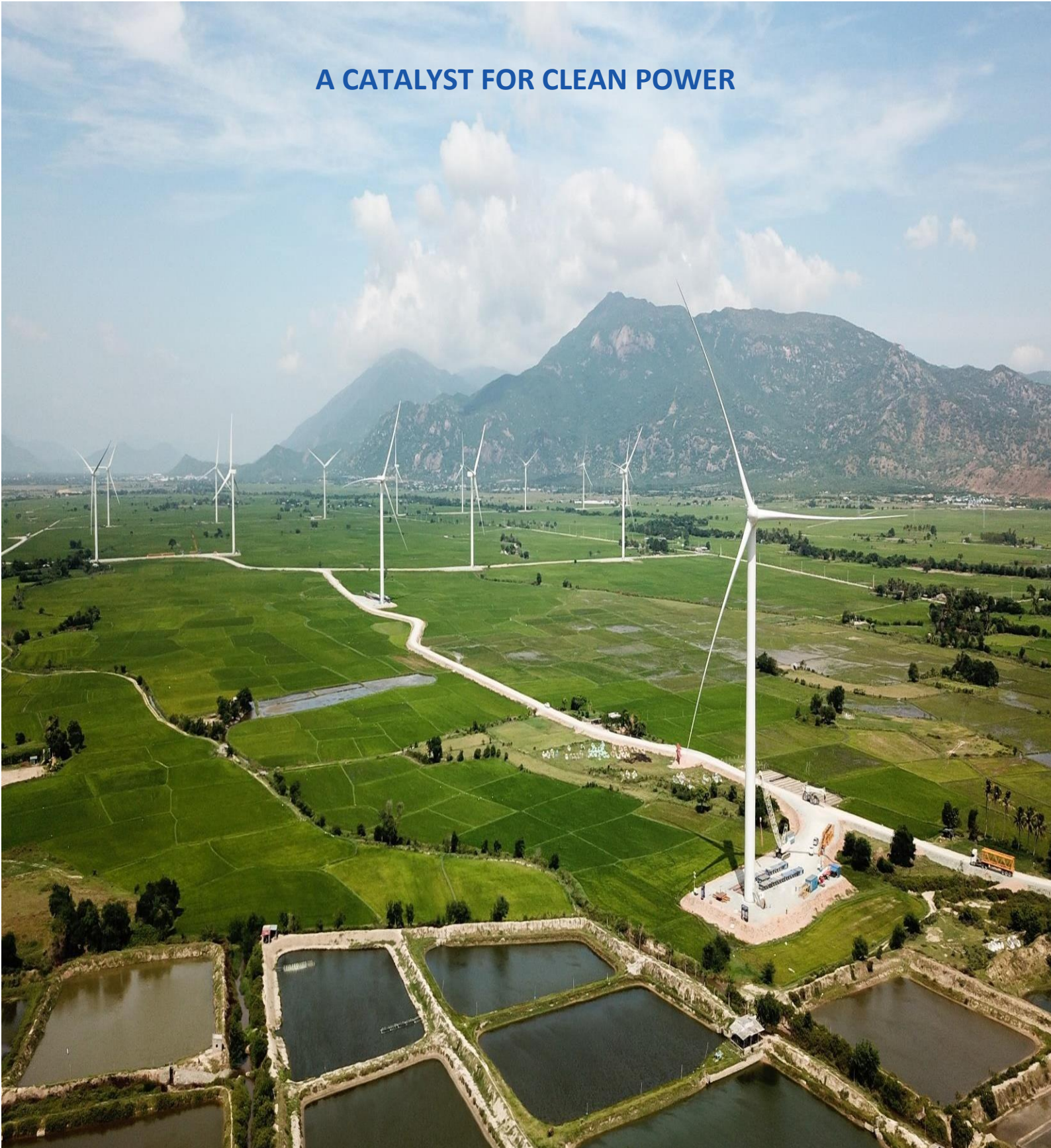


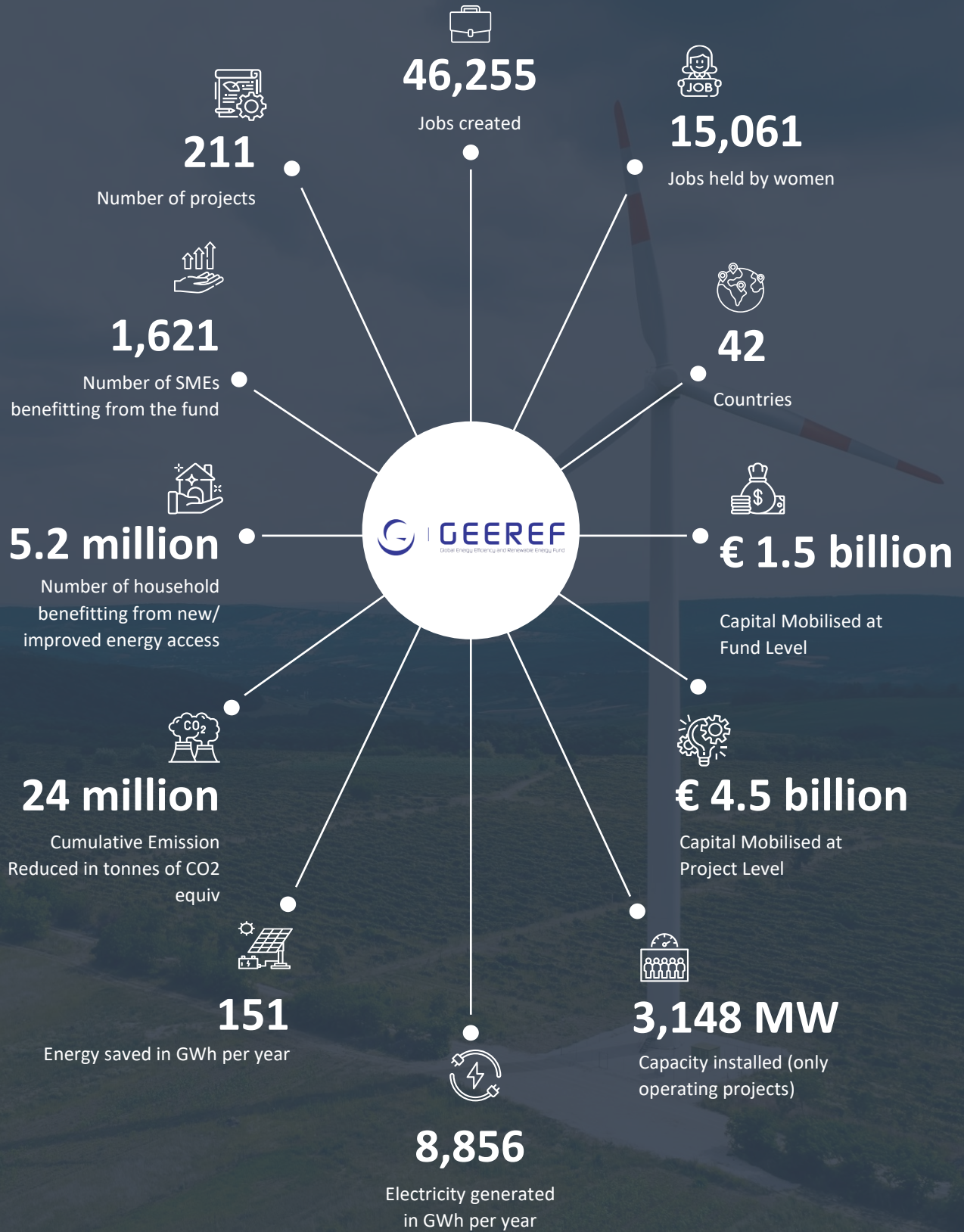
GLOBAL ENERGY EFFICIENCY AND RENEWABLE ENERGY FUND IMPACT REPORT 2023

A CATALYST FOR CLEAN POWER

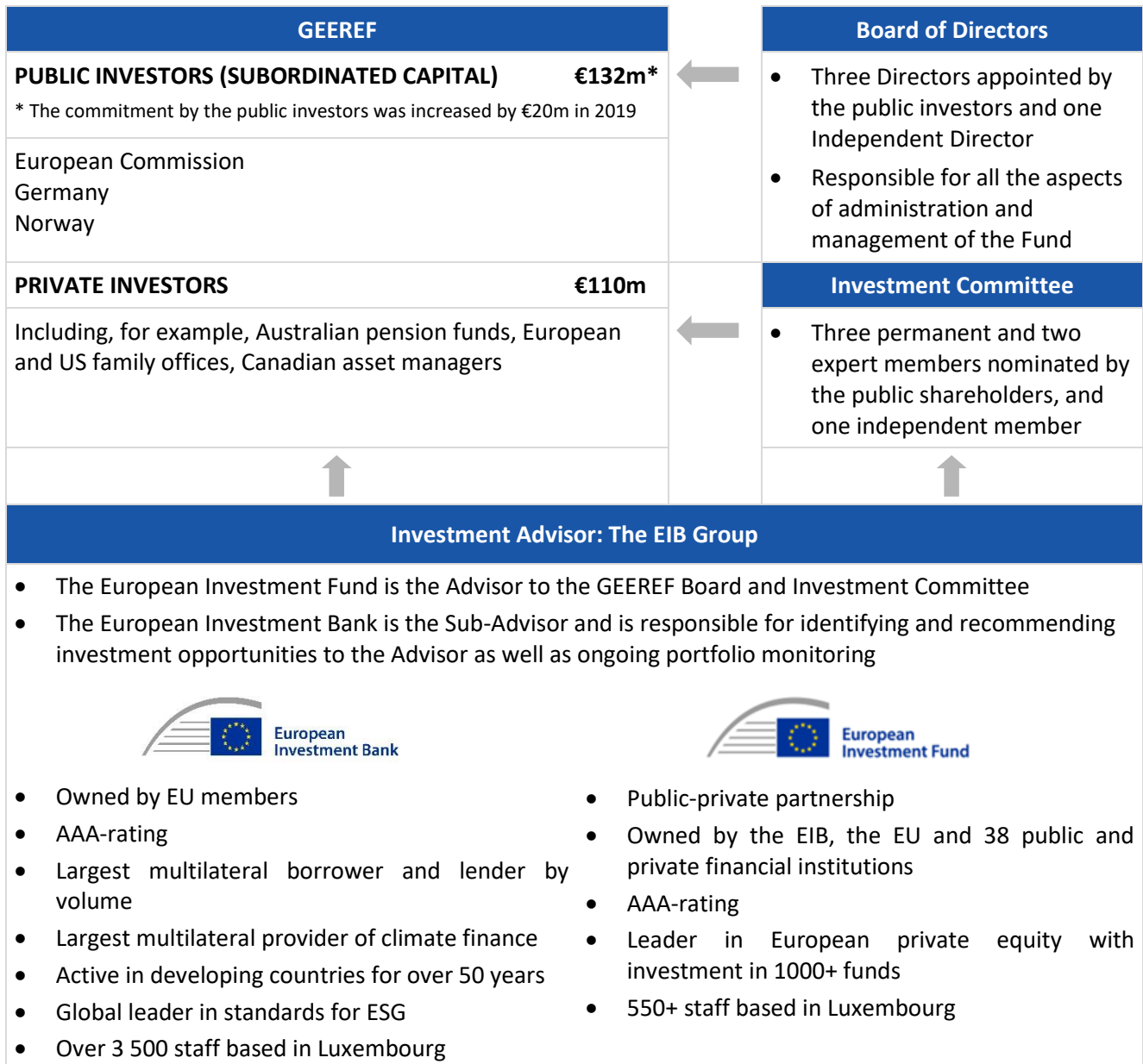


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GEEREF—A PUBLIC–PRIVATE PARTNERSHIP



TRANSFORMATIONAL IMPACTS: IN-COUNTRY HIGHLIGHTS

GEEREF's transformational goal is to create a self-sustaining market for private investment in small-scale renewable energy in Sub-Saharan Africa, aiming to provide millions of people with first-time access to energy and address a financing gap too large for public funding alone. To achieve this, it focuses on reducing investor risk to attract more commercial funds into these markets. Specifically, it achieves this through pioneering groundbreaking solar and hydropower initiatives that align with broader national goals. Here below are two examples:

Planet Solar (Sierra Leone)

Overview: As the first large-scale, grid-connected solar project by an independent power producer in Sierra Leone, Planet Solar exemplifies transformative energy solutions. With only about 23% of the population currently having access to electricity, this project is poised to make a substantial impact.

Capacity and Progress: The project is spread across four locations, with 20 MW already operational in 2023 and an additional 30 MW under construction.

Projected Impact: Once fully operational, Planet Solar is expected to increase Sierra Leone's domestic electricity supply by 30% and contribute to an annual CO2 reduction of approximately 46,500 tonnes, marking a significant step toward sustainable energy independence for the country.

Great Zimbabwe Hydro (Masvingo, Zimbabwe)

Overview: Great Zimbabwe Hydro is a pioneering 5 MW project that utilizes the 48-meter drop of the existing Mutirikwi storage dam to harness hydroelectric power. By tapping into this renewable energy source, the project innovatively addresses energy scarcity while promoting environmental sustainability through the reduction of greenhouse gas emissions and the use of clean, local energy resources.

