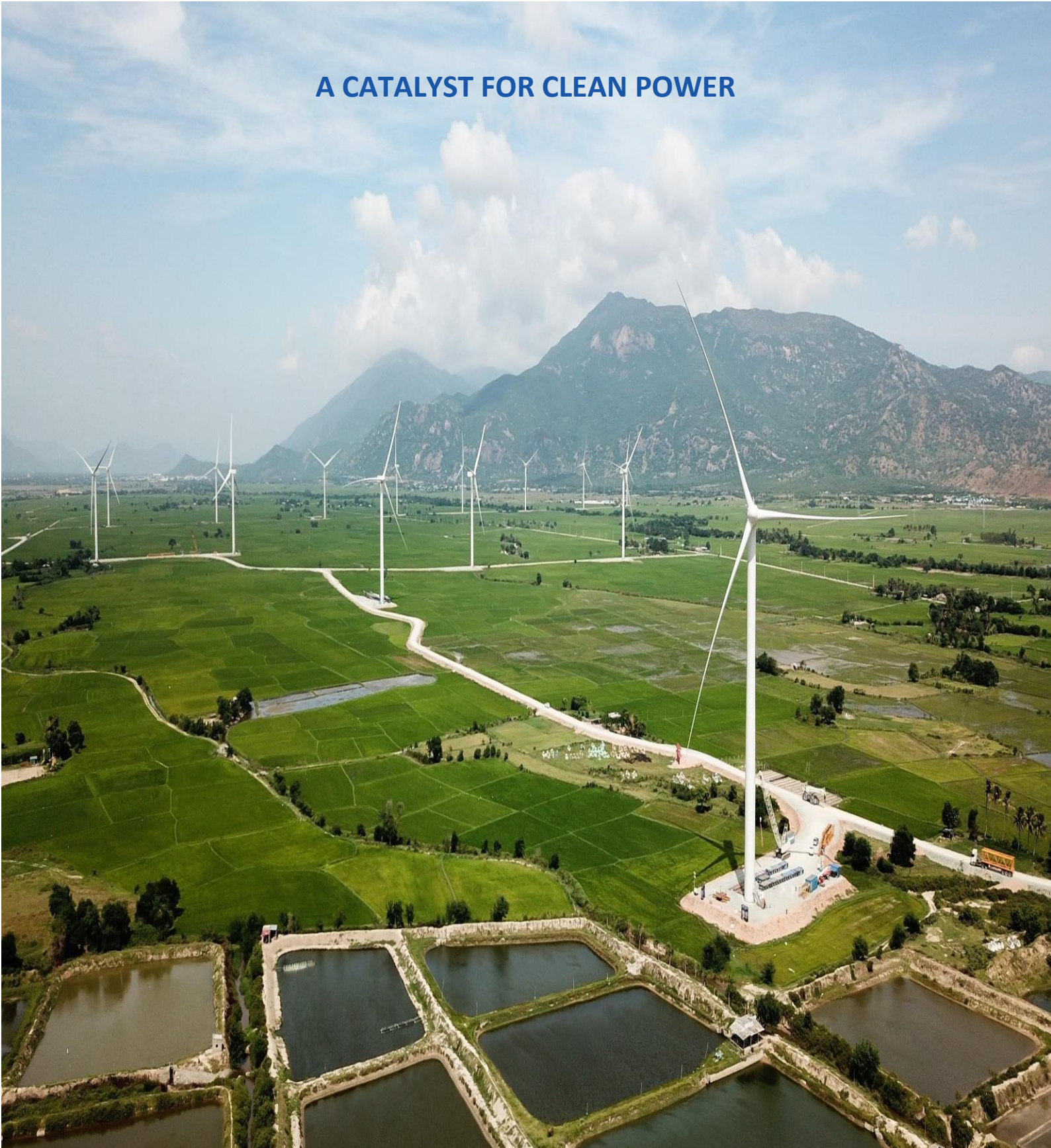


# GLOBAL ENERGY EFFICIENCY AND RENEWABLE ENERGY FUND IMPACT REPORT 2022

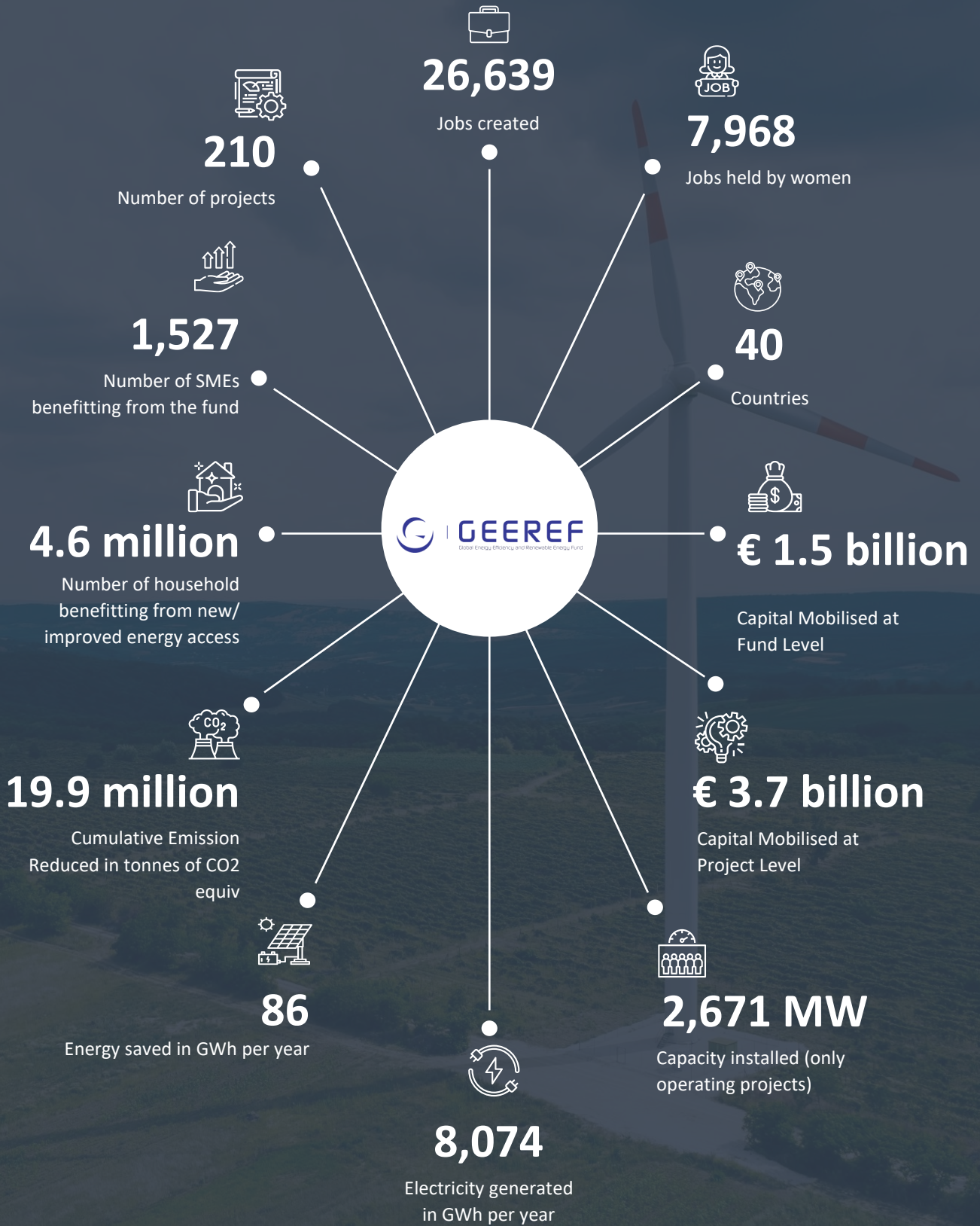
A CATALYST FOR CLEAN POWER



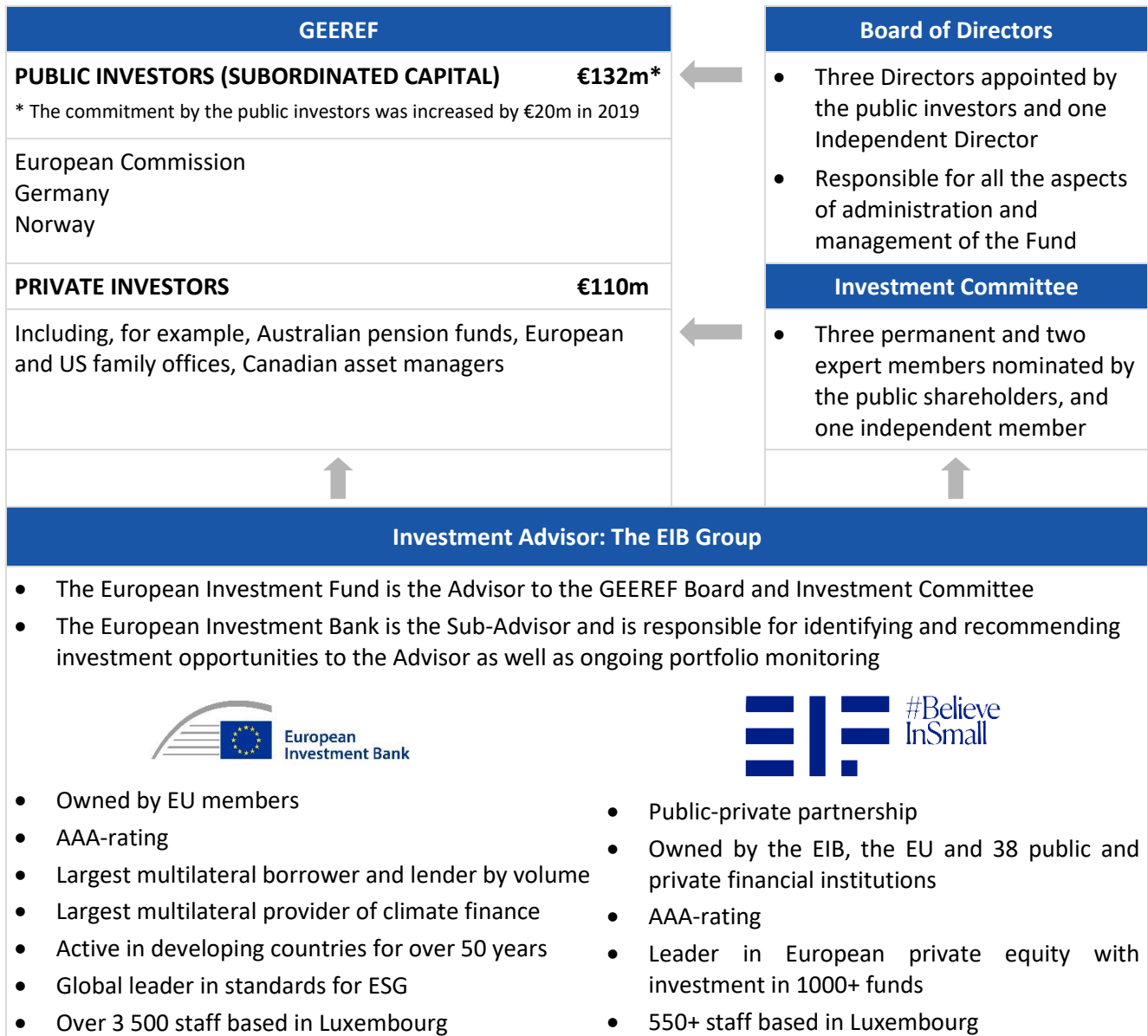
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# GEEREF—A PUBLIC–PRIVATE PARTNERSHIP



## 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, with the aim to give millions of people first-time access to energy and plug a financing gap too large for public money to fill. It is working to achieve this by reducing investor risk so that more commercial funds flow in the future in those markets. It does this by:

Implementing strategic measures in the regions where their projects are operational. Here below are two examples:

- In 2022, Abagold (a project in aquaculture) took a monumental step by installing a 1.3MW solar energy system, with plans for further expansion in 2023. This initiative led to the production and sale of 684 MWh of clean energy, resulting in energy savings of 360 MWh. To further its mission, Abagold is introducing an advanced 1.8 MW Photovoltaic System and a 30 KW Energy Recovery Turbine. Parallel to these endeavors, the company is also emphasizing waste reduction via recycling, underscoring its commitment to a sustainable and eco-friendly future for South Africa.
- In the same year, d.light (an innovative rural electrification company) ignited a renewable energy movement in Kenya, delivering an astounding 87.67 million KWh of clean energy to approximately 1.6 million individuals, especially targeting those previously without electricity. This venture drastically reduced environmental harm by averting over 1 million tons of CO2 and black carbon emissions, which are typically emitted from kerosene lamps. Additionally, d.light's PAYGO model has revolutionized the energy sector, providing affordable solar power solutions, thus paving the way for a greener and economically sustainable energy future for countless Kenyans.



