SIFEM
SWISS INVESTMENT FUND
FOR EMERGING MARKETS

SIFEM SECTOR FOCUS

RENEWABLE ENERGY

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RENEWABLE ENERGY

WHY PRODUCE RENEWABLE ENERGY AND ENERGY EFFICIENT PRODUCTS?

The world has to face two major energy challenges in the coming decades:
(i) securing the provision of energy in the context of fossil fuel resources becoming increasingly scarce or cumbersome to extract and produce and
(ii) dealing with climate change.
The solution or at least the alleviation of both issues can be found in the development and use of renewable and quasi emission free sources of energy like wind, solar, and hydroelectric, which also provide substantial benefits for our health and our economy. Renewable energy is clean, local and infinite, and can be produced at an acceptable cost. It facilitates the creation of jobs and generates revenues for local communities, stimulating the economy and the development of infrastructure such as new roads, schools, and hospitals.

COUNTERING CLIMATE CHANGE

Reducing GHG Emissions

One of the reasons for the rise of carbon dioxide (CO_2) and other greenhouse gas (GHG) emissions is human activity and the related use of fossil fuels. The accumulation of these emissions traps the heat in the atmosphere and steadily drives up the global temperature on the planet, which has significant and harmful effects on our health, our environment, and our climate. The use of renewable energy avoids emissions to the atmosphere otherwise created by fossil fuel energy sources, thus contributing to the mitigation of global climate change. Current research suggests that the climate will irreversibly tip into a much higher temperature equilibrium affecting and reshaping climate zones and weather patterns, if the average global temperature rises more than two degrees Celsius. In addition CO_2, GHG and other chemical pollutants impair the quality of the air and the water of the oceans. The long-term consequences for fauna and flora and ultimately life on earth are yet unknown. Hence, our present actions have a major influence on avoiding that the climate reaches this tipping point.

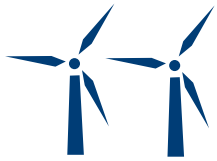
INCREASING ENERGY AUTONOMY

Securing a Reliable and Unlimited Energy Supply

Renewable energy is mainly produced locally and relies on natural resources such as wind, solar radiation and water, which are endlessly available and are not consumed in the process. They therefore represent a reliable, local and cost-efficient source of energy, reducing the reliance on fossil fuels, and the unpredictable prices and dependence on foreign suppliers linked to it. The provision of sufficient amounts of affordable and reliable power is one of the preconditions to economic development as it brings a variety of opportunities.

RENEWABLE ENERGY

PROMOTING THE LOCAL ECONOMY



Supporting Job Creation and Economic Development

Depending on the availability of natural resources at a specific point in time, renewable assets cannot be run at full capacity all the time: sun or wind cannot be stored, but are transformed into energy when they are available. Hence, renewable energy has lower capacity factors than standard fossil fuel power plants, which means that many more, typically small and decentralized assets have to be built and operated to generate the same amount of power. This means on average, more jobs are created for each unit of renewable electricity than from each unit of fossil fuel-based energy. In general, the activities of companies in the renewable energy supply chain - specifically in the civil engineering and manufacturing space - are stimulated and local businesses benefit from increased household and business incomes.
Furthermore, local governments collect property and income taxes and other payments from renewable energy project owners. These revenues can help support vital public services, especially in rural communities where the projects are often located.

CONTRIBUTING TO RURAL DEVELOPMENT

Spurring Electrification in Remote Areas

As renewable energy facilities are transforming natural resources found abundantly in typically underprivileged rural areas, this type of energy also significantly contributes to the electrification of formerly underserved regions in developing countries and stimulates the development of the infrastructure around the asset location. This further reinforces the positive impact in these regions as the availability of electricity opens up a variety of new possibilities to the local community. The use of light or the access to communication technology and information facilitates education and financial security: people are able to study and pursue other income-generating activities also at night.

IMPROVING HEALTH & SAFETY

Reducing Pollutants

In contrast to fossil fuel resources, renewable energy generates little or no waste products such as CO_2, GHG and other toxins which pollute air and water and therefore renewable energy contributes to people's health. People benefit from safer ways of heating homes or cooking, when gas or coal stoves can be replaced by electrical alternatives and indoor pollution can therefore be minimized. Exposure to indoor smoke is associated with health problems such as asthma, cancer, tuberculosis and many other lung and respiratory diseases. According to a study conducted by the World Health Organization (WHO) in 2012 around 4.3 million deaths per year could be linked to indoor air pollution from burning solid fuel and it was identified as one of the top ten global health risks.

WIND POWER

Wind power is derived by extracting a part of the kinetic energy of wind. The wind spins the turbine's blades and creates a torque, which is transformed into electrical power by a connected generator. The electricity generated can be fed into a grid to be distributed to the end-user. Offshore wind is characterized by a laminar flow, more steady and stronger than on land. Offshore farms have less visual impact due to their remote location, but construction and maintenance costs are considerably higher.

WHY USE WIND POWER?