Local Impact: By generating 20% of Masvingo province's electricity needs, this project strengthens local energy security while reducing annual CO2 emissions by 28,500 tonnes. This reduction supports ecological health by mitigating climate change impacts, preserving natural ecosystems, and fostering sustainable economic development in the region.





Great Zimbabwe Hydro Power Energy Project in Zimbabwe. Frontier II

GEEREF IMPACT STRATEGY A CATALYST FOR CLEAN POWER



GEEREF IMPACT STRATEGY

MOBILIZING CAPITAL FOR CLEAN ENERGY

GEEREF's Strategy: GEEREF is a vehicle that invests in renewable energy and energy efficiency- focused private equity funds and directly into companies. GEEREF's aim is to generate both financial and social returns for its investors and stakeholders. It follows a triple bottom line strategy: People – Planet – Profit.

GEEREF reached the end of its investment period in May 2019 and is fully invested. As of the end of 2023, GEEREF had 12 funds, still active in its portfolio across emerging markets in Africa, Asia and Latin America (one fund was still in its investment period). These have, in turn, developed a total of 211 renewable energy and energy efficiency projects, out of which 152 were operational at the end of 2023. GEEREF's approach to financing clean energy expansion combines patient capital investment into infrastructure with specialized technical assistance supporting fund managers and developers. This approach is complemented by a comprehensive impact approach that maximizes the returns for all of its stakeholders – GEEREF's investors as well as the local communities that host each of GEEREF's projects.

Mobilisation of Capital: GEEREF was designed to mobilize high amounts of investment, in particular from private investors, into its underlying projects. GEEREF has a blended structure where public capital has been used to attract private sector investors. The fund of funds approach enables further leverage on the public capital at the investee fund-level as well as further down, at the project-level.

