVENTION	INSTRUMENT (CATEGORIES FROM TERMS OF REFERENCE)	MFA FINANCING AND IMPLEMENTING AGENCY	GEOGRAPHY	CONTEXT[1]	DEPTH OF STUDY
Finland-Latin America and the Caribbean (LAC) Blended Finance Fund	Multilateral support	Implementer: IDB Invest Finnish Contribution: EUR 50 million (100%) Total Value: EUR 50 million. IDB expected to blend at 4:1	America, regional	-	Intensive study
High Impact Partnership on Climate Action (HIPCA)	Multilateral support	Implementer: EBRD Finnish Contribution: EUR 41,730,000 (17%) Total Value: EUR 248 million (to date). EBRD blends at 3:1	North of Sahara, regional	-	Intensive study
African Circular Economy Facility (ACEF)	Bilateral support	Implementer: African Development Bank Finnish Contribution: EUR 4 million (66%) Total Value: EUR 6 million (incl. Nordic Development Fund)	Africa, regional	-	Intensive study
10 Year Framework of Programmes on Sustainable Consumption and Production	Multilateral support	Implementer: UNEP (Sustainable Buildings) Finnish Contribution: USD 956,320 (7%), Sustainable Buildings Workstream. Earlier capitalisation reported pre-2014. Total value: USD 14.34 million (reported 2021 whole 10YFP)	Unspecified	-	Moderate study
UNIDO Partnerships for Sustainable Development in Developing Countries (mining focus)	Multilateral support	Implementer: UNIDO Finnish Contribution EUR 10.35 million (100%) 2014, 2018, 2021 Total Value: EUR 10.35 million (expected to be blended with UNIDO and 3rd party)	Unspecified	-	Moderate study
Future females HQ – Accelerating female Entrepreneurs in the Circular Economy	Bilateral support	Implementer: Future Females Finnish Contribution: EUR 175,771 (71%) Total Value: EUR 247,450	South Africa	Transitional	Moderate study
Circular Economy Youth Empowerment	Bilateral support	Implementer: SOS Children's Villages Lesotho Finnish Contribution: EUR 68,990 (100%) Total Value: EUR 68,990 (co-financing unknown)	South Africa	Transitional	Moderate study

NAME OF THE INTERVENTION	INSTRUMENT (CATEGORIES FROM TERMS OF REFERENCE)	MFA FINANCING AND IMPLEMENTING AGENCY	GEOGRAPHY	CONTEXT[1]	DEPTH OF STUDY
Concessional credit Scheme (Vietnam)	Bilateral support	Implementer: Binh Duong Water – Vietnamese Environment Joint Stock Company (BIWASE) with Finnish Subcontracts Finnish Contribution: EUR 13.3 million (2 phases) + guarantee (100%) Investor co-financing. Total value EUR 13.3 million.	Vietnam	Transitional	Moderate study
GTK Tanzania Mining Project	Bilateral support	Implementer: Geological Survey of Finland (GTK) Finnish Contribution: EUR 4.2 million (100%) Total Value: EUR 4.2 million	Tanzania	Traditional	Moderate study
GTK Afghanistan Mining Project	Bilateral support	Implementer: GTK Finnish Contribution: EUR 712,000 (100%) Total Value: EUR 712,000	Afghanistan	Conflict	Moderate study

Table 2 Examples of relevant MFA supported multi-sector climate and environment funds in the sub-sector.

FUND (GENERAL CLIMATE FUNDS ONLY)	FINLAND MFA CONTRIBUTIONS (APPROX.) AND PERIOD	RELEVANCE TO CLEANENERGY, CRITICAL MINERALS OR CIRCULAR ECONOMY	EVIDENCE/NOTES
Green Climate Fund	Finland participated in the Initial resource mobilisation (2015–2019), First replenishment (2020–2023) and Second replenishment (2024–2027). Total contribution of EUR 240 million (**c. <1% share**) (Total pledges (Initial resource mobilisation, Green Climate Fund-1, Green Climate Fund 2) USD 29.9 billion)	Green Climate Fund supports largescale mitigation projects. Projects under the 2020–2023 replenishment included renewableenergy scaleup, grid modernisation. During the second replenishment Finland advocated riskmanagement and private sector cooperation.	The Green Climate Fund has mobilised over USD 33 billion in cofinancing alongside USD 12 billion of its own funds. Approved projects are expected to cut 2.9 billion tCO_2e of emissions (about 63 times Finland's 2022 emissions). Finland's contributions are grants and therefore leverage additional financing. Attribution of results is challenging because the Green Climate Fund pools contributions from many donors; the benefits and emission reductions cannot be linked solely to Finland.
Global Environment Facility – core trust fund	Finland has been a donor since the Global Environment Facility's founding and regards it as a key instrument for tackling environmental degradation. Finland contributed for (Global Environment Facility5, 2010–2014), Global Environment Facility6 (2014–2018) and Global Environment Facility7 (2018–2022). Total Finnish share not public, but likely **c.1% share** of total capitalisation and Special Drawing Rights reported in Global Environment Facility 8. Finland not one of the top 10 donors.	The Global Environment Facility funds climatemitigation projects across energy efficiency, renewable energy and policy reform. Its investments have provided USD 2.5 billion and leveraged USD 25 billion in cofinancing to expand renewable energy and improve energy efficiency. Global Environment Facility projects introduce standards for appliances, promote energyefficient buildings and support feedin tariffs and reverse auctions that encourage cleanenergy investment.	Because the Global Environment Facility operates as a pooled fund, contributions from individual donors such as Finland are not earmarked for specific projects; results accrue at portfolio level. Finland's influence is exerted through its seat on the Global Environment Facility Council (as part of the constituency with the Netherlands and Estonia) where it champions gender equality, private sector leverage and integrated approaches.
Least Developed Countries Fund and Special Climate Change Fund	Finland made grants to the Least Developed Countries Fund in 2014 and again in 2022. Estimated **c. 1.6% share** (USD 36 million/USD 2,289.2 million). Finland's contributions to the Special Climate Change Fund are small. Estimate **4.1% share** (USD 18.31 million/USD 445.70 million	The Least Developed Countries Fund finances a range of climate projects, which include offgrid renewable energy, resilient infrastructure.	The Least Developed Countries Fund supports leastdeveloped countries, so results are shared across donors. Finland's contributions are pooled with those of other donors; individual attribution is not possible.

FUND (GENERAL CLIMATE FUNDS ONLY)	FINLAND MFA CONTRIBUTIONS (APPROX.) AND PERIOD	RELEVANCE TO CLEANENERGY, CRITICAL MINERALS OR CIRCULAR ECONOMY	EVIDENCE/NOTES
Nordic Development Fund and Nordic Climate Facility	Finland is one of five Nordic shareholders (with Denmark, Iceland, Norway and Sweden) financing the Nordic Development Fund. Finland's share (based on equal capital subscription) is substantial. The Nordic Development Fund provides concessional loans and grants to climateresilient development projects and managed the Nordic Climate Facility. Estimated **18% share** (EUR 253 million/EUR 1.371 billion.	Nordic Development Fund projects focus on renewableenergy expansion, sustainable transport and earlystage circulareconomy initiatives. Because Nordic Development Fund finances riskier projects, it plays a catalytic role in mobilising private finance in Africa, Asia and Latin America. Nordic Climate Facility was a challenge fund active in 2009–2024 to finance early-stage climate change projects in developing countries. Nordic Climate Facility aimed to build a portfolio of innovative business concepts which have been tested, proved viable and are ready to be scaled and replicated.	Nordic Development Fund's results reports and recent evaluation indicate that in 2024 it helped mobilise c. EUR 1.3 billion in additional climate finance and supported tens of thousands of jobs in partner countries. Attribution to Finland is difficult because the fund is jointly owned by Nordic countries and resources are blended.
Nationally Determined Contributions Pipeline Accelerator Trust Fund (IaDB)	In 2022 Finland joined the InterAmerican Development Bank's Nationally Determined Contribution Pipeline Accelerator Trust Fund with a pledge of c. EUR 5 million. Estimated **21% share** (EUR 5 million/USD 25 million).	The fund prepares bankable projects to implement Latin American and Caribbean countries' Nationally Determined Contributions. Many pipelines involve renewable energy, energyefficiency, sustainable transport and sometimes criticalminerals supply chains for battery manufacturing.	Results attribution is difficult because the trust fund blends contributions from Finland, the Nordic Development Fund and other donors; Finland participates in governance but cannot steer specific projects.
Other mechanisms (Climate & Clean Air Coalition, adaptation funds, etc.)	Finland also contributes small amounts to the Climate and Clean Air Coalition, the World Bank's Partnership for Market Readiness and Global Gas Flaring Reduction Partnership, and other multilateral funds.	These funds target methane reduction, flaring, carbon pricing and shortlived climate pollutants, indirectly supporting cleanenergy transition.	Quantitative results are reported at the fund level and are not attributable to Finland.

Source: Evaluation team

2.2 Approach and methods

A theory-based, macro-level, realist evaluation

The methodology is described in detail in Annex 1. It is focused on: (i) exploring beyond the project and programme level to shed light on aggregate and catalytic effects and synergies between actions, actors, instruments and policy-influencing activities within and across the sub-sector; and (ii) establishing how these encourage and enable wider changes at geographic, sectoral and/or institutional scales, including the role of private sector engagement and implications for the portfolio and policy level. It is therefore a 'theory-based', 'macro-level' and 'realist' evaluation:

- **theory-based**, because it is built upon a theory of change for the sub-sector that indicates the logical connections between inputs and instruments, short-range, medium-range and long-range results, and impacts, and hence with an emphasis on the plausibility of assumptions and causal links between steps in the design logic;
- **macro-level**, because it is focused on development cooperation across multiple interventions, locations, and the 15 years 2010–2024; and
- **realist**, because the whole study is embedded within a theory of change that is grounded in the large-scale, long-term development context that applies to those same multiple interventions, locations, and years.

This focus on the macro level differentiates the approach from that of micro-level or intervention-specific evaluation. It rules out applying a detailed understanding of local context to help understand patterns and themes, since contexts cannot be aggregated but only generalised or used in examples. For the same reasons, the key Organisation for Economic Co-operation and Development (OECD)/Development Assistance Committee evaluation criteria of effectiveness, impact and sustainability have different meanings compared with their uses in intervention-specific evaluation.[2] In the present **macro-level context** they are defined as follows:

- **effectiveness** refers to the specific changes that occurred in a system during and as a result of particular kinds of MFA-supported **interventions.**
- **impact** refers to the consequences of those specific changes for the system with which particular kinds of MFA-supported interventions were engaged; and
- **sustainability** refers to the development of new outlooks, abilities, laws, budgets or administrative arrangements that are likely to promote the durability of those specific system changes after MFA's eventual departure.

Macro-level effectiveness, impact and sustainability

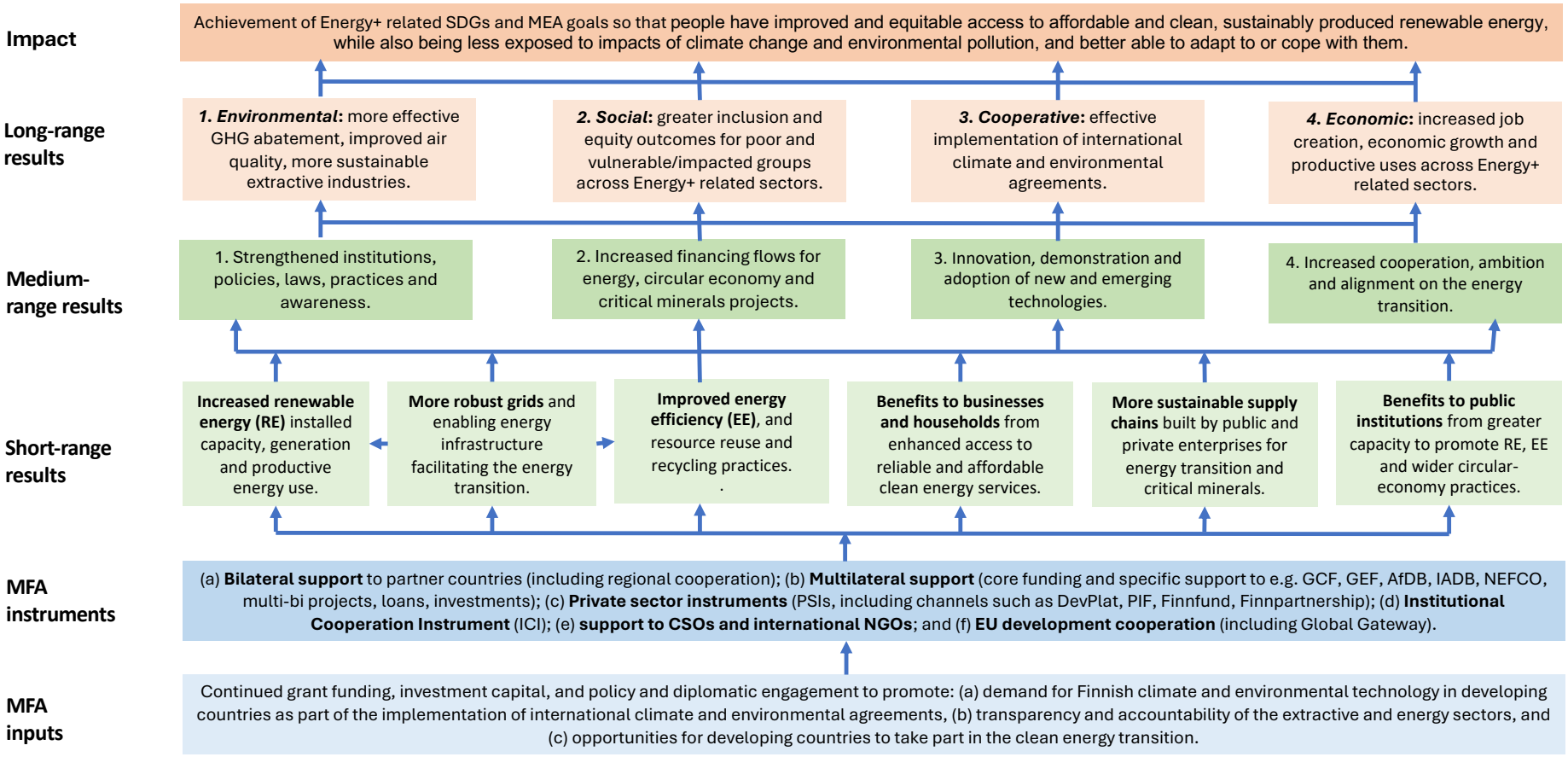
The above makes clear that the sub-sectoral theory of change is of central importance to this evaluation, since performance across the portfolio is to be judged in terms of changes in line with the theory of change and that contribute to the flow of results from short, medium and long-range to

2 At the micro level, effectiveness refers to the delivery of results by an intervention, impact refers to the consequences of the results during the project, and sustainability refers to durable change induced by the project and likely to survive it.

overall effects on achieving the SDGs and related objectives. An early step in the evaluation was therefore to develop a sub-sectoral theory of change (Figure 1) based on MFA's existing theory of change and aggregate indicators for the Environment and Natural Resource policy area (2023) Outcome 2 "*All people have improved and equitable access to affordable and clean, sustainably produced renewable energy (SDG 7, supports also SDG 13.1 and 13.3)*", modified in light of the expanded nature of the sub-sector evaluation (including circular economy and critical minerals), relevant ecological principles and global good practice (such as those developed to meet relevant SDG targets in this sub-sector, and supported by theory of change assumptions listed in Annex 1.

Several core causal pathways from the Outcome 2 theory of change were incorporated, including support for enabling policies, private sector mobilisation, donor coordination, and climate finance contributions. However, the original theory of change is framed at a strategic level and does not reflect the specific thematic composition of the current Energy, Circular Economy and Critical Minerals portfolio. To address this, the evaluation developed a more detailed portfolio-level theory of change that captures the actual delivery pathways (e.g. Finnfund, EEP Africa, blended finance facilities) and integrates additional thematic areas (particularly circular economy and critical minerals) which are not covered under Outcome 2 but have become central components of Finland's Energy, Circular Economy and Critical Minerals cooperation. This allowed the evaluation to more accurately assess Finland's contributions and added value within the limited scope of the sub-sector.

Figure 1 Theory of Change for the Energy, Circular Economy and Critical Minerals sub-sector.



Source: Evaluation team, based on the theory of change and aggregate indicators for the Environment and Natural Resource policy area in MFA (2023)

A mixed-methods evaluation

A mixed-methods design was adopted, tailored to each evaluation question (EQ). The core methods used in each sub-sector evaluation included:

- **Portfolio review:** Mapping and screening MFA-funded interventions in the Energy, Circular Economy and Critical Minerals sector (2015–2022).
- **Development of a sub-sector-specific theory of change:** building on the updated theory of change for Environment and Natural Resources (MFA, 2023), the theory of change for the Energy, Circular Economy and Critical Minerals sub-sector was used throughout the evaluation.
- **Desk studies:** Moderate and intensive reviews of project and programme documentation, including final and ex-post evaluations. Evidence was systematically captured using proformas. A total of 16 interventions were reviewed in the Energy, Circular Economy and Critical Minerals sub-sector, of which 5 were studied in greater depth through intensive studies (see Table 1).
- **Interviews and survey:** Conducted with 17 policy-level, 17 intervention-level, and 11 private sector knowledge-holders to complement desk review findings, clarify gaps, and explore strategic and operational aspects, including private sector engagement. See a more detailed list in Annex 4. Cutting across the sub-sectors, 19 companies responded to a private sector engagement survey, and approximately half a dozen overall Environment and Natural Resources management interviewees from public and private sectors provided information and insights relevant to the Energy, Circular Economy and Critical Minerals sub-sector.
- **Market analysis:** Market analyses focusing on opportunities for Finnish companies were conducted relating to the interventions covered by the intensive studies in each sub-sector. Thus, in the case of Energy, Circular Economy and Critical Minerals, the market analysis focused on the energy sector in Ukraine (Annex 3). This component drew on interviews, desk studies, and additional data sources to assess private sector engagement trends, barriers, and opportunities within the sub-sector.
- **Like-minded peer country review:** Examined strategies, instruments, and delivery models used by comparator countries engage in activities in the same sub-sector. The analysis aimed to identify lessons and contrasts with Finland's approach, including areas of innovation and convergence. In addition, cutting across the sub-sectors two like-minded peer country reviews focusing on engaging private sector were included.
- **Natural Language Processing:** Used to efficiently identify the most relevant sources of information for the sub-sector from a large volume of evaluation reports and documentation, especially during the inception phase.
- **In-country consultants:** Conducted in Ukraine to validate findings, deepen analysis on clusters of interventions, and examine their private sector engagement relevance with support from national experts. Ukraine was selected due to the multiple MFA interventions targeting the Energy, Circular Economy and Critical Minerals sector. Also considering the potential for Finnish private sector engagement to enter those markets, the objectives of the studies were to assess interest in and demand for Energy related Finnish expertise.

Together, these methods enabled the evaluation team to triangulate evidence across a wide range of sources, ensuring that conclusions are robust and grounded in multiple lines of inquiry.

Consistency and comparability

All four sub-sector reports addressed the same EQs and contributed to the preparation of the synthesis report. To ensure comparability and enable aggregation across sub-sectors, all **performance judgements** (i.e. on effectiveness, impact and sustainability) were required to be evidence-based and expressed in a standardised manner by using the following three-point scale as qualifiers where appropriate:

- **Strong performance** – Finnish support was assessed as being successful in achieving most (if not all) of its expected results, made a significant contribution to broader effects or impacts (i.e. through Finnish added value) and benefitted a substantial part of the intended target populations;
- **Moderate performance** – Finnish support was assessed at being successful or at least partially successful in achieving several (but not all) of its expected results, contributed to broader effects or impacts (but only to a limited degree while the contribution of others is likely to have been more significant) and benefitted the intended target populations.
- **Weak performance** – Finnish support only achieved a small proportion of its expected results, did likely not contribute to broader effects or impacts (or only in a very limited and indirect manner) and did not manage to create any wider benefits for the intended target populations.

The adoption of this limited range reflected the nature of the evidence available across the sub-sector portfolio, which did not support more granular distinctions. The same approach was applied across all the sub-sector evaluations to ensure coherence in synthesis. Throughout the reports, these assessments are put into context by a 'realist perspective' offering insights on the circumstances and conditions in which Finland carried out its activities. In addition, further explanation is provided where needed to clarify specific cases or examples used as evidence, in particular where those might provide counterexamples and exceptions to the overall assessment, although these additional descriptive terms informed the evidence base rather than the formal findings.

The subject of the evaluation (and of each sub-sector) being particularly complex and broad, there is a wide range of variables and factors that impact on outcomes and broader effects. Therefore, the evaluation aims at providing evidence for **Finnish contribution** to these effects, rather than seeking to establish direct claims of attribution. As a significant amount of Finnish funding is going through multilaterals, international organisations and other partners, it is not possible to claim any effects as direct results of Finnish support. Finland's share can, in fact, be relatively small, and – wherever feasible – the evaluation attempts to specify the (likely) weight of Finnish contribution in given contexts.

For consistency, **beneficiaries** were defined as individuals who could reasonably be considered to have received some form of direct or indirect benefit from an action funded wholly or in part by the MFA. Benefits and beneficiaries are discussed in the findings in Chapter 4.

3 Context Analysis

3.1 Global policy context and trends

The energy sector, which includes electricity and heating, transportation, manufacturing, construction and buildings, is responsible for about three-quarters of global greenhouse gas emissions. Decarbonising this sector is central to meeting climate goals such as those in the Paris Agreement. Success depends on reducing reliance on fossil fuels, investing in renewables, and adopting circular economy principles that emphasise resource efficiency, waste reduction, and recycling. However, there are several challenges, including energy inequality, with at least 650 million people still lacking access to electricity (mostly in sub-Saharan Africa), and the need for substantial financial investment, estimated at United States Dollar (USD) 2.4 trillion annually in developing countries alone (IEA, 2023b). Managing critical minerals is essential for green transition technologies (e.g. power generation, batteries) and adds a layer of complexity, requiring sustainable sourcing, ethical governance, and recycling to mitigate environmental and geopolitical risks.

The global transition to clean energy, sustainable use of critical minerals, and circular economy models is being driven by urgent environmental pressures, mounting economic risks, and growing social demands. Climate change remains the overriding driver, with the Intergovernmental Panel on Climate Change warning that emissions must peak by 2025 and fall 43% by 2030 to limit warming to 1.5 °C, yet global greenhouse gas emissions reached a record 57.4 $GtCO_2e$ (Gigatonnes of Carbon Dioxide Equivalent) in 2022 and fossil fuels still supply over 80% of global energy (IPCC, 2022). Meanwhile, the technologies underpinning decarbonisation, such as wind turbines, solar panels, and electric vehicle batteries, depend on critical minerals whose extraction and processing can drive deforestation, water pollution, and biodiversity loss. Combined with high-consumption economic models, these pressures have intensified resource depletion and waste generation, highlighting the need for systemic shifts to sustainable production and consumption patterns.

The transition presents major economic challenges. While global clean energy investment surpassed USD 2 trillion in 2023, only about 15% flowed to emerging economies, leaving many at risk of carbon lock-in and future stranded assets (IEA, 2023d). Africa, home to around 20% of the world's population, received only about 2% of global clean energy investment (IEA, 2023b). The International Energy Agency estimates that clean energy investment in emerging and developing economies must rise seven-fold to USD 1 trillion annually by 2030 to stay on track for net-zero by 2050. This requires rapidly mobilising private capital despite high financing costs, volatile fossil fuel prices, and geopolitical instability (such as the COVID-19 pandemic and Russia's war of aggression in Ukraine). Demand for critical minerals is projected to quadruple by 2040, but supply chains are fragile, geographically concentrated, and exposed to long permitting lead times, raising risks of shortages and price shocks (IEA, 2025). Managing these dynamics while phasing out fossil-fuel-based sectors, reskilling workforces, and investing in new infrastructure will require unprecedented financial, technological and institutional effort.

Socially, the energy transition carries disruptive risks alongside long-term benefits. Millions of people currently depend on fossil fuel jobs, and without careful planning, the closure of mines and

refineries could devastate local economies. Calls for a just and inclusive transition stress the need for worker retraining, income support, regional economic diversification, and strong community consultation and benefit-sharing mechanisms, particularly where critical minerals are extracted in fragile governance contexts with human rights risks such as child labour and unsafe conditions. Access gaps persist and clean energy's share of total consumption in developing economies remains far below that of developed ones. Cultural shifts are also needed to support circular economy goals, encouraging reuse, repair, and sustainable consumption, while public engagement and trust-building will be essential to maintain social support for transition policies.

International cooperation has accelerated in parallel, creating a dense global framework that shapes national policies and finance flows for clean energy, critical minerals, and circular economy transitions. The Paris Agreement (2015) established the 1.5 °C target and catalysed widespread adoption of national climate commitments, while the UN Sustainable Development Goals, especially SDG 7 on energy and SDG 13 on climate action, have driven multilateral funding and technical support. The European Union's (EU) Green Deal and its 55% emissions reduction target by 2030 are pushing member states, including Finland, to accelerate decarbonisation. A growing ecosystem of global platforms, such as the International Solar Alliance, Clean Energy Ministerial, and Powering Past Coal Alliance, foster knowledge sharing and joint action, while climate finance facilities like the Green Climate Fund, Global Environment Facility, and World Bank instruments are scaling investments in developing countries. Similar momentum is emerging around critical minerals and circular economy governance. The Minerals Security Partnership promotes diversified and responsible supply chains; the Global Battery Alliance and new EU battery regulations advance ethical sourcing and recycling. The EU Circular Economy Action Plan, alongside Finland's engagement in Global Alliance on Circular Economy and Resource Efficiency and Platform for Accelerating the Circular Economy, reflects growing international consensus on shifting to sustainable production and consumption systems.

The EU's Global Gateway initiative has become a major platform for investments in energy, circular economy, and critical minerals. With a target of mobilising EUR 300 billion worldwide, it operates through the Team Europe model, pooling resources from EU institutions, Member States, and European financial actors. Energy and climate dominate the portfolio: more than half of the 46 flagship projects planned for 2025 involve renewable energy, hydrogen, interconnectors, and sustainable forestry. In critical minerals, the EU has launched partnerships in Latin America and Africa. A EUR 6.3 million EU-Inter-American Development Bank (IDB) initiative is leveraging c. EUR 120 million for responsible mining governance and geological knowledge in Argentina, Bolivia, Brazil, Chile, and Ecuador. In parallel, the EU has selected 13 'Strategic Raw Materials Projects' in countries such as Zambia, Brazil, Greenland, Madagascar, South Africa, and Ukraine, spanning extraction, processing, and recycling of lithium, cobalt, manganese, graphite, and rare earths. Circular economy principles are integrated, particularly in recycling and environmental safeguards tied to these projects. Together, these efforts highlight Global Gateway's emphasis on linking sustainable infrastructure, raw materials security, and green industrialisation with global partnerships under high Environmental, Social, and Governance standards.

