

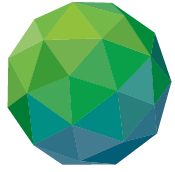
GREEN
CLIMATE
FUND

GCF REGIONAL DIALOGUE

with MIDDLE EAST & NORTH AFRICA

Rabat, Kingdom of Morocco
24–28 June 2024





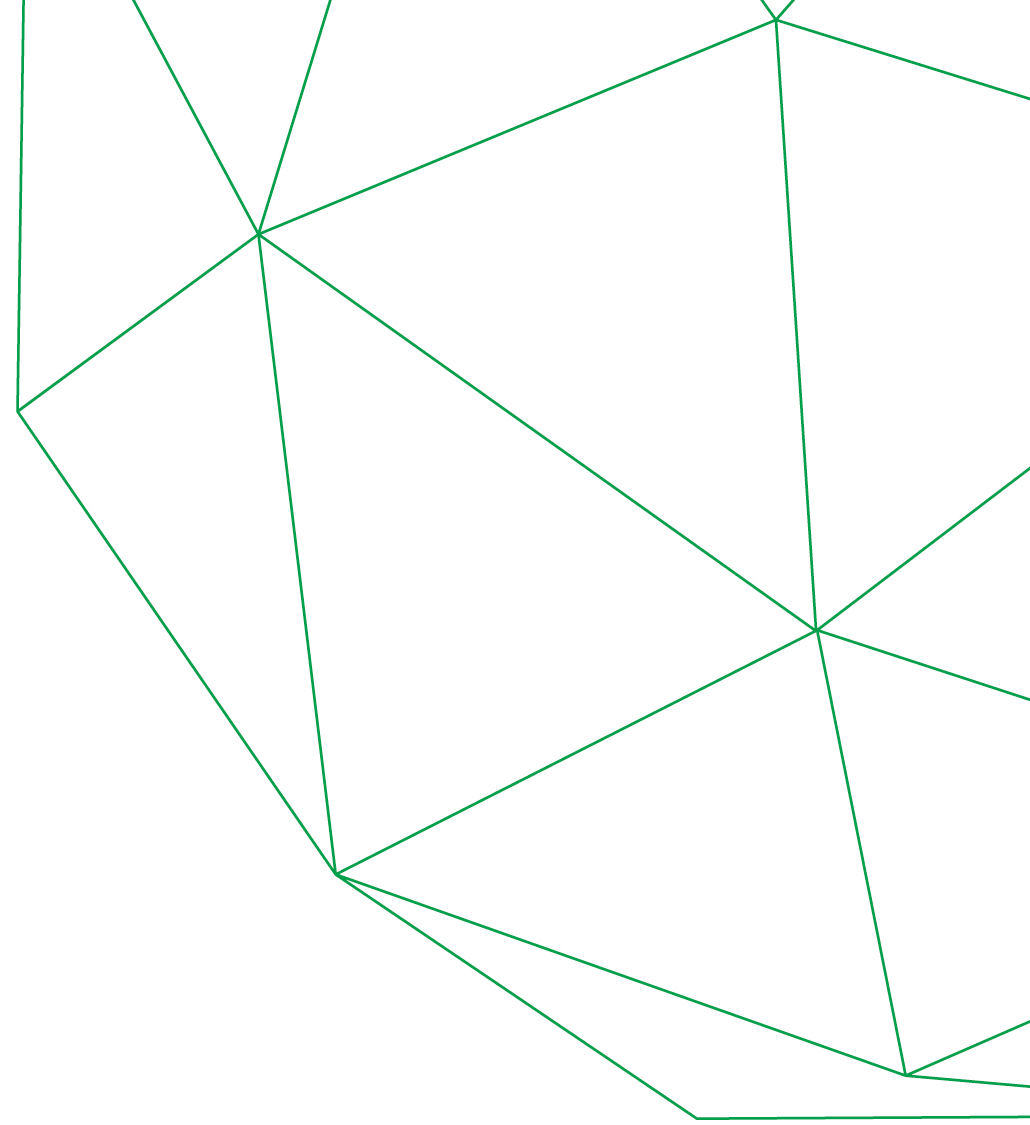
GREEN
CLIMATE
FUND

GCF REGIONAL DIALOGUE
with MIDDLE EAST & NORTH AFRICA

Transformative Opportunities for Energy Transition in MENA Region

Anurag Mishra, Sr Energy Sector Specialist

Rabat, Kingdom of Morocco
24–28 June 2024

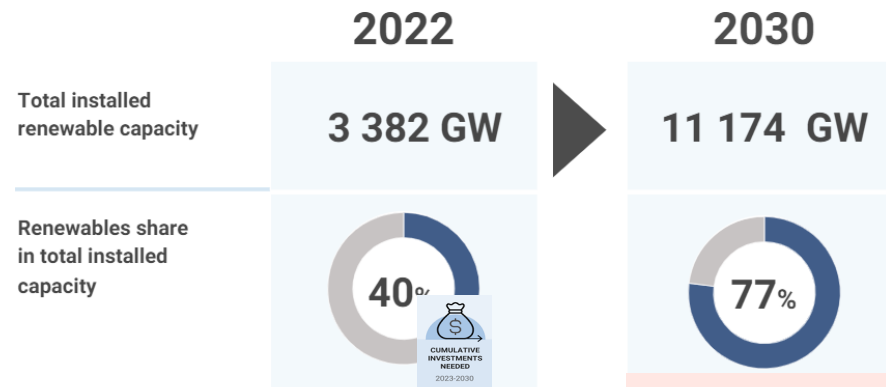


Two key global 2030 priorities

Limit global temperature rise to 1.5C, and achieve peace and prosperity for all



COP28



~USD 10,410 bn



SDGs

Goal 7:

Ensure access to affordable, reliable, sustainable and modern energy for all.



	INDICATOR	2010	LATEST YEAR
	7.1.1 Proportion of population with access to electricity	1.1 billion people without access to electricity	675 million people without access to electricity (2021)