Pioneering groundbreaking solar and hydropower initiatives that align with broader national goals. Here below is an example:

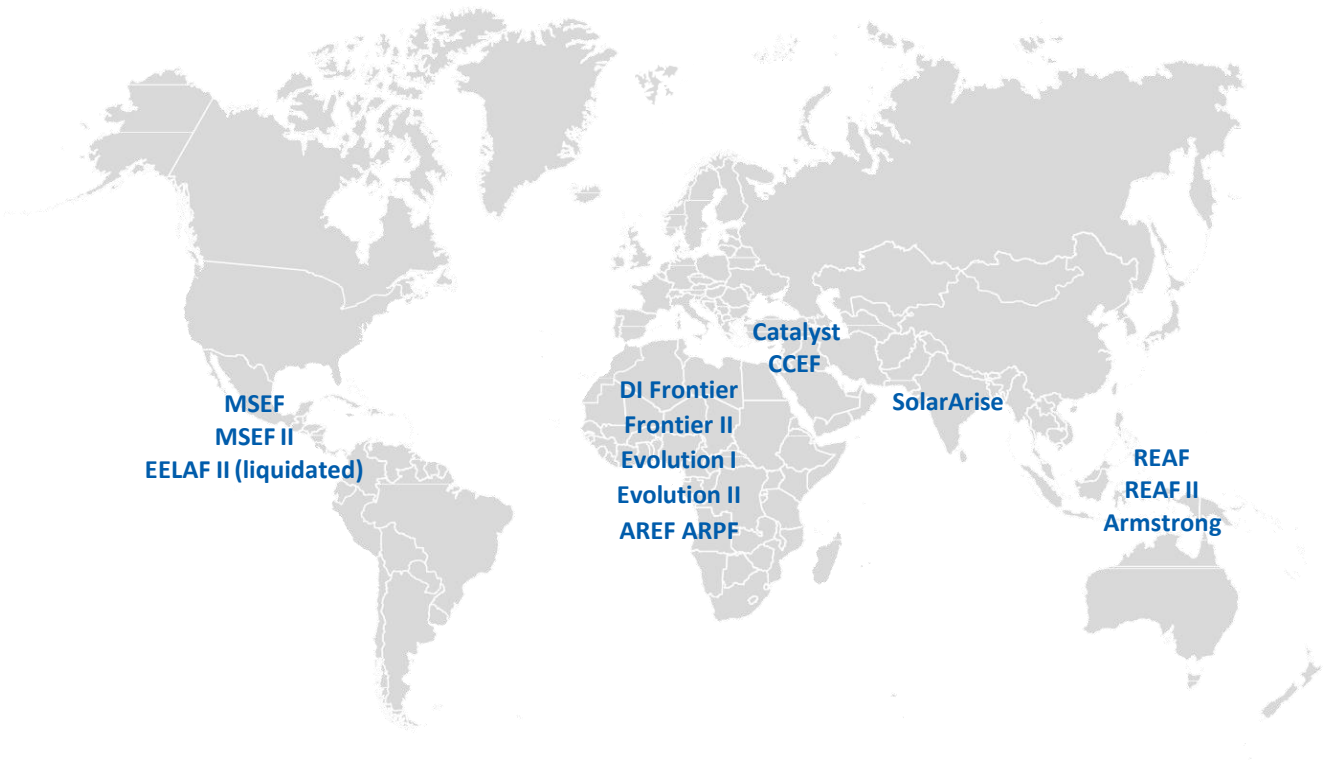
The Burundi Solar PV project (a utility scale IPP project) symbolizes transformative progress in one of the globe's most impoverished countries, profoundly influencing local communities by promoting economic advancement and improving energy access. This project is poised to electrify approximately 87,600 Burundians, igniting a surge of growth and optimism in areas previously lacking consistent energy. Furthermore, it's driving economic progress by creating 398 job opportunities, thereby empowering individuals and rejuvenating communities. This initiative exemplifies the power of renewable energy to instigate positive transformation and enhance lives in Burundi.







## 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. The last investments made were commitments to ARPF fund. As of the end of 2022, GEEREF had 14 funds, still active in its portfolio across emerging markets in Africa, Asia and Latin America (six funds are still in their investment periods). These have, in turn developed a total of 210 renewable energy and energy efficiency projects, out of which 149 were operational at the end of 2022. 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		
		4.6 GW CLEAN ENERGY CAPACITY	8,074 GWh OF ELECTRICITY PRODUCED PER YEAR 86 GWh OF ENERGY SAVED PER YEAR	3.85M TONNES OF CO <sub>2</sub> EQUIV. REDUCED PER YEAR
		including exited projects, operating, development & construction projects	ELECTRICITY PRODUCED EQUALS CONSUMPTION OF 4.6 MILLION BENEFICIARIES	

# GEEREF IMPACT STRATEGY

## QUALITATIVE AND QUANTITATIVE IMPACT ASSESSMENT

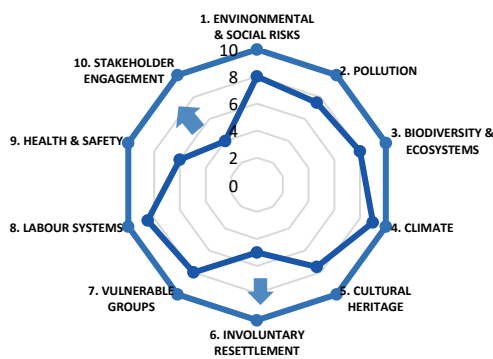
**Impact Assessment:** GEEREF carries out a twofold approach, which combines qualitative and quantitative assessments, to ensure that its impact objectives and the triple bottom line approach are achieved in all of its investment activities.

