



TECHNOLOGIES

The adoption and widespread deployment of technologies for low carbon development and climate resilience is a key aspect of transformational change. The CIF is the only existing climate fund that provides large-scale funding to specific technologies, particularly in renewable energy. CIF concessional financing is supporting the first use of key technologies in some countries, while facilitating MDB collaboration to expand deployment more broadly in others and across regions. Without the concessional resources provided by the CIF and the additional resources mobilized from the MDBs' own balance sheets, many of these projects would not have moved forward.



Morocco's 160 MW Noor I CSP plant (left and above).

SCALING UP CONCENTRATED SOLAR POWER

Concentrated solar power (CSP) holds vast potential due to its ability to provide reliable, utility-scale power even when the sun is not shining. It is such a promising technology that the International Energy Agency estimates that up to 11 percent of the world's electricity generation in 2050 could come from CSP.⁹ Current global CSP capacity, however, is just 4 gigawatts (GW), a tiny fraction of the world's power capacity. High technology costs and a limited number of CSP demonstration projects deter investors, especially in higher-risk emerging markets. To prove the economic and technological viability of CSP, trailblazing projects are needed across the world's most sun-drenched regions.

CTF financing of \$900 million—expected to attract an additional \$6 billion in co-financing from other sources—is supporting early public and private sector CSP projects in Chile, South Africa, and the Middle East and North Africa (MENA) region. Projected generation capacity is 1 GW, or more than one-fourth of the current global CSP capacity (90 percent of which is in Spain and the United States). The CIF's CSP investments are establishing a record of performance for the technology, thereby lowering perceived risk and reducing future project costs for private sector CSP investors and developers.

In **Morocco**, the AfDB and World Bank have jointly supported the 500+MW Noor solar complex, which has been championed by the Moroccan Agency for Solar Energy. Together, the MDBs have channeled \$435 million from the CTF alongside their own investment of \$980 million. Given the scale of public finance required to move this multi-billion-dollar, three-phase complex forward, the support of both MDBs, in addition to the CTF, was critical.

Independent analysis concludes that the low-cost debt is already driving down the cost of CSP in Morocco by 25 percent for Noor I and an additional 10 percent for Noor II and III, thus reducing the government subsidy required to bridge the affordability gap for CSP.

Construction on the **160 MW Noor I plant was completed** in 2015, with inauguration in early 2016. Once Noor II and III are built, the complex expects to achieve over 500 MW installed capacity, ultimately supplying power to 1.1 million Moroccans by 2018. It is estimated that the complex will reduce the country's energy dependence by about 2.5 million tons of oil, while also lowering carbon emissions by 760,000 tons per year.

DE-RISKING GEOTHERMAL POWER

Geothermal power is one of the leading alternatives to fossil fuel-based generation given its affordability, its flexibility, and the fact it can operate 24

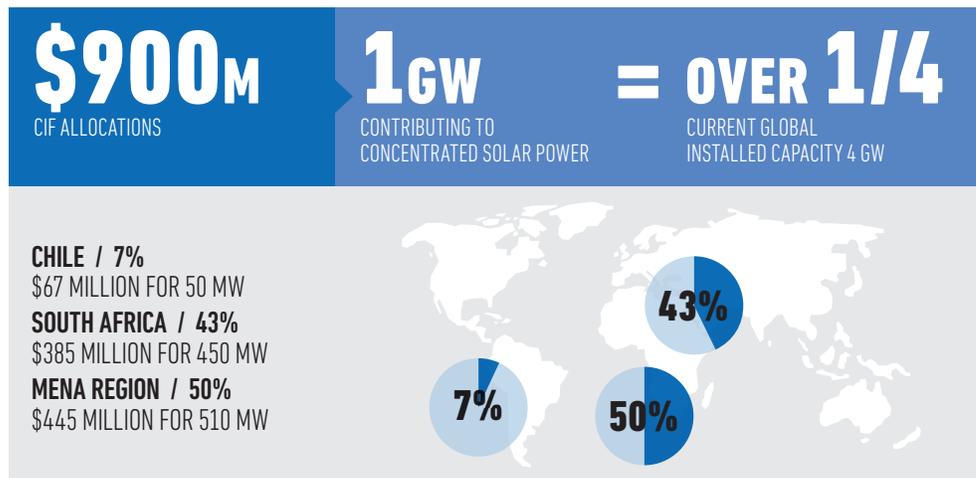


The CIF is needed to encourage investments in what are perceived as riskier countries—whether in Africa, parts of Latin America, Asia, or Middle East—and reduce the perception of that risk. Then the private sector will step in much more readily.