	7.1.2 Proportion of population with primary reliance on clean fuels and technology for cooking	2.9 billion people without access to clean cooking	2.3 billion people without access to clean cooking (2021)

~USD 300 bn

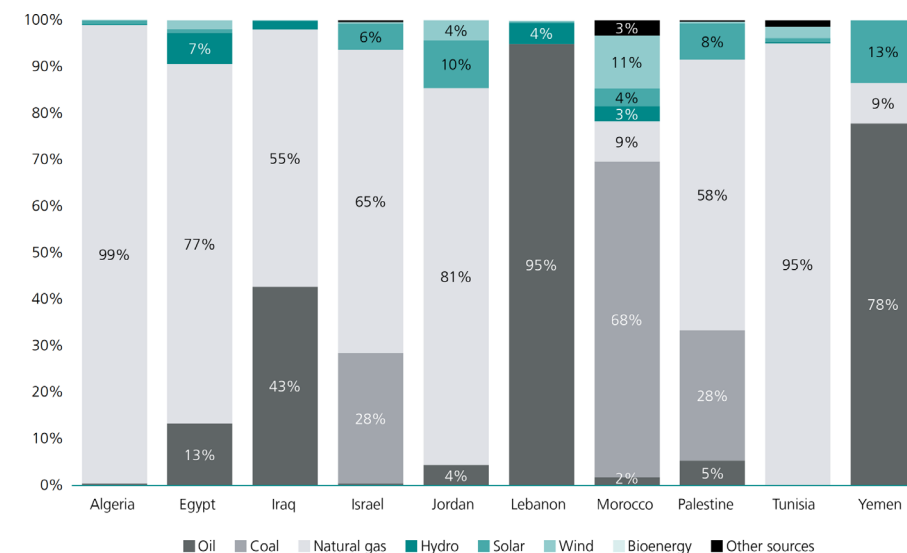
Status of Clean Energy Transition in MENA

MENA countries are crucial for the success of the global energy transition



- **Energy Access Disparity:** Despite vast oil and gas reserves, 65 million people lack electricity, - 30% of the population.
- **High Carbon Emissions and Intensity:** One of the highest per capita carbon emissions and intensity (658g CO₂ per kWh) . MENA countries are 50% more energy-intensive than the world average per unit of GDP
- **Economic Transition:** Need plans for the economic impacts of the global energy transition.
- **Diverse Energy Challenges:**
 - Petro-states: Economies heavily dependent on fossil fuel exports.
 - Net energy importers: Countries focusing on national energy and development needs.
- **Low Renewable Contribution:** As of 2022, renewable energy contributes less than 1% to power generation.