### 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 STANDARDS<sup>1</sup>**



● Investee fund initial score against EIB Standards → GEEREF helps its funds raise standards

<sup>1</sup> 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 <sub>2</sub> 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
<b>ENVIRONMENTAL AND SOCIAL STANDARDS</b>	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.		
<b>TECHNICAL ASSISTANCE FACILITY</b>	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.		
<b>ADVISORY BOARDS</b>	Regular formal and informal supervision to monitor best practice, conflicts of interest, deviations from stated policies, internal issues, strategy, and market context.		
<b>IMPACT REPORTING</b>	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

**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.

2022 GEEREF’S DIRECT SDG CONTRIBUTION	GEEREF’S METRICS	GEEREF’S IMPACT
<p><b>GEEREF BUILDS UP NEW CLEAN ENERGY CAPACITY</b></p> 	<p>Capacity installed (GW<sup>2</sup>) Electricity generated and saved (GWh<sup>2</sup>)</p>	<p>1.4 GW in development, 0.5 GW in construction, 2.7 GW in operation, 8,074 GWh of electricity generated and 86 GWh of electricity saved</p>
<p><b>GEEREF CONTRIBUTES TO DECREASING GHG EMISSIONS IN ENERGY AND OTHER INDUSTRIES</b></p> 	<p>Emissions reduced (tonnes of CO<sub>2</sub> equiv.)</p>	<p>3.85 million tonnes of CO<sub>2</sub> equiv. avoided by projects per year</p>
<p><b>GEEREF CREATES EMPLOYMENT OPPORTUNITIES AND SKILLS TRAINING</b></p> 	<p>Number of people employed: temporary, permanent, male, female Training delivered (hours)</p>	<p>c. 5,486 permanent male jobs c. 2,408 permanent female jobs c. 13,185 temporary male jobs c. 5,560 temporary female jobs c. 76,021 training hours</p>
<p><b>GEEREF IS A PUBLIC-PRIVATE PARTNERSHIP</b></p> 		

<sup>2</sup> 1 GWh = 1 000 MWh, 1 GW = 1 000 MW.



CrossBoundary Energy Solar Project in Africa,  
ARCH

## GEEREF IMPACT METRICS

### CATALYSING BILLIONS OF EUROS FOR CLEAN POWER



SPEE Solar Project in Egypt, Catalyst



## 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 2022. 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 country<sup>1</sup>.

The amount of emissions reduced is calculated by multiplying electricity generated (as reported by fund manager) by a given country grid emission factor<sup>2</sup>.

- 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](#).

<sup>1</sup> Enerdata, 2014 figures

<sup>2</sup> [https://unfccc.int/sites/default/files/resource/Harmonized\\_Grid\\_Emission\\_factor\\_data\\_set.pdf](https://unfccc.int/sites/default/files/resource/Harmonized_Grid_Emission_factor_data_set.pdf), July 2019 data

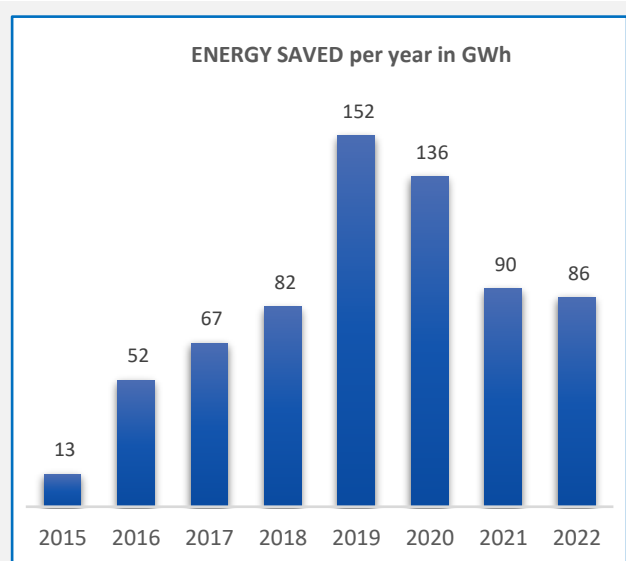
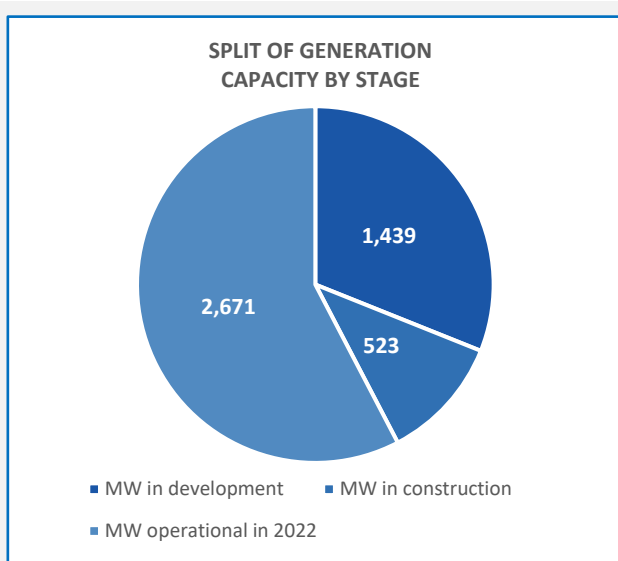
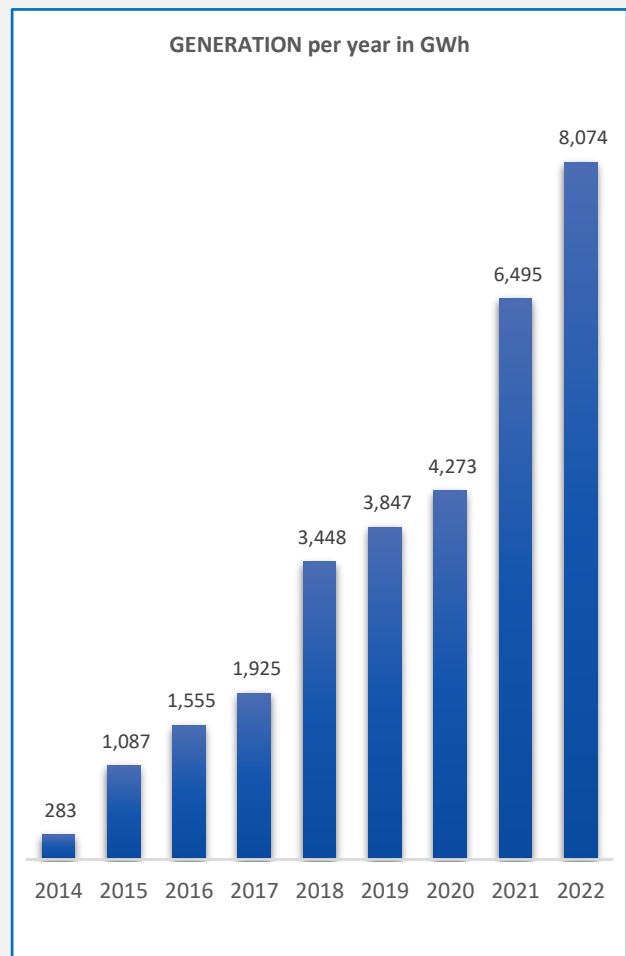
# GEEREF PORTFOLIO METRICS

