

EXECUTIVE BRIEF

ACCELERATING INVESTMENTS IN RENEWABLE ENERGY IN FMFRGING MARKETS

TABLE OF CONTENTS

Appendix. Statement	15
3. Mechanisms to Overcome Barriers and Encourage Investment	8
2. Barriers to EMDEs Attracting Capital at Scale from SWFs for Renewables	6
is a \$1 Trillion Plus Investment Opportunity	3
1. The Energy Transition in Emerging Markets	

Executive Summary

Investing in renewable energy in emerging and developing economies (EMDEs) constitutes a **massive investment opportunity** from the triple perspective of impact, risk and return. Reducing carbon emissions in these countries while meeting rising energy demand will require significantly scaling-up private sector engagement and is critical to meet the Paris Agreement goals.

While meaningful technical challenges remain for large scale roll-out of renewable energy such as the issue of intermittency, advances in technology and economies of scale have increased the role of renewable energy as a major component of the global energy mix, from utility scale generation through to micro grids that allow access to electricity to households for the first time.

However, accessing these markets is often challenging for investors due to individual projects in many jurisdictions often being small, the regulatory environment being complex or non-standardized with insufficient repeat deal flow, and local markets often lacking conditions supportive of foreign direct investment.



Many OPSWF Network members are already providing large amounts of private sector financing to renewables in EMDEs; many more billions of dollars in private investments towards low carbon and resilience could be channeled if the **appropriate enablers are in place**.

Four such priority enablers emerge as vital for escalated investment ambitions: (1) **transparent, repeat tendering programs with an increased focus on large scale projects,** (2) **improved regulatory frameworks for international investors** to enable an enhanced regulatory environment to participate (3) **better structured public private partnerships** to mitigate risk where possible and (4) more use by SWFs of **specialized investment teams** that can facilitate the aggregation of deals and increase the number of participants and developments in EMDEs.

Additionally, advancing international standards and best practices for renewable projects and other sustainable infrastructure in EMDEs will reduce investment cost and contribute to a further acceleration of investments in this segment.

Members of significant scale across the OPSWF Network collectively have the ambition to increase their investments in renewables in EMDEs if the right policies and incentives are in place. Successfully addressing the priority enablers will not only open-up further opportunities for OPSWF members, **but crowd-in increasing flows of other private sector financing.**

In the critical 12-18 month period ahead through COP27 in Egypt and COP28 in the UAE, OPSWF members have an important opportunity to **share and communicate their insights and requirements to invest at scale** and **develop recommendations that can facilitate the transformation of renewables into an even faster growing asset class in EMDEs**, for the segment to take the same path experienced by wind and solar energy sources in developed markets more than a decade ago. In 2023, we see members continuing their contributions to the scaling of renewables in EMDEs and to strengthen the Network's dialogue with key stakeholders.



1. The Energy Transition in Emerging Markets is a \$1 Trillion Plus Investment Opportunity

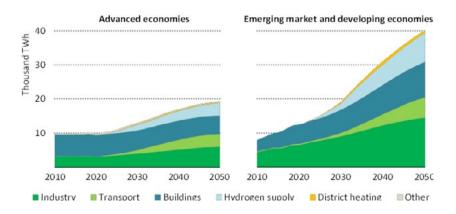
Emerging Markets and Developing Economies (EMDEs) have enormous potential for renewable energy. The International Energy Agency (IEA) has stated EMDEs need \$1 trillion of energy transition investment per year to align with the goals of the Paris Agreement.¹ There is strong focus internationally on the commitment by developed nations to deliver \$100 bn of climate finance annually into EMDEs. This is expected to be a strong theme of COP27 in Egypt.

Key drivers for increased renewable energy deployment include increasing energy requirements due to higher economic growth, creating access to electricity where none exists, and meeting the goals of the Paris Agreement. We have examined each in more detail.

1. What counts as 'Climate Solution' investments?

EMDE market energy investment is driven by growing demand from population growth, urbanization and economic activity. This will provide the bulk of energy sector investment opportunities. The global population (7.8 billion in 2020) is expected to increase by 750 million in 2030 and 2 billion in 2050. Most of the population increase is set to occur in emerging markets, with the African continent alone accounting for 1.2 billion between 2020 and 2050. In the IEA Net-Zero by 2050 Scenario, global electricity demand more than doubles between 2020 and 2050. Emerging markets account for 75% of the global increase in electricity demand in the IEA Net-Zero scenario².