Overview of Electricity Generation by Source 2019/2020



Significant scaleup required in small period



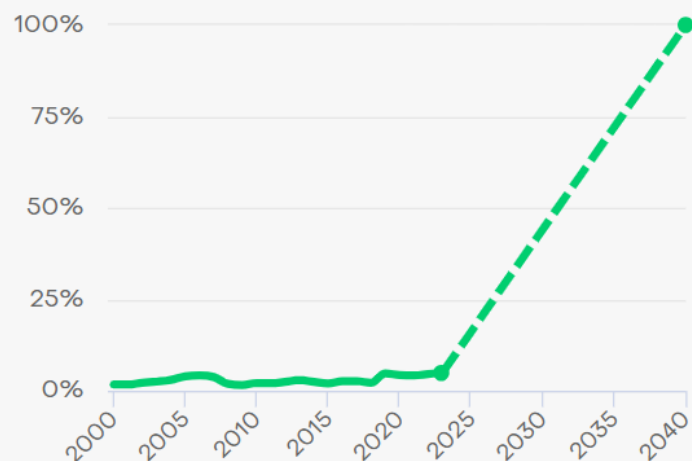
Progress towards 1.5C power sector benchmarks

Middle East

2000–2040

100% **clean electricity** by 2040

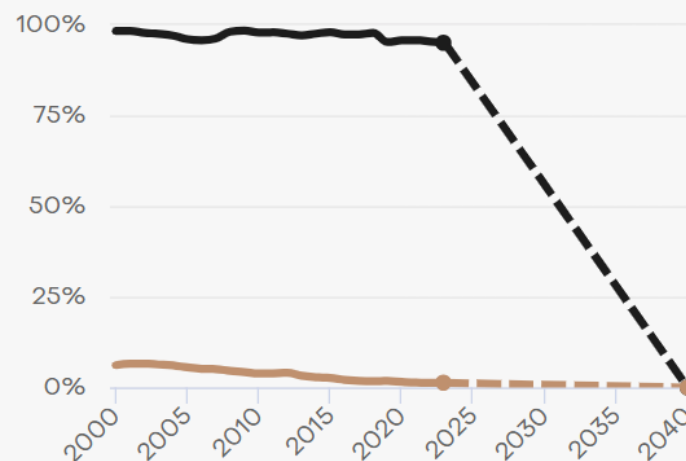
Share of electricity production (%)



No **coal** by 2040

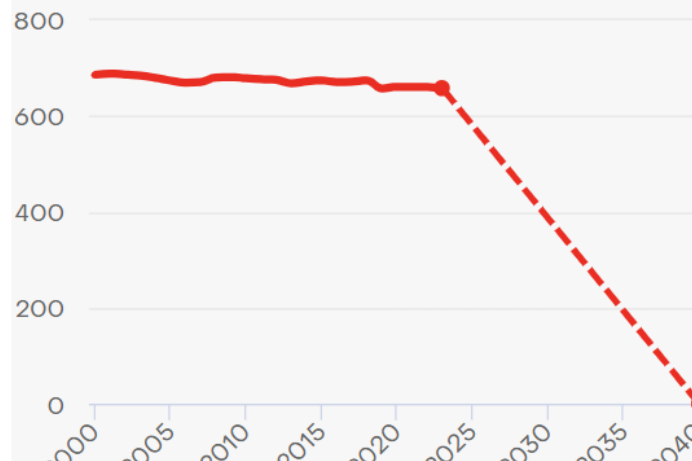
No **fossil fuels** by 2040

Share of electricity production (%)



Zero **carbon intensity** by 2040

Emissions intensity of electricity production (gCO₂eq/kWh)