Wind power is a clean source of energy, as it produces no waste because no chemical reaction takes place. Wind power farming is highly compatible with agriculture and industry, as it requires less than 5% of total land usage. The land can simultaneously be used to keep livestock, and crops can be planted right up to the turbine infrastructure, meaning that food and energy can be produced on the same hectare of land.

POTENTIAL CHALLENGES WITH WIND POWER

Wind is a fluctuating source of energy and the exact power output over time is difficult to predict. To meet the base load energy demand, a form of energy storage needs to be utilized or it must be offset with other forms of energy. It is important to develop the wind power facilities in line with best practice social and environmental standards such as SIFEM requires from its investments. These take into account noise studies, visual impact, and bird and bat habitat guidelines.

EXAMPLE PROJECT

The Kouga Wind Farm is a project of Evolution One*, located in the Eastern Cape region in South Africa. It consists of 32 wind turbines which produce over 300 GWh of clean energy per year. This is sufficient to fully provide the annual electricity consumption of approximately 50,000 average households in South Africa. By providing clean and renewable energy, the Kouga Wind Farm helps to reduce South Africa's impact on climate change and dependence on coal power, by displacing approximately 290,000 tons of CO_2 annually. Approximately 85% of the operational costs are expected to be spent in the Eastern Cape area, which translates into an economic impact on the local communities of USD 9 million per year.

*an overview of Evolution One can be found on page 10.

SOLAR POWER

Solar energy can be produced by harnessing the light and heat from the sun by using devices such as solar thermal collectors or solar photovoltaic (PV) panels. Solar thermal collectors transform the solar radiati on into heat which is then used for heating or cooling water or air for residential or commercial usage. Solar PV panels are made of semiconductor materials, which catch the radiant light to knock electrons loose from their atoms. This process creates an electric current which is bundled to generate a usable electricity output. The solar thermal collectors and solar PV panels can be installed for personal and corporate use as well as incorporated into an electrical grid.

WHY USE SOLAR POWER?

Solar energy is a clean and quiet form of energy: there are no moving parts or waste from chemical reactions. Solar energy through heating and photovoltaics is available anywhere the sun shines. Solar panels are relatively maintenance-free and have a long-life span. Once installed, they produce power at a fixed cost.

POTENTIAL CHALLENGES WITH SOLAR POWER

Solar PV power output has a limited predictability: it is dependent on the weather – mist and clouds decrease the solar radiation levels and the power output can in principal only be harnessed during daylight hours. In addition, the solar panel technology still needs improvement to be more cost-effective and the long-term deterioration patterns of the panels are yet unknown. In contrast to wind and hydro, the space requirements and the land usage factors are very high. Proper land acquisition can be a concern when land needs to be bought from local communities. It is therefore important to develop solar power facilities in line with best practice social and environmental standards, such as SIFEM requires from its investments.

EXAMPLE PROJECT

Symbior is an investee company of Armstrong South East Asia Clean Energy Fund* developing and operating small solar photovoltaic plants in the north east of Thailand. It has finalized the construction of a 1MW plant while another five sites are planned for a total capacity of 29MW. The current operation provides clean renewable power to the grid and covers the energy demand of roughly 2,000 households in the region. It provides an immediate solution for currently inadequate peak time power requirements for areas transitioning from agriculture to manufacturing. Symbior's projects are expected to save over 645,000 tons of carbon dioxide equivalent over the life of the plants.

*an overview of Armstrong can be found on page 11.

RURAL SOLAR ENERGY

POSITIVE IMPACTS OF SOLAR ENERGY IN RURAL AREAS

Solar energy has the potential to reach and benefit the most vulnerable communities, because it is competitively priced, predictable in costs and faster and safer than conventional power or heat generation. The investment required is comparatively modest, the systems are set up for individual, autonomous use and therefore not dependent on large infrastructure such as distribution grids, which are non-existent in many remote places.

Setting aside an oil lamp or a coal stove to use clean and renewable energy has shown direct positive impacts on people's quality of life. Families who have installed solar energy for their homes are finding more and more ways to put the power to productive use such as powering electrical fences for their livestock, water pumping and solar cooling. Parents and caretakers who use solar energy help avoid harmful accidents or even death to their children and families, by replacing the flammable resources previously used to illuminate their homes. Many sad stories of children disfigured by burns can be prevented by using safe, renewable energy.

SIFEM: OBJECTIVES

SIFEM'S ROLE AS A DEVELOPMENT FINANCIAL INSTITUTION

At the core of SIFEM's mandate as a Development Finance Institution (DFI) lies the objective of promoting long-term, sustainable and broad-based economic growth to fight poverty and increase living standards in developing and emerging countries. To do so, SIFEM provides long-term finance which is greatly needed for sustainable private sector-led growth in frontier markets, but is usually considered to be too risky to be offered at reasonable terms by commercial investors. SIFEM financing seeks to lower the risks private investors face, thus attracting investments which would otherwise not be made. SIFEM also assists its investments with advisory support, for example with the implementation of best practice environmental and social standards as well as good corporate governance.