Electricity demand by sector and regional grouping in the IEA Net Zero by 2050 scenario

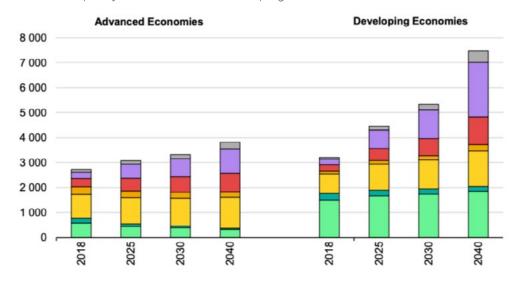




Renewable energy will play a large part in serving this growing demand. Many EMDEs have excellent renewable energy resources. There are significant variations between jurisdictions, depending on the level of development in different economies and their resource endowments. Some markets are underserved for electricity supply overall. In some EMDEs the share of renewables can be relatively high.

In Kenya for example, 92% of electricity is generated from renewable sources (predominantly hydro and geothermal power).³ Others, such as India and South Africa have predominantly coal-fired generation. Overall, the share of fossil fuels in total energy supply in EMDEs is similar to elsewhere (around 80%). However, at 18%, coal plays a bigger role in EMDEs than in advanced economies. This presents an opportunity for renewables in governments' decarbonization and energy transition efforts. Compared with the rest of the world, EMDEs account for a slightly higher share of natural gas, largely due to the inclusion of major gas-consuming countries across Eurasia and the Middle East. EMDEs account for almost all the world's traditional use of solid biomass, which is widely used as a cooking fuel.^{4,5}

All sources of generation in developing economies increase to 2040 to meet growing demand Installed capacity in advanced and developing economies in STEPS



The cost of electricity from solar and wind power has fallen rapidly over recent years. Since 2010, globally, a cumulative total of 644 GW of renewable power generation capacity has been added, with estimated costs that have been lower than the cheapest fossil fuel-fired option in each respective year. In emerging economies, the 534 GW added over the decade from 2010-2020 at costs lower than fossil fuels, reduced electricity generation costs by up to USD 32 billion in 2021. Changing economics of renewables and storage combined with increasing Government and corporate decarbonization emission- reduction goals mean that an ever-larger share of this investment need can be delivered with renewables.

https://www.irena.org/publications/2021/Jun/Renewable-Power-Costs-in-2020



2. The investment opportunity to provide first-time access to electricity has significant social development potential, but is difficult to access for large investors

Today, around 770 million people live without access to electricity, mostly in Africa and Asia. The pandemic put an end to several years of continued progress and worsened the already low energy purchasing power of households in developing countries.⁷

Supplying all of them with electricity is a clear basic development need but faces execution challenges. The main obstacles to project development are the lack of grid infrastructure and the cost of creating it in more remote regions (one of the reasons India has made the progress it has is a reasonable level of existing grid coverage and access); consumers' ability to pay; and projects (mini-and micro-grids) being relatively small, resulting in high project development and management cost per dollar invested. Some will be connected to national and regional grids but many people, particularly in the most rural areas, will at least as an interim stage, need off-grid connection.

Renewable energy projects have a high social impact and contribute the most to human and economic development in the areas where they are deployed. Respiratory diseases and fires are associated with the use of kerosene lamps. The lack of electric water pumps is preventing efficient land irrigation and is an obstacle to farming productivity. The absence of cost-efficient industrial cooling prevents efficient food processing. Schools are without power for lighting and computers, and health care facilities are left without the possibility to refrigerate medicine.

Models for project deployment in small-scale renewable energy for first time access to electricity are typically very small in size, usually less than \$1M in total. Solar home systems (SHS) and mini-grids remain relatively early-stage sectors for institutional investment compared with utility-scale grid-connected generation, with business models still evolving to meet commercial and operational challenges.