3.2 Finnish policy and institutional context

Finland's domestic climate and energy policies provide the framework for its international engagement. The country has set a target of achieving carbon neutrality by 2035 under its 2022 Climate Change Act, requiring emissions reductions of 60% by 2030, 80% by 2040, and 90–95% by 2050

from 1990 levels, alongside strengthened carbon sinks (MFA, 2022). Its power mix includes a significant share of nuclear energy (supported by the addition of the Olkiluoto 3 reactor), growing wind and solar capacity, and a declining reliance on fossil fuels, which now make up about a third of total energy supply and around 5% of electricity generation (IEA, 2023e). This transition has been enabled by policy frameworks including the EU Emissions Trading System, national carbon pricing, and regularly updated national energy and climate plans. Domestic progress on clean energy has informed the design and priorities of Finland's international energy and climate finance portfolio.

Finland is a global leader in sustainable mining, critical minerals, and battery value chains, supported by over 200 companies and institutions spanning mining technology, mineral processing, and advanced refining. Finnish and Nordic firms provide roughly 80% of the world's underground mining technology, reflecting the country's deep industrial and metallurgical expertise. With rich domestic deposits of cobalt, nickel, lithium, and graphite, Finland's National Battery Strategy 2025 aims to strengthen capacity across the entire electrification value chain from responsible extraction to recycling and circular innovation (MEAE, 2021). Key investments include the EUR 300 million capitalisation of the Finnish Minerals Group, the Keliber lithium refinery (with Sibanye-Stillwater), and research platforms such as BATCircle, which advance material efficiency and battery recycling. Circular economy principles are deeply embedded in the sector, promoting reduced mineral demand, waste utilisation, and zero-waste mining through research and development. Finland also participates in the Minerals Security Partnership and maintains Environmental, Social, and Governance -based regulatory frameworks and community engagement processes, though gaps remain in traceability, transparency, and biodiversity safeguards across global mineral supply chains.

Finland has also developed policies and programmes on the circular economy, including a national circular economy roadmap prepared by the Finnish Innovation Fund Sitra (2021). This sets out objectives to decouple economic growth from raw material use through product life-extension, reuse, service-based models, and high recycling rates, and has been implemented across sectors including forestry, bioeconomy, municipal waste, manufacturing, and urban planning. The Strategic Programme for Circular Economy (2021) aims to double the circular material use rate by 2035 and embed circularity into the country's economic model. Cities such as Helsinki and Turku have piloted circular solutions in transport, construction, and food systems, while initiatives by Sitra and Business Finland have supported startups and innovation projects. Finland has contributed this expertise to global dialogues and coalitions, including through its role in establishing the World Circular Economy Forum in 2017 and participation in initiatives such as Global Alliance on Circular Economy and Resource Efficiency.

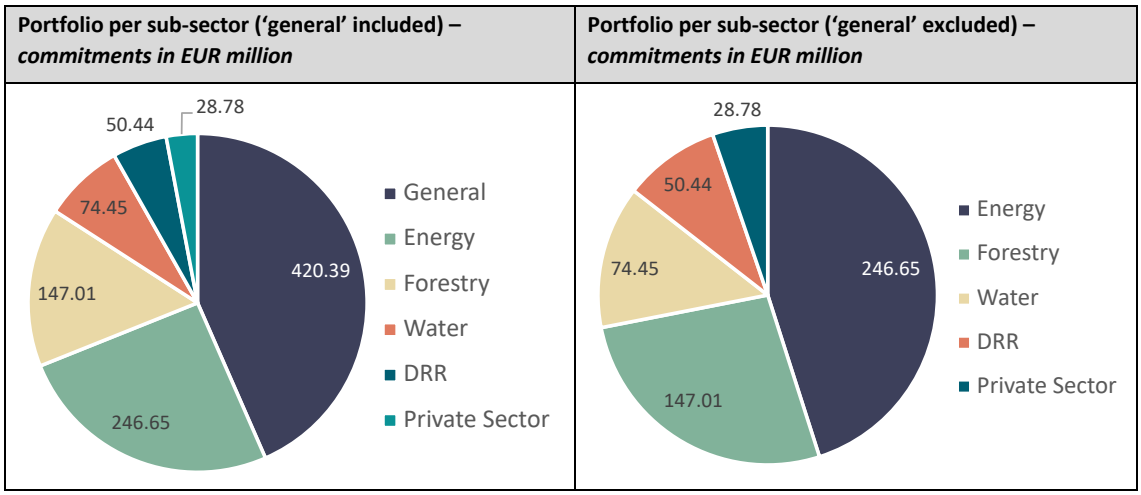
Finland has used a range of MFA-funded instruments to respond to global needs for clean energy, resource efficiency, and circular economy transitions. Regional and country-level programmes such as the EEPs have targeted the early-stage innovation gap in developing countries, financing pilots that expand renewable energy access, promote energy efficiency, and introduce circular economy practices. To address the large-scale investment and financing needs of the global energy transition, Finland has channelled concessional capital through Finnfund and collaborated with international financial institutions including the International Finance Corporation, IDB, ADB, and the Nordic Development Fund, enabling the mobilisation of private capital into renewable energy and green infrastructure. To support enabling environments and global public goods, Finland has contributed to multilateral climate funds such as the Green Climate Fund and Global Environment Facility, which build institutional capacity and scale climate action across countries. At the firm level, Finland has sought to overcome market entry barriers through Finnpartnership, which provides business partnership support to Finnish and local companies, and has strengthened institutional capabilities through the Institutional Cooperation Instrument (ICI), including in the mining

and minerals sector. Together, these instruments form a complementary portfolio that addresses different parts of the global transition challenge while creating pathways for Finnish companies to contribute to emerging green value chains.

3.3 Portfolio review

Quantitative portfolio data of Official Development Assistance (ODA) commitments in the Environment and Natural Resource policy priority area in 2015–22, that was made available to the evaluation, indicate a total commitment of EUR 967.72 million.[3] Energy, Circular Economy and Critical Minerals is the largest sub-sector within the Environment and Natural Resource portfolio, with EUR 246.65 million in commitments in 2015–2022 (Figure 2).

Figure 2 Energy, Circular Economy and Critical Minerals portfolio share from Environment and Natural Resource portfolio (commitments, EUR million)



Source: MFA/evaluation team

For the subsequent portfolio analysis, the share of 'general' interventions, i.e. multilateral funding, were excluded and instead interventions explicitly focused on energy, circular economy and minerals, as well as those with a distinct private sector emphasis within the sub-sector were included.

Among Energy, Circular Economy and Critical Minerals sub-sub-sectors, circular economy and minerals, the former is larger but remains small compared to the share of energy projects (Table 3). This reflects a primary focus on delivering direct energy infrastructure, access, and transition projects. Energy combined with circular economy (Energy/circular economy) receives EUR 11.4 million (5%), supporting projects that integrate waste-to-energy, recycling, and sustainable resource use. Energy/minerals allocations are smaller, at EUR 4.4 million (2%), reflecting Finland's strategic but limited engagement in linking renewable energy with critical mineral supply chains for clean technologies. Private sector-focused energy projects (Energy/Private Sector) are almost negligible at EUR 0.02 million, underscoring a clear gap in leveraging private-sector-led initiatives within the

3 Finland's exclusive ODA budget is administered by the MFA and excludes Finnfund investments.

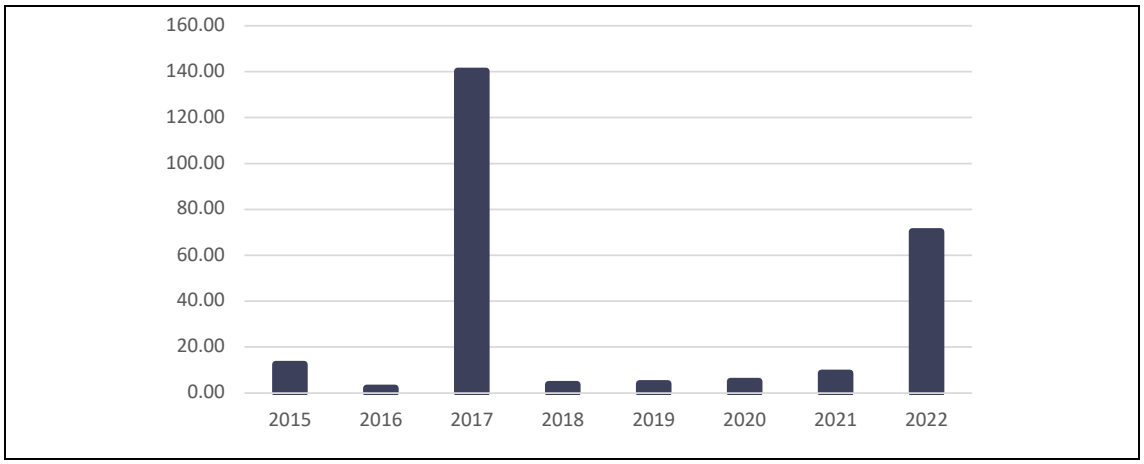
portfolio. Overall, the distribution highlights a strong emphasis on traditional energy investments, with emerging but minor attention to circular economy and critical mineral linkages.

Table 3 Energy sub-sectors

SUB-SECTOR	COMMITMENTS, MILLION EUR	PROPORTION / %
Energy	218.20	88%
Circular Economy	24.03	10%
Minerals	4.41	2%
Energy/Private Sector	0.02	0%
Total	**246.65**	**100%**

Source: MFA/evaluation team

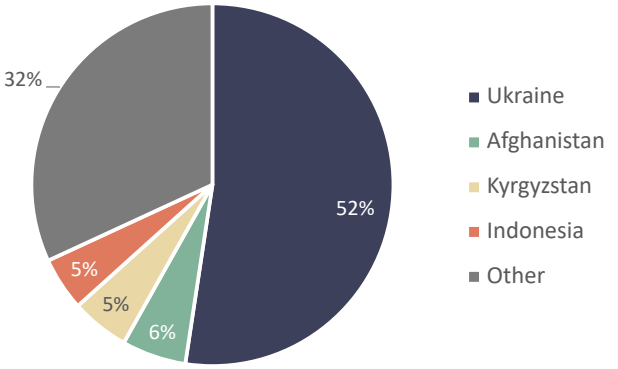
Figure 3 Energy, Circular Economy and Critical Minerals commitments in 2015–2022 (EUR million)



Source: Evaluation team

The following graphs illustrate the geographic distribution, as well as the distribution of channels and decision groups, within the 'energy' sub-sector. Most funding is committed to partners and instruments with a regional or global focus. Only a small percentage is allocated to specific countries, the largest of which is Ukraine (EUR 10.94 million), accounting for over 52% of total country-specific funding. This reflects Finland's focus on supporting strategic energy resilience in a priority partner country. Remaining funds are spread widely across a broad range of countries each receiving between c. EUR 100,000 to 1,000,000. The next largest recipients include Afghanistan (EUR 1.20 million), Kyrgyzstan (EUR 1.09 million), and Indonesia (EUR 1.00 million), each receiving around 5% of the total country allocation, indicating a secondary focus on fragile and emerging energy markets. This long set of small allocations highlights a strategic pattern of maintaining presence and pilot engagements in multiple partner countries, while channelling most resources into a few priority regions. Figure 4 shows the division of the portfolio that was directed to specific countries.

Figure 4 Energy, Circular Economy and Critical Minerals portfolio per country (%)



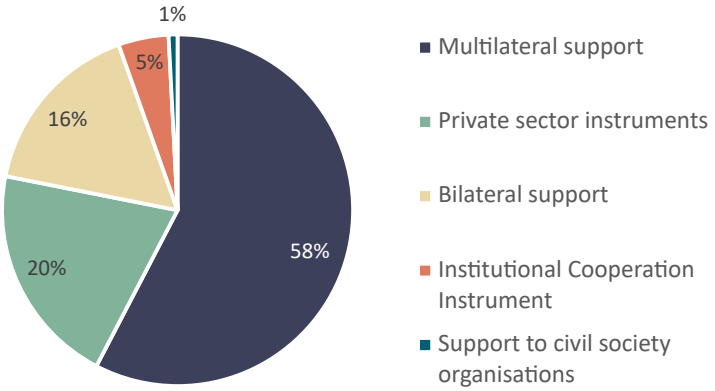
* Category 'Other' includes countries that received less than EUR 1 million in commitments.

** This figure only contains commitments that were directed to specific countries. Hence, regional and unspecified commitments are excluded.

Source: MFA/evaluation team

In terms of instrument, the Energy, Circular Economy and Critical Minerals portfolio is dominated by multilateral support and private sector instruments, reflects Finland's strong reliance on channelling funding through multilateral organisations with earmarked objectives and blended finance approaches (Figure 5). It should be noted that Finland's share of EU ODA is not visible in the Finnish ODA statistics, and therefore it is not possible to determine how much of the Finnish contribution to the EU budget has been allocated to the sub-sector.

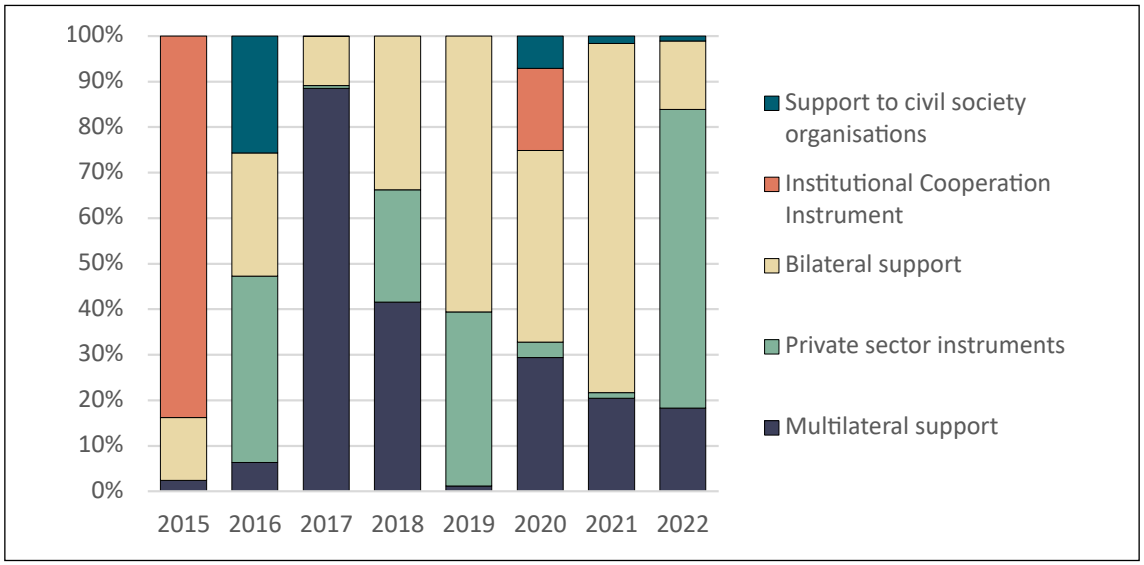
Figure 5 Energy, Circular Economy and Critical Minerals portfolio per funding instrument (%)



Source: MFA/evaluation team

Share of commitments has varied significantly by year (Figure 6), making it difficult to perceive trends over time in terms or priorities.

Figure 6 Use of funding instruments over time in Energy, Circular Economy and Critical Minerals (%)



Source: MFA/evaluation team

Based on a review of the overall shape of the portfolio, Table 4 sets out an overview of the high-level themes and delivery strategies that can be identified in the portfolio, as well as how they link to the theory of change and supporting projects.

Table 4 Themes and strategies of MFA support in the Energy, Circular Economy and Critical Minerals sub-sector

THEME: LARGE-SCALE BLENDED FINANCE & RISK-SHARING
Strategy: Deploy concessional capital with Multilateral Development Banks (co-loans, guarantees, first-loss) to de-risk utility-scale renewables and climate infrastructure; crowd-in private investors in capital-scarce or higher-risk markets.
Links to theory of change: Short-term: utility-scale renewable energy generation, energy efficiency, waste-to-energy. Medium-term: mobilised finance, stronger institutions, investor confidence. Long-term: greenhouse gas abatement, jobs, energy security, market transformation.
Example cases: International Finance Corporation-Finland Climate Program, EBRD HIPCA, Finnfund
THEME: SMALL AND MEDIUM-SIZED ENTERPRISE INNOVATION, PILOTS, CHALLENGE FUNDS & LOCALISED ACCESS
Strategy: Grants/technical assistance/acceleration for last-mile models (pay-as-you-go solar, mini-grids, clean cooking); Demonstrators, competitive calls, mentoring, validate and scale inclusive solutions.
Links to theory of change: Short-term: pilots and first-of-kind deployments. Medium-term: diffusion of viable models, local capacity and firms. Long-term: energy access, social empowerment, jobs and inclusive growth.
Example Cases: EEP Africa, CEYEP (Lesotho youth circular ventures), ACEF (AfriCircular Innovators), NEFCO FUTF
THEME: POLICY ALIGNMENT, TOOLKITS & INSTITUTIONAL PARTNERSHIPS
Strategy: Support national roadmaps and reforms; embed advisors; use toolkits and convening to align with Paris/SDGs and strengthen implementing agencies, geological data and mapping, readiness support.
Links to theory of change: Short-term: roadmaps, feasibility, pilot policies. Medium-term: stronger institutions, coherent policies, increased financing readiness. Long-term: effective climate governance, circular transitions, responsible minerals.
E*xample Cases:* Sitra circular toolkits (adopted in 5+ African countries); PAGE / 10YFP (Uruguay, Ethiopia, Rwanda); World Circular Economy Forum convening; GTK partnerships (Tanzania, Afghanistan).

Sources: Energy, Circular Economy and Critical Minerals evaluation proforma library, wider research

3.4 Engagement with private sector to date

MFA positions private sector engagement as a central channel for delivering development impact in energy, circular economy, and critical minerals, with a focus on mobilising private capital and know-how. Core instruments include Finnfund, the state development finance institution that invests in profitable, responsible businesses advancing renewable energy and climate solutions (Finnfund 2024), and Finnpartnership, which supports small and medium-sized enterprises by de-risking early market entry and building business partnerships in developing markets (MFA Finland 2020). These are complemented by Finland's blended platforms with Multilateral Development Banks, including International Finance Corporation climate programmes, that crowd in private investment.

Finland also supports thematic multilateral initiatives such as PAGE/UNEP and 10YFP/Sustainable Consumption and Production, which strengthen policy environments and generate demand for private solutions.

Across the portfolio, Finnish company participation varied widely, ranging from core project implementers to peripheral suppliers or strategic beneficiaries. Key examples are as follows:

- In *Concessional Credit Scheme* projects like the Binh Duong Solid Waste Treatment Plant in Vietnam, Finnish firms Ferroplan and Doranova were central to delivery (Saarilehto et al., 2022; OECD, 2018). They provided the technical design and installation of waste separation, composting, and landfill gas utilisation systems. These projects gave Finnish companies high-profile reference cases, showcasing their environmental technologies. Support for Finnish firms in concessional credit projects primarily came in the form of tied aid. The Concessional Credit Scheme required the selection of Finnish contractors through public tenders and helped de-risk engagement in emerging markets. Additional support came from Finnish embassies and Business Finland, though evaluations found this coordination to be inconsistent. In Vietnam, embassy support was noted as proactive, while in other contexts, a lack of clarity around roles and strategic follow-up was more common. Business Finland also provided matchmaking support, but its efforts were not always integrated with MFA strategies or country-level priorities, limiting the catalytic potential of its involvement.
- Similarly, the *NEFCO Finland-Ukraine Trust Fund* mandated Finnish interest in each supported project, often through consulting or technology supply (MFA Finland, 2021, 2024a). Around 30 early demonstration projects were financed, and the fund succeeded in raising awareness among Finnish firms and familiarising them with the Ukrainian market. Finnish private sector companies have played a central role in the Finland-Ukraine Trust Fund (FUTF), managed by NEFCO, particularly in advancing sustainable energy and circular economy solutions. In the energy sector, firms like Imatran Lämpö Oy, KPA Unicon, ÅF Pöyry (AFRY) Finland, Gebwell, Purmo, and Elemenco Oy supported district heating modernisation, decentralised grid-balancing plants, and renewable heating solutions, including the delivery of solar-powered infrastructure and clean energy technologies for public buildings. These interventions reduced emissions, improved resilience, and showcased Finnish expertise in low-carbon energy systems. In the circular economy, companies such as Doranova, Deep Scan Tech, AFRY, Ramboll, and Indufor Oy contributed to landfill gas recovery planning, waste characterisation, biogas and waste-to-energy feasibility studies, and biochar market scoping, enhancing waste valorisation strategies across Ukrainian cities. In green finance, Climate Wedge Oy designed a EUR 65 million Energy Service Company's Market Accelerator Fund to catalyse building retrofits through blended finance. However, as most projects remained at the feasibility or early-stage design level, few progressed to full implementation. The main benefit to Finnish firms was early market access and intelligence-gathering, rather than direct commercial gains. Evaluation emphasised that without follow-on investment and stronger post-project support, the value of these engagements risked being lost.
- Under the *Finnpartnership programme*, there have been a small number of Finnish companies participating (Evaluation team portfolio review). Through early-stage support, the programme enabled them to demonstrate Finnish innovation in challenging markets. SLA Innovative Energy Solutions successfully deployed off-grid solar systems

across Somaliland, gaining first-mover advantage and establishing a strong rural customer base while training women as solar agents. Solar Fire piloted solar heat concentrators with rural entrepreneurs in Kenya and Tanzania, enabling fuel-free food processing and expanding into new markets such as Uganda and Brazil with a product tailored to off-grid businesses. Solar Water Solutions deployed solar-powered water purification units in off-grid communities in Kenya and Namibia, delivering safe drinking water to thousands while opening new markets in water-stressed regions. St1, with support from Finnpartnership and the Business with Impact programme, piloted circular economy bioethanol production in Thailand using cassava waste, demonstrating Finnish technology viability in tropical contexts.

- Similarly, *EEP Africa*, more recently managed by Nordic Development Fund, provided grants and technical support to small and medium-sized enterprises in renewable energy (Altai Consulting, 2024). Several Finnish companies have successfully piloted innovative clean energy solutions in Africa through support from EEP Africa, demonstrating the potential for scalable impact and commercial expansion. Doranova Oy developed a landfill gas-to-energy system in Zambia, turning waste into renewable electricity while cutting methane emissions. EkoRent, through its electric taxi service NopeaRide, used a EUR 200,000 EEP grant to install solar-powered electric vehicle charging stations in Nairobi, pioneering e-mobility in the region. AW-Energy's WaveRoller introduced marine-based wave energy as a renewable option in coastal Africa, expanding the clean energy mix. Meanwhile, Tespack leveraged EEP support to refine and field-test its smart solar micro-grid systems, advancing toward market deployment.
- Finnish companies have participated in *Finnfund*-supported projects across energy, critical minerals, and circular economy sectors through diverse modalities that align commercial innovation with development impact (Finnfund, 2024). One key route has been the establishment of joint ventures abroad, such as Solar Finland's partnership in Salotech Thailand, which transferred Finnish solar manufacturing expertise to Southeast Asia, expanding market access while supporting clean energy goals. Another channel involves Finnish technology and service providers supporting local investees. Examples include Claned's digital learning platform being used by Maarifa Education Group in Africa, and Nokia's fibre access infrastructure integrated into South African and Nepali broadband networks through Finnfund investees. Finnfund's broader investment mandate also enables indirect Finnish participation in international funds and platforms that incorporate Finnish technology and partners, such as the OP Finnfund Global Impact Fund. In 2024, Finnfund reported that nearly 41% of new investments involved Finnish companies in roles ranging from suppliers and co-owners to technology partners.

While Finnish companies gained visibility, early market exposure, and technical references, the overall scale and involvement of Finnish firms remained modest, despite increased policy dialogue and institutional capacity in partner countries.

Finland also leverages EU instruments, participating in the implementation of the Global Gateway strategy that was launched in 2021. The goal of this strategy is to improve economic and social development in developing countries by boosting smart, sustainable and secure solutions in the digital, energy and transport sectors, and by strengthening healthcare, education and research systems. The Global Gateway is delivered through a Team Europe approach, which brings together the EU and EU Member States with their financial and development institutions. Under

the strategy, the EU aims to mobilise investments of up to EUR 300 billion by 2027, including from the private sector. The Global Gateway draws on the financial tools in the EU multi-annual financial framework 2021–2027, in particular the Neighbourhood, Development and International Cooperation Instrument-Global Europe, the Instrument for Pre-Accession Assistance III, the digital and international part of the Connecting Europe Facility, but also Interreg, InvestEU and Horizon Europe, the EU research and innovation programme. Finland encourages the participation of Finnish companies in Global Gateway joint projects, especially in the fields of climate and energy solutions. Under Global Gateway and the Neighbourhood, Development and International Cooperation Instrument-Global Europe/ European Fund for Sustainable Development Plus (EFSD+), the EU provides guarantees, blended finance and Team Europe Initiatives that mobilise private investment in clean energy, critical raw materials, and green value chains (e.g. strategic partnerships and corridors in Africa; support for renewables and grids; and Critical Raw Material supply-chain resilience aligned with the EU Critical Raw Materials Act and Circular Economy Action Plan). Finland participates in these platforms to scale private sector engagement beyond national resources and align with EU policy and finance.

Internationally, Finland's private sector engagement approach converges with UN, EU and International Union for Conservation of Nature principles: principle-based business cooperation, high Environmental, Social, and Governance standards, just transition, and systems change for Sustainable Consumption and Production/circularity. UN system guidance calls for a principled, SDG-aligned engagement with business; the EU mainstreams private sector mobilisation through EFSD+ and Global Gateway; and International Union for Conservation of Nature engages business to improve biodiversity outcomes (including in mining) through risk screening, standards and partnerships. Finland's emphasis on blended finance, policy/toolkit support (e.g. Sustainable Consumption and Production), and convening aligns well with these agendas, creating scope for deeper synergy in renewable deployment, Critical Raw Material governance and circular-economy scaling.

4 Findings

4.1 Results and impacts

Summary answer to EQ 1.1 and 1.2 – Results and impacts

The Finnish development cooperation portfolio delivered tangible results across energy, circular economy, and critical minerals. The development policy investment portfolio at end of 2024 (four investments totalling EUR 224 million) was expected to mobilise EUR 1.5 billion of other financing. The IFC fund investments are expected to avoid an estimate 8.5 million tCO2 annually. Through EEP Africa, over 5.7 million people gained modern energy access and, by 2021, EEP had created 11,000 jobs; 40% of them held by women (Finland contributed a third of overall EEP financing). Finnfund-supported companies sustained more than 300,000 jobs worldwide. In the circular economy, Sitra's toolkits and Finland's convening role in World Circular Economy Forum supported policy uptake in more than ten countries, while GTK's mineral mapping informed responsible mining governance in Mozambique, Zambia, and Tanzania.

Finnish support made a meaningful contribution to advancing renewable energy, circular economy, and critical minerals outcomes, though its relative weight was smaller than that of larger donors. In blended finance, Finland's EUR 114 million International Finance Corporation partnership mobilised over USD 2 billion – a catalytic role. In circular economy, Finland shaped global frameworks and provided policy toolkits, but financial scale remained modest compared to multilateral funds. In critical minerals, GTK provided globally respected technical expertise, but without the leverage of major mining financiers. Overall, Finland was most effective in shaping agendas, piloting innovations, and de-risking early markets, while systemic reach and scale of finance came more from other donors.