INPUTS	CAPITAL RAISED	GEEREF: THE FUND-OF-FUNDS (APPROACH)		
		PUBLIC INVESTORS (CONCESSIONAL CAPITAL)		PRIVATE INVESTORS
		EU, GERMANY, AND NORWAY		24 INVESTORS FROM NORTH AMERICA, EUROPE, AND AUSTRALIA
OUTPUTS	TOTAL CAPITAL DEPLOYED	GEEREF'S INVESTEE FUNDS		
		REAF EVOLUTION ONE DI FRONTIER ARMSTRONG MSEF MSEF II AREF		SOLAR ARISE CCEF CATALYST REAF II EVOLUTION II FRONTIER II ARPF
OUTCOMES	CAPITAL DEPLOYED AT PROJECT LEVEL	FUNDS' UNDERLYING PORTFOLIO PROJECTS		
		FUND EQUITY	EQUITY CO-INVESTMENT	PROJECT DEBT
IMPACTS	PROJECTS, INCL. EXITED PROJECTS	DELIVERED UNDER EIB E&S STANDARDS AND GEEREF'S TRIPLE BOTTOM LINE		
		5.2 GW CLEAN ENERGY CAPACITY	8,856 GWh OF ELECTRICITY PRODUCED PER YEAR 151 GWh OF ENERGY SAVED PER YEAR	4.12M TONNES OF CO ₂ EQUIV. REDUCED PER YEAR
		including exited projects, operating, development & construction projects	ELECTRICITY PRODUCED EQUALS CONSUMPTION OF 5.2 MILLION BENEFICIARIES	

GEEREF IMPACT STRATEGY

QUALITATIVE AND QUANTITATIVE IMPACT ASSESSMENT

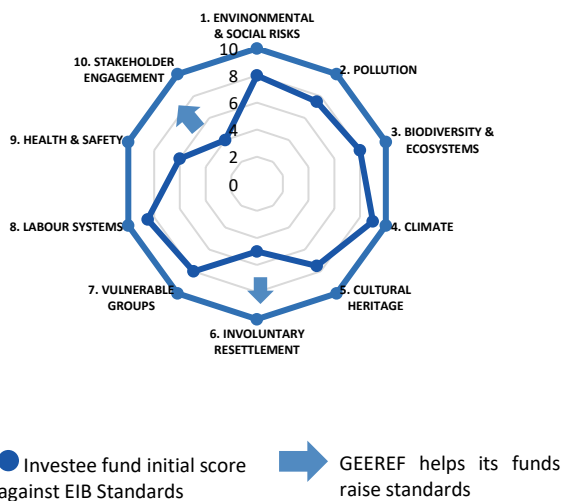
Impact Assessment: GEEREF carries out a twofold approach, which combines qualitative and quantitative assessments, to ensure that its impact objectives and the triple bottom line approach are achieved in all of its investment activities.

1. QUALITATIVE EIB STANDARDS

Implement and Comply with Standards and Processes

GEEREF requires its portfolio funds to carry out social and environmental due diligence in their new projects, using EIB’s Environmental and Social Standards, and subsequently monitor the projects in compliance with the standards. This is institutionalised in the contractual framework with the fund managers. GEEREF’s early participation as a cornerstone investor supports the implementation of EIB Standards from the onset of a fund’s structuring and portfolio construction.

EIB STANDARDS¹



¹ The chart is only illustrative

2. QUANTITATIVE GEEREF IMPACT METRICS

Quantify and Measure

GEEREF measures and monitors quantifiable, realised impact on the ground on an annual basis to assess ESG performance, share results with investors and the wider investment community. These impact indicators were agreed upon between GEEREF and the fund managers.

GEEREF IMPACT METRICS AS PROVIDED IN THIS REPORT

PILLAR 1: CLEAN ENERGY	PILLAR 2: ENVIRONMENT/ CLIMATE CHANGE
INSTALLED CAPACITY (MWh) ELECTRICITY GENERATED (MWh) ENERGY EFFICIENCY SAVINGS (MWh)	NET EMISSIONS REDUCED (tonnes of CO ₂ equiv.)
PILLAR 3: SUSTAINABLE DEVELOPMENT	PILLAR 4: FINANCIAL LEVERAGE
BENEFICIARY HOUSEHOLDS (#) BENEFICIARY SMES (#) NUMBER OF PEOPLE EMPLOYED (#) TRAINING (HRS)	FUND MULTIPLIER PROJECT MULTIPLIER

GEEREF IMPACT STRATEGY

VALUE ADDED THROUGHOUT THE PROJECT CHAIN

Value added: GEEREF works closely with fund managers at each stage of the transaction development. GEEREF provides input on the structuring and strategy to the funds’ teams.

During the due diligence and negotiations phase, GEEREF provides feedback on terms and conditions to ensure the fund’s marketability to private investors. In addition, EIB technical experts review the fund’s environmental and social processes, standards, and staffing plan to ensure alignment with best international practices. GEEREF’s technical assistance facility (RFSF) supported fund managers in upgrading their practices in case of gaps.

Finally, following a fund’s inclusion into GEEREF’s portfolio, GEEREF provides continuous feedback to the fund managers through an active role in the Advisory Board and site visits when necessary. EIB’s technical experts review and enhance the funds’ E&S practices via monitoring.

LIFECYCLE OF GEEREF TRANSACTION

STEPS OF GEEREF TRANSACTION	INITIAL FUND STRUCTURING	PROJECT IMPLEMENTATION	ONGOING MONITORING
ENVIRONMENTAL AND SOCIAL STANDARDS	E&S best practice through the lifecycle of operations. E&S obligations, processes and procedures are listed and described in relevant contractual documents (Limited Partnership Agreement, Side Letter and other). Environmental and Social Management Systems (ESMS) are built within each fund’s management system to manage risks associated with projects and enhance positive outcomes.		
TECHNICAL ASSISTANCE FACILITY	GEEREF’s Regional Fund Support Facility (RFSF), funded by the European Commission, helped nascent fund managers address gaps with recruitment of qualified professionals and the development of investment and monitoring capabilities. The RFSF is now fully deployed and finished operation.		
ADVISORY BOARD	Regular formal and informal supervision to monitor best practice, conflicts of interest, deviations from stated policies, internal issues, strategy, and market context.		
IMPACT REPORTING	GEEREF’s annual impact reporting exercise helps funds maintain focus on Impact and E&S issues. GEEREF’s Impact Report supports greater transparency in Impact Investment and knowledge sharing.		

GEEREF IMPACT STRATEGY

CONTRIBUTING TO SDGS IN DEVELOPING COUNTRIES

GEEREF’s Approach and Sustainable Development Goals:

GEEREF has a triple bottom line approach: People – Planet – Profit. Underpinning its investment strategy, there is a fundamental commitment to financial, environmental, and social sustainability principles which are mutually reinforcing and create value for GEEREF’s shareholders.

Importantly, GEEREF is in a unique position to influence and drive the strategy of funds and their underlying projects via the use of private equity as a long-term investment instrument.

GEEREF mapped its portfolio to the sustainable development goals (SDGs). Its activities directly contribute to 4 SDGs. GEEREF contributes to the expansion of clean energy capacity in developing countries and climate change mitigation and as such, directly contributes to SDG 7: Affordable and Clean Energy and SDG 13: Climate Action. Given the labour-intensity associated with construction of infrastructure assets, GEEREF also contributes to employment opportunities and skills training in markets where it operates (SDG 8). As a public private partnership, GEEREF also directly contributes to SDG 17 (partnerships for the goals).





In addition, as expansion of clean energy promotes the broader development objectives of economic prosperity, well-being and a healthy environment, GEEREF’s activities contribute indirectly at least to even more SDGs.



Measuring Sustainable Development Goals impact:

Assessing the exact contribution to SDGs that GEEREF can claim remains a challenge because of the wide range of SDGs, underlying targets, and key performance indicators, all of which are set at national level. As a result, the figures and findings of this report may not capture the entirety of the impact generated.

GEEREF has tried to track its direct contribution to SDGs via its existing metrics, as illustrated later.