Paddy Padmanathan

Chairman and CEO of ACWA Power (Noor complex project developer)

CIF INVESTMENT IN CSP





Drilling is almost complete and construction is underway at Indonesia's Ulubelu and Lehendong geothermal fields where expansion efforts, supported by CTF \$125 million implemented by the World Bank, will lead to a 150 MW increase in total generation capacity. Close to 1 million households will benefit from cleaner, more reliable electricity and over 1 million tons of CO₂ emissions will be avoided annually.

hours a day, seven days a week, unlike some other forms of renewable energy. Although operational costs are low and consumer prices competitive, the 2015 global installed geothermal capacity of 13 GW is a small fraction of the world's estimated 200 GW potential. Expansion is limited by the time and cost-intensive exploration phase that may reveal insufficient resources to generate power. Most private investors are not willing to take on these risks. Moreover, many countries lack the technological and performance records needed to secure commercial financing.

The CIF is a global leader in supporting geothermal deployment with \$850 million from the CTF and SREP allocated to geothermal investments in 17 low- and middle-income countries. The CIF is helping to expand geothermal markets in countries like Indonesia, Kenya, and Mexico and is supporting some of the first large-scale geothermal projects in Armenia, Chile, Dominica, Ethiopia, and Tanzania. Projects are expected to attract over \$10 billion in co-financing and lead to up to 3.6 GW of new geothermal capacity, more than one-quarter of current global installed capacity.

To overcome key investment barriers, CIF financing is geared to support the earliest, riskiest stages of geothermal projects that prove resource availability. In fact, more than half of total public finance flowing to the exploration and test drilling stages globally comes from the CIF (see page 18). With CIF funds structured to absorb the greatest risk, MDBs and other financiers are able to co-invest.

PUBLIC FINANCE IS KEY TO UNLOCKING GEOTHERMAL POTENTIAL

The CIF commissioned the Climate Policy Initiative (CPI) to undertake a body of analytical work on how public finance and public policy can help scale up geothermal deployment. Concluding in 2015, **the study** included a series of three case studies, three dialogues, and these recommendations:

FOR POLICYMAKERS

- Set ambitious deployment targets
- Develop feed-in tariffs balanced to reduce private sector risks while minimizing excessive public sector costs
- Facilitate centralized data-sharing on geothermal resources

FOR DEVELOPMENT FINANCE INSTITUTIONS

- Increase both concessional finance and grant support
- Continue to rebalance support toward earlier, riskier stages of project development. **CPI reports that \$838 million (11 percent of global commitments to geothermal development) address early project stages, with 55 percent of this amount coming from the CIF.**
- Develop standardized political risk guarantees and partial-risk guarantees specific to geothermal

Source: CPI, "*Lessons on the Role of Public Finance in Deploying Geothermal Energy in Developing Countries*," 2015.

The **Mexico geothermal financing and risk transfer facility** being implemented by the IDB uses \$54.3 million from the CTF to share drilling costs with developers and partially cover private resource risk insurance. Of this, CTF \$20 million is a contingent recovery grant not to be repaid in the case of failed drilling. IDB investment of \$54.3 million will provide direct financial support to project developers.

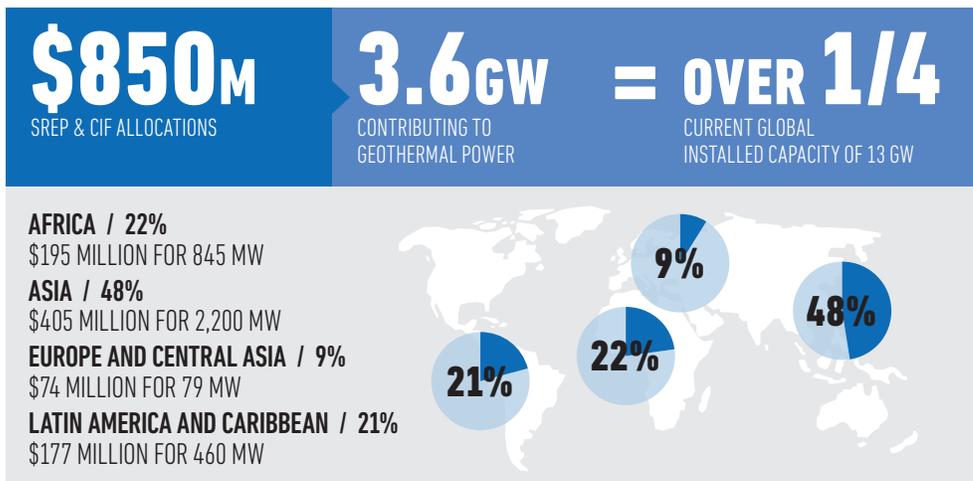
The facility is expected to attract more than \$1 billion in private sector investment for 300 MW of new geothermal capacity and achieve emissions reductions of 33 million tons of CO₂ equivalent, which is like taking over 6 million cars off the road.