In addition to the intended greenhouse gas reductions, energy access, and improved resource efficiency, some unintended environmental impacts were observed. Positive effects included ecosystem benefits from circular initiatives (e.g. soil fertility gains from waste-to-fertiliser projects in Mozambique, reduced deforestation from biogas and clean cookstoves). However, negative impacts also emerged: in Kenya's Lake Turkana Wind Power project, supported indirectly through Finnfund, local concerns were raised about land use and exclusion from benefits. Some landfill gas and waste-to-energy projects raised risks of lock-in to incineration rather than advancing higher-order waste reduction. Similarly, reliance on grant-funded pilots created small-scale gains without addressing long-term cumulative environmental risks, such as e-waste leakage where recycling systems lacked scalability.

Finnish support benefited a diverse set of stakeholders, from rural households and underserved energy users to small and medium-sized enterprises, women, youth, and international investors. Households saw improved safety, health, and productivity from solar, mini-grids, and clean cooking technologies, while over 11,000 direct jobs were created under EEP

Africa, 40% of them for women. Small and medium-sized enterprises received seed capital, mentoring, and technical assistance, enabling entrepreneurs to innovate in energy, waste, and recycling. National governments benefitted through policy toolkits, capacity-building, and institutional partnerships, while Development Finance Institutions and Multilateral Development Banks leveraged Finnish concessional finance to expand into riskier markets. The delivery model was particularly effective where community inclusion, gender mainstreaming, and capacity-building were deliberately embedded, showing that Finnish support generated both direct social dividends and indirect systemic benefits.

Finding 1: Finland's portfolio delivered strong evidence of environmental benefits, with projects reporting more than 8 million tonnes CO_2e per annum, and evidence of reduced pollution, water conservation, and promoting circular economy practices across multiple countries.

Finland's Energy, Circular Economy and Critical Minerals interventions produced multi-dimensional environmental results contributing to long-run result 1 – greenhouse gas abatement, improved air quality, and more sustainable extractive activities – in the theory of change, although gaps in monitoring limit consolidation of outcomes. Large-scale renewable investments supported through Finnfund, International Finance Corporation, and HIPCA accounted for some of the most substantial climate mitigation, with annual reductions exceeding 8–9 million tCO_2e. Complementary instruments added measurable though smaller-scale results: EEP Africa supported over 200 small and medium-sized enterprises, abating around 350,000 tCO_2e between 2010–2017 and is expected to abate 1.475 million tCO_2e over its portfolio life (NDF, 2020). Vietnam's landfill-to-energy project cut 35,127 tCO_2e annually and environmental co-benefits were also observed: BIWASE in Vietnam modernised waste management by closing dumpsites, reducing open burning, and constructing a 480 m^3/day wastewater treatment plant (Saarilehto et al., 2022). EBRD HIPCA-backed projects in North Africa reused over 75 million m^3 of treated wastewater annually, conserving scarce supplies. Evaluations of GTK projects reports that mapping in Afghanistan and Tanzania identified pollution hotspots and degradation risks, supporting more sustainable land-use planning in line with medium-range result 1 on improved institutions, policies, laws and practices. Interviews with ACEF stakeholders indicate that circular economy pilots in Kenya reduced solid waste, promoted eco-enterprises, and aligned with global biodiversity goals under the Kunming-Montreal Global Biodiversity Framework. A review of programme documentation indicates that Finland also contributed to international environmental frameworks (long-run result 3 on effective implementation of international agreements) through 10YFP that supported systemic environmental improvements (e.g. in plastics and food waste initiatives). There are also benefits through Finland's multilateral contributions. For example, the Green Climate Fund is expected to reduce 2.9 billion tCO_2e and benefit one billion people; Global Environment Facility leveraged USD 25 billion of co-finance and committed USD 1 billion to plastics, preventing 25 million tonnes of waste. Collectively, these results confirm the theory of change long-range assumption that targeted Energy, Circular Economy and Critical Minerals inputs deliver broad climate, environmental, and resource benefits.

Finding 2: Finland's EUR 224 million investments through International Financial Institutions are EUR 1.5 billion to support environmental outcomes, focused mostly on renewables, but also on circular economy start-ups, and waste-to-energy. Influence capital has shaped the wider investment climate for food waste and plastics.

Finland amplified environmental impacts through mobilisation of finance in line with medium-range result 2 on mobilising finance to support global sustainability initiatives. Programme reporting and

interviews with relevant International Financial Institution stakeholders indicate that contributions of EUR 224 million to International Finance Corporation Blended Finance for Climate Programme, EBRD HIPCA, and ADB Ventures are expected to mobilise EUR 1.5 billion once funds are fully invested, with International Finance Corporation achieving a leverage ratio of 1:5. ADB Ventures, with Finland's EUR 20 million, aims to raise approximately USD 360 million, with EUR 276.5 million reported as of the end of 2024 and 42% channelled into clean energy start-ups. In the meanwhile, HIPCA mobilised EUR 389 million through EBRD co-financing.[4] This aligns with broader reporting on International Financial Institution mobilisation effects through blended finance facilities (IFC, 2023). At a smaller scale, interviews with ACEF management and board members indicates that the facility was able to mobilise private sector capital, including from the Coca Cola Foundation. Programme reporting indicates that Finland also used modest grants and programme support (e.g. PAGE), as 'influence capital', shaping global initiatives which were then able to secure larger donor and UN financing commitments. These pathways validate the theory of change assumption that concessional inputs (short-range result 4) can mobilise wider finance to contribute to the systemic sustainability outcomes specified in long-range result 1. However, additionality is difficult to confirm, as monitoring does not always prove whether private finance would have flowed without Finnish support, leaving value for money evidence incomplete.

Finding 3: Finnish-backed clean energy projects were the primary contributor to greenhouse gas abatement, generating 9,600 GWh of clean electricity, and delivering key projects such as Africa's largest wind farm.

Finland played a catalytic role in expanding renewable energy capacity, translating concessional finance into installed projects and measurable emission reductions in line with short-range result 1 on renewable energy capacity and long-range result 1 on greenhouse gas abatement. By 2023, Finnfund-backed companies generated 9,600 GWh annually, 95% from renewables (Finnfund, 2024). The flagship Lake Turkana Wind Power plant in Kenya (310 MW) now provides 14% of the country's electricity, supplying 1.2 million homes (Finnfund, 2023). International Finance Corporation report that Finland's EUR 114 million contribution to the International Finance Corporation-Finland Blended Finance for Climate Programme supported 17 large-scale renewable projects. Programme reporting indicates that municipal-scale models also proved effective: in Vietnam, a 700-kW landfill-to-energy facility captured methane and generated power, while EEP Africa demonstrated off-grid systems that abated emissions at smaller scale while pioneering new business models. Yet challenges remain: MFA's 2023 climate finance evaluation noted inconsistent methodologies for abatement estimates, and many large projects are at early stages, making long-term systemic effects harder to confirm (NAO, Finland 2021).

Finding 4: Finland contributed to improved air and water quality, expanded wastewater reuse, and reduced plastic and solid waste, while circular economy pilots and 10YFP initiatives supported biodiversity. These results delivered systemic co-benefits for ecosystem resilience.

Beyond carbon, Finland programming has delivered environmental co-benefits by tackling pollution, conserving resources, and strengthening ecosystems (links to Forestry, Ecosystems and Biodiversity and Water as a Natural Resource sub-sectors). These interventions demonstrate the theory of change pathway from more sustainable supply chains and stronger institutions (short-range results 5 and 6) to stronger governance frameworks (medium-range result 1) and ultimately

4 It should be noted that the investment period for the EBRD HIPCA is still ongoing and not all of the funds have yet been mobilised.

stronger environmental outcomes (long-range result 1). A review of programme documentation and evaluations provides a number of examples. In Vietnam, BIWASE's waste project reduced open burning and dumping, modernised composting and leachate treatment, and improved medical waste management during COVID-19 (Saarilehto et al., 2022). HIPCA reports investments in North Africa enabled reuse of over 75 million m³ of wastewater annually, reducing pressure on agriculture and urban water systems. GTK's geochemical mapping in Afghanistan and Tanzania enhanced risk assessments and provided evidence to manage degraded or polluted areas (Caldecott, 2020; Palenberg et al., 2021). Finland's circular economy initiatives added ecosystem value: programme reporting for the Circular Economy Youth Empowerment Programme (CEYEP) in Lesotho, eco-enterprises in Kenya, and e-waste management frameworks in Rwanda all report reduced waste flows while supporting inclusive livelihoods. At global level, Finland supported the 10YFP Tourism Plastics Initiative and Food Waste Roadmap, cutting marine plastic leakage and pressure on ecosystems..

Finding 5: Finland embedded inclusion across its portfolio, strengthening small and medium-sized enterprises, empowering women and youth, and delivering multi-dimensional benefits in health, education, security, and livelihoods. These results strongly validate the theory of change pathway from access and capacity building to durable equity outcomes.

Finland's cooperation has contributed to multidimensional results in tackling social exclusion (long-range result 2) by expanding access to energy (short-range result 4) and embedding empowerment across its Energy, Circular Economy and Critical Minerals portfolio. Through EEP Africa, millions of people benefitted from clean energy solutions that reduced energy poverty while building markets and skills that continued beyond project cycles (EEP, 2024). As reported under Finding 1, over 200 small and medium-sized enterprises were supported to scale up, transforming them from fragile pilots into viable businesses able to serve last-mile populations. These interventions generated broad social dividends: safer and healthier homes for women and children, extended study time for schoolchildren, stronger community security through lighting, and new income streams for households operating micro-businesses powered by solar or biogas. Finland also worked beyond the energy sector, with GTK mining, and ACEF circular economy initiatives opening new career pathways to women and youth (Caldecott, 2020; Palenberg et al., 2021; Interviews). These outcomes also validate the theory of change assumption that stronger public institutions (short-rage result 6) are stepping stones toward systemic equity outcomes (long-range result 2).

Finding 6: Finland's most tangible social result was expanding last-mile energy access, where EEP Africa alone has enabled over 5.7 million people to gain clean, affordable, and reliable energy from pay-as-you-go solar, mini-grids, cookstoves, and biogas systems, directly replacing kerosene and charcoal with safer alternatives.

Finland's most direct and widespread social results have come from last-mile energy access (short-range result 4), particularly through EEP Africa. Between 2010 and 2017, Finland's EUR 21.5 million investment enabled 800,000 households to adopt clean energy solutions, creating 6,400 jobs. By 2023, as a multi-donor fund, EEP Africa had expanded dramatically to 5.7 million people reached (EEP, 2025, 2024; Altai Consulting, 2024; see also Finding 5). Supported technologies ranged from pay-as-you-go solar kits and hybrid mini grids to cookstoves and biogas digesters, replacing kerosene and charcoal with cleaner, safer, and more affordable options. These generated multiple social dividends: reduced respiratory disease from cleaner cooking, improved sanitation from biogas, reduced deforestation through fuel substitution, safer streets through lighting, and longer study hours for schoolchildren. pay-as-you-go model advanced financial inclusion by allowing unbanked households to make periodic payments through mobile money, enabling

access to energy without prohibitive upfront costs. Finnish NGOs ensured equitable delivery by targeting women-headed households and remote villages, while also providing training to ensure long-term adoption and maintenance. These results provide strong evidence of Finland's ability to move from targeted access interventions to systemic social improvements and durable equity outcomes (long-range result 2).

Finding 7: Women held 40% of jobs created under EEP Africa (jointly funded by Finland to 34%), while other co-financed programmes (e.g. UNIDO) saw women advance into sales and cooperative leadership, and entering forestry and mining roles.

Women benefitted as both end-users and active participants in Finland's Energy, Circular Economy and Critical Minerals portfolio, with strong evidence of empowerment outcomes. Programme review documents indicate that by 2017, Africa had created 6,400 jobs (see also Finding 6), of which 2,500 for women, rising to 11,000 jobs by 2023, 40% of them held by women.[5] This strengthened agency as women moved from domestic users of pay-as-you-go solar and cookstoves to entrepreneurs managing sales networks and cooperatives, especially in Mali and Lesotho. Many became community energy champions, raising awareness and driving adoption among their peers. Clean energy access also freed time for education and income generation, while improved household safety and reduced smoke exposure supported health outcomes in line with short-range result 4. Beyond energy, programme reports indicate that Finland supported women to break barriers in forestry and mining through the UNIDO-Finland programme, which provided technical training in sectors where female representation had been negligible (UNIDO, 2021). These results show that empowerment was not confined to numbers, but also extended to social recognition and leadership roles, validating the theory of change long-range result 2 on inclusion and equity. Finnish NGOs added complementary depth by tailoring delivery to women-headed households and embedding gender sensitivity into community engagement models.

Finding 8: Over 200 youth in Lesotho and 30 start-ups under AfriCircular gained training, mentoring, and finance, while others entered professional careers in geoscience. Finland's support enabled youth to become entrepreneurs, job creators, and community sustainability leaders.

Youth empowerment has been another highly effective and durable outcome area, with Finland providing the skills, finance, and enabling environments needed for participation in green economies, contributing to long-range results 4 and 2. In Lesotho, project reports indicate that the Circular Economy Youth Empowerment Programme (CEYEP) trained over 200 marginalised youth, many young women, in trades such as fashion, culinary arts, and electrical installation (long-range result 4). Graduates created circular businesses that turned textile waste into fashion products and food waste into new goods, combining income generation with environmental benefit. These young entrepreneurs also became sustainability champions, raising awareness in their communities and promoting behavioural change (Embassy of Finland, 2024). The AfriCircular Innovators Programme added a regional layer by providing technical assistance, mentoring, and mini-grants to 30 youth-led start-ups, many of which piloted novel solutions in plastics recycling, packaging, and waste tracking (AFDB, 2024). In addition, technical training in Afghanistan and Tanzania exposed young professionals, including women, to advanced geoscience and Geographic Information System techniques, opening career pathways in sectors often inaccessible to youth. Underpinning these initiatives was Finland's support for sustainable supply chains (short-run result 5) and institutional

5 See https://finlandabroad.fi/web/ken/regional-cooperation and World Energy Council (2021).

capacity building (short-run result 6). Further scaling will depend on continued financing and partnerships (medium-range results 2 and 4).

Finding 9: Job creation and workforce development have been major outcomes of Finnish-supported Energy, Circular Economy and Critical Minerals programmes, with benefits extending beyond temporary construction to long-term skills and livelihoods, and with Finnfund portfolio companies supporting more than 300,000 jobs.

Finnfund's reporting indicates that portfolio companies have supported over 300,000 positions globally, particularly in renewable energy, circular economy, and sustainable mining sectors, with contributions to long-run results 2 and 4). These jobs went beyond short-term construction, often involving skilled or semi-skilled roles such as solar installation, biogas plant operation, customer service, and waste processing, creating pathways into long-term employment and professional careers. (Finnfund, 2024). As mentioned under Finding 7, EEP Africa created more than 11,000 jobs by 2023. Many workers received regular income, job security, and in many cases formal employment for the first time, allowing families to invest in housing, education, and health (short-range result 4). Employment was often local, with energy enterprises hiring from the same communities they served, creating multiplier effects as wages were reinvested spent or saved in the local economy. Jobs were closely tied to training and upskilling (EEP, 2023). As reported under Finding 8, CEYEP in Lesotho and GTK training in Afghanistan and Tanzania equipped youth with vocational, entrepreneurial, and technical skills. By focusing on innovation in low-carbon, resource-efficient industries (medium range result 3), these programmes not only reduced poverty but also created a green workforce ready for future energy and resource transitions (long-range result 4).

Finding 10: Finnish cooperation has supported small and medium-sized enterprise growth and entrepreneurship, enabling small firms to overcome early-stage risks and scale sustainable business models.

Through platforms such as EEP Africa, PAGE, ACEF, and ADB Ventures, Finland provided seed capital, concessional finance, mentoring, and technical assistance to hundreds of small and medium-sized enterprises across Africa, Asia, and Latin America (Altai Consulting, 2024; ADB Ventures, 2020; UNEP, 2024). These interventions helped firms de-risk innovation, attract follow-on capital, and build viable market positions in sectors including clean energy, waste management, sustainable transport, and e-waste recycling (short-range result 5 on sustainable supply chains, medium range result 4 on promoting innovation). In Tanzania, EEP supported pay-as-you-go solar companies to extend energy access to thousands of households (EEP, 2025). In Vietnam, local recycling and biogas enterprises modernised their operations with Finnish technology and business development expertise, improving environmental performance while creating jobs (Saarilehto et al., 2022). As pointed out under Finding 8, the AfriCircular Innovators Programme supported 30 startups across packaging, electronics, and fashion, combining funding with coaching, visibility, and market-entry strategies (AfDB, 2024). In Rwanda, a Producer Responsibility Organisation helped structure private sector efforts around e-waste collection, creating new markets for small players. Afghanite Geo & Mining Engineering, supported by GTK, gained international contacts and improved technical capacity in mineral exploration, positioning it competitively (Caldecott, 2020; Palenberg et al., 2021). Finland also supported small and medium-sized enterprises outside Africa: in Latin America, Tembici, a bike-sharing company, received a EUR 3 million equity investment through the IDB-LAC fund to sustain operations during a venture capital downturn, demonstrating Finland's role in helping stabilise sustainable transport businesses through critical growth phases. Ultimately, the supply-chain and innovation results associated with these actions will promote long-range result 4 on economic growth and jobs creation.

Finding 11: Innovation has been a central pathway for economic benefits, with Finland backing first-of-a-kind technologies and business models that were later scaled by private and public actors.

EEP Africa provided an early testing ground for pioneering off-grid energy models such as pay-as-you-go solar kits, hybrid mini-grids, and solar-powered irrigation systems for smallholder farmers (Altai Consulting, 2024; EEP Africa, 2025). These innovations reduced costs, improved productivity, and expanded energy access in areas where grid extension was infeasible (short-range result 2). In Vietnam, Finnish-supported industrial symbiosis pilots demonstrated circular approaches to waste, including recycling incinerator ash into construction inputs, processing municipal biowaste into compost, and capturing methane for electricity generation (Saarilehto et al., 2022). These initiatives reduced emissions while creating marketable products and lowering costs for farmers and builders. As also mentioned under Finding 8, the Circular Economy Youth Empowerment Programme (CEYEP) in Lesotho enabled over 200 youth to launch sustainable businesses from textile waste (discussions with Finnish Embassy). As also mentioned under Findings 8 and 10, the AfriCircular Innovators Programme provided mini-grants and technical assistance to 30 circular economy startups (AfDB, 2024). ADB Ventures supported early-stage fintech and agritech ventures with climate resilience potential (ADB, 2023). At the policy level, Finland supported PAGE and the 10YFP to develop innovative planning tools such as the Sustainable Consumption and Production Hotspot Analysis Tool and circularity metrics for buildings and procurement. Programme reports suggest these are now adopted in countries including Chile, Bangladesh, and Kenya. GTK introduced advanced geoscientific methods and Geographic Information System mapping platforms in fragile states such as Afghanistan and Tanzania, bringing entirely new capabilities to local agencies (Caldecott, 2020; Palenberg et al., 2021). By coupling product and business model innovation with policy tools and data systems, Finland positioned itself as a global hub for cleantech and circular innovation, while enabling partner countries to transition toward greener, evidence-based economies. By focussing on innovation (medium-range result 3), this has directly led to enhanced small and medium-sized enterprise and job creation (long-range result 4).

Finding 12: Finland's programmes benefitted international investors and Development Finance Institutions by reducing risk, creating pipelines, and strengthening governance frameworks for sustainable finance.

By blending concessional capital with technical assistance, Finland enabled global financiers to place capital in higher-risk and underserved markets (medium-range result 2) while aligning with recognised good practice on blended concessional finance (DFI Working Group, 2023; IFC, 2024a). Finland's partnership with International Finance Corporation through the Finland-International Finance Corporation Blended Finance for Climate Program has supported a portfolio of renewable-energy and climate projects and demonstrates how concessional funds can achieve leverage through private co-investment (IFC, 2024a). At the early-stage end of the pipeline, EEP Africa has provided proof-of-concept grants and technical assistance for clean-energy and circular business models that later attracted follow-on capital (Altai Consulting, 2024). Finland's EUR 20 million commitment to ADB Ventures de-risked early-stage climate-tech across Asia, complementing grants with venture investment to crowd in private capital. In Ukraine, the Finland-Ukraine Trust Fund financed feasibility work and energy audits that helped de-risk reconstruction-relevant projects for subsequent financiers (NEFCO, 2023). At system level, Finnish-supported initiatives such as PAGE's Sustainable Consumption and Production Hotspot Analysis Tool (SCP-HAT) and EU Level(s) advanced the use of lifecycle metrics and policy tools that help create more predictable, standards-based investment environments (UNEP/IRP, 2024; European Commission JRC, 2020). Ultimately, these actions will contribute to wider economic outcomes (long-range result).

Finding 13: Finland has contributed to international climate and environmental agreements and the SDGs by cutting millions of tonnes of CO_2e, providing modern energy to 5.7 million people, and embedding circular economy and mineral governance reforms across more than ten countries.

Finland's cooperation has delivered substantial and measurable results that have advanced the implementation of international climate and environmental agreements (long-range result 3). In energy, blended finance platforms such as the International Finance Corporation-Finland Blended Finance for Climate Programme mobilised billions in co-finance and enabled large-scale renewable energy deployment, delivering annual emission reductions in the tens of millions of tonnes of CO_2e (IFC, 2024b); contributing to medium-range result 2 and long-range result1, respectively. As described under Finding 6, EEP Africa extended modern energy services, reducing time spent collecting fuel, cutting indoor air pollution, and creating jobs (long-range result 1 on reduced greenhouse gas emissions, medium-range result 3 on adoption of emerging innovative technologies, short-range result 4 on benefits to households). In the circular economy, Finland's thought leadership has been visible at both global and national levels. Interviews with Sitra suggest that its circular economy toolkit is being referenced in the production of national roadmaps that embed lifecycle thinking into procurement systems, sectoral investment strategies, and budget processes (short-range result 6). Interviews with MFA and Sitra officials also indicate that Finland's convening power through the World Circular Economy Forum helped to expand the African Circular Economy Alliance from 7 to 15 members and also influenced African Development Bank's long-term strategy, creating regional platforms that amplify systemic reforms, contributing to long-range result 3). In critical minerals, GTK's geological mapping and environmental safeguards in Mozambique, Zambia, Afghanistan, and Tanzania enabled governments to publish geochemical atlases, create hazardous waste strategies, and regulate exploration more transparently (short-range results 5 and 6) aligning with Extractive Industries Transparency Initiative standards (Caldecott, 2020; Palenberg et al., 2021). Collectively, these results demonstrate that Finland has reduced emissions, expanded access, created jobs, passed laws, and strengthened institutions, thereby contributing directly to the Paris Agreement, SDGs 7, 12, and 13, and global environmental governance, supporting long-range result 3. While Finland's modest financial scale limits systemic transformation, its influence has been disproportionately strong given its technical credibility and leadership.

Finding 14: Through long-term partnerships and support, Finland contributed to programmes strengthening the ability of national and municipal institutions' to serve as regulators and service providers and build their capacity to deliver waste, energy, and mineral governance services.

Finland has achieved strong and durable results in building institutional capacity at national, municipal, and sectoral levels across energy, circular economy, and critical minerals (short-range result 6). In the extractives sector, and as also described in Finding 13, GTK's long-term partnerships with Afghanistan's Geological Survey (AGS) and Kabul Polytechnic University strengthened regulatory capacity by training geoscientists and producing thematic maps and geophysical datasets that informed land-use and mining policy (Caldecott, 2020, Palenberg et al., 2021). In Tanzania, GTK-supported institutional cooperation delivered applied geoscience capacity, including geochemical mapping and data systems that improved mineral exploration efficiency and supported agricultural planning. GTK has also advanced sustainable mining and circular economy approaches through broader cooperation in African partner countries, contributing to stronger governance frameworks. In the circular economy, interviews with the ACEF indicate that technical assistance to ministries in Africa has supported circular economy road-mapping and policy development that link to investment priorities and Nationally Determined Contribution implementation. At the municipal

level, and also referring to Findings 1 and 4, Finland's cooperation with BIWASE in Vietnam helped transform a provincial utility by introducing waste separation, composting, landfill-gas capture, and wastewater treatment, alongside strengthened financial systems and public-private partnership models. These improvements were sustained beyond concessional support, with BIWASE doubling its composting capacity using internal funds. These outcomes show Finland's effectiveness in building institutions that continue delivering services and governance reforms after project close, consistent with the theory of change pathway from institutional capacity (short-range result 6) to durable governance and service delivery (medium-range result 1) and ultimately enhanced delivery of international agreements (long-range result 3).

Finding 15: Finland's support has contributed to concrete policy reforms, including Uruguay's circular economy law, national roadmaps in Ethiopia, Benin, Cameroon and Chad, and African Development Bank's adoption of circularity principles.

Finland's support has contributed to embedding sustainability principles into national and regional policies through laws passed, strategies drafted, alliances expanded, budgets influenced, and tools mainstreamed (medium-range results 1 and 4), promoting alignment with international goals and standards (long-range results 1 and 4). Through PAGE, Uruguay adopted procurement reforms and a national circular economy law that institutionalised lifecycle thinking, while Peru and Mongolia integrated green product standards and lifecycle analysis into government procurement, directly shifting national spending practices (MFA, 2017). In Ethiopia, ACEF roadmaps are shaping sectoral strategies and budget allocations in agriculture, water, and manufacturing, providing governments with frameworks for resource efficiency. At the regional level, Finland co-founded ACEF with the African Development Bank, contributing to the expansion of the African Circular Economy Alliance from 7 to 15 member states and promoting circularity in regional policy dialogues (AfDB, 2024; Interviews). GTK's technical innovations also delivered systemic results: in Afghanistan and Tanzania, Geographic Information System-based mapping and digital geochemical platforms enabled evidence-based regulation of land use, extractives, and agriculture, marking a shift from fragmented data to institutionalised planning (Caldecott, 2020; Palenberg et al., 2021). Finland's global influence extended through its support for the Sustainable Consumption and Production Hotspot Analysis Tool and circularity metrics for buildings and procurement, now applied by multiple governments to benchmark and track sustainability (UNEP, 2024).

4.2 Most effective approaches

An 'approach' is a key method or tactic – a portable element of a strategy. To qualify as 'most effective' in this evaluation, an approach must be judged to be: (i) strongly effective, impactful and sustainable;[6] (ii) in line with the theory of change; and (iii) strongly cost-effective.

Summary answer to EQ1.3 – Most effective approaches

The Finnish MFA portfolio demonstrates a mix of approaches tailored to scale and context, and to identify one approach as most effective for all purposes would be misleading. Blended finance platforms proved most effective at promoting economic development and jobs creation where risk-sharing, stable regulation, and credible off-take agreements created investor confidence for utility-scale renewables. Leverage also boosted cost-effectiveness. Smaller challenge funds, often aimed at promoting off-grid innovation, inclusion and social empowerment, were most effective when flexibility, trusted local entrepreneurs, and community engagement were in place. Finnfund's patient equity model and small and medium-sized enterprise support mechanisms enabled gradual market entry but faced scaling barriers due to limited follow-on finance and Finnish small and medium-sized enterprise capacity. Toolkit and convening approaches, such as Sitra's roadmaps and the World Circular Economy Forum, built coherence between global frameworks and national policies, but required sustained political buy-in and long timelines to succeed. Across themes, enabling factors included predictable policy environments, strong local ownership, and coordination with partner institutions, while barriers ranged from rigid concessional instruments and slow disbursement in fragile contexts to fragmented institutional roles, grant dependency, and weak mechanisms for translating pilots into commercial pipelines. Effectiveness did not always translate into impact and sustainability; e.g. in the area of climate and environmental governance, toolkits and convening platforms were effective in embedding circular economy principles into national policies and expanding global coalitions, but systemic impact and sustainability were constrained by the long policy reform timeline, short project cycles and institutional coordination gaps.