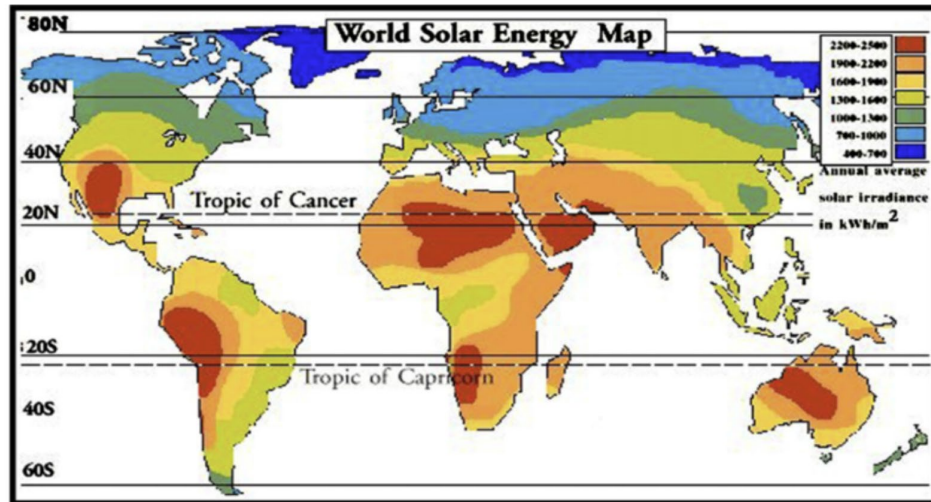


High Renewable Energy Potential



MENA receives 22-26% of all solar energy striking the earth. Solar energy potential in MENA per square kilometer is equivalent to energy produced by 1-2 million barrels of oil annually and could meet at least 50% of global electricity demand.

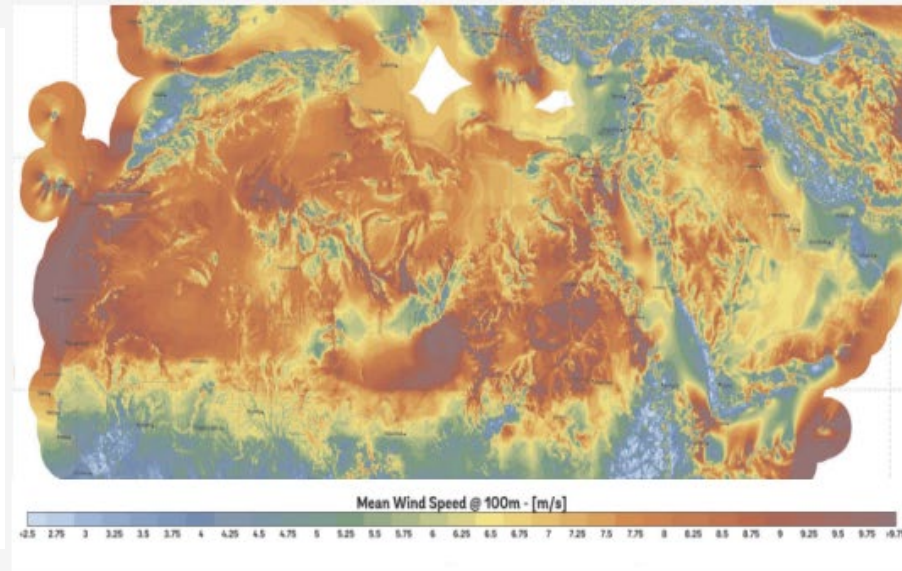
SOLAR RESOURCE MAP



This map is published by the World Bank Group, funded by ESMAP, and prepared by Solargis. For more information and terms of use, please visit <http://globalsolaratlas.info>

Direct Normal Irradiation in MENA. Source: [Global Solar Atlas](#)

75% of MENA has average wind speeds that exceed the minimum threshold for utility-scale wind farms. Wind speeds in countries such as Morocco, Egypt and Tunisia are amongst the highest in the world.



Average Wind Mean Speed in MENA. Source: [Global Wind Atlas](#)

- **Renewable Energy Potential:** The MENA region could supply up to 40% of global energy from solar and wind by 2050.