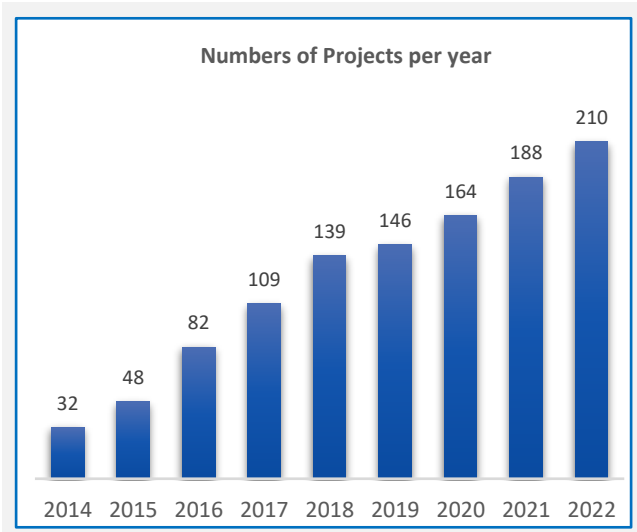
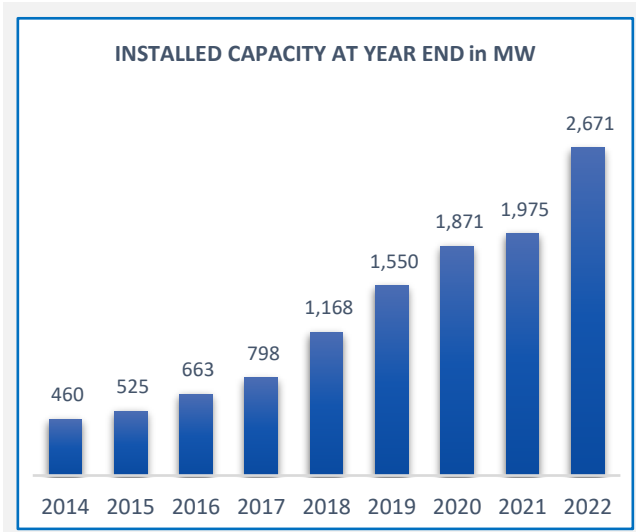
## PILLAR 1: CLEAN ENERGY

*In 2022, the Global Energy Efficiency and Renewable Energy Fund (GEEREF) observed a notable uptick in its clean energy capacity development within developing nations, achieving approximately 4.6 gigawatts (GW). This increase, slightly surpassing the 2021 figures, was largely driven by the expansion of operational projects, particularly in the realms of solar energy and Solar Distributed Generation (SDG)-aligned efficiency initiatives, with significant contributions from Africa and Latin America. Of the total new clean energy capacity, 2.7 GW originated from operational projects.*

*Further emphasizing its impactful year, GEEREF's portfolio of funds yielded approximately 8,074 gigawatt-hours (GWh) in 2022, marking a substantial 24% rise compared to the previous year. This achievement not only underscores the fund's growing influence in the clean energy sector but also its commitment to fostering sustainable energy solutions in developing regions.*

*Since 2019, energy savings have been on a downward trend, largely due to the restrictive impact of COVID-19 and operational implications in certain projects. This decline, evident from the previous year, has been marked by reduced energy saved in efficiency technology projects. While there have been incremental gains in specialized technologies like biogas re-utilization, they have not been enough to offset the combined effects of COVID restrictions and operational challenges faced in various technology projects.*



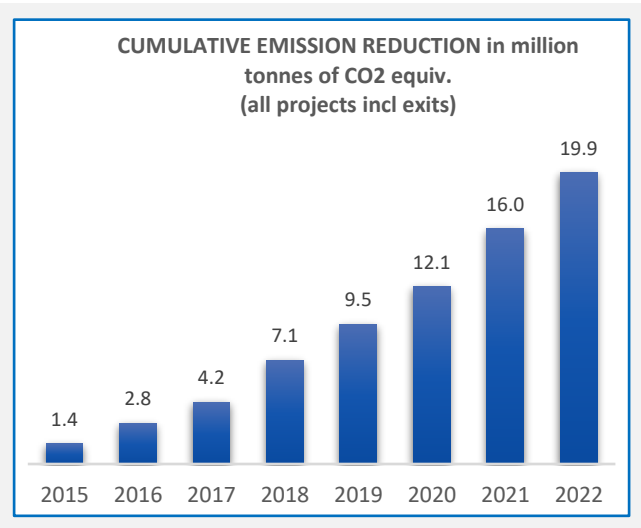




## GEEREF PORTFOLIO METRICS

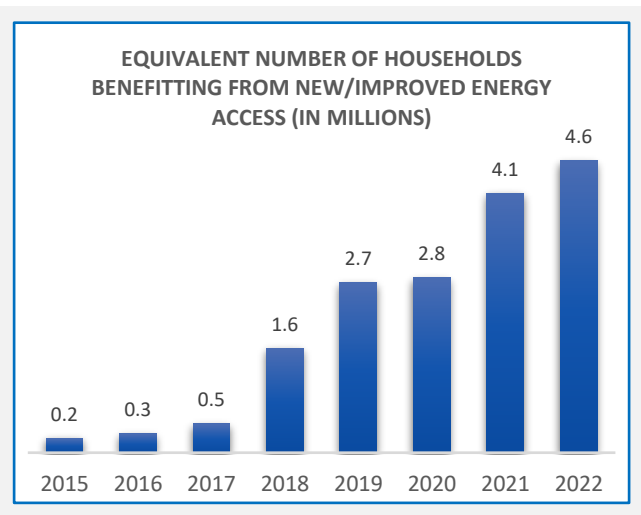
### PILLARS 2 AND 3: CLIMATE MITIGATION/ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

*As of end 2022, GEEREF's projects (including projects exited by the funds) had a climate mitigation effect of c. 19.9m tonnes CO2 equiv. (cumulatively since 2015).*