Finding 16: Finland's most effective, impactful, and sustainable approaches to delivering environmental outcomes have been large-scale blended finance platforms, which mobilised private capital and achieved major greenhouse gas reductions.

The strongest environmental results (primarily greenhouse gas emissions reductions; long-range result 1) came from large-scale blended finance platforms and risk-sharing mechanisms, which were strongly effective, impactful, and sustainable. Interventions such as the International Finance Corporation-Finland Blended Finance for Climate Programme and EBRD's HIPCA mobilised hundreds of millions in private finance (medium-range result 2) and enabled renewable projects that avoid millions of tonnes of CO_2e annually. Their effectiveness lay in crowding in private capital in fragile markets, creating a replicable model of investment mobilisation that aligned with the theory

6 A strongly **effective approach** is one that reliably delivered valuable outcomes, with clear causal contribution; results were consistent, replicable, and aligned with the theory of change. A strongly **impactful approach** is one that contributed to significant positive change, with evidence of influence on broader systems, policies, or behaviours in line with the theory of change. A strongly **sustainable approach** is one that had consequences that were likely to continue producing results without external support, due to strong local ownership, institutionalisation, financial viability, or policy uptake.

of change assumption that risk-sharing enables systemic transformation. Impact was demonstrated through measurable greenhouse gas reductions, expanded energy access, and market transformation effects beyond individual projects. Sustainability was strong because these investments created self-reinforcing markets and institutions that continued beyond Finland's direct involvement. Complementing this, smaller challenge funds such as EEP Africa were moderately effective on mitigation, but strongly impactful in catalysing innovation and market confidence by introducing pay-as-you-go solar, clean cooking, and mini grids (medium-range result 3). Such platforms could potentially be expanded to address a broader thematic scope (e.g. circular economy). These proved moderately sustainable where entrepreneurs secured follow-on investment, again illustrating how large-scale blended finance and catalytic pilots together formed a balanced, theory of change-consistent pathway from inputs to long-range outcomes.

Blended finance platforms were strongly cost-effective, with abatement achieved broadly within international norms (see World Bank IEG, 2025). Mobilisation ratios of 10:1 or higher compared well with leading Development Finance Institutions, demonstrating strong leverage of public capital. These results underline their strong effectiveness and systemic impact in terms of avoided emissions per euro invested. Challenge funds were moderately cost-effective. Unit costs per tonne were higher due to small-scale pilots and transaction intensity yet remained within global norms for innovation and energy access contexts.

By contrast, a number of approaches were only moderately effective or even weakly effective, often due to fragmented design or lack of scaling mechanisms. Fragmented grants and small-scale circular economy initiatives offered only weak cost-effectiveness: while they showcased innovation, they lacked replicability or measurable large-scale abatement. Fragmentation and transaction costs in certain schemes diluted efficiency. Circular economy pilots and youth-focused grants generated visible local benefits, but impacts were small in scope and sustainability weak without market integration or replication pathways. Their contribution to theory of change progress was therefore partial: they delivered short-range results but did not consistently advance to medium-range institutional or market transformation. Concessional credit schemes such as those in Vietnam were moderately effective, delivering important technology transfer and visible environmental improvements, yet their impact was constrained by slow disbursement, limited replication, and reliance on tied-aid modalities. Similarly, policy roadmaps and toolkits were strongly effective in shaping policy discourse, but only moderately impactful in practice, as adoption requires long political cycles and sustained domestic commitment, leaving sustainability outcomes uneven and uncertain. In all these cases, weak causal links from outputs to systemic outcomes limited their alignment with the theory of change longer-range impact pathway.

The degree of effectiveness across all approaches was highly dependent on enabling context, consistent with the theory of change underlying assumptions. Interviews with key stakeholders and reviews indicate that blended finance platforms were strongly effective only where stable regulation, credible off-take agreements, and political commitment created predictable environments for investors. Challenge funds were strongly impactful in contexts with entrepreneurial capacity, flexible grant structures, and strong community trust, but fell to moderately effective in fragile or low-capacity markets. Policy toolkits and institutional partnerships achieved moderate to strong effectiveness where national ownership was high and embedded within long-term policy processes, but weak where political continuity or financing was absent. Key success factors included coherence with Finland's own climate neutrality and circular economy agendas, which enhanced credibility; deliberate gender and inclusion mainstreaming, which strengthened sustainability of benefits; and multi-actor partnerships such as global convenings, which reinforced legitimacy and systemic reach. Conversely, barriers such as institutional fragmentation, difficulty quantifying

diffuse circular economy benefits, and slow disbursement in fragile contexts weakened effectiveness and sustainability. Overall, where enabling assumptions of the theory of change – regulatory predictability, local ownership, and investor confidence – were met, interventions delivered strong, durable environmental outcomes.

Finding 17: Flexible challenge funds and non-governmental organisation-led models effectively expanded energy access, reduced burdens, and created jobs for women and youth, relying on community ownership and inclusive design.

The most effective instruments for advancing social empowerment and inclusive access to energy were small, flexible challenge funds and NGO-led delivery models, complemented by investment-backed programmes that created employment at scale (but with less evidence on inclusion). The Energy and Environment Partnership (EEP Africa) was strongly effective in expanding access to clean energy (short-range result 4). Its impact was strongly positive on household welfare, as it reduced indoor air pollution, cut fuel collection time, and enabled safer, healthier, and more productive lives (short-run result 4, long-range result 2). Sustainability was strengthened where models built local entrepreneurial capacity and secured follow-on finance. Finnfund's investments were strongly impactful in job creation (see Finding 9). These approaches aligned closely with theory of change pathways by linking inclusive delivery with systemic social gains.

Other instruments showed only moderate effectiveness due to limitations in scale, or lack of systemic integration. Youth-focused training programmes, such as CEYEP in Lesotho, built valuable entrepreneurial skills for young people, but broader impact was limited without stronger access to finance or markets. NGO-led pilots often scored high on cultural appropriateness and trust-building but were only moderately sustainable, as they relied on ongoing grant support rather than commercial models. Larger-scale investment programmes, while delivering significant employment, were sometimes only weakly effective in empowerment where gender or social inclusion criteria were not explicitly integrated into design. Concessional finance for social infrastructure in fragile contexts, such as Ukraine, also produced only moderate impact as rigid procurement and slow disbursement prevented rapid re-electrification of schools and clinics, constraining social dividends. These examples highlight that empowerment effects were uneven where theory of change assumptions on local ownership and enabling systems were weakly met.

Challenge funds and clean cooking or solar home system programmes (e.g. under EEP Africa) were strongly cost-effective, with significant household benefits far outweighing subsidy costs. Tangible co-benefits (e.g. reduced smoke inhalation, time savings for women, and improved access to education and health) enhanced their value, supporting a case for strong effectiveness on both economic and social grounds. By contrast, fragmented pilots and grant-dependent NGO models were weakly cost-effective, given high per-beneficiary costs and limited scaling and sustainability depending on continued capital inflows.

The degree of effectiveness in advancing empowerment depended heavily on enabling context and alignment with theory of change assumptions. Programmes were strongly effective where they embedded community engagement, supported local entrepreneurs with technical assistance, and aligned with national energy access policies, thereby ensuring ownership and scaling. Social targeting (particularly gender-responsive design), was a critical because it enabled women to transition into roles as agents, cooperative leaders, and energy entrepreneurs. Inclusive finance, flexible grants, and trusted NGO partners strengthened access for the poorest households and youth. Where these enabling conditions were absent, effectiveness fell to moderate or weak. Barriers included dependence on short-term grants, weak municipal procurement systems to absorb proven

pilots, and slow disbursement in fragile contexts. In general, NGOs offer significant insight into local conditions that could be better leveraged by MFA when designing private sector engagement.

Finding 18: The most effective, impactful, and sustainable approaches for economic development and jobs were blended finance, patient equity, and small and medium-sized enterprise challenge funds, each underpinned by elements such as risk-tolerant capital, technical assistance, and long-term investment models.

The most effective contributions to economic development and job creation (long-range result 4) were those that aligned closely with theory of change pathways of mobilising private finance, building inclusive markets, and supporting systemic transformation. Blended finance platforms such as Finnfund and ADB Ventures were strongly effective, combining concessional or patient capital with Environmental, Social, and Governance safeguards to mobilise private investment. This reflects the theory of change assumption that risk-sharing and predictable finance flows unlock market transformation. Their impact extended beyond direct employment to broader economic ecosystems, including supply chains and ancillary services (short-range result 4), while their sustainability was reinforced by commercial viability and long-term capital structures. Small and medium-sized enterprise challenge funds such as EEP Africa provided strong effectiveness at the earlier end of the theory of change causal chain by delivering pilot models, first-of-kind demonstrations that progressed toward medium- (investment, innovation) and long-range outcomes (small and medium-sized enterprise development and job creation). Over 200 companies were supported, generating thousands of jobs and showing that theory of change assumptions on local ownership and innovation could produce durable benefits. Patient equity models underpinned long-term viability, providing firms with the time horizon to move from early pilots to market maturity. Finally, market-structuring interventions such as ACEF supported AfriCircular Innovators or Producer Responsibility Organisations validated the theory of change link between enabling frameworks and viable small and medium-sized enterprise niches. Collectively, these approaches were not integrated, but each mapped strongly onto specific points of the theory of change, from inputs and risk-sharing to systemic outcomes of job creation and small and medium-sized enterprise growth.

Approaches that were only moderately effective often failed to advance fully along the theory of change pathway from outputs to systemic outcomes. Youth-focused training programmes and NGO-led pilots, for example, achieved short-range results in building skills and trust (consistent with theory of change inputs), but without accessible finance or integration into market structures they will take longer to generate medium-range results such as small and medium-sized enterprise growth or job scaling. Their sustainability is therefore moderate currently, reliant on continued donor support. Concessional credit schemes provided demonstration projects and technology transfer, partially aligning with theory of change assumptions around mobilisation and innovation, but their rigidity and lack of risk tolerance limited their progression to systemic change. Large-scale infrastructure, such as Finnfund investment in Lake Turkana, delivers enabling infrastructure but economic effects are mostly measured at a macro-, rather than project level.

Blended finance models demonstrated strong cost-effectiveness aligned with theory of change assumptions by mobilising multiples of private investment (3:1 or higher) and achieving durable job creation with modest public inputs. This reflects the theory of change long-range outcome of leveraging private finance for systemic impact. Patient equity models produced financial returns while enabling firms to survive early risk periods and contribute to economic multipliers. Small and medium-sized enterprise-focused instruments like EEP Africa were moderately cost-effective – their unit cost per job was higher than for infrastructure, but consistent with the theory of change assumption that innovation and early-stage support are necessary to generate inclusive, locally

anchored benefits. Market-building measures were more difficult to assess in strict cost terms, but their role in creating viable entry points for small and medium-sized enterprises supported theory of change pathways toward institutionalised markets. Conversely, fragmented pilots and donor-dependent NGO schemes were weakly cost-effective, as they delivered outputs without moving further along the theory of change results chain, leading to high unit costs and limited systemic return. Overall, Finland's interventions delivered strong Value for Money where they followed theory of change assumptions of mobilisation, innovation, and scaling, but performed only moderately where those pathways stalled.

As pointed out under Finding 16, the effectiveness, impact, and sustainability of economic interventions was strongly determined by whether the enabling assumptions of the theory of change were in place. Blended finance achieved strong effectiveness where the theory of change conditions of stable regulation, investor confidence, and credible off-take agreements were present. Challenge funds were most effective thrived when theory of change assumptions around local ownership and entrepreneurial capacity were realised and where flexible grants and technical assistance enabled small and medium-sized enterprises to prove concepts and attract follow-on investment. Patient equity performed best where theory of change conditions of patient timelines and supportive ecosystems allowed businesses to transition from short-range results to medium-range outcomes. Market-structuring interventions advanced systemic change when policy environments and regulatory frameworks aligned with theory of change assumptions about enabling institutions. By contrast, effectiveness was reduced to moderate or weak in contexts when enabling assumptions failed, e.g. where pilots lacked financing ladders, donor objectives conflicted with community priorities, or Finnish small and medium-sized enterprises were unable to compete in local ODA markets. The key success factors across all interventions were those that the theory of change explicitly identifies: predictable finance, local ownership, supportive institutions, and sequencing from pilot to scale. Where these were in place, Finland's interventions moved effectively along the theory of change pathway, generating durable jobs and small and medium-sized enterprise growth; where they were absent, results remained partial or short-lived.

Finding 19: Finland's key governance climate contributions were toolkits and platforms that advanced circular economy policies and global coalitions, though impact was limited by short cycles and coordination gaps.

Finland's most effective contributions to strengthening climate and environmental governance were those that directly advanced theory of change pathways of institutional capacity (short-range result 6), policy alignment (medium-range result 4), and systemic reform. Toolkit-based approaches, notably Sitra's circular economy roadmap toolkit, were strongly effective because they provided practical, replicable methodologies for embedding sustainable consumption and production principles into national planning (medium-range result 1). Replication of this approach across countries illustrates strong impact at the medium-range level of the theory of change, translating technical tools into national policy frameworks. Convening platforms such as the World Circular Economy Forum were strongly impactful in building global coalitions, helping expand the African Circular Economy Alliance from 7 to 15 members and influencing African Development Bank's 10-year strategy (long-range result 3). These initiatives proved sustainable where they were integrated into national institutions and supported by sustained international coalitions, demonstrating progression along the theory of change from inputs to long-range outcomes of strengthened governance and alignment with international agreements.

Other governance-focused interventions were only moderately effective in translating influence into systemic reform. Multilateral contributions to pooled funds such as PAGE, ACEF, and 10YFP

enabled governments to integrate sustainability principles into policy frameworks (medium-range result 1), but attribution is difficult to determine and progress was uneven across contexts. These approaches produced moderate impact by creating entry points for reform but did not consistently embed systemic change, reflecting partial movement along theory of change pathways. Weaknesses also emerged in fragile contexts. For example, rigid concessional instruments in Ukraine limited Finland's responsiveness to urgent climate policy needs, with negative effects on both effectiveness and sustainability. Coordination gaps across Finnish institutions often weakened the causal chain from Finnish support to systemic governance outcomes. In such cases, interventions achieved outputs – such as workshops, roadmaps, or policy drafts – but failed to sustain momentum into medium- or long-range theory of change outcomes.

Institutional and governance reforms are among the most cost-effective interventions globally, as modest technical assistance can unlock large-scale investment and durable reforms. Finland's toolkit-based and convening approaches were strongly cost-effective, given their relatively low financial inputs and the breadth of policy and coalition impact they achieved. By contrast, pooled multilateral contributions were only moderately cost-effective, as results are diffuse and Finland's specific added value in relation to governance and institutional reform is difficult to identify (unless there are strong linkages, e.g. through ACEF). Overall, the portfolio was most cost-effective where Finland applied targeted, visible engagement on the enabling environment, but generated only moderate returns where engagement was indirect or fragmented.

The degree of effectiveness in strengthening governance depended heavily on the enabling assumptions of the theory of change: political buy-in, continuity of funding, and technical credibility. Success was strong where partner governments committed to reforms and Finland's expertise provided credible entry points, as seen in African Development Bank partnerships and Sitra's African roadmaps. Sustained coalitions and EU-level initiatives such as Global Gateway also reinforced theory of change pathways of donor coordination and systemic influence. Effectiveness was reduced to moderate or weak where enabling conditions were absent: political commitment was short-lived, pooled funds obscured Finland's visibility, or project cycles were too short to support the long reform timelines. Coordination weaknesses within Team Finland further constrained outcomes, undermining the theory of change assumption that institutional coherence strengthens systemic impact. In sum, Finland's governance contributions were credible and often highly aligned with international frameworks, but sustainability and systemic reach were uneven, leaving overall performance strong in targeted instruments but only moderate at the portfolio level.

Finding 20: Compared to Denmark's long-term government-to-government model that embeds institutions and private firms in systemic energy transitions, Finland's approach has been more investment-driven, with weaker institutional and private sector pathways.

Denmark's Danish Energy Partnership Programme exemplifies a high-impact, systemic approach to supporting partner countries in their clean energy transitions (see Annex 2). Through embedded government-to-government partnerships, long-term technical assistance, and institutional capacity building, the Danish Energy Partnership Programme shapes energy policies, regulatory frameworks, and planning systems that create predictable environments for renewable energy investment. Its focus on offshore wind, integrated energy planning, and district energy systems leverages Denmark's global technical strengths, enabling partner countries to adopt robust strategies for renewable integration and just energy transitions. Danish Energy Partnership Programme 's model inherently builds sustainability and local ownership, as embedded advisors work side by side with ministries and utilities, transferring knowledge that underpins long-term systemic change.

Finland's approach to Energy, Circular Economy and Critical Minerals development cooperation has been primarily finance-driven, relying on multilateral contributions and blended finance mechanisms such as Finnfund, FUTF, EEP Africa, and Multilateral Development Bank climate funds to mobilise investment for renewable energy projects. This model has successfully delivered installed capacity, co-financing, and expanded energy access, often through large-scale solar, wind, hydro, and off-grid mini-grid initiatives. However, Finland's engagements tend to focus on project-level outcomes rather than systemic institutional reform (MFA, 2023), and there has been limited direct government-to-government technical cooperation compared to Denmark. As a result, Finland's approach has less influence over partner-country energy policies and regulatory frameworks, and private sector participation remains sporadic, with few Finnish firms entering developing markets despite available financing opportunities.

Comparing the two models highlights complementary strengths and opportunities for cross-learning. Denmark's Danish Energy Partnership Programme approach excels at enabling systemic transformation and creating market conditions that naturally support Danish private sector engagement, while Finland's model is effective at mobilising finance and delivering concrete renewable energy infrastructure. Yet, Finland could enhance long-term impact and private sector participation by adopting elements of the Danish model (particularly technical cooperation, embedded advisors, and strategic market-enabling interventions) to bridge the gap between investment and sustained market presence. Conversely, Denmark's experience suggests that pairing policy and institutional support with investment pathways can produce a holistic approach that maximises both development and commercial outcomes.

It should be recognised that the Finnish and Danish private sectors may differ in their business models, internationalisation pathways and appetite for global partnerships. Danish companies tend to be larger, more consolidated and more experienced in operating within international development finance frameworks, whereas many Finnish firms are smaller, more technology-focused and less accustomed to working through long-term public-private partnerships in developing markets. These structural differences affect how companies engage with development-oriented financing instruments and help explain variations in the scale and nature of private sector mobilisation observed between the two countries.

4.3 Finland's added value in the results

To assess Finland's added value, the evaluation adopted certain criteria to support its findings under this section. They are: (i) the unique or complementary 'strategic' value of Finland's cooperation compared to its peers in this sub-sector that others did not bring (i.e. what was distinctive about Finland's cooperation in the sub-sector); (ii) the 'operational' value of Finland's cooperation (i.e. the way Finland has used its financial instruments available to develop long-term partnerships dedicated to capacity and institutional building at the public, private and non-governmental levels; (iii) the 'normative' value of Finland's cooperation (i.e. capacity to influence policy reform).

Summary answers to EQ1.4 - Finland's added value

Finland's added value is strongest in energy, circular economy, and critical minerals, where institutions like the Technical Research Centre of Finland (VTT), GTK, and Sitra provide internationally recognised expertise in renewables (e.g. distributed energy), waste

valorisation, and responsible mining practices. Finland has brought technical leadership (both in institutions and innovation) and expertise. Finnish innovations have supported solar deployment, district heating, circular economy roadmaps, and Environmental, Social, and Governance-compliant mineral governance across Africa, Asia, and Eastern Europe, while Sitra's toolkits and the World Circular Economy Forum have positioned Finland as a thought leader. GTK's geological mapping and governance frameworks, combined with Finnfund's blended finance and NEFCO's recovery investments, show Finland's ability to integrate technical capacity with catalytic finance. Finnish programmes also embed social inclusion, job creation, and gender equity, reinforcing Finland's credibility as a rights-based and context-sensitive partner. However, systemic influence is constrained by modest financial scale, limited commercial presence of Finnish firms, and fragmentation between MFA's development mandate and business-focused agencies such as Business Finland, Finnvera, and Finnfund. Despite efforts through Team Finland, structural and mandate differences hinder coherence, leaving Finland's technical leadership under-leveraged relative to its potential impact.

Finding 21: Finland's strongest added value lies in technical leadership across Energy, Circular Economy, and Critical Minerals, where its specialised institutions and innovation ecosystem translate domestic expertise into international reforms, policies, and investments.

Interviews with key stakeholders suggest that a strong part of Finland's comparative advantage and global credibility is rooted in its innovation ecosystem and specialised institutions such as VTT, GTK, and Sitra. These actors are internationally recognised for advancing renewable energy, circular economy, and responsible mining governance. Finland's domestic experience with decentralised, cold-climate energy systems has translated effectively into contexts across Africa, Asia, and Eastern Europe, enabling solar deployment, district heating solutions, and renewable integration in fragile markets. In the circular economy, Finland was the first country to adopt a national roadmap and has since supported over ten partner countries in developing theirs. Sitra's step-by-step toolkit has been replicated in Africa and Asia, enabling systemic reforms in waste management, sanitation, and resource efficiency. Finland's convening role through the World Circular Economy Forum has further consolidated its thought leadership, expanding the African Circular Economy Alliance from 7 to 15 members and shaping African Development Bank's 10-year strategy (see also Finding 19). In critical minerals, GTK has provided globally respected geological mapping, databases, and Environmental, Social, and Governance-compliant mining frameworks, supporting governance in Mozambique, Zambia, and beyond (Caldecott, 2020; Palenberg et al., 2021). This combined technical and financial expertise demonstrates Finland's ability to bridge science, innovation, and investment, aligning well with theory of change assumptions of systemic capacity building and long-term sustainability.

Finding 22: Finland's integration of technical expertise with social empowerment and equity goals enhances its legitimacy and influence, making it a trusted partner that connects innovation with inclusion and strengthens the sustainability of reforms.

There is moderate to strong evidence that Finland's added value is amplified by embedding social empowerment and equity within technically focused interventions (MFA, 2023). The examples of EEP Africa and CEYEP in Lesotho have been described above. While waste-to-energy "bio-centres" in Kenya generated both sanitation improvements and community-level income. These examples show that Finland has been able to integrate rights-based and inclusive approaches into its technical cooperation, aligning clean technology and responsible mining with social outcomes

such as gender equity, youth and community empowerment, and livelihoods (MFA, 2023). Interviews suggest that such integration has strengthened Finland's credibility in multilateral fora and with partner governments, positioning it as a context-sensitive and values-driven donor. However, evidence suggests that scale remains moderate: while project-level social outcomes are well-documented, systemic replication is limited, and many initiatives remain pilot-based or dependent on continued grant support. Nevertheless, the theory of change assumption that social inclusion and local ownership underpin sustainability is clearly validated in Finland's portfolio, where empowerment elements have strengthened trust, legitimacy, and the durability of reforms (MFA, 2023).

Finding 23: Finland's systemic influence is constrained by the modest scale of financial resources, fragmented institutional mandates, and weak private sector engagement, which limit its ability to translate technical leadership into large-scale transformation.

There is strong evidence that Finland's international impact is constrained by structural and operational barriers, which limit its ability to translate technical leadership into systemic transformation (MFA, 2023; NAO, 2021). Financial inputs remain relatively small compared to peer donors, reducing Finland's capacity to influence major national energy transitions or mineral industrialisation. Despite clear technical niches, the presence of Finnish firms in global clean energy and mineral supply chains is weak. Evidence from the portfolio and interviews suggest that many small and medium-sized enterprises lack the capital to scale beyond pilots, and even successful demonstrations often plateau without pathways to larger commercial contracts. Institutional fragmentation compounds these challenges. Interviews suggest that MFA, Finnfund, Business Finland, and Finnvera operate under distinct mandates and financing logic, with limited mechanisms to align development cooperation, export promotion, and investment strategies. While platforms like Team Finland were designed to improve coherence, legal and structural barriers mean that coordination has remained inconsistent, leaving Finnish firms without clear pipelines or aftercare once projects are delivered. This has meant that otherwise strong instruments, such as concessional credits or blended finance, have not systematically created market footholds for Finnish companies. Compared to peer models, such as Denmark's government-to-government partnerships, Finland's approach has been more fragmented, producing high project-level outcomes but limited systemic influence. The evidence therefore points to moderate overall effectiveness: Finland demonstrates strong thought leadership and technical credibility but lacks the scale, coherence, and private sector engagement required to achieve long-range systemic transformation.

4.4 Markets, competition and demand for Finnish private sector

Summary answer to EQ 2.1 – Demand and competition for Finnish private sector

Across the MFA portfolio, the private sector has been a central delivery channel, taking roles as implementers, innovators, financiers, advisors, and policy enablers across energy, circular economy, and critical minerals. Demand for Finnish expertise is evident, with firms delivering landmark infrastructure under concessional credit in Vietnam, piloting off-grid innovations through EEP Africa, and supporting district heating in Ukraine. Yet opportunities have often been underexploited: blended finance facilities and circular economy platforms aligned strongly with Finnish strengths but lacked matchmaking, follow-up, and financing for small and medium-sized enterprises to scale beyond pilots. Finnish companies hold a

clear niche in modular, decentralised, Environmental, Social, and Governance-compliant solutions – from off-grid solar to responsible mining – but face stiff competition from larger multinationals, local firms, and peer donors, compounded by weak export finance and fragmented Team Finland coordination. Global demand for clean energy, circular solutions, and traceable critical minerals is set to grow rapidly, presenting strong opportunities for Finland's technology offer. However, without stronger institutional integration, aftercare, and positioning within large blended finance platforms, Finnish firms risk remaining confined to pilots while others capture scale.

Finding 24: Across the MFA portfolio, the private sector plays diverse and often central roles as implementers, innovators, financiers, advisors, and policy enablers. These varied roles highlight that private companies are not peripheral actors but a core delivery mechanism in MFA-supported results.

The private sector plays five broad roles across the MFA portfolio: implementers of infrastructure and services, innovators piloting new solutions, financiers and operators scaling projects, technical advisors in feasibility and design, and policy enablers contributing to market shaping. These roles are not mutually exclusive: many firms operated across categories depending on the programme and instrument. For example, African small and medium-sized enterprises in EEP Africa (multilateral trust fund) both implemented projects and tested business models (Altai Consulting, 2024), while Finnish consultancies in Ukraine acted as advisors and indirectly enabled future markets under the bilateral trust fund (NEFCO, 2023).

As *implementers and service providers*, private firms were essential in delivering energy and waste infrastructure. In Vietnam's concessional credit scheme, Finnish contractors designed, supplied, and installed landfill gas and composting systems. In African off-grid markets, small and medium-sized enterprises under EEP Africa installed solar home systems and mini-grids. These roles demonstrated the private sector's technical capacity to deliver sustainable infrastructure at both utility and community levels.