Energy Transition Challenges and Opportunities



Three strategic enablers : access to capital/financing, existing physical and soft infrastructure for energy exports, and decisive leadership

Enablers and Opportunities:

- **Cost-Efficient RE Power:** Significant advantage in solar power production, with costs being one-fifth of the global average.
- **New Industry Creation:** Can drive the creation of new industries and sectors within the energy market,
- **Utilization of Financial Resources:** Countries with significant financial reserves, such as those with sovereign wealth funds (SWFs) not under pressure to deliver fast returns
- **Renewable Export Prospects:** particularly in low-carbon energy sources like hydrogen and ammonia.
- **Existing infrastructure:** world-class infrastructure in place to trade energy products globally: ports, pipelines, and roadways.(grid infra is lacking)
- **Resource and Geographical advantage:** North African could benefit from their geographical proximity and existing gas pipeline interconnections if a big clean hydrogen market arises in the future. The region also has favorable geological locations for carbon capture, utilization, and storage (CCUS),
- **International Participation:** MENA countries are increasingly participating in international climate-related initiatives, such as the Carbon Sequestration Leadership Forum, the Oil and Gas Climate Initiative, and the Net Zero Producers Forum.
- **Commitment to the global climate agenda:** Hosted significant climate conferences like COP27 and COP28 underscores commitment

— Status of Energy Access and Renewable Energy in MENA



Five tools to unleash MENA's potential (IEA):

1. **Market access.** Needs clear policies on long-term purchasing agreements for clean energy, and greater awareness among users. Governments can also make offtake commitments to help nascent technologies take hold and to nurture the market for low-carbon technologies.
2. **Regional harmonization** . common definitions, standards, and certifications. Beyond regional harmonization, MENA must collaborate with international partners, so it can be prepared to lead and operate on the global stage.
3. **Technology and infrastructure.** To deploy these projects, developers need access to critical infrastructure (including grid, pipelines, ports), plus faster administrative processes (e.g., land permits).
4. **Financial incentives.** Decrease the cost of low-carbon technologies through direct grants, tax credits, and low-cost financing . They can also support consumer adoption through targeted end-user incentives.
5. **Green capabilities.** Bridge the critical skills gap and train the workforce for green jobs. R&D partnerships among governments, educational institutions, and the private sector can also spread the cost and accelerate innovation.

GCF Targets- USP2 and 2030

Aligned to the global ambitious targets and needs of the future generations



- **Updated Strategic Plan (2024-27) Results** (Energy Transition): *20 to 30 developing countries supported to expand access to sustainable, affordable, resilient, reliable renewable energy, particularly for hardest to reach, and/or to increase renewable energy sources in the energy mix.*
- *18+ countries shift to clean and efficient transport, buildings and industries*
- *Other related priorities:*
 - **Doubling the number of Direct Access Entities with projects**
 - **Enhanced access to early-stage capital for MSMEs and startups** (adaptation and energy access)
 - **Smallholders helped to adopt low-emission, and climate resilient agriculture and fisheries**
 - **Green financing institutions established**
 - **Local FIs engaged to expand access to green finance**



Transformational Opportunities for USP2

Human Centric | Mitigate and Adapt | Drive Development | People and Planet



1. Enhance energy for productive use access-hardest to reach (Africa and SIDS)

- Basic services (health, education, water)
- Irrigation and agriculture value-chain
- Livelihood applications



2. Create markets - First GW of RE (Countries with high-potential, low market dev.)

- LFI financing
- Policy support
- Capacity building of private developers



3. Path to Net-zero- 50% RE by 2030 (Countries with >15% RE penetration, G20)

- Grid flexibility
- System friendly procurement
- New Smarter demand
- Distributed RE



4. Hard to Abate- demonstrate solutions (Countries with high industrial demand)

- Green Hydrogen
- Thermal RE
- Sectoral strategies and mandates

Rabat, Kingdom of Morocco | 24–28 June 2024

Efficiency and Climate Resilience of energy systems

Transition of GCF's Energy Portfolio



INITIAL PART OF GCF Initial Resource Mobilization (IRM)

LATTER PART OF GCF's IRM and GCF 1

GCF 2

Utility scale RE frameworks

Successfully implemented projects in:

- Egypt ■ ■
- Kazakhstan ■ ■

Accelerated energy access through RE, especially in LDCs

- Mini-grids with battery storage in DRC – AfDB ■ ■
- ASER solar rural electrification project in Senegal – BOAD ■ ■
- Mini-grids in Haiti – NEFCO ■ ■ ■