3. Accelerated deployment of renewable energy to meet the goals of the Paris Agreement

In addition to the growth drivers for renewable energy to meet increased demand for electricity for economic growth and first-time electrification, a third driver is increasing the share of renewable energy generation in EMDEs, particularly to replace unabated coal-fired generation, to complement other resources in meeting increased demand while achieving global climate targets. Getting the world on track for 1.5°C requires a surge in annual investment in clean energy projects, which includes both renewable energy and low-emission energy technologies (which could include CCUS and removal technologies) and infrastructure to nearly USD 4 trillion by 2030. In energy, some 70% of the additional spending required to close the gap between announced climate commitments and the IEA's Net Zero by 2050 Scenario, is needed in EMDEs.9 In this scenario, total electrification annual investment will rise to USD 800 billion in 2030 from USD 259 billion in 2020. Investment will need to continue to rise to USD 1 trillion in 2040 before slowing down to 2030 investment levels in 2050 once the grid is fully decarbonized and the growth of renewables equals demand. By 2030, emerging markets will account for over 40% of total energy investment globally.10



2. Barriers to EMDEs Attracting Capital at Scale from SWFs for Renewables

Renewable energy can be an attractive sector for investors. However, compared to other asset classes such as public equities, fixed income, real estate and infrastructure, most SWFs are relatively underweight renewables. This is often driven by SWF'sgeneral preference for public markets and larger ticket sizes, as well as strong competition for the renewable energy asset class from other financial investors with corresponding pressure on financial returns (including in EMDEs). Like all investments, renewables will only be appealing to SWFs when they meet their individual investment criteria.

While there are variations in the size of individual SWF investment allocations, for larger SWFs, average ticket sizes for individual investments are typically large, whether in individual projects or portfolios, and such ticket sizes are hard to find in EMDEs outside a few larger markets. Ticket size aside, few SWFs are set up to directly invest in individual renewable energy projects. The share of management effort needed to assess opportunities in the sector, combined with relatively sub-scale opportunities in many (though not all) EMDEs and an overlay of more general business risk factors, and pressure on returns notwithstanding these greater risk factors, limits SWF appetite for EMDE renewables at present.

Renewable energy projects are likely to be relatively large (in locations with good solar or wind resource, available land and other necessary factors) where they are meeting grid-connected demand, and typically subject to public tendering programs or through direct contracting by commercial and industrial (C&I) users from renewable energy developers providing clean generation either on-site or through the grid. But these general points are subject to significant variation: in some Least Developed Countries with low demand and grid penetration, grid-connected projects may be relatively small and not part of larger programs.

1. Sovereign Wealth Funds require scalable investments with measurable risk characteristics

In principle, many OPSWF members are interested in increasing their allocation to renewables in EMDEs, in recognition of the drivers of potential growth in the sector, and in some cases in an effort to support development in their own jurisdiction with national sovereign capital. In other cases, diversifying developed economies into EMDEs is an important driver.

While SWFs can generally present competitive cost of capital, it is often within a framework that dedicates a large focus to managing risk and deploying capital cost-efficiently. Their sweet spot is typically therefore either very large projects to justify the Due Diligence (DD) costs (for example NBIM's EUR1.4bn investment for 50% of Borsele 1&2 offshore wind farms in the Netherlands) or large portfolios of projects with sufficiently desirable risk characteristics to make the DD process easier and to provide portfolio diversification benefit.

2. Complex risk characteristics in EMDEs constitute a challenge for Sovereign Wealth Fund Investors



Though emerging markets are relatively heterogeneous, they share a set of common characteristics typically posing significant challenges for the attractiveness of renewable energy projects, even when economics may be supportive of individual projects. In large individual project investments, technical, commercial, regulatory and legal due diligence is considerable. Investing in development platforms requires some degree of look through to the underlying project portfolio, even when contextualized by a developer track record.

SWFs invested in the renewables sector in developed markets generally observe several differences when looking at individual renewable energy projects or portfolios of projects in EMDEs. These include emerging market financing costs being on average higher, with considerable variations between countries depending on economic maturity and other factors. Even where payment records are good (such as in the South African REIPPP program) a sovereign guarantee is often needed to make utility scale renewable energy projects bankable. The fiscal capacity of national utility or public authority off-takers can in turn become a constraint on expansion of renewable energy programs. Commercial & Industrial counterparty risk arguably is more easily assessed as the off-takers are typically larger corporates but requires investor education to understand the sector, which has a different business model compared to developing grid-connected renewables for national or regional public off-takers.

Clarity on the payment and regulatory regime is in any case essential for developers and in turn investors, especially in jurisdictions where, even with greatly reduced technology costs, the contracted off-take price is higher than the subsidized cost of electricity to some or all consumer groups.