As *innovators*, the private sector generated solutions suited to underserved contexts. Firms like Tespack (portable solar systems) and Solar Fire (solar agro-processing) pioneered niche technologies under challenge fund support. These projects validated proof-of-concept models that could later attract commercial investors. Multilateral instruments like ACEF and ADB Ventures deliberately targeted this innovation function, highlighting the private sector's role in experimentation and entrepreneurship.

The private sector also served as *financiers* and *commercial operators*, particularly in blended finance platforms. Under the Finland-International Finance Corporation Climate Facility and LAC Climate Fund (both Development Policy Investments), private investors co-financed renewable energy projects once concessional capital reduced perceived risks. Similarly, in Finnfund investments, Finnish and local companies co-invested in ventures ranging from solar manufacturing to sustainable forestry. Finally, firms contributed as *technical advisors* and *policy enablers*, shaping upstream pipelines and market conditions through feasibility studies, consultations, and participation in programmes like PAGE and 10YFP (both multilateral instruments). Collectively, this breadth underscores that private actors were not peripheral but central to how MFA interventions achieved outcomes.

Finding 25: Beneficiary countries have procured Finnish solutions, and intermediaries have created windows for Finnish companies to enter blended finance and innovation pipelines. The constraint has not been lack of demand, but the ability to convert opportunities into longer-term presence.

Demand for Finnish private sector engagement is evident across multiple instruments and geographies. Both intermediaries and beneficiary countries have sought Finnish technologies and expertise, particularly where they align with urgent energy, waste, and governance needs.

In Vietnam, the Concessional Credit Scheme created explicit opportunities for Finnish firms. Companies such as Ferroplan and Doranova supplied and installed waste-to-energy and landfill gas systems at Binh Duong, which became the country's most advanced municipal waste facility. Importantly, the Vietnamese utility BIWASE later expanded the system with its own resources, showing that Finnish solutions were valued beyond the initial concessional financing (Saarilehto et al., 2022).

In Ukraine, the Finland-Ukraine Trust Fund financed around 30 studies and demonstration projects that brought in over 30 Finnish companies, including AFRY Finland, KPA Unicon, Gebwell, and Doranova. These projects responded to pressing municipal needs for district heating, renewable generation, and waste valorisation. The willingness of Ukrainian municipalities to collaborate with Finnish experts illustrates demand for international technology and expertise, even though the current conditions have limited actual investments made in Finnish solutions (NEFCO, 2023).

Demand has also been demonstrated in African contexts. Through EEP Africa, Finnish companies piloted first-mover solutions such as NopeaRide's solar-powered taxi fleet in Nairobi, Tespack's smart micro-grids, and AW-Energy's WaveRoller technology (Altai Consulting, 2024).

Intermediaries such as Finnfund and Finnpartnership have also actively channelled Finnish firms into clean-energy and circular economy markets. Finnfund reported that more than 40% of its 2023 investments involved Finnish interest (e.g. mostly as sub-contractors, advisers or supply-chain support) (Finnfund, 2024). Finnpartnership supported a range of small and medium-sized enterprises to pilot renewable energy and bio-based innovations. For example, in Thailand, St1 demonstrated cassava-based bioethanol production, and in East Africa, Solar Fire piloted solar concentrators.

Private sector orientation with selected proforma studies is set out further in Table 5.

Table 5 Finnish private sector engagement opportunities in Energy, Circular Economy and Critical Minerals portfolio

NAME OF INITIATIVE	INSTRUMENT USED	COUNTRY/ REGION	FINNISH PRIVATE SECTOR OPPORTUNITIES			
			ACTIVE OR PASSIVE	EXISTS OR MISSED	NEW BUSINESS OR OTHER	WITH FUNDING OR NOT
Energy and Environment Partnership (EEP) Southern and East Africa Multidonor Trust Fund	Multilateral support	Africa, regional	Active	Exists	New business	Funding available
Finland-International Finance Corporation Blended Finance for Climate Program	Multilateral support	Unspecified	Active	Exists through procurements	New business	No direct funding but procurement opportunities
NEFCO/Support to energy efficiency renewable energy and alternative type of energy sources in Ukraine	Multilateral support	Ukraine	Passive	Exists through procurements	New business	Had funding available during implementation.
Partnership for Action on Green Economy PAGE	Multilateral support	Unspecified	Passive	Missed	No	No funding
ADB Ventures	Private Sector Instruments	Asia, Regional	Active	Exists	New business	Funding (investments)
Finland-LAC Blended Finance Fund	Private Sector Instruments	America, regional	Active	Exists through procurements	New business	Funding (procurements and potentially investment)
European Bank for Reconstruction and Development High Impact Partnership on Climate Action (HIPCA)	Multilateral support	N. Sahara, regional	Active	Exists	New business	Funding (procurements and potentially investment)
African Circular Economy Facility	Multilateral support	Africa, regional	Active	Missed	Some potential for business	No direct funding but procurement opportunities
10 Year Framework of Programmes on Sustainable Consumption and Production	Multilateral support	Unspecified	Active	Missed	Other	No funding
Future females HQ – Accelerating female Entrepreneurs in the Circular Economy	Private Sector Instruments	Namibia	Passive	Missed	No	No funding
Circular Economy Youth Empowerment	Bilateral support	South Africa	Passive	Missed	No	No funding

Source: Evaluation team

Finding 26: The MFA portfolio opened strong entry points for Finnish firms through blended finance, circular economy, and innovation platforms, yet these opportunities remained underused. Despite clear alignment with industrial strengths, mechanisms to turn influence into commercial outcomes were weak and small and medium-sized enterprise uptake limited.

The portfolio review revealed several missed opportunities where Finnish firms could have benefitted more from MFA-backed interventions. In blended finance platforms like the International Finance Corporation Climate Facility, Finnish technology providers in waste-to-energy, forestry, or clean mobility had strong comparative advantage, yet despite efforts to promote participation, engagement was minimal due to limited pipeline visibility and a lack of uptake/alignment (MFA, 2023; IFC and MFA interviews). These instruments created large-scale market openings, but Finnish companies did not capitalise on them.

Circular economy initiatives were another area of underutilisation. Programmes like ACEF, CEYEP, and 10YFP embedded circular economy principles in policy and practice across Africa, Latin America, and Asia, directly aligned with Finnish expertise in modular waste systems, bio-based packaging, and lifecycle analysis. However, Finnish companies have not been engaged in delivery or procurement, leaving these initiatives at the level of policy influence.

Digital tools and data systems represented further untapped potential. GTK's geological surveys in Tanzania and Afghanistan generated high-value datasets, while Sitra's circular economy toolkits were adopted in multiple African countries. These public goods could have been commercialised into services by Finnish Information and Communication Technology firms, but no structured strategy linked data platforms to Finnish digital exports.

Innovation platforms like ADB Ventures and AfriCircular also presented strong opportunities for Finnish cleantech small and medium-sized enterprises. Interviews suggest that while many Finnish companies were screened, very few pursued investments, often because they lacked interest or support to internationalise into Asian or African markets. With stronger aftercare, export-readiness assistance, and co-development partnerships, these funds could have been powerful launchpads for Finnish innovation. Overall, while Finland positioned itself well at the policy and enabling-environment level, the commercial dividends for Finnish firms were not fully realised due to missed opportunities for linkage and scale, as well as a lack of interest to expand to developing markets by Finnish companies.

Finland's participation in Multilateral Development Bank blended finance facilities illustrates both strengths and limitations of its added value. Investments in International Finance Corporation's Blended Finance for Climate Program, IDB Invest's LAC Climate Fund, and EBRD's HIPCA, as well as ADB Ventures, demonstrate Finland's catalytic finance role in creating positive development impacts in developing countries and the ability to create entry points for Finnish solutions. Yet international procurement rules limit the earmarking of contracts for Finnish suppliers, and to date only a handful of Finnish companies have engaged directly (MFA, 2023; Interviews with International Financial Institutions, MFA). MFA and Business Finland have actively encouraged firms to pursue these pipelines, but results remain limited due to weak small and medium-sized enterprise presence in least developed and lower middle-income countries and the higher risks of operating there. More recent adjustments, such as allowing IDB Invest to support upper middle-income projects with Finnish content, may increase traction, but so far successes have been more in shaping standards, piloting blended finance, and influencing Multilateral Development Bank agendas, rather than consistently embedding Finnish companies in delivery of blended finance vehicles.

Finding 27: Finnish firms hold a niche in modular, decentralised, and Environmental, Social, and Governance-compliant solutions, including off-grid solar, water purification, district heating, and responsible mining services. Circular economy pilots also show their innovation and community fit.

Finland's private sector offers substantial added value to global sustainable development through specialised, export-ready technologies aligned with pressing global needs. Finnish firms excel in clean energy, particularly off-grid systems, district heating, and smart grid solutions suited to Central Asia and Sub-Saharan Africa (MFA, 2023). Their modular and cold-climate-optimised innovations perform well in areas with unreliable grid infrastructure. In circular economy and waste-to-energy, Finnish companies bring advanced solutions for biogas, anaerobic digestion, and sanitation, highly relevant for rapidly urbanising cities across East Africa and Southeast Asia. Finland's water technology sector, spanning wastewater reuse and smart water management, is also important in arid regions like Middle East and North Africa and South Asia.

In mining and critical raw materials, Finland is recognised for ethical and environmentally sound practices. Institutions like Metso Outotec and GTK provide expertise in responsible mineral processing, environmental monitoring, and mine closure, which is increasingly valued in Africa, Latin America, and Southeast Asia. Finland's contributions to geological mapping and closure planning in Zambia, Mozambique, and Afghanistan demonstrate how its expertise strengthens governance, transparency, and safety, aligning with growing global demand for traceable supply chains in the electric vehicle and battery industries (Caldecott, 2020; Palenberg et al., 2021).

Digitalisation further enhances Finland's competitiveness. Finnish firms lead in AI-enabled infrastructure management, predictive maintenance, smart meters, and environmental monitoring. These solutions are in demand for smart city planning, energy efficiency, and resilience in Eastern Europe and South Asia. Finnish consulting and policy design support, including circular economy toolkits and advisory services, have been deployed in countries like Rwanda, Ghana, and Indonesia, where governments seek structured strategies for sustainable consumption and production (UNEP, 2024).

The Finnish private sector's niche lies in delivering modular, decentralised, Environmental, Social, and Governance-aligned solutions that balance technical sophistication with social and environmental goals. Products like plug-and-play solar systems, mobile water units, and landfill gas recovery plants are tailored for underserved or fragile contexts, from off-grid villages to humanitarian settings. Finnish firms such as Solar Water Solutions in Namibia and district heating innovators in Ukraine have demonstrated how context-appropriate solutions can directly improve resilience and livelihoods in challenging environments.

Finding 28: Finnish firms face strong global and local competition in energy, circular economy, and critical minerals, often losing out in large finance schemes, while weak support and limited funding hinder scaling beyond pilots.

Competition in energy, circular economy, and critical minerals is intense, with Finnish firms competing against larger multinationals and increasingly capable local companies. In blended finance platforms like International Finance Corporation's climate facility and ADB Ventures, few Finnish small and medium-sized enterprises have tried to secure capital, despite efforts to screen and identify potential companies (MFA Interview). In Vietnam licensing barriers and entrenched suppliers constrained market entry despite strong technologies. Their edge lies in modular, sustainable solutions suited to niche markets, but interviews suggest that weak export finance, fragmented

institutional support, and limited partnerships have hindered scaling. Few Finnish firms have joined challenge funds such as EEP Africa since 2018, and most failed to sustain market presence (Altai Consulting, 2024).

Interviews suggest that several persistent barriers limit Finland's full private sector potential in development markets. A general lack of interest among Finnish private sector small and medium-sized enterprises operating in the Energy, Circular Economy and Critical Minerals sub-sector to engage in higher risk developing markets was noted by several respondents. Finnish firms often struggle with limited visibility and market penetration in large-scale infrastructure sectors dominated by multinational giants. Weak export financing, lack of in-country support, and minimal local manufacturing capabilities hinder competitiveness in public tenders. Engagement in high-growth regions like Southeast Asia, West Africa, and Latin America remains inconsistent, while high product pricing and complex procurement rules in low-income countries often prevent uptake of premium Finnish technologies. Without stronger export support, financing instruments, and local partnerships, much of the growing demand for Finnish expertise risks going unmet.

Finding 29: Global demand for clean energy, circular economy, and critical mineral services will grow rapidly, creating strong opportunities for Finland, yet competition will intensify from peer donors, multinationals, and local firms, requiring stronger follow up and positioning.

Looking ahead, demand for clean energy, circular economy, and critical minerals solutions will rise sharply, but so will competition. Meeting global climate targets will require a seven-fold increase in clean energy investment in developing countries by 2030 (IEA, 2021b), translating into strong demand for decentralised, inclusive, and modular technologies. This directly aligns with Finnish strengths in off-grid solar, water purification, district heating, and circular waste-to-value systems. Demand for critical minerals is projected to quadruple for lithium, cobalt, and nickel by 2040 (IEA, 2023a), creating opportunities for Finland's expertise in responsible mining, geological mapping, refining, and recycling, as well as engaging on reduction in overall mineral use.

Circular economy platforms are scaling rapidly and opening new entry points for Finnish firms. The African Circular Economy Facility (ACEF), co-founded with Finnish support, is expanding roadmaps and financing ventures in plastics, textiles, and electronics recycling (AfDB, 2025a; Impact Investor, 2022), creating growing demand for advanced waste management and digital tracking tools where Finnish companies already have pilot experience. Complementary initiatives, including the Africa Circular Economy Support Programme and the AfriCircular Innovators Programme, provide pathways for Finnish clean-tech firms, recyclers, and digital solution providers to engage with emerging African markets (AfDB, 2025a; ACEA, 2024) while also linking Finnish investors and accelerators with high-impact ventures. At the policy level, multilateral platforms such as PAGE and the 10-Year Framework are embedding lifecycle approaches into national strategies, further increasing opportunities for Finnish circular economy solutions to be mainstreamed into developing country systems (UNEP, 2022; UN PAGE, 2021).

Multilateral Development Bank investee procurements continue to represent potential direct opportunities for Finnish companies, even though evidence of realised contracts remains scarce (MFA, 2021). A small number of Finnish firms have secured business across other sectors in Multilateral Development Bank-funded markets elsewhere in Latin America, Asia and Africa, showing that the model is feasible.

At the same time, competition will intensify. Peer donors such as Denmark are already embedding their private sectors through integrated models that pair systemic policy reform with downstream commercial pipelines. Multinational corporations are deepening their presence in blended finance facilities, while local firms are professionalising with donor support, capturing more domestic market share. Finnish pilots (e.g. in Vietnam and Ukraine) created early visibility but have often failed to secure long-term contracts due to weak follow-up (NAO, 2021).

The financing landscape is also changing. Over the next five years, opportunities are likely to shift away from small pilots towards large, bankable projects requiring blended finance, guarantees, and strong local anchoring (DFI Working Group, 2023). While this could favour Finnish firms if they are strategically positioned within facilities, it also risks further marginalising them if access continues to favour larger global players.

4.5 Foreseen gains and benefits for Finnish companies and development cooperation

Summary answer to EQ 2.2 – Potential gains for Finnish companies and development cooperation

Finnish companies could secure substantial benefits in the Energy, Circular Economy and Critical Minerals, circular economy, and critical minerals sectors, ranging from direct revenues through contracts for clean-tech solutions to indirect gains in reputation and strategic positioning in global value chains. Even modest market shares in rapidly expanding sectors like renewable energy and critical minerals could generate hundreds of millions of euros. However, realising these opportunities depends on overcoming key constraints. Access to finance is crucial, as many Finnish small and medium-sized enterprises lack the capital to scale, while stronger localisation, aftercare, and partnerships are needed to sustain market presence. Coordination between Finnish institutions, leveraging Finland's Environmental, Social, and Governance reputation, and the ability to participate in large, bankable projects will determine whether companies move beyond pilot initiatives. Without progress on these fronts, Finland risks remaining a niche actor while competitors dominate growing global markets.

Finding 30: Finnish companies have the potential to benefit directly from contracts, and indirectly through reputational leadership and strategic positioning in global clean energy and minerals value chains, where small market shares can yield substantial value.

Finnish companies stand to gain a wide spectrum of commercial, reputational, and strategic benefits by engaging more fully in the Energy, Circular Economy and Critical Minerals, circular economy, and critical minerals sectors. These benefits are both direct (through revenue, contracts, and partnerships) and indirect, through market positioning, reputation, and influence.

Commercially, Finnish firms can capture revenue streams from supplying modular clean-tech solutions, such as off-grid solar systems, decentralised water purification, waste-to-energy plants, and district heating upgrades. Projects such as Binh Duong in Vietnam, where Finnish companies supplied landfill gas utilisation and waste management technologies, show that these contracts

can be significant in size, with follow-on opportunities as local utilities expand operations. Similar benefits were seen in Ukraine, where over 30 Finnish companies supported scoping and early demonstration of municipal energy and waste projects, which could have supported pipelines for consultancy, equipment supply, and maintenance services.

The potential scale extends beyond individual contracts to systemic participation in rapidly expanding global markets. Were Finnish firms to secure even a modest share, the value could run into hundreds of millions of euros. For instance, Finnfund already invests around EUR 900 million with 41% involving Finnish interest (supply chain participation, consultancy, financing); scaling this ratio to larger flows through blended finance platforms could substantially expand commercial opportunities.

Reputationally, Finnish companies can reinforce their identity as leaders in Environmental, Social, and Governance-compliant, inclusive, and innovative solutions. Participation in projects with visible social and environmental benefits (such as Namibia's solar water purification systems or Kenya's biogas and solar mini grids) positions Finnish brands as ethical and reliable partners. This credibility is valuable in markets where donor scrutiny and public accountability are rising.

Strategically, Finnish firms gain entry into value chains that are central to Europe's green transition. For example, Geological Survey of Finland mapping projects in Africa not only build governance capacity abroad but also secure Finland's positioning in critical mineral supply chains vital for Europe's battery industry. Likewise, early participation in circular economy platforms like the African Circular Economy Facility enables Finnish small and medium-sized enterprises to participate in shape emerging standards and markets.

Finding 31: Finnish participation depends on de-risking, localisation, coordinated support, Environmental, Social, and Governance leverage, and scaling capacity; without this, Finnish firms risk staying niche as competitors dominate global markets.

The evaluation underscores that Finnish companies' participation in the Energy, Circular Economy and Critical Minerals, circular economy, and critical minerals sectors will depend less on demand, which is clear and rising, and more on a set of enabling and constraining factors that shape market access.

One decisive factor is access to finance. Many Finnish small and medium-sized enterprises lack the balance sheets to compete with multinational corporations in blended finance facilities. Without sufficient export finance, guarantees, and de-risking instruments, they struggle to scale beyond pilots. The report notes cases in EEP Africa where Finnish firms like Doranova and NopeaRide delivered innovative solutions but failed to secure follow-on capital. Future participation will therefore hinge on aligning Finnfund, Finnpartnership, and MFA instruments to close this financing gap.

A second factor is localisation and aftercare. Successful Finnish entry in Vietnam and Ukraine demonstrated that Finnish technologies are attractive, but weak local anchoring limited continuity. In Vietnam, regulatory barriers and entrenched suppliers constrained Finnish firms. Building sustained partnerships with municipalities, utilities, and local firms will be essential for deeper participation.

Institutional coordination is another determinant. Compared with peer donors like Denmark, which is more proactively link policy dialogue with commercial entry points, Finland's approach is fragmented. The evaluation stresses that Business Finland, embassies, and Finnfund need to act in

concert to connect upstream advocacy with downstream procurement opportunities. Without this alignment, Finnish firms risk being marginalised despite technical strengths.

Reputation and standards also shape participation. Finland's niche lies in Environmental, Social, and Governance-compliant mining and resource governance, yet capitalising on this requires continued investment in transparency and technical leadership. Instruments like GTK's mapping and data systems give Finland credibility, but this must be actively leveraged into commercial pipelines.

Finally, scale and timing matter. Future opportunities will increasingly focus on large, bankable projects requiring blended finance, guarantees, and risk-sharing. Firms that remain confined to small pilots may find themselves excluded from mainstream procurement. Participation will therefore depend on Finnish companies' ability to aggregate into consortia, engage in cluster models, and deliver at scale.

4.6 The best approaches and measures for private sector engagement

Summary answer to EQ 2.3 – Most promising approaches for promoting Finnish private sector engagement

MFA instruments that combined risk-sharing with structured entry points have been the most effective in embedding Finnish firms and supporting their participation in developing markets. Concessional credit schemes, such as the Binh Duong Solid Waste Treatment Plant in Vietnam, tied Finnish companies like Ferroplan and Doranova directly into delivery, giving them large reference projects and reputational gains. Similarly, the Finland-Ukraine Trust Fund ensured Finnish content in over 30 projects, providing visibility and early market access. Challenge funds like EEP Africa allowed small and medium-sized enterprises such as Solar Water Solutions and Tespack to pilot innovations in off-grid energy, while Finnfund's equity model engaged Finnish firms in long-term ventures across energy and mining. Yet despite these successes, systemic barriers persist. A 'missing middle' in finance leaves small and medium-sized enterprises without the EUR 1–10 million needed to scale, aftercare mechanisms to support follow-up contracts are weak, and institutional fragmentation within Team Finland often prevents coordination between MFA, Finnfund, Business Finland, and embassies. As a result, Finnish companies frequently secured valuable references but struggled to translate them into lasting market footholds or commercial continuity. Strengthening coordination and bridging financing gaps remain critical to maximising the value of these instruments.

Finding 32: MFA tools blending risk-sharing and entry points, such as concessional credits, Finland-Ukraine Trust Fund, EEP Africa, and Finnfund, effectively engage Finnish firms, while large multilateral facilities mobilise capital but rarely benefit them without better coordination.

The MFA has deployed a broad toolkit to promote Finnish private sector participation, with effectiveness depending on the context, maturity of the market, and stage of the business cycle. The

instruments that have worked best combine risk-sharing with structured entry points, ensuring Finnish firms are tied into delivery while gaining reputational and commercial footholds. Examples include:

- Concessional credit schemes have proven highly effective where tied aid guarantees Finnish participation. In Vietnam's Binh Duong Solid Waste Treatment Plant, Concessional Credit Scheme enabled Ferroplan and Doranova to design and install landfill gas capture, composting, and waste separation systems. This gave them large reference projects and de-risked entry into a challenging market. Embassy facilitation helped navigate local licensing barriers, but evaluations noted the absence of follow-up funding to sustain market presence. Concessional Credit Scheme is most effective in middle-income countries where financing is available but foreign suppliers face entry barriers.
- Trust funds with Finnish content requirements, such as the NEFCO-managed FUTF, also created structured opportunities. Around 30 projects involved Finnish companies like AFRY, KPA Unicon, Gebwell, and Doranova, supporting district heating, renewable energy, and waste valorisation. These gave Finnish small and medium-sized enterprises visibility and market intelligence in Ukraine, though most remained feasibility-stage. The trust fund worked particularly well in high-risk contexts, anchoring Finnish participation when commercial entry was unlikely.
- For smaller firms, challenge funds such as EEP Africa proved most effective. Finnish innovators including Solar Water Solutions, Tespack, EkoRent, and AW-Energy piloted off-grid solar, smart micro-grids, electric vehicle charging, and wave energy. While few scaled commercially, EEP gave firms credibility, references, and first-mover advantage in African markets. The instrument works best in early-stage or high-risk contexts where pilots can validate technology before scaling.
- Finnfund's equity investments have been critical in embedding Finnish firms in long-term ventures. Its co-investment in projects like Salotech Thailand and Gemco Kati in Africa allowed Finnish firms to operate in capital-scarce markets and expand internationally. In 2023, 41% of new Finnfund investments involved some element of Finnish involvement, showing its value as a sustained market enabler.
- Blended finance platforms such as the International Finance Corporation-Finland Blended Finance for Climate Program and HIPCA are now taking more proactive steps to review options for inclusion of Finnish companies in their portfolios, following more proactive efforts by MFA.

Experience suggests that targeted instruments and proactive matchmaking can significantly increase Finnish firm engagement. One example is MFA's effort to connect an IDB Invest investee in the biocarbon value chain with Finnish companies, which showed how early identification and tailored outreach can build interest. Another is the Finland-Ukraine Investment Facility (FUIF), which mobilised strong participation by explicitly embedding Finnish content, providing both visibility and early market access. Building on these models, MFA and Business Finland could systematically screen Multilateral Development Bank fund portfolios, identify investees with demand for Finnish expertise, and proactively introduce firms before procurement specifications are finalised. Tools such as encouraging Finnish companies to support their own clients in securing Multilateral Development Bank blended finance already exist and could be scaled further. Developing multi-actor consortia of Finnish and local firms, supported by small and medium-sized enterprise funds within

Multilateral Development Bank pipelines, could address the missing middle in finance and ensure that Finnish engagement extends beyond pilots into sustained commercial partnerships.

The EU's Global Gateway, particularly through the EFSD+ guarantees and Team Europe initiatives, presents promising pathways for Finnish energy firms to expand into developing and emerging markets. Finnfund is already a formal implementing partner under Global Gateway, giving Finnish companies access to de-risked project pipelines in energy and transport sectors. Finnpartnership is likewise supporting Finnish small and medium-sized enterprises through its Global Gateway campaign, offering tailored funding (EUR 100–300,000) and assistance to participate in EU-funded energy and climate-related procurements. These mechanisms reduce entry costs, improve visibility, and align bilateral MFA efforts with larger EU resources.

While much of Finland's development-related private sector support has targeted small and medium-sized enterprises and early-stage innovators, several interviewees noted that larger Finnish corporations (such as Wärtsilä, Nokia, Metso, Stora Enso and UPM) can play an equally important role as ecosystem leaders in developing markets. Their projects are often large enough to attract international financiers such as International Finance Corporation and IDB Invest, and they can serve as anchor clients that pull Finnish small and medium-sized enterprises into international supply chains as subcontractors, generating broader spillover effects, employment and technology transfer. Several interviewees also noted that by successfully implementing large-scale projects in developing countries, these firms also enhance the credibility of Finnish expertise and create reference cases that open markets for smaller Finnish companies. MFA's role for these companies is not primarily to provide finance but to act as a strategic partner, facilitating access to high-level networks, supporting engagement with government decision-makers, and helping position Finnish capabilities in major infrastructure or energy-sector investment pipelines. However, coordinating with large corporations presents distinct challenges: identifying the appropriate contact points within complex global organisations, and synchronising MFA support with their long-term business strategies and investment decision cycles, both require early and targeted engagement.

Finding 33: The Team Finland network promotes Finnish firms through diplomacy, finance, and export support, but weak coordination between MFA, embassies, and Business Finland limits follow-up and scale, highlighting the need for better integration.

The Team Finland network (comprising MFA, Business Finland, Finnvera, the Ministry of Economic Affairs and Employment, and Finnish embassies) plays a central role in promoting Finnish companies internationally, including in clean energy, circular economy, and critical minerals. It provides coordinated export promotion, market intelligence, financing instruments, and diplomatic support that help position Finnish firms in emerging markets. Beyond trade promotion, Team Finland supports matchmaking between Finnish innovators and international project developers, organises delegations to key markets, and helps firms navigate procurement opportunities with multilateral development banks. Its integrated approach has ensured that Finnish technological solutions – from renewable energy generation and grid modernisation to circular business models – are showcased to relevant decision-makers.