New market modalities, innovative financial structures

- Embedded Generation Investment Programme in SA– DBSA ■ ■
- Risk sharing for RE & EE in Argentina – IDB ■ ■

Innovative and new technology

- Espejo de Tarapaca in Chile – MUFG ■
- Battery storage in Pacific SIDS (Cook Islands and Tonga) – ADB ■
- Sustainable Energy Facility in Caribbean – IDB ■ ■

COVID 19 Relief & Recovery

- EARF across multiple countries in sub-Saharan Africa – Acumen ■

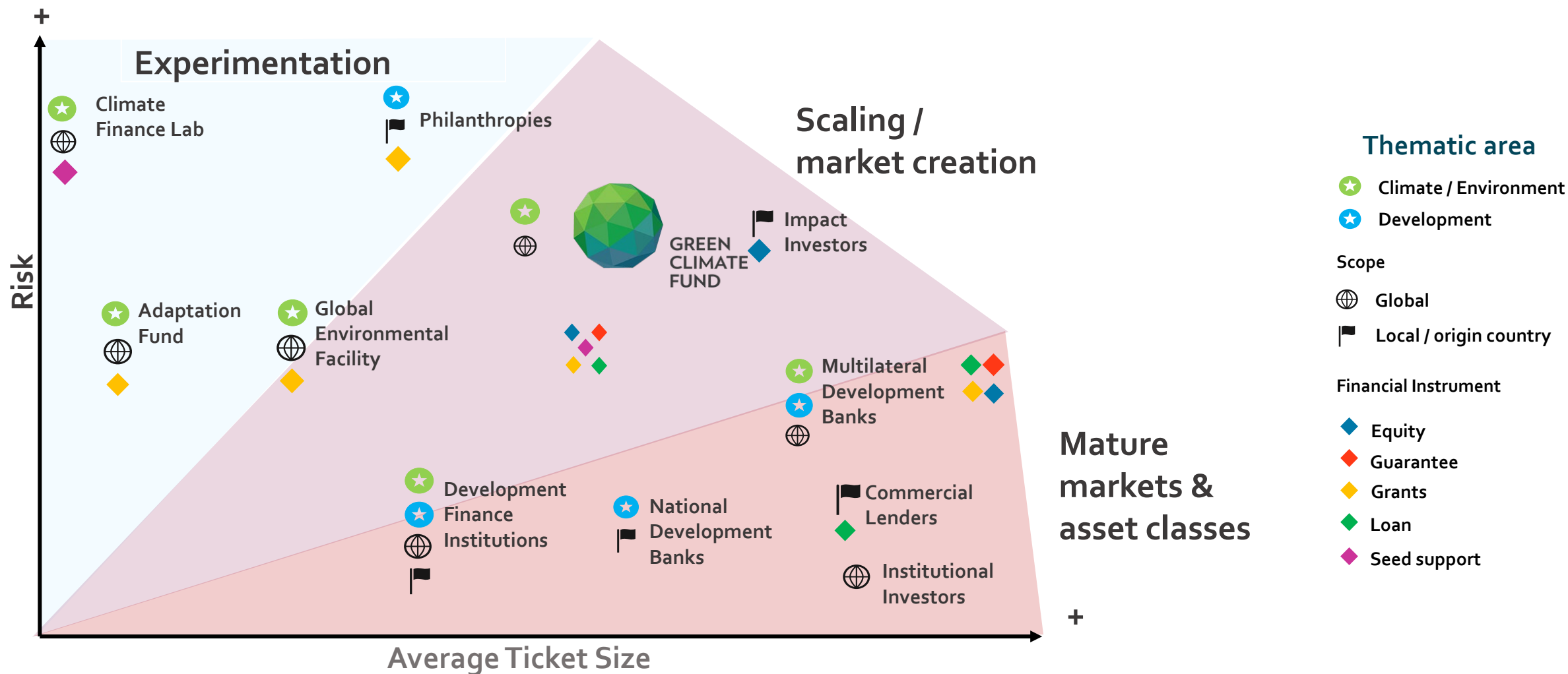
- Human centric
- Mitigate and adapt
- Drive development
- Add value to GCF's portfolio
- For people and planet