INVESTING IN EMERGING MARKETS

The support of DFIs such as SIFEM to the renewable energy sector in emerging markets is crucial. Renewable technologies tend to be more capital intensive than conventional technologies, because most of the costs are incurred upfront. Conventional technologies on the contrary involve high operational and maintenance costs mainly due to the procurement of fuel and spare parts. To date, the lower operating costs and long-term savings of renewable systems have not been sufficient to always persuade investors to finance the higher upfront costs to the required extent. By making long-term finance available in emerging markets to cover the high upfront expenditures such as the land acquisition, the development of surrounding infrastructure and the construction of the actual renewable power plant DFIs play a catalytic role. They can greatly contribute to get such projects off the ground, taking the risk of investing in innovative projects in emerging markets and demonstrating the financial viability of these ventures to attract further capital from more commercial investors and thus help develop the entire sector and local economies.

ENGAGING THE PRIVATE SECTOR

The private sector plays a significant role in promoting renewable energy and in implementing global climate change policies. Financial investments from the private sector can stimulate the market and increase the investment potential and ultimately work towards meeting climate change objectives. The financing required to combat climate change cannot be met by the public sector alone.

SIFEM can account for a variety of underlying portfolio companies invested via generalist funds which are active in the sector of renewable energy. Since 2008, SIFEM has also invested in funds specifically targeting renewable energies.

SIFEM: RENEWABLE ENERGY INVESTMENTS

EVOLUTION ONE

Evolution One is a private equity fund investing in renewable and clean technologies in South and Southern Africa. The fund was launched in 2008, with SIFEM being one of the first close investors.

It focuses on deploying clean technologies across the environment goods and services sector in Southern Africa, making both technology and infrastructure-related investments in the form of equity and equity related instruments. The Fund's portfolio includes projects in the sectors of wind and solar power generation, waste management, aquaculture and energy efficiency.

Evolution One seeks to innovate in these new energy and environmental markets and foster their high-growth potential. The projects contribute to mitigating climate change and resource scarcity while at the same time providing benefits and empowering the local communities.

INTERACT CLIMATE CHANGE FACILITY

The Interact Climate Change Facility (ICCF) is a joint investment facility for financing climate change and climate efficiency projects in developing countries, backed by the majority of the European Development Finance Institutions (EDFIs), to which SIFEM belongs. ICCF provides long-term loans, guarantees and mezzanine finance to private sector projects that reduce climate change by cutting greenhouse gas emissions.
Projects financed by ICCF include businesses building renewable energy plants, clean energy distribution infrastructure, energy efficiency technology or transport projects that cut emissions from road and air travel. ICCF promotes the use of clean technology as an integral part of sustainable economic development. It also acts directly in the poorest countries, which are the most exposed to the harmful effects of climate change and where the energy shortage is greatest.

SIFEM: RENEWABLE ENERGY INVESTMENTS

LATIN RENEWABLES INFRASTRUCTURE FUND

The Latin Renewables Infrastructure Fund (LRIF) is a private equity fund investing in renewable energy generation projects in Latin America, primarily in Central America, and to a lesser extent in South America and the Caribbean.
LRIF targets investments in asset-based, capital-intensive segments of renewable energy generation, mainly focusing on hydro, but also investing in wind, geothermal, and solar energy sub-sectors. The fund achieves strong development impact by providing equity to smaller-scale renewable energy projects, addressing Latin America's growing demand for energy in an environmentally sustainable way, increasing access to energy and fostering local industrial development.

ARMSTRONG SOUTH EAST ASIA CLEAN ENERGY FUND

The Armstrong South East Asia Clean Energy Fund is a private equity fund investing in renewable energy generation and resource efficiency projects in Southeast Asia with a focus on Indonesia, Thailand and the Philippines.
The Fund targets small-scale renewable energy projects, such as run-of-the-river hydro and solar PV, therefore contributing to their professionalization and improving the access to sustainable, clean energy, particularly for underserved regions. Simultaneously, it reduces the dependence on fossil-based fuels and fosters economic development in Southeast Asia.

ABOUT OBVIAM

Obviam is an independent investment advisor specialised in long-term investments in emerging and frontier markets. Obviam advises public, institutional, and private clients, including the Swiss Investment Fund for Emerging Markets (SIFEM), the Development Finance Institution (DFI) of the Swiss Confederation. Obviam offers investors an opportunity to capture attractive returns and generate sustainable positive impact in emerging and frontier markets, via a proven and responsible investment approach.

ABOUT SIFEM

The Swiss Investment Fund for Emerging Markets (SIFEM) is the Swiss Development Finance Institution. It provides longterm finance to private equity funds and financial institutions in emerging markets. SIFEM's primary focus is on institutions investing in the small and medium enterprise (SME) sector. On a selective basis, SIFEM also invests in microfinance. SIFEM's investment philosophy is guided by the belief that investing in commercially viable emerging market SMEs can provide investors risk adjusted returns, as well as generate sustainable, long-term development effects in local communities. SIFEM is fully owned by the Swiss Confederation and managed by Obviam, a privately owned management advisory group.

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