In development cooperation, Team Finland is increasingly positioned as a bridge between Finland's private sector and energy sector development opportunities in partner countries. Its combined diplomatic and commercial reach allows it to identify early-stage opportunities, facilitate consortium building, and link Finnish financing instruments (e.g. Finnfund, concessional credit, or blended finance platforms) with companies seeking to scale operations. The network also offers reputational legitimacy in sensitive markets, where political support can help Finnish small and medium-sized

enterprises overcome regulatory or procurement hurdles. As the Business Finland-MFA merger and new export strategy are finalised, Team Finland's role is expected to grow further, providing a coherent platform for aligning trade diplomacy, innovation services, and development programming to maximise Finnish added value in the Energy, Circular Economy and Critical Minerals sectors.

However, the evaluation highlights that to date, Team Finland's potential is often under realised due to weaknesses in institutional coordination. While embassies, Business Finland, and MFA finance instruments have occasionally worked in synergy (as in Vietnam, where concessional credit was reinforced by proactive embassy support) in many other cases integration has been fragmented. For example, Finnish firms involved in the NEFCO Finland-Ukraine Trust Fund or in EEP Africa often lacked systematic follow-up support, with business promotion and development instruments operating in parallel rather than as a coherent package. This fragmentation stems from the structural separation between Finland's development cooperation mandate (MFA) and its export promotion agencies, creating different incentives, timelines, and accountability frameworks.

The result is that strong Team Finland coordination has been the exception rather than the norm. Where integration was achieved, instruments complemented one another, linking upstream pilots with downstream finance and turning technical expertise into credible market references. Where coordination was weaker, Finnish firms reported lost opportunities, limited commercial continuity after pilots, and difficulties leveraging MFA-backed visibility into real contracts. Strengthening Team Finland's coordination mechanisms, particularly in aligning MFA's development instruments with Business Finland's commercial services, remains a critical enabling factor for Finnish private sector engagement in energy, circular economy, and critical minerals.

Finding 34: MFA instruments are held back by limited aftercare, weak matchmaking, fragmented coordination, and poor localisation support. Closing these gaps is vital for Finland to scale beyond pilots and secure lasting positions in fast-growing global markets.

Despite a wide array of MFA instruments, systemic weaknesses have constrained Finnish private sector participation beyond pilots and early-stage projects.

A central weakness is the lack of structured aftercare. In Vietnam's Concessional Credit Scheme, firms such as Ferroplan and Doranova delivered landmark waste-to-energy infrastructure, but once the concessional loan ended, there was no mechanism to support further contracts. Local partner BIWASE replicated Finnish designs with domestic funds, leaving the Finnish companies sidelined despite having delivered the largest references in their portfolios. Similarly, in Ukraine, over 30 Finnish firms gained visibility through the Finland-Ukraine Trust Fund, but engagements mostly stopped at feasibility or pilot stage (in part due to the conflict). Few transitioned into procurement or investment because the fund lacked risk-sharing or commercialisation pathways.

There is also a pronounced "missing middle" in financing. At one end, EEP Africa provides small grants, while at the other, blended finance platforms like International Finance Corporation-Blended Finance for Climate Programme mobilise billions. Finnish small and medium-sized enterprises needing EUR 1–10 million to scale from pilots to commercial projects found no tailored support. This gap is evident in EEP Africa, where only four Finnish firms entered since 2018, three of which later collapsed (NopeaRide, Waveroller, Doranova Zambia) due to lack of follow-on capital. The collapse of Kenya's NopeaRide in 2022 illustrates how innovation can succeed technically but fail commercially during market dislocation (e.g. COVID-19), or without longer term backing.

Institutional fragmentation compounds these problems. While embassies supported Concessional Credit Scheme firms in Vietnam with regulatory navigation, similar coordination was absent in Latin America. None of the Finland-LAC Climate Fund's three projects in 2023 involved Finnish companies, despite promotion by Business Finland. Disconnects between MFA, Business Finland, Finnfund, and embassies left companies without coordinated support, undermining the potential of otherwise well-designed instruments.

Other systemic weaknesses include delays and complexity in implementation. The Concessional Credit Scheme in Vietnam suffered a 7.5-year lag between appraisal and execution, inflating costs and forcing cancellation of components such as wastewater treatment. Companies like Doranova waited years for contract execution, complicating staffing and undermining viability.

Finally, MFA instruments often failed to track commercial outcomes. Tools like EEP Africa measured development indicators (jobs created, emissions avoided) but not Finnish revenue, contracts, or exports. This made it impossible to assess cost-effectiveness or learn from failed engagements.

5 Conclusions

Conclusion 1: Finland's blended finance model successfully expanded renewable energy access and infrastructure, but market sustainability and Finnish firm involvement remain limited.

Findings: 2, 3, 6, 10, 11, 13, 20, 21, 25, 27, 28, 31

The Energy, Circular Economy and Critical Minerals sector is perhaps the most commercially aligned and private sector-dominated of all climate sub-sectors. Finland's use of blended finance, through platforms like Finnfund, International Finance Corporation-Blended Finance for Climate Programme, EEP Africa, and HIPCA, catalysed significant investments in renewable energy infrastructure. These mechanisms enabled delivery of both large-scale projects such as the Lake Turkana Wind Farm and smaller off-grid solutions that expanded access in underserved communities (e.g. through EEP). They also contributed to emissions reductions and energy system diversification. For large project finance investments with international capital, this model is successful. However, for small and medium-sized enterprise-type support and market creation efforts, long-term commercial sustainability was constrained by gaps in aftercare, limited access to scale-up financing, and a lack of structured engagement. Despite Finland's comparative advantages in clean tech and energy services, few Finnish firms gained footholds through these platforms, in part due to weak promotion of Finnish content, limited embassy capacity, and the absence of clear pathways from grant funding to commercial partnership. As a result, while development impacts were high, the opportunity to align these outcomes with Finnish industrial strengths was missed.

Conclusion 2: Circular economy programming generated policy innovation and local pilot success, but systemic impact was constrained by fragmentation and limited scaling.

Findings: 4, 8, 9, 11, 14, 15, 19, 28

Finland's support for circular economy initiatives contributed to important policy and grassroots advances which promoted resource efficiency, waste-to-value innovation, and industrial sustainability. Programmes like PAGE and ACEF have helped countries integrate circular economy principles into procurement frameworks and national strategies, while local pilots (such as composting systems and upcycled product businesses) engaged youth and small and medium-sized enterprises. However, these efforts were often small-scale, with limited replication or investment traction. Follow-up funding has been rare, and pilots were not always linked to investment pipelines or embedded in national economic planning (although these initiatives are relatively new and some of these issues are being addressed through the AfriCircular 2 programme planned for 2026–27). Institutional fragmentation, short timeframes, and a lack of commercial anchoring prevented promising interventions from delivering more transformational change. Moreover, despite Finnish global leadership in circular economy models, there was little evidence of direct uptake of Finnish private sector expertise in implementing or scaling these interventions.

Conclusion 3: Finland built strong governance foundations in critical minerals, but under-leveraged private sector expertise reduced commercial outcomes.

Findings: 14, 17, 21, 30, 31

Through GTK-led efforts, Finland made strategic contributions to the governance and technical capacity of partner countries in critical minerals. Geological surveys, mapping, and regulatory reforms in countries such as Afghanistan, Tanzania and Mozambique helped build transparent systems and align national approaches with global sustainability norms. These efforts positioned Finland as a credible partner in responsible mineral development. However, Finnish private sector participation in the critical minerals value chain remained minimal, despite Finland's industrial strengths in mining technology, battery supply chains, and processing. There was little evidence of matchmaking, supplier development, or value-chain integration that could translate Finland's governance leadership into market presence for Finnish firms. This disconnect between institutional engagement and commercial strategy weakened the overall developmental and economic returns of Finland's work in this sector.

Conclusion 4: Finnish-supported interventions yielded substantial environmental co-benefits, but biodiversity and ecosystem results were poorly captured.

Findings: 2, 3, 4, 13, 18, 19

Finland's energy and circular economy programming contributed to broader environmental outcomes, primarily greenhouse gas mitigation benefits as well as reduced pollution, improved waste management, and cleaner air and water in partner countries. Examples included circular sanitation models in Rwanda and clean energy access in peri-urban areas that displaced diesel use. However, biodiversity and ecological health (including metrics like habitat restoration, species protection, or ecosystem resilience) were not systematically incorporated into project frameworks. M&E systems lacked indicators specific to biodiversity, and environmental reporting often focused narrowly on carbon and pollution. This limited Finland's ability to demonstrate the full environmental value of its interventions, particularly in areas where co-benefits could have supported wider sustainable development objectives or informed global biodiversity reporting.

Conclusion 5: Finland's institutional capacity-building efforts were transformative in some cases, but short-term planning and weak transition strategies often undermined durability.

Findings: 14, 16, 17, 20, 21, 32

While Finland does not pursue a targeted institutional capacity programme (for example in the same manner as the Danish Energy Partnership Programme), MFA programming nonetheless contributed to major institutional capacity strengthening, for example in geoscience or urban services. Through sustained partnerships with geological surveys and municipal utilities, Finland supported data digitalisation, planning tools, and cross-agency coordination. These interventions built durable capabilities and improved public service delivery. However, in several cases, the lack of coordinated exit strategies or domestic resource mobilisation plans meant that once Finnish support ended, institutional performance declined or stagnated. Some agencies reported difficulties maintaining new systems or attracting domestic investment. Transition planning was not systematically embedded in programme design, and short funding cycles discouraged long-term strategic planning. These gaps highlight the need for sustainability strategies that go beyond capacity-building to include financing, staffing, and policy integration.

Conclusion 6: Innovation and inclusion were effectively promoted through catalytic support to entrepreneurs, but scaling and systematic integration remain weak.

Findings: 1, 5, 6, 7, 8, 9, 10, 11, 24, 25, 26, 28

Finland made substantial contributions to inclusive small and medium-sized enterprise development and business model innovation through platforms like EEP Africa, ADB Ventures, and CEYEP. These initiatives enabled early-stage enterprises and youth- or women-led businesses to pilot new solutions in clean energy, waste valorisation, and digital services. They also played a vital role in reaching underserved populations with affordable, decentralised solutions. However, these efforts often remained at the pilot stage. Weak follow-on support, limited availability of commercial finance, and an absence of formal market-entry pathways meant that enterprises struggled to scale or sustain impact. Furthermore, inclusion was inconsistently tracked across the portfolio. Disaggregated data on youth, gender, or vulnerable groups was limited, and inclusion was more commonly cited as a principle than actively monitored as an outcome. Without improved aftercare, financial pipelines, and accountability mechanisms, the gains achieved in social inclusion and enterprise development risk being short-lived.

Conclusion 7: Fragmented coordination among Finnish institutions undermined strategic coherence and reduced system-wide impact.

Findings: 20, 21, 22, 23, 32, 33

Multiple Finnish actors (including MFA, Finnfund, GTK, Business Finland, and embassies) played important but often uncoordinated roles in delivering the Energy, Circular Economy and Critical Minerals agenda. While each institution brought valuable expertise, the absence of shared country strategies, integrated theories of change, and joint monitoring systems meant that opportunities for synergy were regularly missed. In some cases, separate teams worked in parallel in the same country without mutual awareness or joint planning. This fragmentation reduced the visibility and consistency of Finnish engagement, confused local partners, and limited opportunities for learning and innovation. Where joint platforms did exist, such as in some embassy-led initiatives, coherence improved, but these were the exception rather than the norm. Institutionalising collaborative planning and review mechanisms could significantly strengthen Finland's strategic footprint and increase the efficiency and learning value of its investments.

Conclusion 8: Finland's partnership instruments were underutilised and disconnected from larger financing and programming channels.

Findings: 22, 23, 24, 25, 26, 33, 34

Despite offering preparatory grants, matchmaking services, and partnership brokering, instruments like Finnpartnership and the ICI programme were not systematically linked to major programme pipelines or blended finance vehicles. As a result, their uptake within Energy, Circular Economy and Critical Minerals was limited. In many cases, companies and partners were unaware of their availability or did not receive adequate guidance on how to access them. These tools operated in siloes, with minimal connection to sectoral strategies or Multilateral Development Bank pipelines. Furthermore, the lack of formal 'graduation pathways' (such as linking feasibility funding to follow-on capital) meant that promising projects often stalled before reaching commercial maturity. Without strategic integration and visibility, these instruments missed the opportunity to build firm-level capability while advancing broader development goals.

Conclusion 9: Finland has demonstrated strong global leadership in energy, critical minerals and circular economy governance, but local-level translation of these norms into implementation has been weak.

Findings: 10, 11, 14, 15, 17, 21, 29, 30, 31

Through the strength of its domestic institutions and MFA support for international initiatives (e.g. PAGE, Extractive Industries Transparency Initiative, and the 10YFP), Finland played a meaningful role in shaping international sustainability frameworks, leveraging its domestic expertise to influence global governance. This enhanced Finland's reputation as a credible and principled actor. However, the link between global norm-setting and practical country-level outcomes was often weak. Local institutions struggle to translate high-level commitments into policy change, due to limited capacity, lack of technical assistance, or insufficient integration into national budgets and planning systems. Finland rarely backed up its global advocacy with the resources or frameworks needed to implement those norms on the ground. Finland's ongoing retreat from bi-lateral programming will limit this further, creating the challenge of finding programme vehicles that can replicate the benefits of long-term commitments to country programming. This gap limited the systemic impact of its normative contributions and represents a missed opportunity to align international leadership with national transformation.

Conclusion 10: Finland achieved greatest impact where innovation, long-term institutional partnerships, and systemic programming were combined, but this model remains inconsistently applied.

Findings: 6, 7, 8, 10, 11, 14, 17, 20, 21, 28, 32

The most transformative outcomes in the Energy, Circular Economy and Critical Minerals portfolio were achieved where Finland combined innovation, sustained partnerships, and system-wide approaches. Examples include GTK's long-term engagement in geological capacity development and EEP Africa's multi-cycle support to clean energy entrepreneurs. In these cases, continuity enabled experimentation, trust-building, and adaptation, resulting in resilient systems and measurable development gains. However, this integrated model was the exception. Many programmes operated in isolation, with short funding windows, fragmented technical support, and a lack of strategic continuity. Without codifying and replicating this approach across its portfolio, Finland risks falling short of its potential to deliver systemic, long-term impact.

Conclusion 11: The limited participation of Finnish firms in the Energy, Circular Economy and Critical Minerals portfolio reflects missing strategies, unclear pathways, and a lack of firm-level support.

Findings: 16, 20, 22, 23, 24, 25, 26, 27, 30, 34

Despite Finland's industrial capabilities in clean energy, circular design, and geoscience, few Finnish firms secured meaningful roles in Energy, Circular Economy and Critical Minerals programming. Participation was hindered by high entry barriers, risk aversion/opportunity costs, and inadequate support mechanisms. MFA, Business Finland, and embassies lacked coordinated strategies to promote firm participation, offer aftercare, or align export services with development investments. Opportunities in Multilateral Development Bank-led projects (even those co-funded by Finland) were seldom leveraged to promote Finnish content. The absence of matchmaking platforms, visibility mechanisms, and structured export pipelines contributed to this disconnect. Unlocking Finland's private sector potential in development cooperation will require coherent engagement strategies, institutional coordination, and long-term support mechanisms tailored to firm needs.

6 Potential Action Points

Action point 1: Finland should systematically embed private sector engagement across the entire Energy, Circular Economy and Critical Minerals project lifecycle, ensuring clear pathways, risk-sharing, and sustained aftercare to translate Finnish innovations into lasting development impact.

Finland must systematically embed private sector engagement throughout the development project lifecycle, from design to scale, to achieve sustainable commercial and development outcomes. While Finland has effectively mobilised private finance through instruments like Finnfund and International Finance Corporation Blended Finance for Climate Programme, these project finance type vehicles can be difficult to use for Finnish commercial engagement. Long-term private sector impact in other instruments remains constrained by weak structuring of support across the full lifecycle of engagement. Finnish firms often lack clearly defined pathways from feasibility to scale, risk-sharing tools, and sustained aftercare. To address this, future programming must include structured private sector integration mechanisms: early engagement during programme design, follow-on financing pathways, market-entry support in partner countries, and strategic matchmaking with local actors. These elements must be standardised, not optional, in all MFA-supported programming to ensure Finnish innovations translate into market presence and lasting development results.

Action point 2: Finland must shift from short-term, fragmented grants toward long-term, market-driven programmes that align Energy, Circular Economy and Critical Minerals industrial strengths with country-specific development transitions.

Finland should move away from fragmented, grant-based programming toward long-term, market-driven approaches that align Finnish industrial strengths with development needs. Many Finnish interventions (particularly in the circular economy and clean energy) have been short-lived pilot projects that failed to achieve replication or commercial viability. To enable systemic change, Finland must embed its sectoral strengths (e.g. waste-to-energy, battery value chains, sustainable minerals) into long-term, country- and sector-specific roadmaps. These should be matched with integrated financing instruments, predictable funding cycles (7–10 years), and coordinated implementation across development and export actors. Rather than focusing on one-off opportunities, Finland should adopt a programmatic approach that positions its private sector innovations within broader development transitions, ensuring scale, impact, and relevance in target markets.

Action point 3: Finland should institutionalise joint planning and delivery platforms across MFA, Finnfund, Business Finland, GTK and embassies for Energy, Circular Economy and Critical Minerals interventions to overcome fragmentation and achieve unified, credible international engagement.

Finland should institutionalise cross-agency coordination through formal planning platforms, shared results frameworks, and joint delivery mechanisms. Fragmented implementation across MFA, Finnfund, Business Finland, GTK, and embassies has reduced effectiveness and missed opportunities for strategic alignment. Success stories (e.g. Finnpartnership supported and Embassy-led facilitation of EkoRent's electric vehicle market entry), remain the exception rather than the rule. To address this, Finland must create institutional platforms that formalise joint planning

and programming at country and thematic levels, with shared targets, coordinated pipelines, and integrated monitoring. Empowering embassies with defined coordination roles, supported by advisory groups and market intelligence from the private sector, will strengthen local engagement. This reform is critical for achieving unified delivery, optimising public resources, and amplifying Finland's international credibility. MFA is already beginning to address this through institutional reforms to merge Business Finland with the MFA's external economic relations and development cooperation functions, alongside the finalisation of Finland's new export strategy, which is being jointly developed by the two institutions. It should also be noted that business promotion must be aligned with the presence of real commercial opportunity to ensure that efforts are not wasted.

Action point 4: Finland needs to adopt 7–10-year adaptive financing models with flexibility, transition planning, and resilience measures to ensure durable and context-responsive development outcomes for long term energy sector transition.

To deliver transformative development outcomes, Finland must commit to long-term funding horizons and embed adaptive delivery systems that respond to context. Programmes like GTK's geological support or PAGE's policy integration have shown the importance of long-term institutional engagement. However, many Finnish projects still operate on short cycles with limited continuity. Simultaneously, rigid approval structures and limited local flexibility have slowed response in fragile settings. Finland should reform programming guidelines to promote 7 to 10-year engagements, with built-in transition planning, clear sustainability strategies, and contingency tools. Adaptive management should be institutionalised through feedback loops, decentralised funding mechanisms, and flexible design modules, especially important in volatile contexts like Ukraine or Afghanistan. These reforms would enable Finland to better respond to local realities while fostering systemic resilience.

Action point 5: Finland must convert its global leadership on sustainability in the Energy, Circular Economy and Critical Minerals sector into concrete national outcomes by embedding technical assistance, regulatory support, and institutional partnerships in partner countries.

Finland must convert its global sustainability leadership into tangible national outcomes by embedding technical assistance, regulatory support, and long-term institutional partnerships. Finland has played a key role in shaping global sustainability frameworks, but in practice, these norms have not always translated into impactful national implementation. Programmes promoting circular economy or sustainable mining governance often lacked tools to help partner countries implement reforms. Moving forward, Finland should find mechanisms to create dedicated national-level support packages that include policy toolkits, technical assistance, and institutional capacity-building aligned with its global priorities. Using its diplomatic and financial leverage to support reform (e.g. in energy regulation or resource efficiency) will allow Finland to align its normative identity with practical, scalable country-level outcomes, while also generating enabling environments for Finnish solutions.

While environmental sustainability, biodiversity, human rights, disability and other cross-cutting themes were explicitly excluded from the scope of this evaluation, it is important to note their relevance for the Energy, Circular Economy and Critical Minerals portfolio. The scale and nature of renewable energy and critical minerals investments carry potential environmental, social and human rights risks (for example, ecosystem disturbance from large-scale infrastructure or labour and community impacts in mineral supply chains). Future MFA engagement in these areas will need to systematically incorporate these dimensions to ensure results are both sustainable and equitable.

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In addition to the references listed above, the evaluation team consulted project-specific documentation made available during the evaluation process.

Annex 1: Methodology and analytical process

Overall approach and theory of change

The sub-sector evaluation aims: (i) to explore beyond the project and programme level to shed light on aggregate and catalytic effects and synergies between actions, actors, instruments and policy-influencing activities within and across the sub-sector; and (ii) to establish how these encourage and enable wider changes at geographic, sectoral and/or institutional scales, including the role of private sector engagement and implications for the portfolio and policy level. Its design concept is that of a 'theory-based', 'macro-level' and 'realist' evaluation. Being **theory-based**, it is built upon a theory of change (theory of change) embracing the logical connections between inputs and instruments, short-range, medium-range and long-range results, and impacts, and hence emphasising the plausibility of assumptions and causal links between steps in the design logic. Being **macro-level**, it focuses on development cooperation across multiple interventions, locations, and the 15 years of 2010–2024. And being **realist**, it is embedded within a theory of change that is grounded in the large-scale, long-term development context that applies to those same multiple interventions, locations, and years.

As explained in Chapter 2, this approach requires the use of macro-level definitions of OECD/Development Assistance Committee performance criteria such as effectiveness, impact and sustainability, rather than the intervention-level definitions that are applied to individual projects. It also requires a theory of change that robustly reflects current realities of large-scale context, which embodies logic supported by evidence, and that covers all the main pathways of cause and effect by which results can be obtained in the sub-sector. The MFA's existing sub-sectoral theory of change (MFA, 2023) was therefore reviewed during the inception phase (28 Nov 2024 to 11 Mar 2025), and an updated theory of change prepared for the sub-sector that was based on assumptions in Table 6. Interventions funded wholly or partly by MFA were then assessed against the short-, medium- and long-range results in the theory of change. These results were defined respectively as (i) the initial or 'first generation' results, (ii) the later or 'second generation' results, and (iii) the strategic consequences leading to impact.

The evaluation team adopted the EQs outlined in the Terms of Reference (see synthesis report), with EQs 1 and 2 being specifically designed for the sub-sector evaluation and thus are answered in this report. EQs 3 and 4 will be addressed in the synthesis report. To ensure a structured and transparent approach to evidence collection and analysis, the evaluation team developed a matrix that divided each EQ into more manageable sub-EQs and listed the types of evidence required to answer each, the methods used to collect that evidence, and the data sources to be consulted. The matrix thus served as a central tool to guide both data collection and analytical consistency across the evaluation. The following methodology was applied to support the triangulation of findings in Chapter 4 of this report and to support development of the conclusions in Chapter 5.

Table 6 Assumptions and logical steps in the theory of change for the Energy, Critical Minerals and Circular Economy sub-sector

From long-range results to impact:

- The geopolitical and domestic political environments remain supportive of actions to achieve Energy, Circular Economy and Critical Minerals related SDGs and Multilateral Environmental Agreement goals, with conducive climate and energy policies at global, regional and country levels, and commitments to phase out fossil fuel subsidies and create level playing fields for clean technologies.
- Developed economies continue to increase financial support to developing countries, with sustainable budget allocations to support investment and further innovation, alongside increasing private sector investment as the competitiveness of clean energy and circular economy technologies improves.
- All stakeholders continue to recognise the urgency of the climate change challenge and move at a pace consistent with scientifically-informed policy aims, including the SDGs (e.g. 7, 8, 9, 11, 12, 13 and 15), climate change (e.g. Paris Agreement), and circular economy (e.g. EU Circular Economy Action Plan).
- Further technology and market innovation in renewable energy and circular economy approaches results in lower cost and greater availability, improving accessibility and economic value for end users, including the poor and other marginalised communities.

From medium-range to long-range results:

- MFA programmatic efforts are well targeted, align with global, regional and national strategies, and are complimentary to and coordinated with wider international donor, International Financial Institution and philanthropic funding efforts.
- Institutional capacity and policy changes are sufficiently robust and well-resourced to change perceptions of the viability of new and alternative energy and circular economy solutions over time, and to encourage their adoption relative to fossil fuels and other business-as-usual approaches.
- Increased financial flows are well targeted, address key risks, improve the availability and cost of capital, enhance access to finance (including for marginalised groups) and help attract additional public and private capital for the clean energy and circular economy transition.
- The demonstration of new technologies and business models is aligned with scaling efforts supporting their wider adoption and uptake, increasing entrepreneurship, private sector engagement and market development (including among marginalised groups).

From short-range to medium-range results:

- MFA programming actively supports wider sector reform and policy strengthening, addressing key barriers, enhancing incentives and improving the viability of clean energy and circular economy solutions in an integrated manner.
- MFA investments in the energy and circular economy transition attract and incentivise additional capital from public and private sources, strengthen financial systems and change perceptions around financial viability among investors.
- MFA programmes piloting innovative clean energy and circular economy technologies, business models and market approaches, are delivered successfully, demonstrate improvements in efficacy and efficiency, and strengthen the value proposition to government, private sector and end users.
- MFA aid instruments promote cooperation and alignment between range of stakeholders (e.g. donors, private sector, philanthropy and civil society), incorporate effective political economy strategies, promote inclusivity, enable learning, and build collective ambition towards the transition.

From inputs/instruments to short-range results:

- Energy and circular economy interventions receive sufficient MFA funding and continue to be deployed at a scale and in a manner likely to facilitate catalytic results over time (in close collaboration with partners).
- MFA programming efforts are strategically targeted across the range of energy transition challenges, including renewable generation, access, energy efficiency, and sustainable supply chains, and incorporate pathways to social and economic outcomes (affordability, employment, business formation).
- MFA policies, guidelines, coordination and capacity support provide project partners and implementers with clarity and the necessary frameworks for efficient implementation and effective and sustainable results, including their monitoring and verification.
- Finnish private sector instruments engage private sector actors (e.g. manufacturers, developers, distributors, investors, service companies) and encourage the adoption of responsible business practices (including UN guiding principles) in order to support the clean energy and circular economy transition.

Source: Evaluation team

Mainstreaming private sector engagement

To comprehensively address private sector results, impact and opportunities in the context of Finland's development cooperation in Environment and Natural Resources, the private sector engagement analysis was mainstreamed throughout the evaluation. In addition to mainstreaming, distinctive supplementary private sector engagement analysis methods were also applied, as summarised in the following paragraphs. These private sector engagement -specific analysis methods were required to specifically provide evidence for the largely formative and future-oriented assessment of Finland's private sector engagement in Environment and Natural Resource Management.