Shift from plain vanilla RE projects at concessional rates to transformative programmes through innovative deployment of risk bearing GCF capital

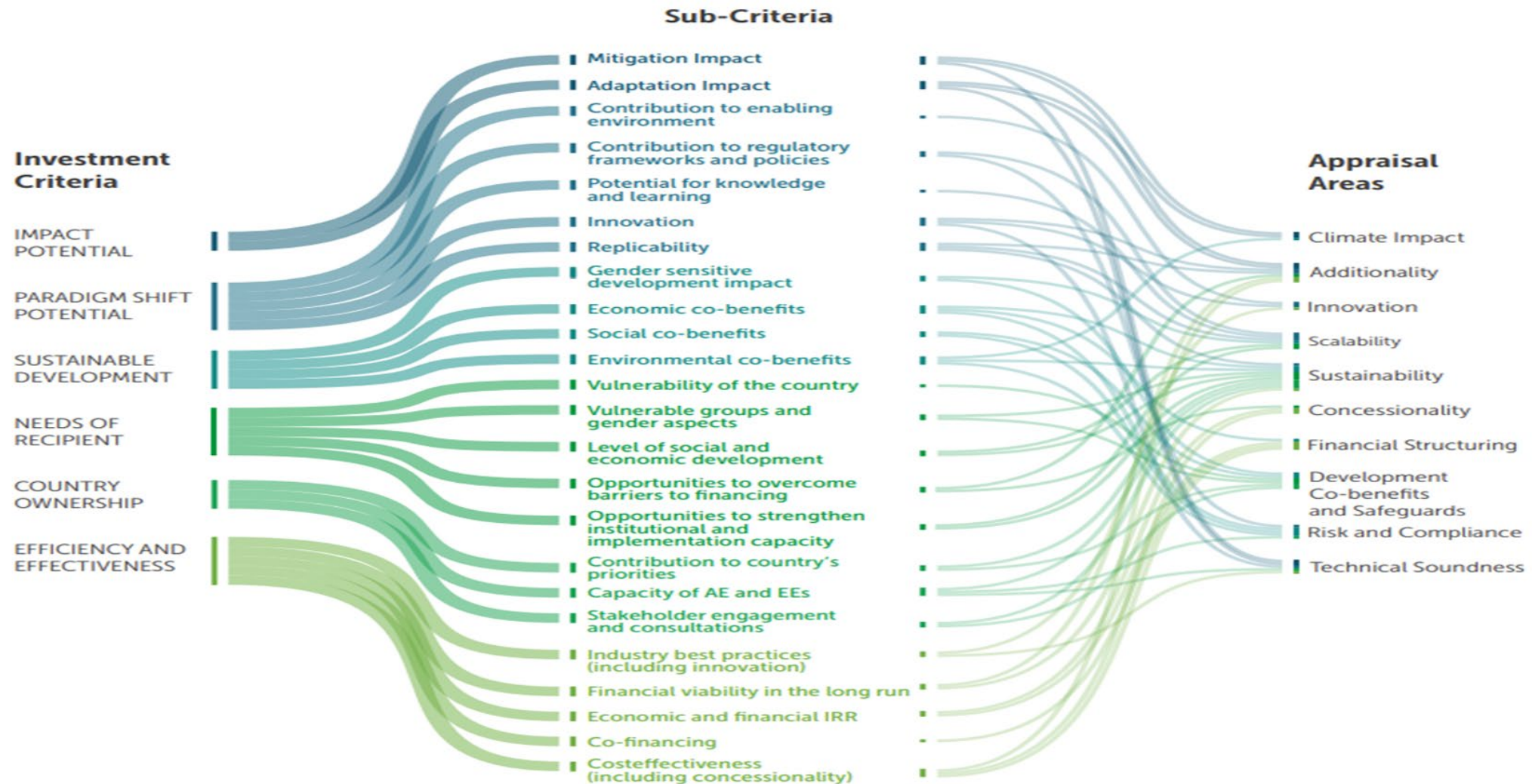
Unleash the full potential of renewable energy

GCF's size and risk appetite

Play a scaling / market creation role



GCF Investment Criteria



Case Examples



Case Example 1



Climate Risk: The power sector is heavily reliant on high emission electricity sources (~54% thermoelectric) and unpredictable hydropower (~30% hydroelectric) due to climate change.