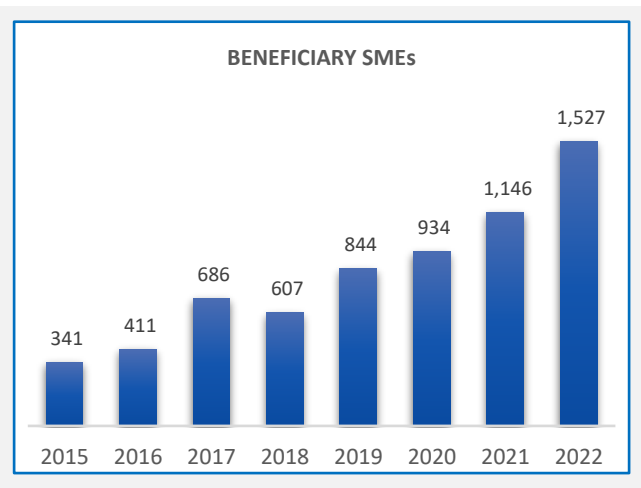


*The 8,074 GWh of electricity generated and 86 GWh saved by GEEREF's projects in 2022 is equivalent to the energy consumption of 4.6 million households which was 13% higher in 2022, compared to 2021 figure.*

*The increase was primarily due to higher renewable electricity generation, resulting in a higher equivalent number of households.*



*GEEREF's operational projects, projects under construction and pipeline projects benefited 1,527 beneficiary SMEs in 2022 which is 33% higher than 2021, and one of the attributable factors is the increase in the number of projects in 2022.*



## GEEREF PORTFOLIO METRICS

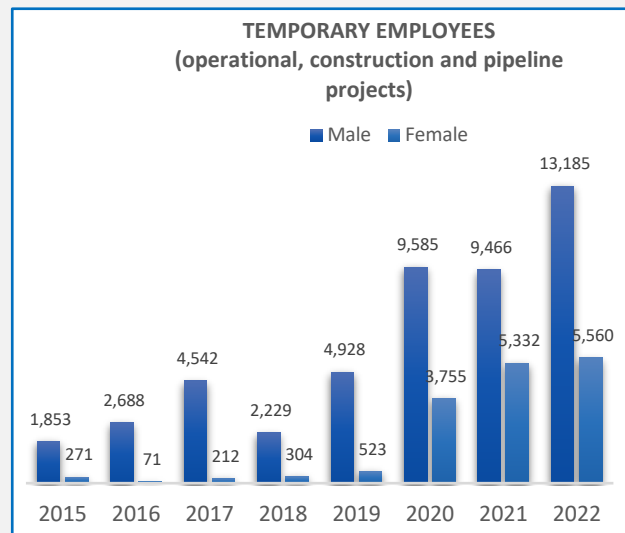
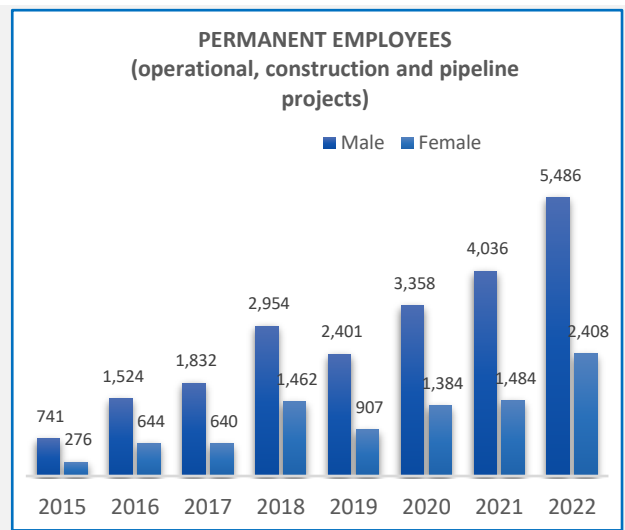
### PILLAR 3: SUSTAINABLE DEVELOPMENT<sup>3</sup>

*The total number of jobs created (permanent and temporary) has been increasing year after year.*

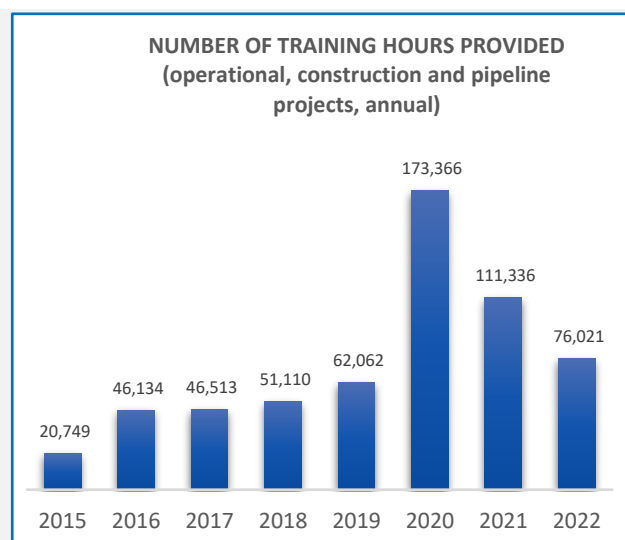
*The number of temporary employees has been significantly higher than the number of permanent employees since 2019 because of the project-based, seasonal nature of the energy sector and the need for specialized skills on a short-term basis. This trend is also driven by economic uncertainties and rapid technological changes requiring flexible workforce solutions.*

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

*Since 2019, there has been a significant increase in the representation of female employees, marking a positive stride towards diversity and inclusion in the project workforce. This growth, particularly noticeable in temporary positions, originated from a relatively low base, indicating a promising trend in gender balance.*



*In 2022, the total training hours provided by the funds and their projects fell to 76,021 hours on an annualized basis, largely because one of the African funds, which holds a significant portion of the overall training programs, reduced its training hours.*

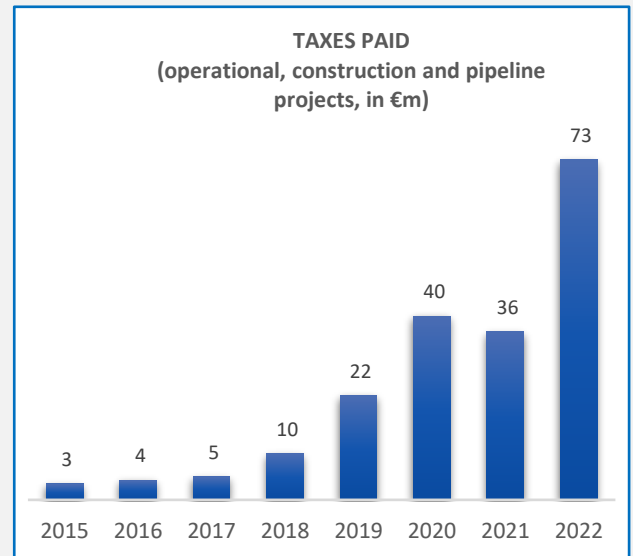


<sup>3</sup> All employment and training figures are reported annualized as when projects are fully operational.