2023 GEEREF’S DIRECT SDG CONTRIBUTION	GEEREF’S METRICS	GEEREF’S IMPACT
<p>GEEREF BUILDS UP NEW CLEAN ENERGY CAPACITY</p> 	<p>Capacity installed (GW²) Electricity generated and saved (GWh²)</p>	<p>1.6 GW in development, 0.4 GW in construction, 3.1 GW in operation, 8,856 GWh of electricity generated and 151 GWh of electricity saved</p>
<p>GEEREF CONTRIBUTES TO DECREASING GHG EMISSIONS IN ENERGY AND OTHER INDUSTRIES</p> 	<p>Emissions reduced (tonnes of CO₂ equiv.)</p>	<p>4.12 million tonnes of CO₂ equiv. avoided by projects per year</p>
<p>GEEREF CREATES EMPLOYMENT OPPORTUNITIES AND SKILLS TRAINING</p> 	<p>Number of people employed: temporary, permanent, male, female Training delivered (hours)</p>	<p>c. 7,136 permanent male jobs c. 3,733 permanent female jobs c. 24,058 temporary male jobs c. 11,328 temporary female jobs c. 194,637 training hours</p>
<p>GEEREF IS A PUBLIC-PRIVATE PARTNERSHIP</p> 		

² 1 GWh = 1 000 MWh, 1 GW = 1 000 MW.



Commercial Energy Project in South Africa. Inspired Evolution

GEEREF IMPACT METRICS

CATALYSING BILLIONS OF EUROS FOR CLEAN POWER



Red Rocket Wind Energy Project in South Africa. Inspired Evolution

GEEREF PORTFOLIO METRICS

BEHIND THE FIGURES

- All data are **collected annually** from GEEREF's fund managers. The report accounts for data and results for the entirety of each project, rather than a pro rata share of them, with the underlying assumption that the projects would not have been financed without GEEREF's support.
- The data is reported on an annual basis.

The analysis is done at the level of the current portfolio of the funds at year-end 2023. This includes reported values from the relevant financial year on each of the active investments in each portfolio as well as assets under construction. Projects that have been exited or sold by the underlying funds are generally included in the reported data, especially when it's realistic to assume the project remains operational. This inclusion is based on the latest available information as of when it is realistic.

The portfolio contains a wide variety of projects, ranging from larger-scale renewable energy projects to small solar PV plants for the commercial and industry sector, as well as solar home systems and solar lanterns. In addition, the portfolio grew to its present level over a number of years. This all implies large variations between portfolio projects regarding specific costs, capacity factors and specific GHG emissions avoided, making it difficult to draw general conclusions.

- The data collection is reported along four pillars: **Energy, Environment, Sustainable Development and Financial Leverage**.
- While some metrics in the Energy, Environment and Sustainable Development pillars are reported as provided by the fund managers, others are calculated by the GEEREF Team using inputs from fund managers and external resources.
- The data calculated by the GEEREF Team are sensitive to the evolution of assumptions, including the grid emission factor and the average consumption per household by country.

The number of households impacted is calculated by dividing total electricity generated (as reported by fund managers) by average household consumption in a given country¹.

The amount of emissions reduced is calculated by multiplying electricity generated (as reported by fund manager) by a given country grid emission factor².

- For the fourth pillar: financial leverage, GEEREF reports on the amount of capital mobilized (both private and public) at three levels: project level, fund level and GEEREF level.

The project level multiplier assesses the total project capex (both private and public, including fund equity, co-investment, and debt) relative to the equity invested by the fund manager.

The fund level multiplier assesses the total that a fund has raised from all investors (both private and public) relative to the initial capital contribution made by GEEREF.

The GEEREF level multiplier is the project level multiplier times the fund level multiplier.

A more detailed explanation of the GEEREF Impact Methodology can be found on GEEREF's website [here](#).

¹ Enerdata, 2014 figures

² https://unfccc.int/sites/default/files/resource/Harmonized_Grid_Emission_factor_data_set.pdf, July 2019 data

GEEREF PORTFOLIO METRICS

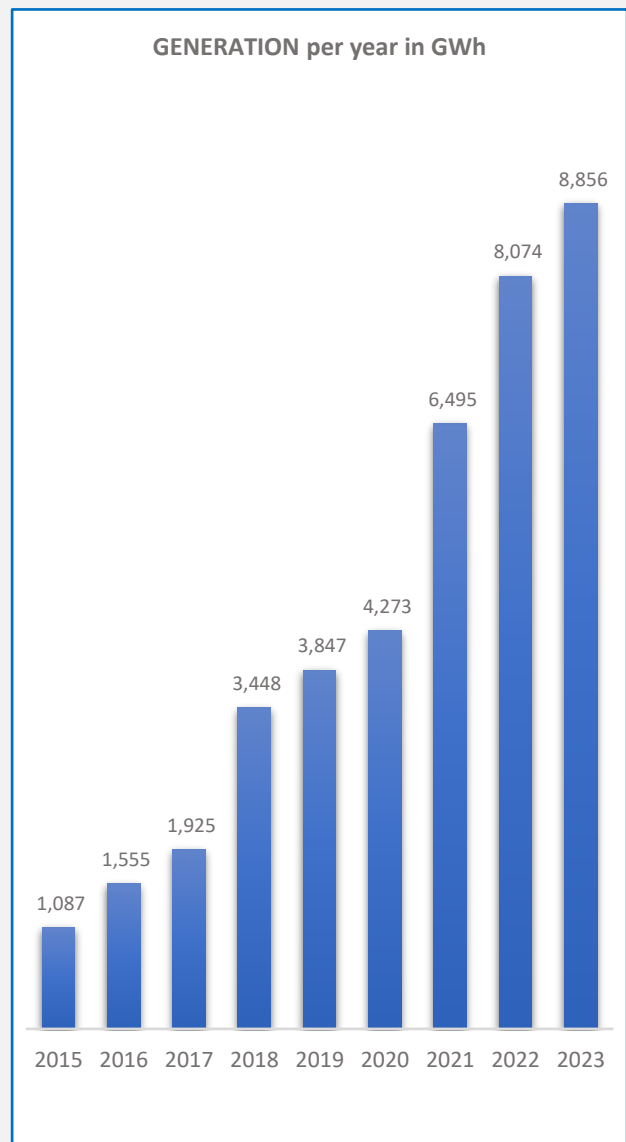
PILLAR 1: CLEAN ENERGY

In 2023, the Global Energy Efficiency and Renewable Energy Fund (GEEREF) demonstrated significant growth in its clean energy initiatives, expanding its capacity to 5.2 gigawatts (GW). This increase from the previous year's 4.6 GW was primarily driven by a surge in operational projects, especially in Africa and Asia, with a particular focus on solar energy, and Solar Distributed Generation (SDG). The inclusion of projects from countries such as India highlights the fund's geographical expansion and diversification of its investment portfolio, which is crucial for global energy transition efforts.

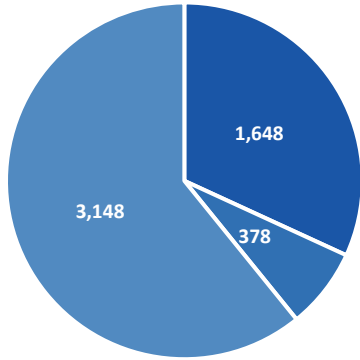
Moreover, GEEREF achieved a notable rise in energy production, reaching 8,856 gigawatt-hours (GWh), which marks a 10% increase from 2022. This enhancement in generated energy aligns with the substantial scale-up of operational projects, which soared to 3.1 GW originating from such initiatives in 2023 compared to 2.7 GW in the previous year. The increase in gigawatt-hours is a direct reflection of the additional capacity brought online and the effective operational performance of the projects within the GEEREF expansive portfolio.