In addition to specific regulatory regimes and market operation, general business conditions, including dispute resolution regimes, can be relatively immature. Project financing in the least developed markets therefore tends to come from development banks rather than the commercial banking sector.

Given these challenges, relatively limited capital has been invested into renewable energy projects in EMDEs by SWFs to date. Among SWFs in developed markets, only those with dedicated renewable energy divisions or subsidiaries (e.g. Masdar) have invested into EMDEs outside the largest markets, notably India. Other SWFs have sought exposure to renewables through partnerships with specialized managers, where there can be diversification across regions or globally and via investment into development and portfolio platforms as well as individual projects. Historically, market sizes and EMDE project sizes typically have not met SWFs' investment ticket size criteria for individual projects, and often have not met requirements on a portfolio or platform basis.



3. Mechanisms to Overcome Barriers and Encourage Investment

Assuming that technical feasibility is met, there are broadly two barriers many SWFs face in considering EMDE renewable investments: (i)in common with other investors, insufficient addressable deal flow in a number of jurisdictions affects the overall size of the investable universe, and (ii) difficulty in developing a suitably diversified and scaled portfolio of renewable energy investments outside the largest EMDE markets.

A. Increasing the Addressable Investment Universe

First, there is a need for a suitably permissive enabling environment for private sector-participation in long-term sectors such as renewable energy and other infrastructure. Without that, developers will struggle to operate, and institutional investors will find it difficult to access the market either as investors in developers or as long-term owners of renewable energy projects.¹¹ Key elements include:

- political will for private sector involvement in the sector;
- capacity/ability of public authorities to execute political and commercial intent;
- predictable legal and regulatory environment, as well as permissive general financial regulation around movement of capital into and out of a jurisdiction; and
- general ease of doing business.

Second, there needs to be greater deal flow from the roll out of renewable energy programs at scale. It is important to note that each individual jurisdiction has its own particular risk characteristics; but there are some common themes on what is needed for renewable energy programs to be developed successfully at scale, including:

- a capable procurement authority with capacity to run a transparent process for publicly procured programs;
- repeated, predictable procurement rounds by that authority that offer the prospect of scale for developers/investors and thus justify setting up local teams, the advisory and services ecosystem, and local manufacturing;
- payment guarantees from Governments or otherwise directly to market participants to make projects bankable where there is material off-taker counterparty risk and/or delays in payment for generated power (in some jurisdictions the sovereign guarantor may need to be back-stopped in turn by an international agency);
- standardized Power Purchase Agreements and other project documentation;
- openness to national and regional power pooling to create scale; and
- a credible system operator and grid development plan.



Policy support for C&I clean power development (bringing with it with wider industrial development benefits) is also a strong driver of growth, facilitating inward investment by manufacturers and other corporates who require clean power to meet their own net zero goals.

While the detailed regime will vary between jurisdictions, these characteristics are apparent in successful renewable energy programs in developed markets such as the UK and Germany and in EMDEs such as India and South Africa.

Case study:

India

India has implemented a model of competitive tariff-based biding via intermediary agencies. Two specific innovations which have allowed it to move ahead at pace include:

Creation of the Solar Energy Corporation of India (SECI) in 2011 to catalyze PPPs for accelerating transition to clean energy. SECI aggregates demand for clean power and provides a viable, transparent and credible environment for the private sector to deploy their capital in PPPs. Auctions with SECI as an intermediary have attracted robust participation, not only due to developers' confidence of dealing with a central government entity with a contractual obligation to pay, but also due of the assurance of power sale and steady payments from a Central Government entity. SECI had awarded ~37 GW of solar projects by March 2022.

Ultra Mega Solar Parks: In 2016, India initially set a target for 40 utility scale industrial solar parks with a combined capacity of 20GW. In 2017, India doubled this target to 40GW by 2022. The concept pioneered by India, involves a state government or local distribution company facilitating a single central grid connection and taking on the procurement and time delay risks relating to land acquisition. This approach has been instrumental in driving economies of scale and attracting global capital into India's renewable energy sector. India now houses multiple ultramega solar parks with a capacity of more than 1GW each. Utility-scale solar parks in India have successfully overcome the major risks associated with renewable energy development in India, namely land acquisition risk, project execution risk, off-taker risk and operation and maintenance risk.