## GEEREF PORTFOLIO METRICS

### PILLAR 3: SUSTAINABLE DEVELOPMENT

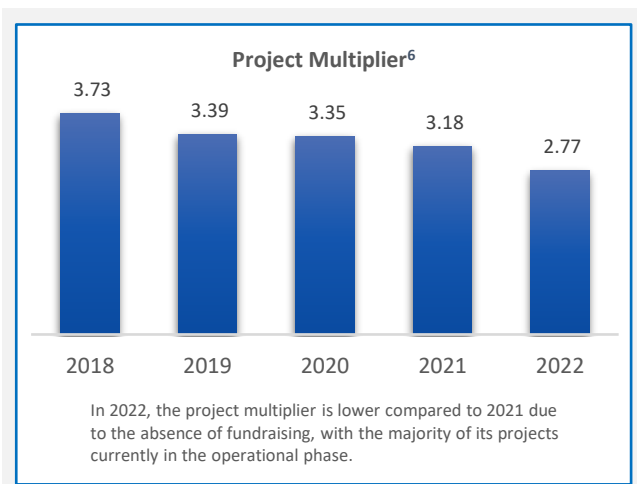
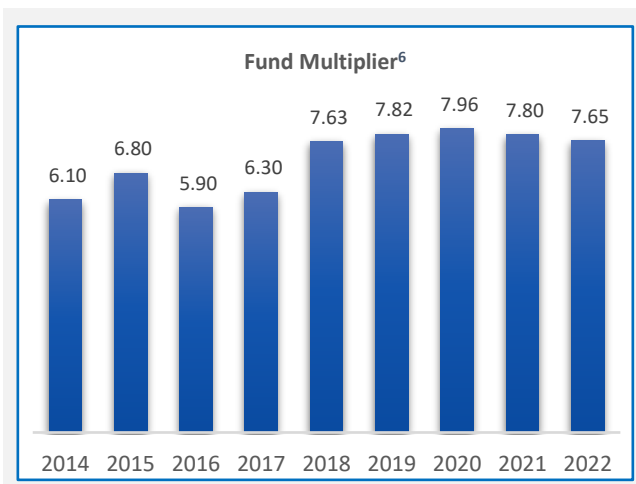
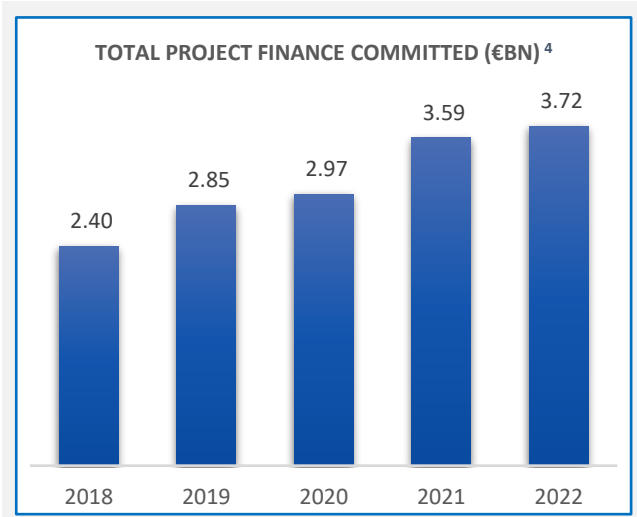
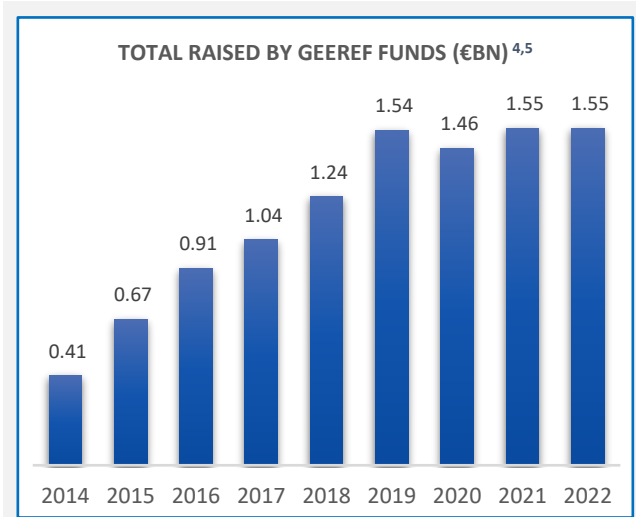
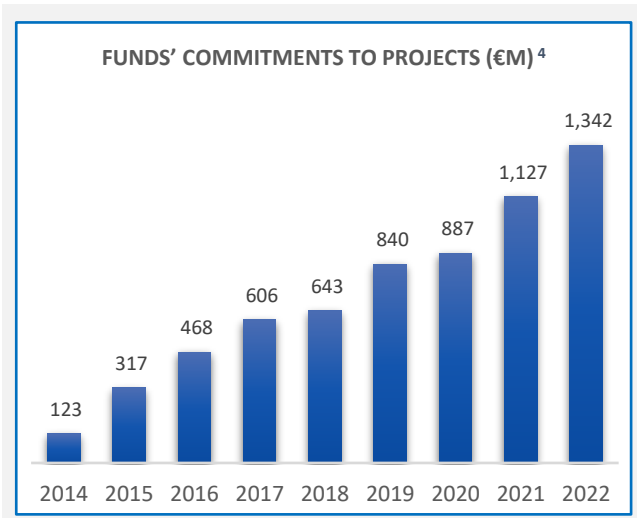
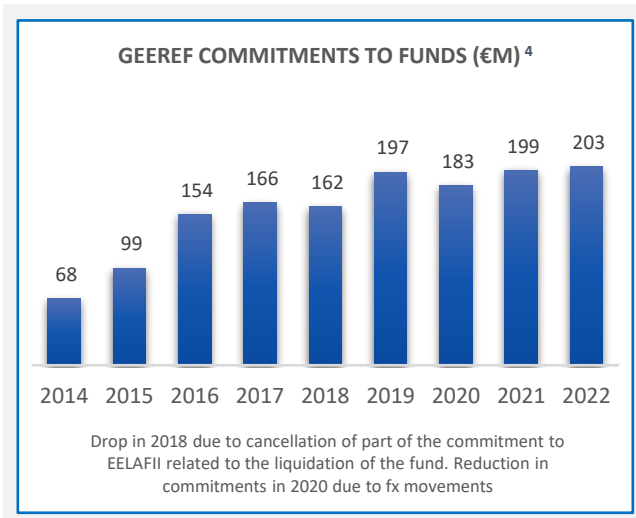
*The underlying projects paid an equivalent amount of EUR 73 million in taxes locally, which is higher than in 2021. These taxes support the local government institutions and their revenue generation potential.*