Additionally, GEEREF reported a significant improvement in energy savings, with 151 GWh saved in 2023, up from 86 GWh in 2022 and 90 GWh in 2021. This increase can be attributed to the recovery from COVID-19-related disruptions, which had previously hindered project operations and efficiency improvements.

Following further technology optimization effort and enhanced operational efficiencies, it is expected to see continued growth in energy savings, underscoring GEEREF underlying funds' commitment to fostering sustainable energy solutions in developing regions.

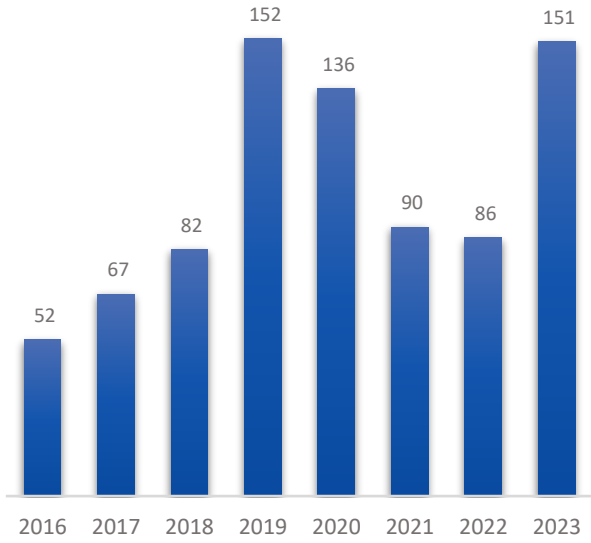


SPLIT OF GENERATION CAPACITY BY STAGE

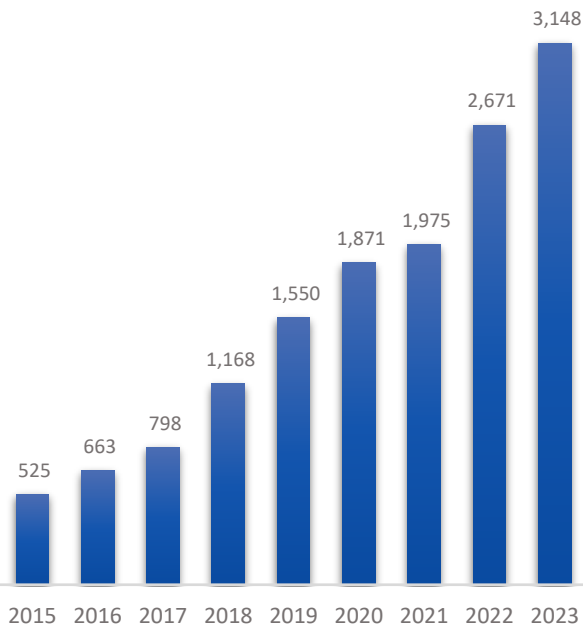


- MW in development
- MW in construction
- MW operational in 2023

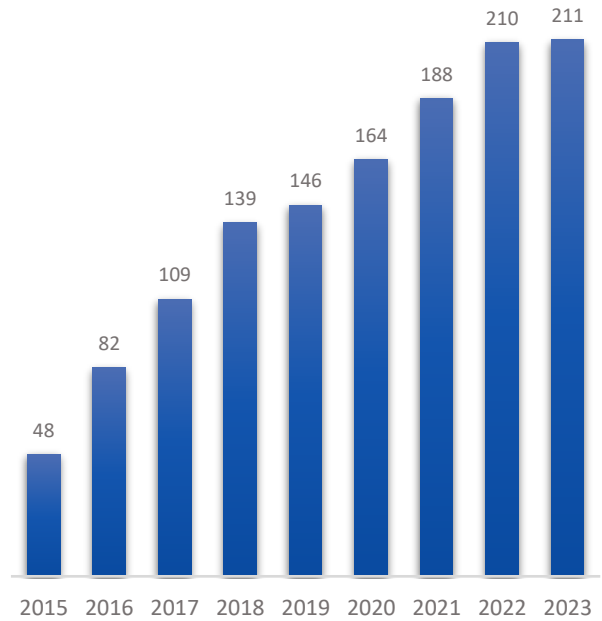
ENERGY SAVED per year in GWh (operational projects)



INSTALLED CAPACITY AT YEAR END in MW



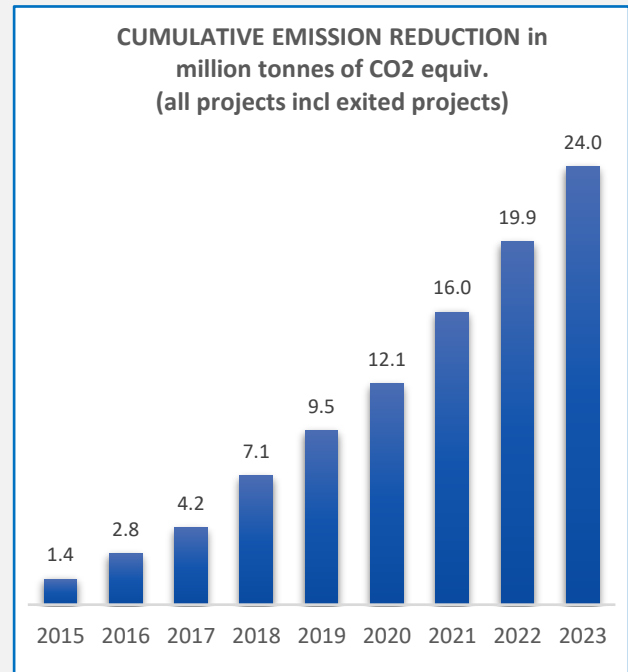
Numbers of Projects per year



GEEREF PORTFOLIO METRICS

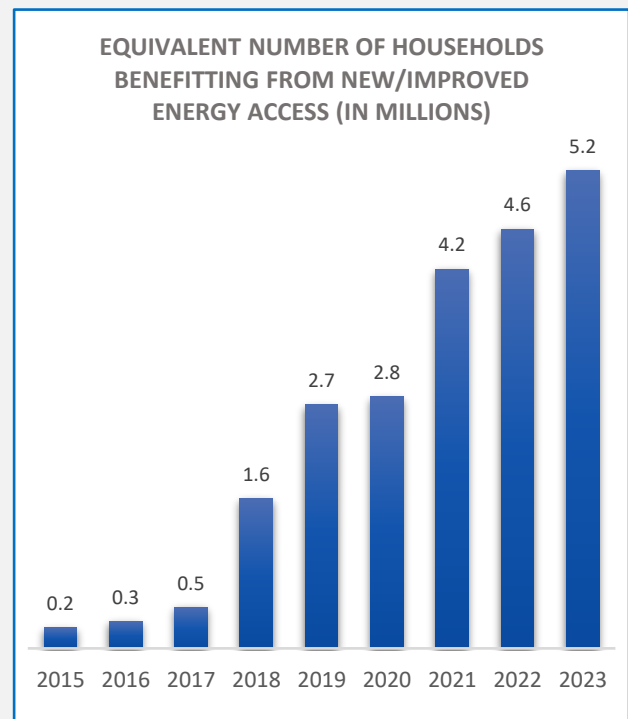
PILLARS 2 AND 3: CLIMATE MITIGATION/ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

By the close of 2023, the projects under GEEREF, including those exited, had achieved a cumulative climate mitigation impact of about 24 million tonnes of CO2 equivalents since 2015.