Much of this is being delivered via generally well-understood, repeated procurement rounds, particularly those run by the two national off-taker agencies which were set up to increase scale and reduce investor concerns about public off-taker counterparty risk. Recent changes to the legislative framework for the private (Commercial & Industrial) renewable generation market, including promoting greater consistency across States, are expected to facilitate further growth in an already rapidly expanding sector, complementing the public procurement programs. India's National Infrastructure Investment Fund is supporting renewables roll-out and other sustainable



٠ ،		
Intractrii	cturo	investment.
111111111111111111111111111111111111111		1111/6211116111
111111111111111111111111111111111111111	CCGIC	III V COCITICITE.



B. Accessing the Sector at Sufficient Scale

Mega projects are unlikely to materialize in many EMDEs due to their relatively small economies. There have been large scale procurement programs in a limited number of EMDE markets, for example India. In many cases an investment in portfolios put together by portfolio aggregators (such as a specialist fund manager) or possibly by investing directly into a large-scale developer platform may be the most pragmatic route enabling SWFs to consider suitably diversified participation in the renewable energy sector. Even in the case of mega projects not all SWFs are set up to consider direct project investments (large or small).

Case study:

South Africa

The South African Renewable Energy Independent Power Producer Program (REIPPP) now embarking on its sixth bid window round is the largest repeat renewables program in sub-Saharan Africa. With a transparent and predictable procurement process run by an independent agency it has attracted significant and competitive private sector participation. In turn, the repeat REIPP program has led to a growing secondary market in operating renewable energy projects, which can provide an attractive, relatively defensive exposure to the renewable energy sector for indirect investors through 'yieldcos'. These have been a successful feature of evolving developed markets renewables investment ecosystems, moving assets to institutional investors, who are the natural long-term owners, and helping recycle developer capital commitments into new greenfield projects. Africa's first dedicated renewable energy 'yieldco', Revego Africa Energy, cornerstoned by Macquarie-managed UK Climate Investments, was launched in 2021 to meet this need and has invested in 600MW of operating renewables and attracted local institutional investment.

Investment portfolios must be sufficiently large to allow for the diversification of individual project risks, yet sufficiently homogeneous from a risk perspective to facilitate efficient due diligence and support capital allocation decisions to risk categories internally in many SWFs. A key question becomes whether portfolios of sufficiently homogeneous projects can be assembled that meet SWFs' requirements for size and measurable risk characteristics. Increasing the number of repeatable programs and aligning investment characteristics helps SWFs to consider sectoral investment by driving efficiency and appropriate investment volumes.. Some SWF members have invested at large scale in certain EMDE renewable sectors, notably in India. The wider adoption by EMDEs of private-sector friendly enabling environments, which in turn can facilitate private sector involvement at scale, is the most important driver for SWFs to be able to allocate a greater volume of capital into the utility-scale renewable energy sector in EMDEs.



A considerable challenge facing the market today is a lack of standardization relating to assessing the sustainability profile of potential investments. For instance, there is no universally agreed taxonomy for what constitutes as 'green' activities. Bringing standardization to these issues would help cost and resource efficiency in the deployment of capital into clean energy investments. One example is the FAST-Infra Label, which is being developed under the Sustainable Markets Initiative with the support of a number of OPSWF members and partners. This aims to be a consistent, globally applicable labelling system designed to assist investors in identifying and evaluating renewable energy and other sustainable infrastructure assets. The label will facilitate due diligence processes and structuring of investments for sustainable infrastructure assets, thereby reducing transaction costs and making it easier for investors to commit capital. This is expected to be especially useful in EMDEs. Information on all labelled assets will be made available to market participants via a data repository, which will also help the market to disclose, report, and measure performance of sustainable infrastructure assets over time.

C. Public/private partnerships to reduce risk

SWFs recognize there is a valuable capacity-building role for international and national agencies to support setting up good regulatory frameworks, transparent and effective procurement agencies and standardization of contracts.

In addition, the role of public finance to support guarantee schemes where necessary to mitigate off-taker risk is acknowledged as an important risk mitigant in some EMDE jurisdictions and an efficient use of public funds to leverage in greater volumes of private finance. Guarantee schemes are not a substitute for transparent, repeat procurement programs and a workable regulatory and payment framework but will continue to be needed to address residual counterparty credit risk and make projects bankable. Programs like the World Bank's Scaling Solar Program13 are effective in helping to underwrite the risk for investors, through capping their returns, and through use of repeatable procedural and documentation templates.