EXPANDING USER-FRIENDLY CLIMATE SERVICES

In developing countries hard hit by climate change impacts, hydro-meteorological and climate services are a fundamental pillar of building climate resilience. They are a key enabler of a broad range of adaptation decisions, such as disaster relief management systems, early warning systems, advice to male and female farmers, and design of infrastructure and insurance products. Private companies and businesses also need and rely on the data provided by climate services to make investment decisions related to climate risk mitigation for their operations.

Approximately \$190 million, or 17 percent of PPCR resources, is earmarked for enhancing climate services in participating PPCR countries. Every regional and

CIF INVESTMENTS IN GEOTHERMAL POWER

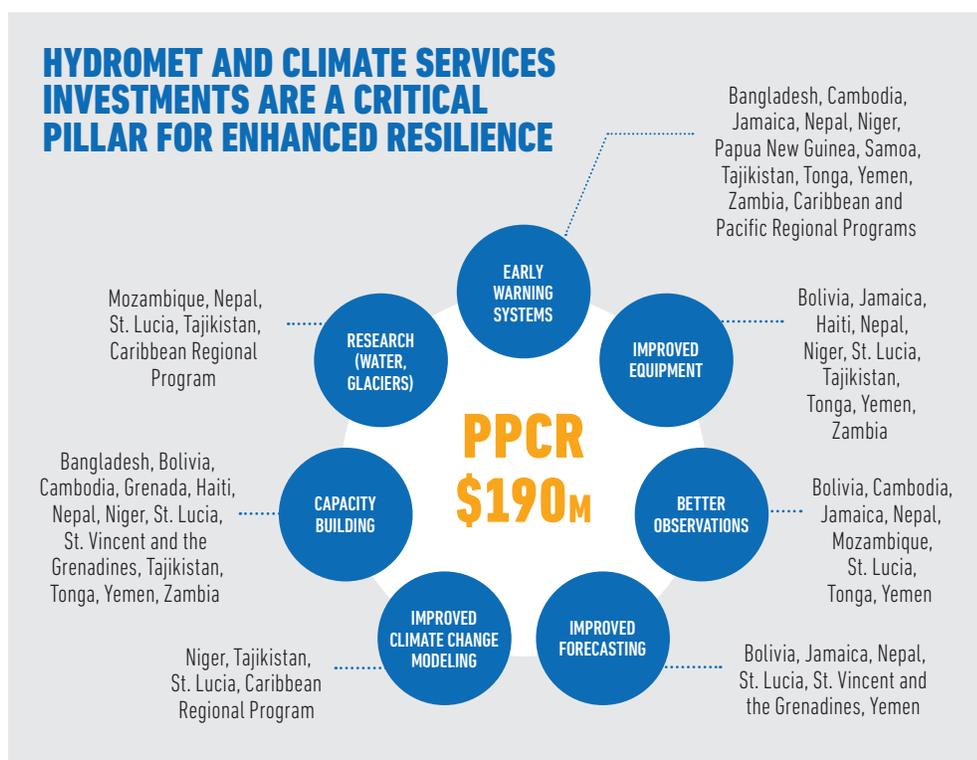


national plan for climate resilience that has been prepared and endorsed under the PPCR (20 so far) includes investments to strengthen these services.

In **Nepal**, where agriculture contributes to 35 percent of the country's gross domestic product and employs 80 percent of the population, getting weather information to farmers is critical. A PPCR-supported project is helping government agencies work together to facilitate agro-meteorology data exchange and product development. This collaboration has led to the development of agromet advisories for the Banke district and ongoing efforts to develop bulletins and products for other areas. Eight district offices are receiving support to establish agro-call centers where farmers can access a variety of information and services on managing weather and climate risks.

A climate-smart mobile telephone application and text messaging system are also being piloted. Expansion will be supported by an agreement with Nepal Telecom to provide 5,500 farmers with "green SIM cards" allowing free talk and data access to climate services.

This project is part of a larger program to build government capacity to mitigate climate-related hazards by improving the accuracy and timeliness of weather and flood forecasts and warnings for climate-vulnerable communities, supported by \$31 million from the PPCR administered by the World Bank.



Nationwide television advertisements in Nepal explain how to access agromet information through a new mobile app and district call centers.