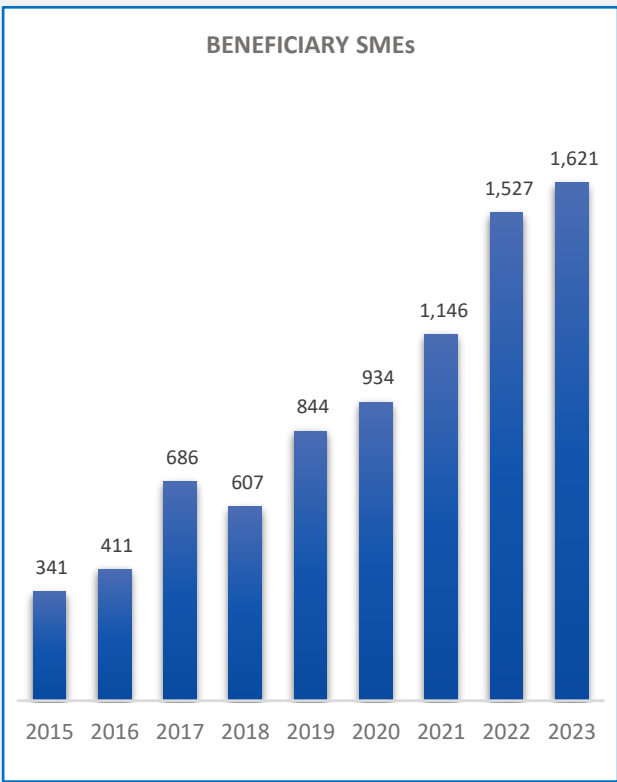


In 2023, GEEREF's projects produced 8,856 GWh and saved an additional 151 GWh, equating to the energy needs of 5.2 million households, a 13% increase from the prior year.

The rise primarily stemmed from an increase in renewable electricity production and increase in the generation capacity of operational Projects consequently supporting a larger number of equivalent households.



GEEREF's operational projects, projects under construction and pipeline projects benefited 1,621 beneficiary SMEs in 2023 which is 6% higher than 2022, and one of the attributable factors is the increase in the number of operational projects in 2023.



GEEREF PORTFOLIO METRICS

PILLAR 3: SUSTAINABLE DEVELOPMENT

Year over year, the total job creation, encompassing both permanent and temporary positions, has consistently risen.

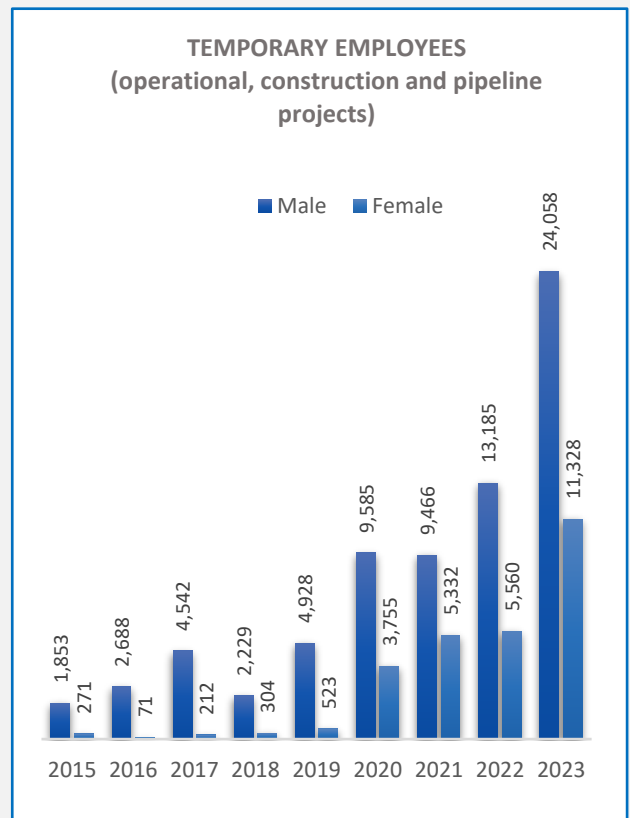
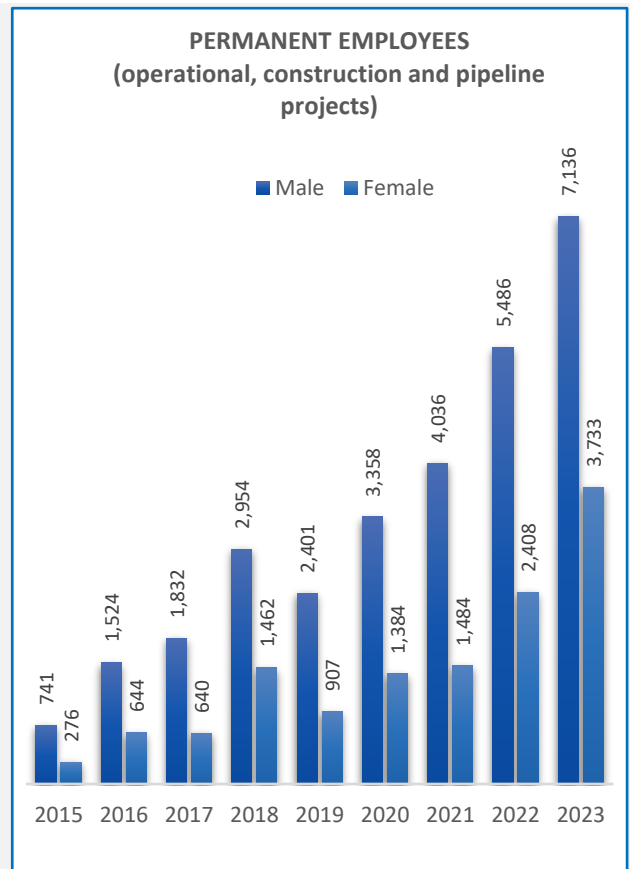
Since 2019, temporary positions have substantially outnumbered permanent ones.

The number of male positions is higher than the number of females positions every year.

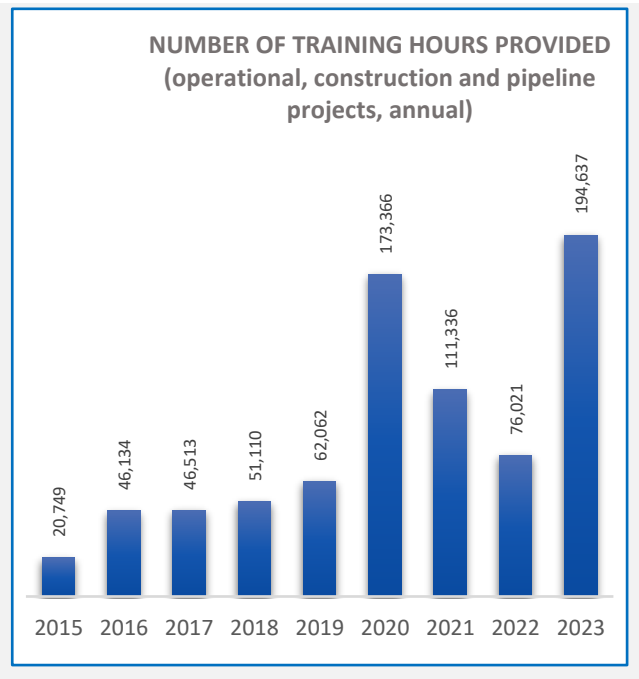
Since 2019, there has been a gradual increase in female representation within the workforce, particularly in temporary roles, starting from a low baseline and signaling a positive move toward greater diversity and inclusion.

The sharp increase in temporary jobs between 2022 and 2023 reflects the renewable energy sector's project-based nature.