Case study:

SWFs catalysing first of a kind project

OPSWF members in Nigeria and Gabon have each invested in renewable energy projects within their national jurisdiction, taking the time and effort to suitably diligence and structure investment in an initial renewable energy project. The intention is then to utilize the learnings from these initial projects to catalyse similar repeat projects alongside other investors, helping build confidence in the local asset class and scaling-up local renewable energy deployment.

The Nigeria Sovereign Investment Authority (NSIA) recently developed an all equity financed 10MW grid-connected solar PV plant in Kano, Nigeria, the largest capacity yet deployed in the country. The project is currently in construction, with a target start date for commercial operations date in Q1 2023. Based on learnings from the Kano Solar Project, the NSIA –



alongside IFC – are e energy-backed utilit	developing a renewable energy platform to scale integrated renewable ty projects across Nigeria.



D. Blended finance equity as a tool to de-risk, pool and scale

Blended finance equity funds can address many of the issues associated with scale, diversification and risk-return profile, which are some of the main obstacles for investments in EMDEs as outlined above. In such structures, junior equity providers (typically public or philanthropic investors) would take a subordinated position in a fund structure to de-risk investments by senior investors (typically institutional capital). The senior position in the structure provides institutional investors with downside protection and improved risk-return characteristics, commensurate with (or similar to) investments in OECD markets. Such vehicles can offer the required scale and diversification to investors as they serve as aggregator of equity stakes across various projects/platforms/companies in various countries. A number of OPSWF members/partners are working with national and international public partners in the pilot CFLI and Just Transition Energy Partnership country platforms and other country/regional initiatives designed to bring concessional and private capital and other stakeholders together to scale up capital deployment, focused on specific jurisdictions. Masdar is supporting IRENA's Energy Transition Accelerator Financing (ETAF) platform, which benefits from concessional finance from the Abu Dhabi Fund for Development as part of an offering to accelerate renewables deployment in EMDEs.

Case study:

Blended Finance

The recently launched Emerging Market Climate Action Fund (EMCAF) by OPSWF member Allianz Global Investors serves as an example of a structure to help grow investable portfolios at scale. EMCAF is a target EUR600m vehicle that finances renewable energy and other climate transition projects in EMDEs. EMCAF serves as an aggregation tool, allowing large institutional investors to participate in an expected portfolio of c. 20 investments in developer platforms and fund managers in EMDEs (each of which individually would be subscale for such investors), creating a diversified portfolio of 150+ projects in these markets. In addition, EMCAF's focus on equity financing generates important additionality in the market. By financing the scale up of developer platforms and new projects, EMCAF is incubating a high number of players each of which could grow to reach the size and maturity required for direct participation by SWFs in the future.



Like the way utility-scale renewables grew in Europe, there is a role for local SWFs and investment institutions to play in aggregating and standardizing smaller tickets into a portfolio into which international SWFs can then invest. This usually brings both the capital recycling element to local investors and an element of discount rate contraction that attracts further investors into the aggregation/development play. One example of much smaller scale investments that can use this model is the use of off-grid Solar Home Systems (SHS) for households and small businesses. These are based on a very different business model from utility-scale development, with SHS akin to a consumer finance business. National planning based on consumption patterns along with a supportive regulatory is necessary where mini-grid development, supplemented by SHS, will be the principal means of providing rural access to electricity.

In more carbon intense energy systems that areaddressing wider social considerations associated with an accelerated just transition from use of unabated coal in particular, there is likely to be a necessary role for developed market public finance in partnership with national governments. These joint efforts can support social aspects to create the social and political conditions for deployment of private finance to support this transition, as highlighted at COP26. OPSWF Members will continue to work with international and national agencies to develop these concepts further with a view to increasing the opportunities for SWF private capital to be deployed in line with SWF investment requirements.

Case study:

the potential of SWF cooperation

In June 2022 nine African SWFs formed the African Sovereign Investors Forum (ASIF). ASIF is a platform focused on mobilizing capital and equity for renewable energy and other green projects and improved logistics in Africa. It is expected that the ASIF members will partner with other SWFs outside Africa that are interested in supporting these investment objectives. This new partnership is intended to bring greater collective weight to individual SWF efforts by clarifying investor needs and showcasing potential investment opportunities to a greater volume of capital than any individual member can mobilize.