Market Risks: Exposed to spot market price, the Chilean energy market is unique in that it has volatile pricing throughout the day. Many renewable energy projects encounter intermittent issues where volatile pricing on the spot market can be a great disadvantage, particularly in solar power plants, which operate during the daytime only, limiting private sector investments. Traditional private investors were not willing to invest in Hybrid RE projects due to final development risks (e.g. security bonds for energy contracts, final stage of permitting and associated guarantees, engineering and design tests, etc.)

The Espejo de Tarapacá project : Provide stable, 24-hour baseload energy and solving the intermittency of renewable energy through a combination (1) a 300 MW pumped storage hydroelectric plant using the Pacific Ocean as its lower reservoir; and (2) and a 561 MW photovoltaic solar plant. The project sets a precedent by providing a renewable baseload solution at a competitive price. It also contribute to climate change adaptation by providing stable water supply from its own desalination plant to vulnerable local communities. GCF's USD 60 million anchor equity investment will help attract additional private sector debt and equity investors, which will fund the remaining investment of USD 1.1 billion.

Case Example 2



Ethiopia, Guinea Bissau, Indonesia, Kyrgyzstan, Mongolia, Seychelles, Somalia, Tajikistan and Tunisia

Climate Risk: The energy sector stands out as the primary contributor to greenhouse gas (GHG) emissions, mainly due to its heavy reliance on fossil-based power generation. The grid infrastructure is particularly vulnerable to the impacts of extreme weather events driven by climate change.

Market Risks: In developing countries, the potential for economically viable investments in renewable energy (RE) has been hindered by various factors. These include i) limited capacity for generation and transmission planning, ii) an inadequate regulatory framework to attract private investments, iii) challenges in selecting Independent Power Producers (IPPs) due to limited procurement capacity, iv) the financial instability of off-takers, and v) difficulties in integrating Variable Renewable Energy (VRE) into grids.

SRMI-II: Recommend a comprehensive approach of financial and technical support to unlock approximately USD 1.8 billion in private investments for the 2.1 GW of renewable energy projects throughout their lifespan. Strengthen institutional and regulatory systems for energy planning and development integrating climate risks. Establish robust procurement processes. Improve institutional capacity to attract investors and develop a track record enabling them to enhance their credit rating.

Case Example 3



Climate Risk: Significant increase in power demand leading to higher GHG emissions due to high dependence on fossil based (88%) generation.

Market Risks: Even with the world's largest estimated potential for geothermal energy resources, the development has been limited in Indonesia due to risky and expensive early-stage development costs. These barriers are further exacerbated by the geothermal tariff framework which needs to be competitive to enable private sector investment. Indonesia's financial markets are considered very shallow, and capital markets smaller and less liquid.

The risk mitigation facility: This project aims to help the Government of Indonesia scale up geothermal energy development by introducing a well-designed upstream risk mitigation mechanism and by promoting a conducive regulatory environment. Under this project, both public and private sector geothermal developers will have access to funds to help mitigate early-stage development risks. The geothermal resource risk mitigation facility will provide contingent financing and soft loans for resource confirmation drilling.

Case Example 4



Climate Risk: India is the world's fourth largest carbon emitter, responsible for 6 per cent of global greenhouse gas emissions. In its Nationally Determined Contribution (NDC), the Government of India has stated its ambition to achieve 40 percent cumulative electric power capacity from non-fossil fuel-based energy resources by 2030 - with a target of 40 GW of rooftop solar power by 2022.

Market Risks: Despite significant scaleup in the utility scale solar project, the deployment of rooftop solar was very slow due to several market constraints including limitations in the availability of long-term debt financing. Commercial lenders were also cautious in lending to rooftop solar projects because there are high perceived risks and limited information on the track records of rooftop solar investments.

Line of Credit for Solar rooftop: will enable access to long-term and affordable financing for the construction of 250 MW of rooftop solar capacity in India and thereby reduce emissions by 5.2 million tonnes of CO₂ equivalent over 20 years. This pioneering private sector-driven initiative will unlock private sector investment in the rooftop solar market and pave the way toward a sustainable bankable model in India and beyond.



Thank you