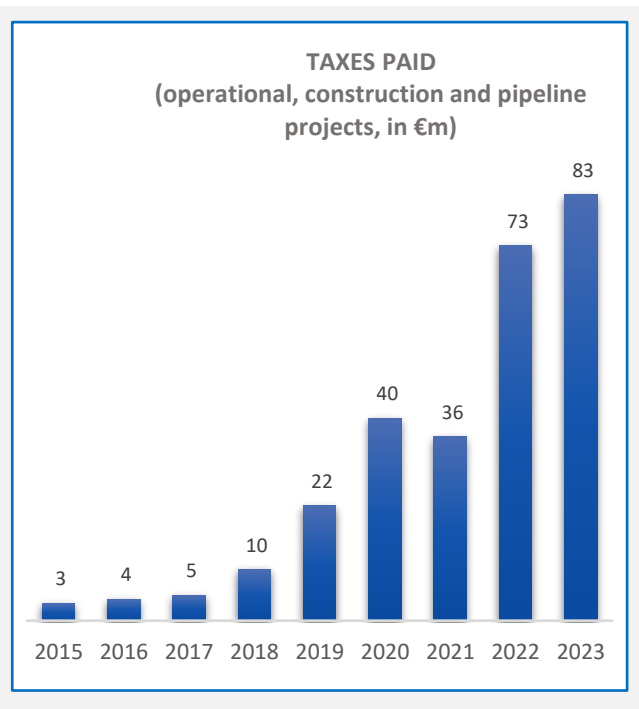
It aligns more broadly with energy transitions and post-pandemic recovery efforts.



The rise in training hours from 2022 to 2023 reflects the operational expansion of some projects, coupled with a broader trend toward workforce development and capacity building in the renewable energy and energy efficiency sectors. This growth emphasizes the need for skill development in clean energy technologies, operational efficiency, and community engagement to ensure the success and sustainability of these global initiatives.

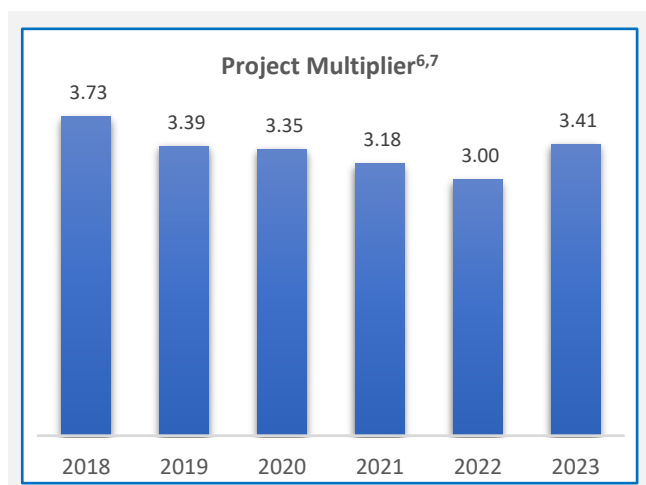
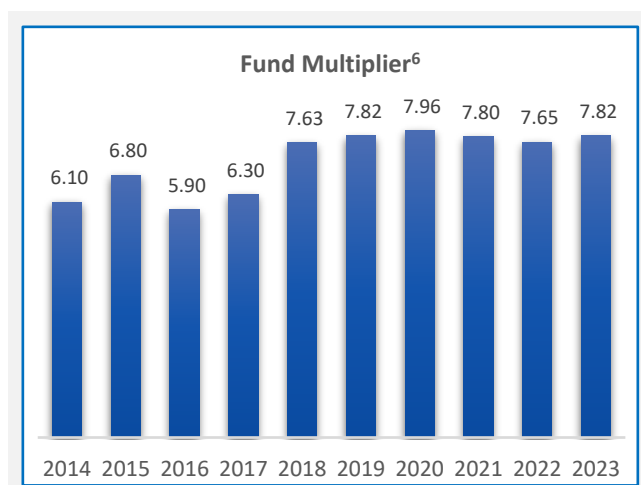
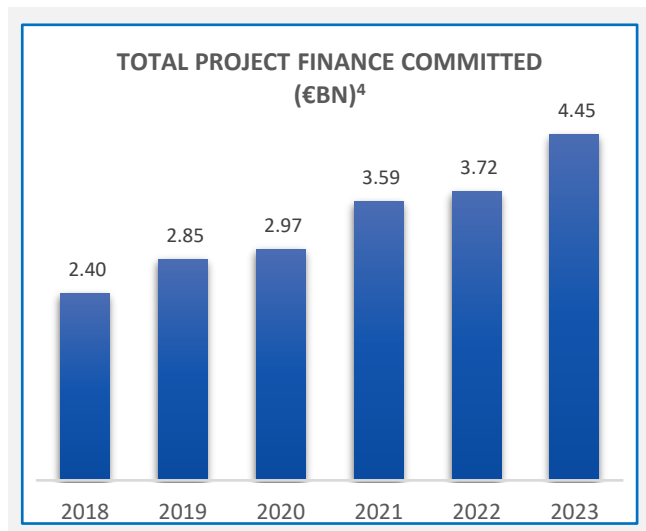
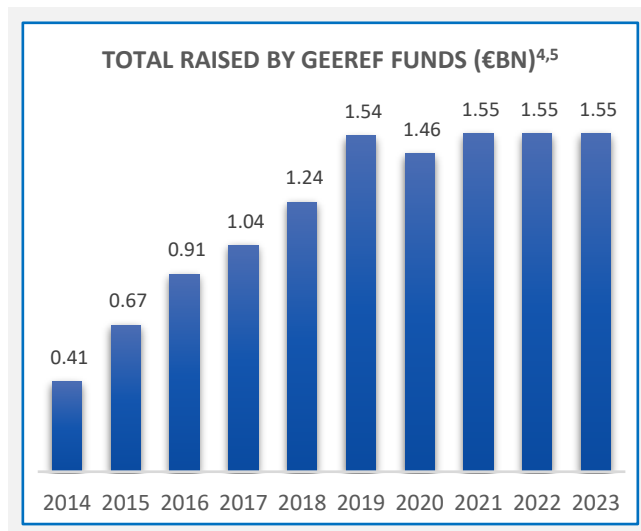
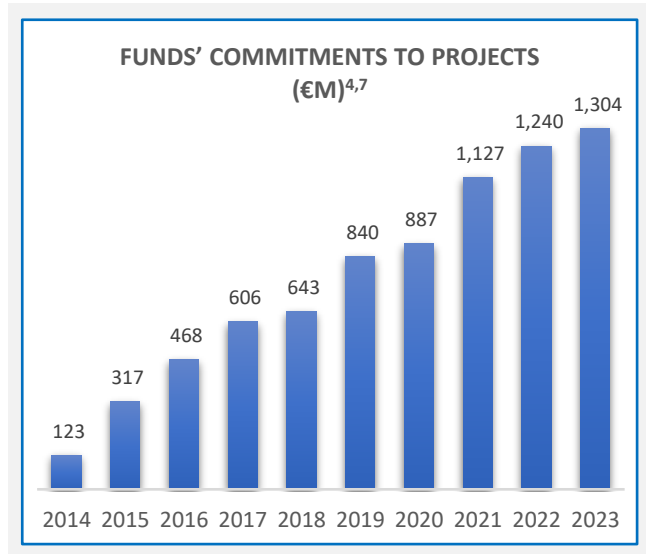
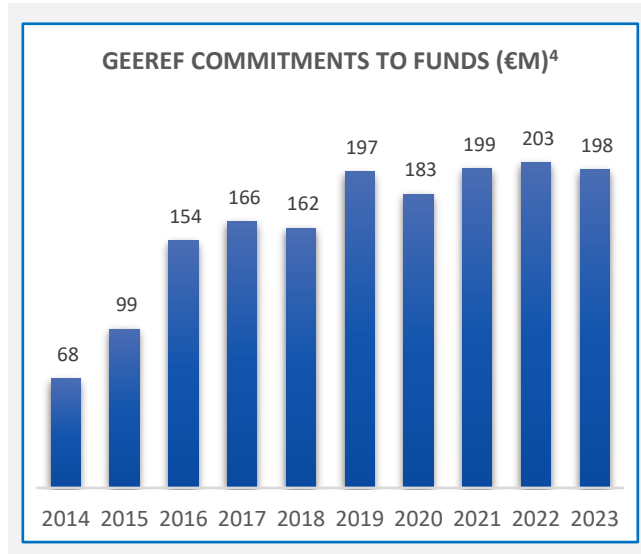


The underlined Projects contributed roughly EUR 83 million in local taxes in 2023, an increase from the previous year, aiding in the financial empowerment of local governments.