Portfolio review

A review of MFA's portfolio was carried out for two purposes: (i) to delineate the four relevant sub-sectors while gaining a better understanding of their characteristics, such as geographic distribution, channels and instruments; and (ii) to lay the groundwork for establishing the evaluation sample (see 'Desk studies and organising evidence' below). For the first purpose, the evaluation team started by 'cleaning' the data in a spreadsheet received from the Development Evaluation Unit (EVA-11) of MFA on 19 November 2024. The dataset spanned the years 2015 to 2022, covered Finland's exclusive ODA budget administered by the MFA and included 2,746 rows of data, representing 2,124 interventions with unique donor project numbers. The first step involved categorising interventions as either 'in scope' or 'out of scope'. All interventions in the natural resources policy priority area (labelled '4' in the spreadsheet) were included in the scope. As not all interventions had such a number, particularly earlier ones, sector codes were used to classify these. Keyword searches were also used to identify individual interventions for inclusion.

Interventions deemed relevant to the evaluation were further assigned to the sub-sectors, mostly guided by sector codes. Those with an identifiable environment and natural resources (Environment and Natural Resource) focus but not clearly linked to any sub-sector were categorised as 'general'. Interventions with explicit objectives in agriculture or exclusive focus on sanitation and/or hygiene were excluded, as specified in the Terms of Reference. The resulting sub-sector portfolios were reviewed and validated by the sub-sector teams, yielding a final Environment and Natural Resource portfolio comprising 286 interventions. Sub-sector specific portfolios were then extracted and provided to the sub-sector teams to inform their work.

Three constraints were applied to the data for analysis. First, only **commitment data** (*myönnöt*) were used, as they were considered more informative than disbursement data. Second, where interventions had **multiple purposes**, including elements related to other sectors, only the share of resources allocated to one of the Environment and Natural Resource sub-sectors was included in the portfolio. Third, to improve the clarity of graphical presentations of the portfolio's **geographical distribution**, country commitments below EUR 1 million were aggregated under the category of 'Other'. Finally, only ten **delivery channels** were used to characterise the portfolio: Development Funds; Finnish Government and Embassies; International Financial Institutions; Multilateral and Intergovernmental Organisations; Non-Governmental (non-profit) Organisations (NGOs); Private Sector; Recipient Governments; Research and Academic Institutions; United Nations (UN) Agencies; and Other.

Since the portfolio review used a dataset for the years 2015–22, it includes neither the oldest nor the most recent interventions in the time-scope of the evaluation (2010–24). To correct for this, some of these older and younger interventions were included in the moderate and intensive

studies. As interventions initiated in 2023 or later were unlikely to demonstrate measurable results, particularly long-term impacts, their main contribution here was in assessing design relevance. Older interventions presented other challenges, in terms of missing documents and informants, or limited recall of details by knowledge-holders. Even so, these interventions remain relevant for assessing relevance, impact and sustainability and were mostly assessed through existing evaluation evidence and documentary materials.

Since the data received from the MFA covered Finland's exclusive ODA budget, which is administered by the MFA, it excluded Finnfund investments. These investments were, however, considered significant for Finland in the area of Environment and Natural Resources and as a part of the private sector engagement Intensive Study on Finnfund (annexed to the evaluation's synthesis report), a portfolio analysis of Finnfund's investments in the sector was conducted. This was based on data received from Finnfund on 4 April, 2025, which covered their Environment and Natural Resources investments in 2015–2023.

Sampling

A purposive and tiered sampling approach was used to select interventions for moderate and intensive studies, balancing interventions that were mature enough to yield meaningful insights while excluding those too recent to show results and those too distant in time to be effectively analysed. Interventions for moderate and intensive studies were prioritised based on recommendations by the Reference Group and on the interventions' likely ability to provide substantive findings on effectiveness, impact and sustainability, ensuring a focused and methodologically sound assessment. By making it possible to select interventions to ensure balanced coverage of context, instrument and geography, the review allowed the evaluation to proceed with a robust evidence base.

Extensive document analysis

It was agreed with EVA-11 from the outset that the evaluation would rely primarily on secondary data. As there was vast amount of policy papers, evaluation reports and other reports, intervention level documentation, etc., a structured and systematic approach to retaining and storing information was needed. A standard system for consistent collection and organisation of evidence by all evaluators was developed in the inception phase, and further refined in the implementation phase (12 Mar to early Oct 2025). This structured library resource was then available to support Natural Language Processing (see below) as a way to find and organise dispersed references to relevant topics.

Desk studies and organising evidence

A sample of the Energy, Circular Economy and Critical Minerals portfolio was explored through 'moderate' and 'intensive' desk studies. The sample was built based on recommendations by EVA-11 and the Reference Group, and supplemented with other interventions to ensure that all key MFA instruments and channels were covered. The main source of information for each of these past and on-going interventions was the most recent of an annual report, a mid-term review, a final report or a final review. In each moderate study the reviewer searched the key document for

evidence of: (i) achievements; (ii) connections, synergies and policy-relevant effects; (iii) private sector engagement opportunities; and (iv) Finnish added value, and organised the evidence in a project results framework (proforma; Table 7). Additional documents and other sources (such as informants) were also used to the extent that the reviewer felt necessary to capture useful evidence.

Table 7 Structure of the proforma used to organise evidence in moderate studies

Sub-sector; name of intervention:	
Document(s) reviewed:	Reviewer:
Narrative overview: scale and kind; details on location, duration, modality, budget.	
Development/environment achievements.	
Connected interventions, synergistic and policy-relevant effects.	
Finnish private sector engagement opportunities.	
Finnish added value.	
Other observations.	
References.	
Acronyms and abbreviations used in the proforma.	

Source: Inception Report. The proforma was colour coded to aid data compilation.

A small number of interventions were chosen for **intensive** study because of their clear importance for major policy-relevant themes and future priorities in the Environment and Natural Resource policy area. They tended to be complex actions or engaged in complex areas of work, with many implications for policy, practice and partnership, so they needed more thorough investigation than the others in the sample. In these intensive studies, project documents and evaluations provided by MFA were used as a starting point, but multiple interviews with knowledge-holders were also undertaken along with extensive web searches. Evidence obtained from all sources in all intensive studies was organised in a slightly more extensive proforma (Table 8). A library of proformas was accumulated during the evaluation that was used as a reference for analysis and reporting. Table 1 in Chapter 2 lists all completed studies.

Table 8 Structure of the proforma used to organise evidence in intensive desk studies

Sub-sector; name of intervention:	
Document reviewed:	Reviewer:
Narrative overview: scale and kind of the intervention; details on location, duration, modality, budget.	
Development/environment achievements of MFA in target location.	
General achievements resulting from MFA intervention.	
MFA achievements that involved private sector actors.	
Lessons learned from MFA achievements and failures.	
Finnish private sector engagement in Finland or target location.	
Achievements resulting from Finnish private sector engagement.	
Lessons learned from Finnish private sector engagement achievements and failures.	
Opportunities identified for Finnish private sector engagement in future.	
Finnish added value.	
Other observations.	
References.	
Acronyms and abbreviations used in the proforma.	

Source: Evaluation team. The proforma was colour coded to aid data compilation.

Private sector engagement intensive studies

The private sector engagement dimension of the evaluation was further strengthened by additional intensive investigation of four objects which can be classified as development policy investments/ blended finance, Private Sector Instruments or private sector engagement-frameworks. These cut across the four sub-sectors and operate at the level of the full ENR policy area. Focus of the private sector engagement intensive studies, as of all intensive studies in this evaluation, was on the 'higher level' of analysis, i.e. focusing on synergies, modelling and leveraging. The private sector engagement intensive studies are annexed to the evaluation's synthesis report.

Interviews and survey

Interviews helped to correct information gaps and added depth to an understanding of MFA's intervention logic. Their role was to enrich the proformas (especially those compiled for intensive studies), and to provide additional context on partnerships, implementation experience, programming and policy priorities. Approximately 45 semi-structured interviews were conducted: 17 with policy-level stakeholders (including MFA staff and representatives of international financial institutions), 17 with intervention-level actors (implementing partners, fund managers, and local stakeholders), and 11 with private sector knowledge-holders (Finnish companies, investors, and business support organisations). A full list of interviewees with institutional affiliations was submitted to EVA-11, and an anonymised list is given in Annex 4.

Cutting across the sub-sectors, a private sector engagement survey engaged 19 respondents. The first invitation wave for the survey was launched on 21 May 2025, followed by two more invitation waves. The invitation was sent to a total of 212 recipients. By 21 July 2025, the survey received 19 responses. Most of the respondents were private companies, but there was also one association and one public research institution among them. Nearly third of the respondents (32%/6 organisations) were active in water sector, four of them in construction, two in soil and minerals, two in environmental monitoring, and the rest in other industry sectors. A succinct report of the survey's results is annexed to the evaluation's synthesis report.

In-country interviews

In-country consultations in Ukraine adopted a targeted, multi-stakeholder interview approach to capture a comprehensive view of Finland's Energy, Circular Economy and Critical Minerals engagement and its alignment with local priorities, particularly in the context of post-conflict recovery and renewable energy transition. Interviews were conducted both virtually and in-person (where feasible) with a help of a national consultant with a diverse set of stakeholders, including government institutions, local utilities, international organisations, Finnish entities, and private-sector actors involved in or benefiting from Finnish-supported energy projects. Key stakeholders interviewed included government and public sector (e.g. State Agency on Energy Efficiency and Energy Saving (SAEE), development and international finance partners: (e.g. EBRD Eastern Europe Energy Efficiency and Environment Partnership (E5P), NEFCO programme staff), Finnish institutions and implementers (MFA Helsinki desk officers for Eastern Europe, staff from the Finnish Embassy in Kyiv) and private sector and industry. These interviews provided insights into both the achievements and limitations of Finland's support, capturing perspectives on energy access, renewable

energy integration, private-sector engagement, and post-conflict energy rebuilding efforts. Stakeholder input was essential to triangulate evidence from desk review, project reports, and proformas.

Like-minded peer country review

The like-minded peer country review applied a structured and evidence-based methodology to assess Danish Energy Programme (DEP) and compare it with Finland's approach to energy-related development cooperation. The process began with a targeted desk review of DEP documentation, including official programme strategies, country partnership reports, evaluation studies, and thematic publications from the Danish Energy Agency and Danida. This review mapped the DEP's structure, geographic reach, delivery mechanisms, and private sector engagement. In parallel, Finnish development cooperation documentation and recent evaluations were examined to provide a comparative baseline for analysis.

The analysis used a thematic and case study approach, highlighting five key DEP partner countries, Vietnam, South Africa, Ethiopia, Ukraine, and Colombia, chosen to illustrate DEP's range and effectiveness. Programme activities were assessed in terms of strategic alignment, operational design, private sector engagement, and contribution to enabling environments for energy transitions. A comparative lens was applied to identify how Denmark's focus on long-term institutional capacity-building and market shaping contrasts with Finland's finance-driven model, which prioritises project-level investment and risk mitigation.

Triangulation of evidence from programme documents, evaluation findings, and cross-donor comparisons enabled a synthesis of practical lessons. The final analysis emphasises patterns of success, structural differences, and opportunities for Finland to strengthen future programming by combining Denmark's system-oriented advisory model with its own investment-focused approach. This ensures Annex 4 provides clear, policy-relevant insights for enhancing the impact and private sector value of Finnish energy, critical minerals, and circular economy initiatives.

In addition, cutting across the evaluation's four sub-sectors, two like-minded peer country reviews focusing on engaging private sector were included and are annexed to the evaluation synthesis report.

Market analysis

A brief, general-level business and market opportunity analysis was conducted focusing on the markets with specific country-focus covered by the sampled interventions' intensive studies in each sub-sector. It provided information regarding the local context and business environment, demand and competition within the sub-sector, and a description of the Finnish companies' offer relevant to the market demand. Its purpose was to provide evidence and insights with which to support answering EQ 2.1: *What concrete and context-specific opportunities, entry points and models are there for Finland for partnering with Finnish and local companies and economic actors within the sub-sector topic(s) in the next five years?*

The market analysis was based on information gathered as part of the desk review, interviews with representatives of government, business and international organisations from the target location,

as well as interviews and survey with Finnish companies with previous experience or interest in the target markets. In the case of Energy, Circular Economy and Critical Minerals, the market analysis was based on the in-country assessments conducted by the evaluation team's national expert in Ukraine, supplemented and triangulated by desk review. The desk review considered in particular sources such as the Multilateral Development Banks' and the UN's analyses, market location country government reports and key development partners' resources, as well as data and resources from various business-membership organisations and civil society and research organisations.

The market analyses used the following template which indicates the focus of inquiry in the form of its headings:

Summary:
1. Local context and business environment
1.1 Description of the focus area
1.2 Status in the country
1.3 Focus-area development needs and challenges
1.4 General private-sector business environment
2. Demand within the focus area
2.1 Typical client/customer segments
2.2 Scale of demand and 5–10-year outlook
2.3 Regional differences (if any)
3. Competition/Current offering within the focus area
3.1 Key companies active in the sector
3.2 Estimated current market size reached by businesses
4. Finnish companies' offer
5. Conclusions
References/documents reviewed:

Natural Language Processing

Natural Language Processing was used to search through the over 140 evaluation reports provided by EVA-11 in the inception phase to identify and structure content related to the evaluation's sub-sectors. The approach enabled the evaluation team to explore document content efficiently, going beyond keyword searches to understand the broader thematic coverage. All documents were digitally processed to extract usable text content, accounting for the wide variety of formats and layouts. In cases where the text could not be extracted directly (e.g. scanned or stylised PDFs), automated character recognition tools were applied to retrieve the information. The extracted content was cleaned and standardised to ensure it could be analysed consistently across the corpus.

A modern topic modelling technique was used to classify text segments into pre-identified sub-sectors relevant to the evaluation, such as water, energy, biodiversity, and the private sector. This approach is based on advanced language models that can recognise context and meaning in full sentences, not just individual words. This allowed for a more accurate thematic classification of the content. The method was unsupervised, meaning it did not require pre-labelled training data, and was adapted through iterative testing and expert feedback to improve performance. To ensure

reliability, several verification steps were conducted. These included visual checks of common topic terms, targeted reviews of document summaries, and random sampling of sentences to assess thematic consistency. Expert reviewers also participated in validating the topic assignments and refining category definitions where needed. This combination of automated and manual methods helped ensure a balance between coverage and accuracy.

The results were integrated into an interactive dashboard that allowed the evaluation team to filter, combine, and explore document content by sub-sector. This helped identify patterns, gaps, and areas of emphasis across the portfolio. Importantly, the method was used as a tool to structure the information, not as a substitute for expert judgement. It contributed to better targeting desk reviews and provided a basis for further analysis and triangulation. The technique enhanced efficiency in navigating large volumes of text and provided a structured basis for comparison across documents. It offered a better understanding of themes than conventional keyword searches. However, it required significant testing, validation, and expert involvement to ensure interpretability. Some technical limitations related to document formats and overlapping topics remained, and Natural Language Processing was used as a complementary tool rather than a stand-alone evaluation method.

Use of artificial intelligence

Artificial intelligence (AI) has been used in this report as a search too to identify relevant material for wider contextual research beyond the MFA portfolio, including targeted searches to provide comparative insights and background information relevant to the Energy, Circular Economy and Critical Minerals sector. AI tools were also sporadically applied for language support, including proof-reading and enhancing the clarity, coherence, and readability of the text. All sources and outputs generated through AI have been fully reviewed, verified, and adapted by the author, ensuring that the final content reflects accurate analysis, aligns with the evaluation findings, and maintains the author's own judgment and conclusions.

Triangulation

The evaluation synthesised evidence through a structured, multi-source approach to ensure the reliability and depth of findings. A comprehensive desk review formed the foundation, covering programme documents, annual reports, evaluations, and strategic guidance. This was complemented by semi-structured interviews with MFA staff, implementing agencies, Finnish embassies, partner-country stakeholders, and private sector representatives, which provided qualitative insights into both successes and bottlenecks. The proformas were used to organise evidence and systematically analysed to capture reported outputs and outcomes, while like-minded peer country comparisons offered a benchmark for understanding Finland's positioning relative to donor peers, highlighting areas of convergence, differentiation, and potential learning. The evidence was then triangulated and synthesised to ensure that findings and conclusions were grounded in multiple perspectives. Insights from proformas and like-minded peer country comparison were cross-referenced with interview evidence to validate reported results and uncover gaps, while contextual factors were incorporated to explain variations in performance. This layered synthesis enabled the evaluation to integrate quantitative data, qualitative findings, and comparative insights into a coherent narrative.

Limitations

The evaluation was constrained by uneven data availability and the maturity of interventions. While some programmes, such as concessional credit schemes and select multilateral initiatives, had detailed reporting and clear indicators, others lacked consistent monitoring frameworks or comparable outcome data. In particular, results for emerging areas like circular economy and critical minerals were often reported as intermediate outputs rather than measurable long-term impacts.

Attribution posed a significant challenge given Finland's reliance on multi-donor mechanisms and blended finance approaches, where outcomes result from collective efforts. Isolating Finland's specific contribution to systemic changes, such as policy reforms or private sector market creation, was therefore difficult. Evidence on private sector outcomes was also fragmented, with limited tracking of follow-on investments, commercial benefits, or sustained engagement of Finnish firms.

Finally, contextual and external factors influenced both programme performance and the evaluation process. Global market volatility, partner-country policy changes, and unforeseen events like COVID-19 and the war in Ukraine affected data availability, the achievement of results, and the feasibility of on-site validation. As a result, findings should be interpreted with some caution, particularly where they rely on projected or intermediate outcomes rather than fully verified long-term impacts.

Annex 2: Comparable actions by like-minded peer countries

Case study - Danish Energy Programme and Finnish Development Cooperation

This report examines Denmark's international DEP and compares it to Finland's model of development cooperation in supporting energy transitions. It provides an overview of the DEP, describes how DEP engagements are structured on the ground, analyses how Danish core strengths are leveraged, explores Danish private sector involvement, and contrasts the Danish approach with that of Finland (both ODA and non-ODA).

Overview of the Danish Energy Programme (DEP)

DEP is a flagship initiative under Danida (Denmark's development cooperation agency) supporting energy transition in partner countries. It focuses on helping governments integrate renewable energy, improve energy efficiency, and strengthen regulatory frameworks for clean energy investment. It aligns with Denmark's international climate goals and the SDGs (SDG 7 on clean energy and SDG 13 on climate action). The program delivers support through technical assistance, long-term capacity building, and policy dialogue. This is typically done via government-to-government partnerships led by the Danish Energy Agency. By embedding Danish energy experts within partner ministries and agencies, DEP helps countries undertake power sector reforms, adopt renewable integration plans, and create supportive environments for green investment.

The DEP's alignment with the Paris Agreement and Denmark's long-term climate strategy has been reinforced by the DEP 2026 programme, which emphasises just and inclusive transitions, with country-tailored approaches including long-term energy modelling, regulatory reform, and renewable integration. Danish Energy Partnership Programme 2026 explicitly targets strategic country-specific support in five high-emission economies - China, Indonesia, Mexico, South Africa, and Vietnam. Collectively, these cover c.36% of global CO2 emissions, supporting both system transformation and enhanced Nationally Determined Contribution implementation.

Geographic Reach and Recent Developments:

Initially launched in the 2010s, the DEP has expanded to multiple emerging economies. As of 2024, Denmark's Energy Agency was supporting partnerships in 16 countries. Key partner countries include Vietnam, South Africa, Ethiopia, Ukraine, and (since 2021) Colombia. Each partnership is tailored, but all draw on Danish expertise in clean energy systems.

- *Vietnam:* Denmark and Vietnam have cooperated on energy since 2013. The partnership is now in a third phase (2021-2025). The partnership produces biennial Vietnam Energy Outlook Reports to guide policy and has helped Vietnam draft regulations for offshore wind power and grid integration of renewables. Danish input on long-term energy modelling has informed Vietnam's Power Development Plans, while there is collaboration on renewable energy auctions and energy efficiency is ongoing.

- *South Africa:* Cooperation with South Africa began in 2011. DEP assistance has focussed on integrated energy planning, renewable integration, and a Just Energy Transition. Danish advisers worked with South Africa's Department of Energy to incorporate wind and solar into its electricity mix (historically coal-dependent) while ensuring energy security. The focus on just transition emphasises retraining and new jobs in green industries so that South Africa's shift away from coal is socially equitable. Denmark has supported South Africa's wind resource mapping and grid stability measures. A Danish energy advisor is embedded at the South African energy ministry and another at the utility Eskom to provide on-the-ground expertise.

- *Ethiopia:* Denmark and Ethiopia have cooperated since 2016 on diversifying Ethiopia's renewable energy mix and expanding electricity access. An initial Advancing Wind Power project (2017–2022) and a Strategic Sector Cooperation (2020–2023) led to significant capacity building in energy modelling. In July 2023 a new five-year Danish-Ethiopian Energy Partnership was launched. This program focuses on national energy planning and modelling, development of Ethiopia's substantial wind potential, and integration of solar and wind into the grid. Denmark's transmission system operator, Energinet, is advising Ethiopia's grid operator to ensure stability as more renewables come online. The partnership involves Ethiopia's Ministry of Energy and utilities alongside the Danish Energy Agency and Embassy and will last until 2028. Early results include Ethiopia adopting improved energy data management tools and drafting feed-in tariff regulations for wind power with Danish guidance.

- *Ukraine:* Since the mid-2010s, Denmark has supported Ukraine's energy sector transformation, originally via the Ukraine-Denmark Energy Centre. Despite the challenging context of conflict since 2022, the Ukraine-Denmark Energy Partnership Programme remains active. In April 2025, at the sixth Ukraine-Denmark Energy Partnership Programme steering meeting in Kyiv, Ukrainian and Danish officials noted several tangible outcomes: an energy technology catalogue (to help rebuild and modernise the power system after wartime damage), detailed recommendations to reform Ukraine's district heating sector (introducing EU 'energy efficiency first' principles and cost-reflective tariffs), and a white paper for a new decarbonisation fund and industrial emissions agreements. The Danish Energy Agency also helped Ukrainian partners develop renewable energy auction schemes and improve grid codes prior to the war. Denmark was the first country to contribute to the Energy Community's Ukraine Energy Support Fund for emergency repairs.

- *Colombia:* In 2021, Denmark expanded the DEP to new countries through a Danish Energy Transition Initiative. Colombia became a partner under this initiative, reflecting its growing clean energy ambitions. Danish-Colombian cooperation focuses on developing an offshore wind energy framework (building on Denmark's global leadership in offshore wind) and on sustainable, long-term energy planning in Colombia. Starting from a Memorandum of Understanding in 2021, Danish experts have been advising Colombia's energy ministry on mapping offshore wind resources and drafting

regulations for offshore project licensing. This support comes as Colombia seeks to diversify beyond hydropower and meet rising demand with renewables. The partnership also addresses energy efficiency policies. Though still in early stages, Colombia's engagement with DEP illustrates Denmark's expanding reach to upper-middle-income countries poised for green transitions.

Across these partnerships, the DEP model has achieved notable results. Danish-supported energy outlook models and plans have been formally adopted in countries like Vietnam and Mexico, setting more ambitious renewable energy targets. New regulations influenced by Danish advice (e.g. auction rules for independent power producers in Vietnam and Ukraine, wind farm grid connection codes in South Africa) have unlocked private investment in clean energy. Partner countries have piloted Danish-type solutions: for example, district heating modernisation in Ukraine and energy-efficient district cooling pilots in India, both drawing on Denmark's century of experience in efficient thermal networks. Through peer learning, study tours, and demonstration projects, Denmark's program has helped facilitate first-of-a-kind projects such as the first onshore wind farms in Ethiopia and integrated renewable energy zones in South Africa.

Structure of DEP In-Country Engagement

Each DEP partnership is structured around in-country engagement that ensures alignment with the host nation's priorities while bringing Danish know-how directly into local institutions. By anchoring support within national institutions and fostering long-term trust through embedded advisors, Denmark helps countries become 'choice-aware' which is a critical trait for sustainable systems transformation, according to the 2021 Mitigation Evaluation.

The engagement typically begins with a formal government-to-government agreement (often an Memorandum of Understanding or framework agreement between the Danish Energy Agency and the partner country's energy ministry) that defines joint objectives and a governance setup. A Steering Committee co-chaired by senior officials from both sides oversees the cooperation, meeting regularly to review progress. For example, in Brazil's energy partnership under DEP, the steering committee is co-chaired by Brazil's Energy Ministry Undersecretary and the Danish Ambassador, ensuring high-level commitment and joint decision-making. Similar bilateral governance arrangements exist in Vietnam, South Africa, and other DEP countries.

Recent Danish Energy Partnership Programme documentation highlights increasing emphasis on subnational engagement, participatory scenario development, and transparency in energy planning.

At the operational level, DEP utilises a mix of technical cooperation formats:

- *Embedded Advisers:* Denmark posts long-term energy advisers in partner institutions. Typically, an adviser from the Danish Energy Agency (or another relevant authority) is stationed in the energy ministry or related agency of the partner country. For instance, one Danish energy adviser is based in Pretoria (South Africa's Department of Mineral Resources and Energy) and another inside Eskom (the South African utility), acting as liaisons and on-site experts. Likewise, advisors have been embedded in Vietnam's Ministry of Industry and Trade and Mexico's energy planning unit, among others. These long-term advisors (often on multi-year postings) work side by side with local officials on planning, policy, and project tasks, effectively transferring skills and facilitating continuous dialogue.

- *Short-Term Expert Missions:* Specialised Danish experts are deployed for defined tasks – e.g. to help draft a grid code, conduct a wind resource assessment, or train staff on an energy model. DEP draws on experts from the Danish Energy Agency, Energinet (Denmark's Transmission System Operator), universities, and consultancies for these missions. In Ethiopia, for example, Danish wind engineers conducted short-term missions to design a 'technology catalogue' and advise on wind farm permitting processes. These inputs address technical gaps and produce concrete outputs (like studies, software tools, draft regulations).
- *Capacity Building and Peer Learning:* A core part of engagement is building local capacity through workshops, training courses, study tours, and peer exchanges. DEP frequently organises training on Denmark's energy planning tools – for instance, hands-on courses in using Balmorel (a Danish-developed power system model) for Ethiopian and Indonesian planners, or workshops on offshore wind tender design for Vietnamese officials. Partner delegations often visit Denmark to see Danish energy infrastructure (offshore wind farms, district heating plants, smart grids) and learn from Danish regulators. This peer-to-peer learning fosters institutional change; as an example, Ukrainian regulators learned from Danish counterparts about competitive electricity market reforms, which informed Ukraine's own market liberalisation roadmap.
- *Pilot Projects and Demonstrations:* While DEP is not primarily a financing vehicle, it facilitates pilot projects to test and showcase solutions. Modest grants or technical studies under DEP have helped initiate pilot solar photovoltaic mini-grids in Ethiopia and building energy efficiency retrofits in Vietnam's public buildings. These pilots are usually co-financed with local or other donor funds, and Danish companies often contribute technology or expertise. The pilots serve as proof-of-concept, demonstrating the viability of innovations (such as integrating rooftop solar on factories or converting a city block to district cooling) in the local context, thereby encouraging scale-up by larger investors.

In-country engagement is designed to be adaptive and evolving. DEP programs often start with a focus on planning and policy frameworks; over time, as local capacity grows and new needs emerge, the cooperation may extend into implementation support or new sub-sectors. For example, in Vietnam, early phases (from 2013) emphasised national energy scenario modelling and strategy advice. In later phases, as Vietnam's needs evolved, the partnership incorporated newer areas like offshore wind regulatory development and energy efficiency enforcement. Similarly, in Kenya, an initial focus on integrating wind power expanded to include electrification planning and eventually green hydrogen collaboration as Kenya's ambitions grew. This flexibility is built into DEP's design – the steering committees can adjust annual work plans, and new components (or even new partner institutions) can be added to respond to changing circumstances (such as post-COVID green recovery or, in Ukraine's case, wartime energy system repairs). Regular monitoring and mid-term reviews help to assess progress and recalibrate the cooperation if needed.