# GEEREF PORTFOLIO METRICS

## PILLAR 4: FINANCIAL LEVERAGE

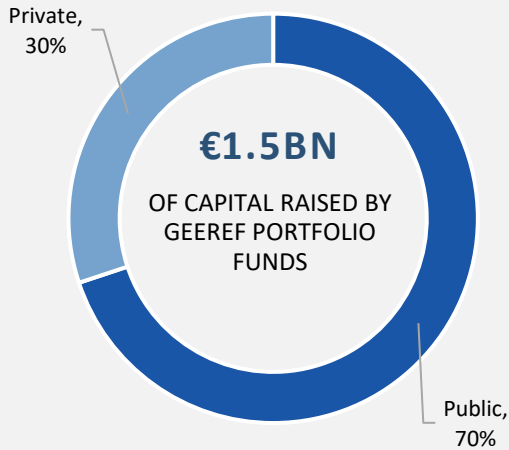


<sup>4</sup> All above numbers are subjected to FX movements. <sup>5</sup> Including GEEREF commitments. <sup>6</sup> See definitions on page 12 and see page 19

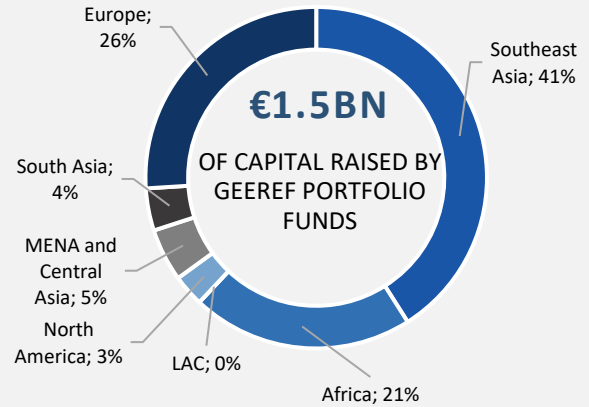
# GEEREF PORTFOLIO METRICS

## PILLAR 4: FINANCIAL LEVERAGE

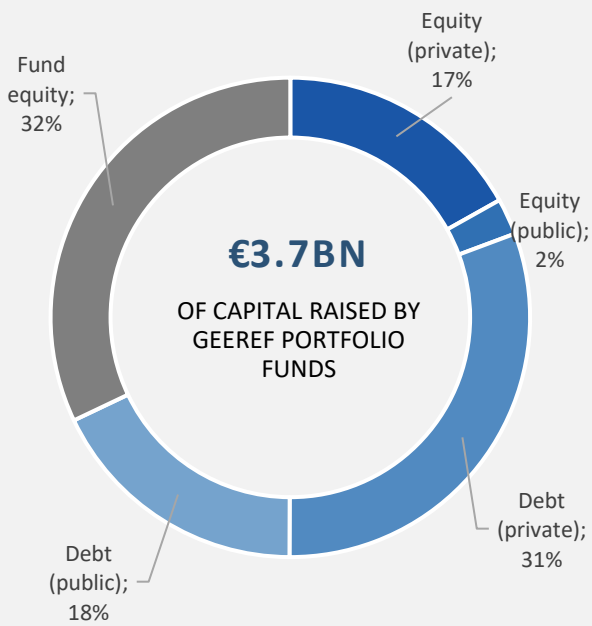
CAPITAL MOBILISATION AT A FUND LEVEL, BY FUNDING SOURCE



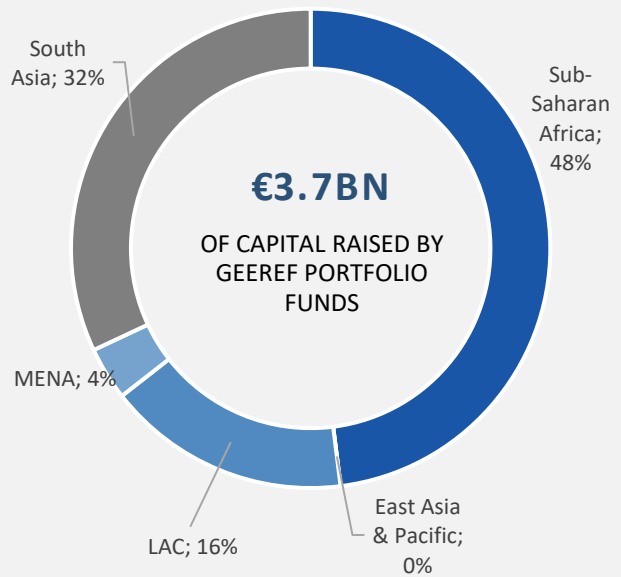
CAPITAL MOBILISATION AT A FUND LEVEL, BY GEOGRAPHY



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 2022, GEEREF's portfolio consisted of EUR 203m of commitments to 14 funds.

#### FUND LEVEL

**€1.5BN**

**TOTAL RAISED BY FUND MANAGERS**

- Based on GEEREF's commitment of EUR 203 million, fund managers have raised a total of EUR ~1.5bn. This translates into a fund-level multiplier of 7.8x, which is similar to the 2021 multiplier. Up until 2021, one of GEEREF's funds was still fundraising.
- A vast majority of the capital raised as of the end of 2022 – 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

**€3.7BN**

**OF PROJECT FINANCING RAISED**

- By year-end 2022, the final cost of projects developed by GEEREF fund managers reached EUR 3.7bn, 32% of which represents their equity contribution, 17% represents private investors' equity contribution and, 2% the public investors' equity support. Lenders supplied the remaining 49% of project financing: 18% stemmed from DFIs, national development banks and equivalent and, 31% from private local banks.
- The total capital mobilised increased by 4% (i.e., 0.1bn) compared to 2021 and the project multiplier declined slightly to 2.8x.

## ABBREVIATIONS

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