GEEREF PORTFOLIO METRICS

PILLAR 4: FINANCIAL LEVERAGE

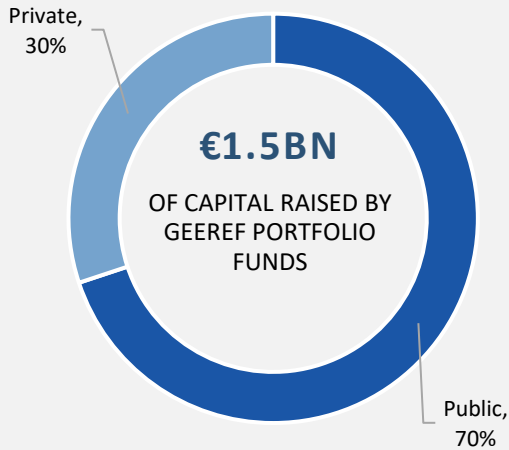


⁴ All above numbers are subjected to FX movements. ⁵ Including GEEREF commitments. ⁶ See definitions on page 12 and see page 20. ⁷ This change (with regards to 2022 figure) is due to rectification of an inconsistency when updating underlying data reporting tables.

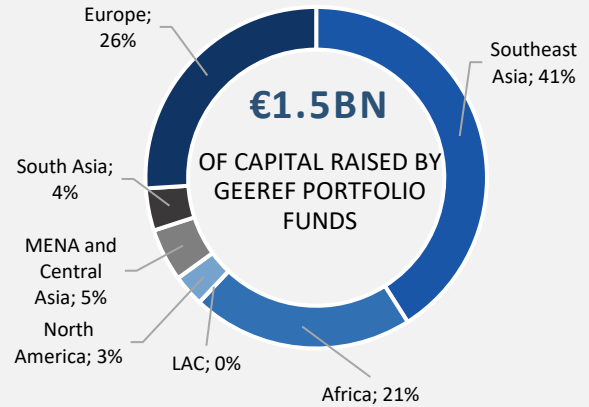
GEEREF PORTFOLIO METRICS

PILLAR 4: FINANCIAL LEVERAGE

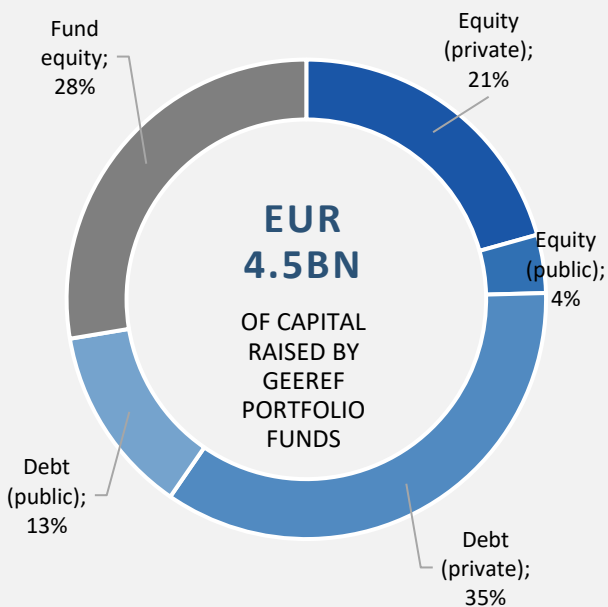
CAPITAL MOBILISATION AT A FUND LEVEL, BY FUNDING SOURCE



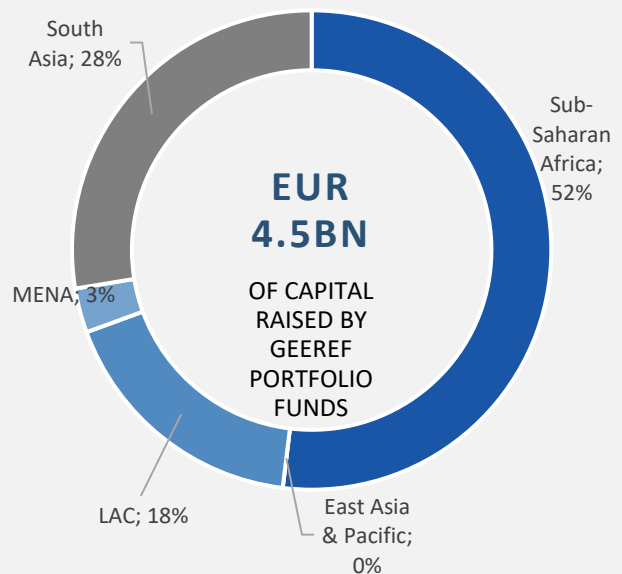
CAPITAL MOBILISATION AT A FUND LEVEL, BY GEOGRAPHY



CAPITAL MOBILISATION AT A PROJECT LEVEL, BY FINANCIAL INSTRUMENT & SOURCE



CAPITAL MOBILISATION AT A PROJECT LEVEL, BY GEOGRAPHY



GEEREF PORTFOLIO METRICS

PILLAR 4: FINANCIAL LEVERAGE

GEEREF LEVEL

€242M

SIZE OF GEEREF

- Public investors committed EUR 132m to GEEREF, which mobilized a further EUR 110m of private investor commitments.
- At the end of 2023, GEEREF's portfolio consisted of EUR 198m of commitments to 14 funds.

FUND LEVEL

€1.5BN

TOTAL RAISED BY FUND MANAGERS

- Based on GEEREF's commitment of EUR 198 million, fund managers have raised a total of EUR ~1.5bn. This translates into a fund-level multiplier of 7.8x, which is in line with the 2022 multiplier. Up until 2021, one of GEEREF's funds was still fundraising.
- A vast majority of the capital raised as of the end of 2023 – 70% – comes from Development Finance Institutions (DFIs). 30% comes from a diversified pool of private investors (asset managers, impact investors, and others). Asian funds attracted the biggest portion of private capital (~45% of the capital raised) whereas the private capital share raised by funds focusing on Africa and Latin America was significantly less.

PROJECT LEVEL

€4.5BN

OF PROJECT FINANCING RAISED

- As of year-end 2023, the total investment in projects managed by GEEREF fund managers amounted to EUR 4.5bn. Of this, 28% was equity from the GEEREF underlying funds, 21% from private investors, and 4% from public investors. The balance, 48%, was financed by lenders, with 13% from DFIs and national development banks, and 35% from private local banks.
- The capital mobilized by GEEREF surged by c. 20%, rising by c. EUR 0.7bn from the previous year, with the project multiplier reaching 3.4x.

ABBREVIATIONS

AREF	Africa Renewable Energy Fund	GEEREF	Global Energy Efficiency and Renewable Energy Fund
ARPF	ARCH Africa Renewable Power Fund	GHG	Greenhouse gas
CCEF	Caucasus Clean Energy Fund	MENA	Middle East and North Africa
CO2	Carbon dioxide	MSEF	MGM Sustainable Energy Fund
DFI	Development Finance Institution	MW	Megawatt
EELAF	Emerging Energy Latin America Fund	MWh	Megawatt hour
EIB	European Investment Bank	REAF	Renewable Energy Asia Fund
EIF	European Investment Fund	RFSF	Regional Fund Support Facility
E&S	Environmental and social	SDG	Sustainable Development Goals
ESG	Environmental, social and governance		
ESMS	Environmental and social management system		
EU	European Union		