Institutionally, DEP engagements are based around a whole-of-Danish government approach. The Danish Ministry of Foreign Affairs (Danida) funds the program and coordinates with the Ministry of Climate, Energy and Utilities, under which the Danish Energy Agency operates. The Danish Energy Agency's Centre for Global Cooperation manages the technical work, often in partnership with other Danish entities (like Energinet for grid issues or the Danish Utility Regulator for market design). Danish embassies in partner countries also play a key role: many have a Sector Counsellor for energy (a diplomat with technical expertise) who helps link the Danish Energy Partnership activities with diplomatic and trade efforts. This arrangement provides coherence between

development assistance and Denmark's broader bilateral relationship. It also means Danish Energy Partnership is not an isolated donor project but part of a strategic partnership framework, which increases its influence and sustainability.

Leveraging Danish Strengths in Energy Transition

A defining feature of the Danish Energy Partnership is how it leverages Denmark's unique strengths in the energy sector to benefit partner countries. Denmark is internationally recognised as a green energy frontrunner, and Danish Energy Partnership serves as a vehicle to transfer Danish expertise, models, and technologies in key areas:

- *Energy System Integration:* Denmark has over 50 years of experience managing an electricity grid with large shares of variable wind power while maintaining reliability. This expertise in integrated energy system planning informs Danish Energy Partnership assistance. Danish advisers help partners develop long-term energy scenarios that balance renewables, base-load power, and grid stability. For example, in Ethiopia, Danish support introduced sophisticated power system modelling to plan a diversified generation mix beyond hydropower, ensuring stability even as wind and solar are added. The Danish Transmission System Operator (Energinet) is directly sharing operational best practices with Ethiopia's grid operator to improve load management and contingency response. Likewise, Denmark has guided grid code updates in countries like Vietnam and Indonesia to enable higher penetration of wind and solar without blackouts. This systems knowledge – from deploying large-scale wind farms to fine-tuning grid frequency regulation – is a key Danish strength that Danish Energy Partnership deploys for partner benefit.
- *Offshore Wind Expertise:* Denmark built the world's first offshore wind farm and remains a leader in offshore wind deployment and policy. Through Danish Energy Partnership, Denmark actively shares this offshore wind know-how. For instance, the partnership with Vietnam devotes significant effort to helping Vietnam unlock its vast offshore wind potential. Danish experts assisted Vietnam in mapping wind resources, setting up wind measuring masts, and creating 'one-stop-shop' permitting processes for offshore projects. They advised on Vietnam's Offshore Wind Strategy and grid connection rules so that future offshore farms can improve system reliability. In Colombia, cooperation focusses on building Colombia's offshore wind capacity from the ground up, drawing on Danish models for maritime spatial planning, investor tender design, and environmental regulation. Danish experience (both successes and lessons learned) in offshore wind deployment, including stakeholder consultations and supply chain development, are transferred, helping avoid challenges that Denmark has already faced.
- *District Energy and Energy Efficiency:* Denmark has pioneered district heating and cooling systems and energy-efficient urban design. Danish Energy Partnership leverages this by integrating Danish expertise on thermal energy systems into urban energy planning components of the partnerships. For example, Danish specialists have worked with Ukrainian authorities on modernizing district heating networks, providing input on technology upgrades and tariff reforms to make heating more efficient and financially sustainable. A Danish-funded analysis in 2024 proposed updates to Ukraine's heat sector law to incorporate the EU's 'energy efficiency first' principle and

enable investments in modern combined heat and power plants. In China, the Danish Energy Partnership collaboration included demonstration of Danish district cooling in a pilot zone, which helped inform China's national guidelines for urban cooling systems. Additionally, energy efficiency is a cross-cutting focus. Denmark's success with highly efficient buildings and industries is shared via audits and standards development. Danish Energy Partnership-supported projects have introduced Danish approaches like near-zero-energy building codes in Vietnam and efficient appliance standards in Ghana. By building capacity in these areas, Danish Energy Partnership helps countries curb energy waste and reduce peak demand, often at low cost.

- *Renewables Integration & Regulatory Design:* A major strength Denmark brings is its progressive energy regulatory framework, from independent regulators to competitive power markets, which has enabled renewable energy integration and private investment. Through Danish Energy Partnership, Danish regulatory experts advise partners on designing transparent tariff systems, renewable energy auctions, and market rules that attract investment while protecting consumers. For instance, Vietnam's partnership included crafting an auction mechanism for utility-scale solar and wind, replacing feed-in tariffs, with Danish input ensuring bankable Power Purchase Agreements and grid priority for renewables. In Ukraine, Danish advisors (alongside EU partners) supported electricity market liberalisation and establishing an independent energy regulator, contributing to a shift from a Soviet-style single-buyer model to a competitive market by 2019. Denmark's own experience of unbundling power utilities and incentivising cogeneration provides a model for such reforms. Moreover, Danish involvement in institutional capacity-building means partner institutions (ministries, regulators, system operators) become more capable of managing the transition. For example, the Danish Energy Agency's long-term advisory in Indonesia led to the creation of an Energy Modelling Unit in the Indonesian government that now produces the country's official energy outlooks annually, instilling a culture of evidence-based policy like Denmark's.

- *Whole-of-Government Climate Policy and Institutional Coordination:* Denmark's energy transition success has also been about cross-ministerial coordination and public engagement. Danish Energy Partnership attempts to transfer this 'soft' knowledge too. Partners learn from Denmark's approaches to inter-agency energy planning (e.g. Denmark's Climate Law and Climate Council model). Through policy dialogue activities under Danish Energy Partnership, Danish officials share how Denmark engages stakeholders (municipalities, industry, civil society) in energy decisions, and how it aligns local action with national targets. For instance, South Africa's partnership has included dialogues on just transition governance, where Danish representatives described Denmark's tripartite agreements with labour and industry during its coal-to-wind transition.

An independent evaluation (2021) rated Danish Energy Partnership interventions in countries like Ethiopia and Vietnam as having high design quality and strong anticipated mitigation effectiveness due to their alignment with national policies and strategic institutional cooperation. However, the evaluation noted capacity gaps in institutional skills assessments and recommended embedding capacity planning and tracking more systematically into Danish Energy Partnership's future cycles.

By leveraging national strengths, Danish Energy Partnership ensures that assistance is not generic but derives from real capacity and credibility. Partner countries value government-to-government cooperation. The Danish Energy Partnership both acts as a channel for expertise and also reinforces Denmark's international role as a leader in climate and energy. This is a form of 'green diplomacy' where technical collaboration boosts Denmark's soft power.

Role of the Danish Private Sector in Danish Energy Partnership

Private sector engagement is a core component of the Danish Energy Partnership model, ensuring that Danish companies both contribute to and benefit from the partnerships. Denmark explicitly views green commercial opportunities and development cooperation as mutually reinforcing goals. In practice, Danish Energy Partnership integrates the Danish private sector in several ways:

- *Creating Enabling Markets:* One of Danish Energy Partnership's primary impacts is improving the investment climate in partner countries' energy sectors, which in turn creates markets for renewable energy developers and technology providers, including Danish firms. For example, Danish Energy Partnership-supported policy reforms in Vietnam and Ukraine introduced competitive renewable energy procurement (e.g. auctions) and modern grid codes, which paved the way for Danish companies such as Vestas and Ørsted to enter these markets. In Vietnam, after Denmark helped design transparent auction rules and long-term power purchase agreements for wind power, Vestas rapidly expanded its local presence and has supplied turbines for projects totalling over 1,400 MW. Ørsted likewise began exploring offshore wind project opportunities along Vietnam's coast as soon as the regulatory framework was developed with Danish support. In Ukraine, the advisory on integrating renewables resulted in grid upgrades and market rules that enabled independent power producers. For example, by 2019 Vestas turbines were installed in Ukraine's largest wind farm, a project facilitated by the improved policy environment.
- *Public-Private Partnerships and Demonstrations:* Danish Energy Partnership often involves Danish firms in on-ground activities like pilot projects, technical studies, and exchange visits. Danish engineering consultancies (e.g. Ramboll, COWI, Ea Energianalyse) have won contracts under Danish Energy Partnership to deliver technical analysis, showcasing their expertise and building relationships. For instance, under the South Africa partnership, Danish consultants contributed to grid integration studies and wind energy planning for South Africa's Integrated Resource Plan. This not only addressed local needs but also positioned those firms for future consulting work as South Africa's renewable program expanded. Similarly, technology providers like Danfoss (in efficient cooling) or Kamstrup (in smart metering) have been invited to demonstration workshops or pilot implementations orchestrated by Danish Energy Partnership. In Ethiopia, a Danish Energy Partnership pilot introduced smart meters in a section of Addis Ababa's grid, using Kamstrup equipment, which proved the concept of reducing losses and has led the utility to consider larger procurements, with Kamstrup now a recognised brand in that market.
- *Matchmaking and Networking:* Danish Energy Partnership facilitates linkages between Danish companies and local stakeholders. This happens through business forums, trade delegations dovetailed with Danish Energy Partnership events, and sector-specific matchmaking. For example, during a Danish Energy Partnership-supported wind energy seminar in Hanoi, Vietnamese provincial officials developing wind projects met Danish turbine suppliers and service companies, leading to several Memorandum of Understandings. Danish embassies, with Trade Council staff, often use Danish Energy Partnership milestones (e.g. an energy outlook report launch or new policy announcement) to organise networking receptions or site visits that include Danish firms. Such access gives Danish companies early information on upcoming projects and tenders.

In Colombia, as Denmark helped craft the offshore wind roadmap, Danish offshore wind firms were kept informed of the pipeline and even contributed feedback – effectively giving them a first-mover advantage once Colombia tenders its first offshore wind blocks.

- *Indirect Market Shaping:* Beyond direct involvement, Danish Energy Partnership's long-term capacity building and regulatory support indirectly benefit Danish industry by promoting standards and solutions aligned with Denmark's offer. For instance, Denmark's promotion of district energy and smart grid approaches in partner cities often aligns with Danish products and strengths. (e.g. Grundfos's efficient pumps for district heating networks, or ABB (partly) Danish grid control systems). When a partner country adopts Danish-informed regulations for energy-efficient water utilities or waste-to-energy, it creates demand for the types of equipment and services that Danish firms supply. Denmark's insistence on transparent, non-discriminatory procurement in partner countries benefits all investors but especially helps level the playing field for foreign entrants like Danish companies.

In summary, Danish Energy Partnership's incorporation of the private sector is based around a 'create markets and then connect suppliers' model. By helping partner countries establish the policies and confidence needed for clean energy investment, it unlocks opportunities which Danish (and other international or local) companies can then pursue. The Danish government actively tracks these commercial outcomes: Danish exports of energy technology to Danish Energy Partnership partner countries have grown steadily, and some partnerships report a direct increase in contracts won by Danish firms following Danish Energy Partnership interventions.

Comparison: Denmark's Danish Energy Partnership vs. Finland's Energy Cooperation Model

Denmark and Finland are closely aligned in their strategic ambition to facilitate sustainable energy transitions in developing countries and simultaneously support their national green-tech sectors. Both emphasise leveraging national strengths. Denmark through technical assistance and Finland through financial investments and smaller scale private sector support both promote renewable energy deployment. However, their delivery mechanisms diverge significantly: Denmark primarily exports its expertise model, embedding government experts directly into partner-country institutions to advise on policy frameworks, energy planning, and regulatory reforms. Finland, conversely, focuses more heavily on investments like renewable power plants through multilateral collaborations or private sector partnerships. Finland's bilateral approach (e.g. through EEPs) has declined over time.

The Danish Energy Partnership model adds distinctive value to Denmark's international energy offer by directly shaping systemic conditions that underpin sustainable energy markets. Danish Energy Partnership's intensive policy advisory, institutional capacity-building, and regulatory assistance help create robust enabling environments, supporting long-term market stability and predictable investment conditions. In practical terms, Danish Energy Partnership's bilateral technical cooperation, such as Denmark's support for Vietnam's wind-power integration into its national grid code, builds foundational capacity that attracts broader energy-sector investment. Finland's model, by contrast, achieves impact primarily through the deployment of capital and financing specific projects, yielding immediate and measurable outcomes, yet without Denmark's depth of systemic institutional reform.

The Danish Energy Partnership model significantly enhances Denmark's domestic industry engagement by laying essential groundwork for subsequent Danish investments. By shaping energy policies, regulatory frameworks, and procurement processes in partner countries, Danish Energy Partnership systematically lowers barriers and market-entry risks for Danish firms while bringing them into early investment discussions. For instance, Denmark's policy advice and technical assistance in developing offshore wind frameworks in countries such as India or Vietnam create clear market demand and regulatory certainty, thereby directly benefiting Danish turbine manufacturers or project developers. Unlike Finland's financing-focused approach, Denmark's Danish Energy Partnership actively ensures a favourable investment climate tailored specifically to Danish technical expertise and industry strengths, translating strategic advisory interventions into tangible commercial opportunities for Danish companies.

Conclusion

Danish Energy Partnership demonstrates how a focused bilateral partnership model can drive systemic changes in developing countries' energy sectors. Through long-term engagement, technical assistance, and by sharing Denmark's world-class expertise in wind energy, energy efficiency, and grid management, the Danish Energy Partnership helps partner nations lay the policy and institutional groundwork for a green transition. This has been illustrated in countries like Vietnam, South Africa, Ethiopia, Ukraine, and Colombia, where Danish-supported plans and reforms have catalysed renewable energy growth and improved energy governance. Crucially, the Danish Energy Partnership also aligns with Denmark's interests by indirectly creating opportunities for Danish businesses, showing that climate cooperation can be a win-win for development and domestic industry.

Finland's approach, while rooted in the same climate and development objectives, has a different path - development finance and investment. By deploying capital through Finnfund and similar instruments, Finland directly supports the realisation of clean energy projects and leverages private sector solutions. This model has enabled concrete outcomes like major renewable energy installations and support for green entrepreneurs, and it provides Finnish companies with backing to expand abroad. However, it operates more at the level of individual projects and companies, with less emphasis on shaping partner countries' overall energy policies.

These approaches offer valuable insights. Denmark's Danish Energy Partnership model highlights the importance of capacity building and enabling environments as without sound plans and institutions, investments may not materialise or be sustainable. Finland's model highlights the need for financing and risk mitigation as without capital, plans cannot be implemented. A holistic strategy needs to incorporate elements of both approaches. Technical cooperation programs like Danish Energy Partnership can prepare the ground for investment, ensuring there are pipelines of bankable projects and robust policies, while development finance can then funding these projects and scale up technologies.

Annex 3: Market analysis, including potential Finnish companies in the sub-sector

This market analysis reviews the status of Ukraine's energy sector (including power-generation capacity and the role of renewables, waste-to-energy developments, and smart-energy systems) and demand for the provision of Finnish companies' solutions.

1. LOCAL CONTEXT AND BUSINESS ENVIRONMENT	
1.1 Description of the focus area	• Ukraine's energy system undergoing wartime recovery and structural modernisation toward EU-aligned, efficient, low-carbon, and decentralised supply. • New building requirements for nearly zero-energy buildings (nZEB) have come into effect, setting higher energy efficiency standards for new constructions.
1.2 Status in Ukraine	• Market unbundled; state-owned Ukrenergo operates transmission; Suppliers act under market rules; EU Energy Community integration ongoing. • Current electricity demand: Pre-war electricity demand (2021) comprised some 150–160 TWh/year, in 2022 it dropped by 30–40% due to industrial shutdowns and damage to infrastructure caused by the Russian invasion. Partial rebound in consumption took place in 2023-2024 as some industrial activity resumed. Still, generation capacity remained impaired due to repeated attacks on power infrastructure. • Current natural gas demand: The gas demand had fluctuated at 30–32 bcm/year, decreasing by a third in 2023. Today, Ukraine remains reliant on domestic production for approximately 70% of its needs but still imports gas, mainly from EU countries, since 2015 having no direct imports from Russia. • Current heating and district energy demand: Systems suffered large-scale damage, especially in eastern and southern cities, creating high demand for decentralised, resilient heating solutions (biomass, electric heat pumps, etc.). • Over the next 3-5 years, demand is set to be driven by ~12–13 GW of new renewables (many ≤10 MW) backed by pilot auctions and EU-aligned policy; investment needs signal strong uptake (≈USD 20 billion for renewables; ≈EUR 13 billion for residential efficiency by 2030 with only ~4% funded). Consumer-side smart energy is small but growing (~USD 15 m by 2028, ~9.3% CAGR) despite wartime headwinds.
1.3 Focus-area development needs and challenges	• Rapid repairs ('winterisation'), balancing capacity and storage, renewable energy sources integration, and grid digitalisation. • Address outdated building stock and industrial energy management. • Manage security risks, financing barriers, lengthy permitting/procurement, and skills shortages.
1.4 General private-sector business environment	• **Energy Strategy** to 2050 indicates about USD 383 billion of opportunities (clean energy, grid, efficiency) • **Recent laws** aim to align Ukraine's energy market with European standards, promoting transparency and competition. • **Risks:** political/operational uncertainty from war, governance issues, dispute resolution delays.

2. DEMAND WITHIN THE FOCUS AREA	
2.1 Typical client/ customer segments	• **Energy consumers:** households (incl. rooftop solar/batteries/heat pumps); commercial and industrial sites; public sector and municipalities (hospitals, schools, DH); military and civil defence seeking resilient power. • **Energy facilities and sectoral stakeholders:** Independent Power Producers and utilities; developers/investors; NGOs/donors/development banks facilitating resilient/ green projects, e.g. EU, EBRD, World Bank, United States Agency for International Development, and others funding reconstruction and green transition.
2.2 Scale of demand and 5–10-year outlook	• **Electricity:** return toward ~150 TWh in 2025–2030, and 170–180 TWh by 2030–2035 with electrification. • **Natural gas:** approximately 20 bcm and declining by 2030, and 15–18 bcm by 2035. • **Heat:** rising demand for decentralised renewable heat, shifting to low-carbon systems. • **Renewables targets:** 24 GW installed by 2030 (12.2 GW solar, 6.1 GW onshore wind, 4.7 GW hydro, 876 MW bio, 40 MW geothermal, 100 MW offshore), and overall ~27% RES in final energy by 2030. Auctions to scale build-out.
2.3 Regional differences[7] (if any)	• **East/Southeast** (e.g. Dnipropetrovsk, Donetsk, Zaporizhzhia): historically high industrial demand; wartime decline. • **West** (e.g. Lviv, Ivano-Frankivsk, Ternopil, Vinnytsia): comparatively higher efficiency uptake, modernisation projects. • **Urban centres** (Kyiv, Lviv, Kharkiv): more advanced infrastructure (smart metering, DH); many rural areas rely on inefficient individual heating. • **South** (Odesa, Mykolaiv, Kherson): strong solar/wind potential but damaged infrastructure.

3. COMPETITION/CURRENT OFFERING WITHIN THE FOCUS AREA	
3.1 Key companies active in the sector	• **Utilities/Generation:** DTEK and DTEK Renewables; Energoatom; Ukrhydroenergo; Ukrenergo (TSO). • **Renewables and bioenergy:** MHP Eco Energy; Pro-Energy; Energy Perspective LLC; Alteco Group. • **Equipment/industry:** Turboatom. • **Associations/initiatives:** European-Ukrainian Energy Agency; Renewable Energy Agency; Energy Act for Ukraine Foundation.
3.2 Estimated current market size reached by businesses	• **Policy and targets:** The Draft National Energy and Climate Plan (2024) sets a 65% cut in greenhouse gas emissions by 2030 (from 1990 levels), climate-neutral energy by 2050, and at least 25%renewable energy by 2030. An August 2024 plan adds 24 gigawatts of renewable capacity by 2030, requiring about USD 20 billion in investment, with a push for wind power and green hydrogen. • **Market activity and rooftop solar:** Businesses added about 850 MW of new solar in 2024. Rooftop solar potential is estimated at roughly 238.8 GW. • **Grid modernisation and storage:** Since synchronising with the European grid in 2022, Ukraine has expanded smart grids, microgrids, and smart meters. Targets include about 2 GW of new peak-covering capacity and around 500 MW of storage in 2025. A January 2025 law eases connections for renewable energy and defines microgrids and demand response. Major investments include DTEK's EUR 2.4 billion programme in the Kyiv region, a EUR 100 million EU grant for transmission upgrades, an EUR 11 million digital substation, and roughly 200 MW of advanced storage.

7 Further information about regional differences in energy sector development can be found from the Energy Map (https://map.ua-energy.org/en/resources/?page=1). The online resource provides data on energy production, market dynamics, infrastructure, and renewable energy projects across Ukraine.

3. COMPETITION/CURRENT OFFERING WITHIN THE FOCUS AREA	
3.2 Estimated current market size reached by businesses	• **Waste to energy and circular shift:** Ukraine generates about 11 to 13 million tonnes of municipal waste each year, landfilling 93-95% and recycling only 5–7%. The only waste-to-energy plant is outdated. Donor-backed plans in cities such as Lviv and Dnipro aim to expand recycling, biogas through anaerobic digestion, and modern energy recovery. • **Dedicated financing windows:** The UNDP launched a Decarbonisation Fund in 2024 to lend about USD 23 million to municipalities and businesses for energy efficiency and renewable energy. The UNDP Green Energy Recovery Programme (around USD 270 million) supports continuous operation of critical energy infrastructure and accelerates decentralised green generation. • **Multilateral and bilateral commitments:** The EBRD has committed EUR 3 billion for energy-sector reconstruction. The Ukraine Energy Support Fund has secured more than EUR 1.2 billion in grants from international donors and the EU. The United Kingdom's Innovate Ukraine programme provides 16 million pound sterling for green-energy innovation.

4. FINNISH COMPANIES' OFFER	
Finnish companies that can provide products and services that are in high demand in Ukraine	• **AFRY** – a Finnish consulting and engineering company, is focusing on underground civil shelters and energy management solutions. The company aims to leverage its expertise to support Ukraine's energy sector transformation. AFRY has an office in Kiev. • **Imatran Lämpö** – district heating company, has partnered with Ukraine's Vinnitsyamiskteploenergo in a twinning project to enhance digitalisation in maintenance functions and fuel procurement. The project involves implementing KPA Unicon's cloud-based digitalisation software to improve the efficiency of district heating operations in Vinnytsia. • **Sweco Finland** – supported by Finnpartnership, is spearheading the sustainable reconstruction of industrial parks across Ukraine. The initiative aims to develop over 100 parks in alignment with EU green transition goals, emphasizing digital design, circular economy practices, and resource efficiency. The international Sweco has been actively engaged in Ukraine's reconstruction efforts for over three decades, focusing on sustainable infrastructure development. It constructed housing for Internally Displaced Persons in six western Ukrainian cities, including Chernivtsi, Dubno, and Lviv. assisted in reconstructing the city's drinking water system to benefit approximately 220,000 residents. In the Mykolaiv and Odesa regions, Sweco is advising on projects to secure drinking water and modernise wastewater treatment systems. • **VTT Technical Research Centre of Finland**[8] – involved in supporting Ukraine through initiatives like the #ScienceForUkraine program, which offers training and job opportunities for Ukrainian nationals in research and technology. Additionally, VTT collaborates on projects aimed at rebuilding Ukraine's infrastructure and enhancing its energy solutions. • **Wärtsilä** – specialising in energy solutions, is actively participating in the projects aimed at modernising thermal power plants and enhancing energy efficiency across the country.

8 While VTT is state-owned and fulfils a public research mandate, it actively sells services to industry and commercialises research (licensing, spin-offs), i.e. it engages in clear commercial activities alongside public research.

4. FINNISH COMPANIES' OFFER

Finnish companies that can provide products and services that are in high demand in Ukraine	**Additional Finnish-linked activities via FUTF**[9] • AX-Process Ltd (now part of A-Insinöörit) has experience in DH Hydraulic Modelling in Ternopil. • Climate Wedge Oy has prepared a business plan for the Green Investment Fund of Ukraine. • Deep Scan Tech Oy has measured landfill gases at Melitopol landfill. • Doranova Oy has worked with landfill gas in Melitopol. • Elemenco Oy provided construction modules for a school in Kherson. • Fenno Caledonian Oy has prepared a feasibility study for a geothermal heat site in Dolyna. • Gebwell Oy has had projects on hot water supply and geothermal heat pumps. • Granlund Oy designed a diagnostic laboratory building in Volyn, but the building construction was not completed during the project. • Indufor Oy has prepared biochar studies and business models for the National University of Life and Environmental Sciences. • New Bike Oy has provided procurement expertise to FUTF. • Planora Oy has worked with district heating in Vyshneve. • Ramboll Finland Oy has worked with biogas in Rada.

5. CONCLUSION: Ukraine's energy sector has substantial modernisation and efficiency needs alongside strong renewable and decentralisation momentum. Financing is available from multiple sources. Finnish firms already have a foothold and tailored instruments exist to scale participation, tempered by conflict-related and governance risks.

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На київському сміттєспалювальному заводі «Енергія» продовжують проєкт хімводоочищення, що дозволить підвищити екологічність роботи заводу. (2024). https://kyivcity.gov.ua/news/na_kivskomu_smittyespalyuvalnomu_zavodi_energiya_prodovzhuyut_proyekt_khimvodoochischennya_scho_dozvolit_pidvischiti_ekologichnist_roboti_zavodu/

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Annex 4: List of institutions consulted.

ORGANISATION/UNIT	NUMBER OF INFORMANTS
African Development Bank - Africa Circular Economy Facility	2
Africa Circular	1
Centre for Resource-Efficient and Cleaner Production, Ukraine	1
Chortkiv Municipality, Ukraine	1
Coca-Cola Foundation	1
EastCham Finland	2
EBRD	1
Ecoaction Ukraine	1
EEP Africa	1
Embassy of Finland, Hanoi	2
Embassy of Finland, South Africa	1
Embassy of Finland, Washington D.C.	1
Finnfund	1
Finnpartnership	1
International Finance Corporation	1
Impact Hub / AfriCircular Innovators Programme	1
Independent / Former Finpro	1
MFA - Asia and Oceania	1
MFA - Department for Development Policy/Climate and Environmental Diplomacy Unit	2
MFA - Department for International Trade	1
MFA - Department for Development Policy/Unit for Development Finance and Private Sector Cooperation	3

ORGANISATION/UNIT	NUMBER OF INFORMANTS
MFA - Department for Africa, the Middle East and Latin America/Unit for Eastern and Southern Africa	1
MFA - Euro-Atlantic Department/Unit for Eastern Europe	2
NEFCO (Ukraine)	1
Nordic Climate Facility	1
Nordic Development Fund	1
Sitra	1
State Agency for Energy Efficiency (SAEE) Ukraine	1
World Wide Fund for Nature (WWF)	1

PRIVATE SECTOR COMPANIES[10]	NUMBER OF INFORMANTS
Circulate Capital	4
IC-Consulenten LLC	1
INTEGRITES CO Ukraine	1
Vaisala	2
Wärtsilä	1

10 Private sector companies (19) who participated in the survey, did so anonymously, therefore, they are not included in this list.

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