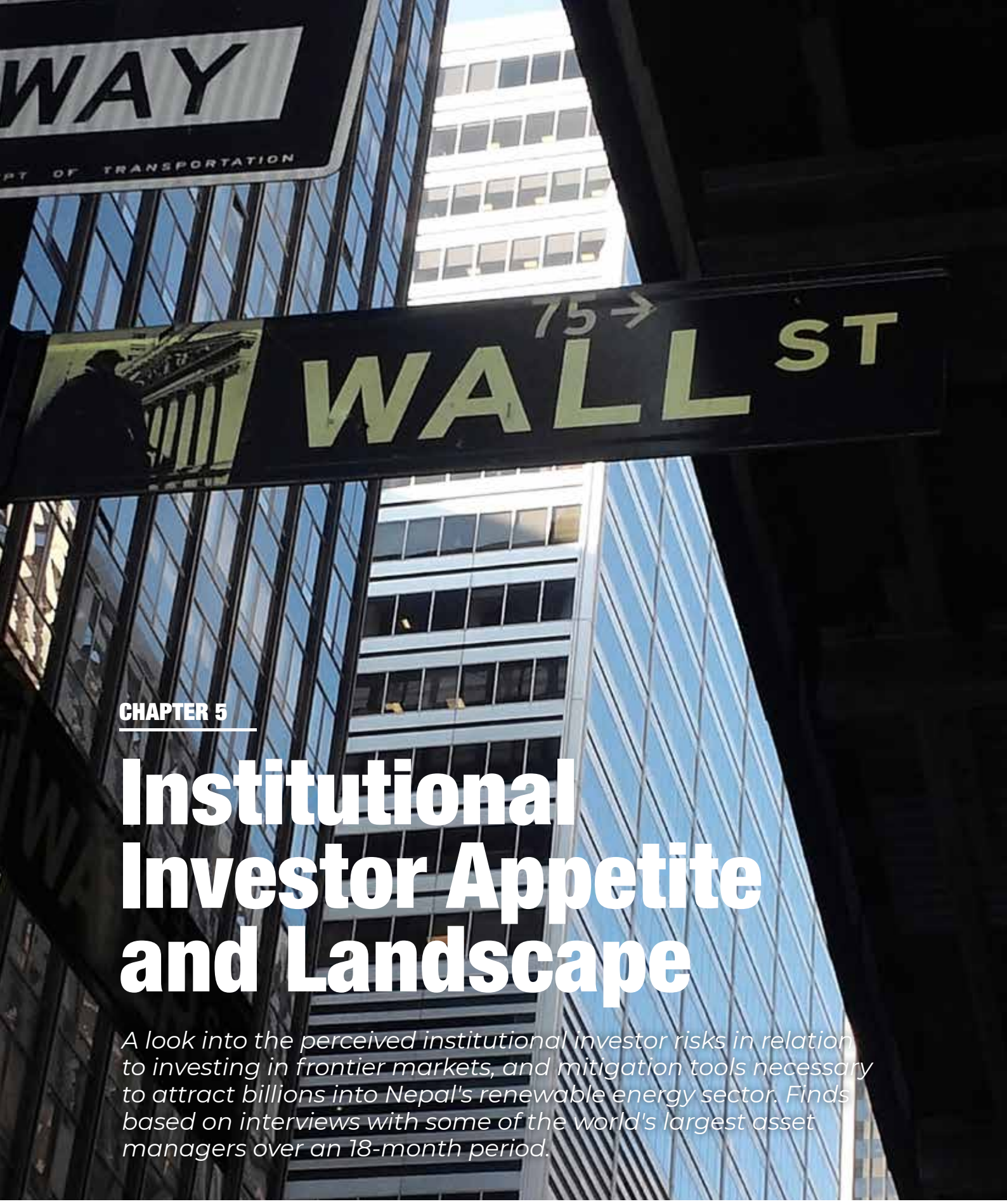

CHAPTER 5

Institutional Investor Appetite and Landscape

A look into the perceived institutional investor risks in relation to investing in frontier markets, and mitigation tools necessary to attract billions into Nepal's renewable energy sector. Finds based on interviews with some of the world's largest asset managers over an 18-month period.

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CHAPTER 5

Institutional Investor Appetite and Landscape

This chapter is an excerpt from the publication: Lessons on how to promote and execute equity capital in the renewable energy sector of Nepal (Dolma Foundation, 2019).

The full publication can be accessed at: www.dolmaenergy.com/publication

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Dolma Foundation is a non-profit organisation, promoting prosperity by investing in education and sustainable business in Nepal that are risky for the private sector.

This report series was produced and authored by Matthew Ribeiro-Norley and Vishal Bista. The team is grateful for collaboration and data within Dolma and from various agencies in Nepal. The cut-off date for data in this report was January 2019.

SUGGESTED CITATION

This chapter is an excerpt from the publication: Lessons on how to promote and execute equity capital in the renewable energy sector of Nepal (Dolma Foundation, 2019).

DISCLAIMER

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EXECUTIVE SUMMARY

CHAPTER 1: ENERGY MARKET ANALYSIS

Chapter 1 sets the tone for the series in highlighting that commercial institutional investors are the only sector with the capacity to finance this gap.

Nepal currently sits on a USD 17.8 bn infrastructure gap (excluding transmission and distribution) which needs to be addressed.

A prime solar belt region with 300 days of sunshine, and holding an economically feasible potential of ~43,000 MW of hydropower, Nepal boasts impressive renewable energy potential.

Despite this, Nepal's total installed capacity (March 2018) stands at 1,017 MW – 968 MW from hydro resources and 49 MW from thermal alternatives. Solar capacity is limited to 1.2 MW.

Electricity imports remain high in the dry season (Oct-Mar) for both peak load and base load energy, and as of March 2019 stood at 650 MW.

The Nepalese Rupee has remained pegged to the Indian rupee since 1993, primarily in the interest of price stability.

Based on Dolma's findings, the Project Internal Rate of Return for hydropower projects in Nepal range from 15-20%.

The main barriers to entry in Nepal include political stability, policy stability, currency, weak governance, climate change and bureaucracy.

Barriers to exit include the process of repatriating funds (whereby multiple authorities are required to sign-off after taxes are paid); as well as the lock-in period of up to three years after IPO on the Nepal Stock Exchange.

While there is a clear opportunity to export electricity to India in future, a clear framework agreed by both parties has not yet been enforced.

CHAPTER 2: CLIMATE CHANGE

Chapter 2 reflects on the environmental and social implications of a changing climate. Known for its pristine glaciers and abundant flora, the Himalayan region has witnessed an alarming number of climate-related tragedies in the last two decades. Between 2000 and 2015, ICIMOD estimates that 45,534 people died due to flooding, 10,893 to extreme heat, and 191 by drought, in Himalayan countries alone.

Higher temperatures have resulted in glaciers receding at alarming rates, adding volume to Glacial Lakes which pose a threat to those living downstream in the event of a burst. Moreover, unpredictable river flow can be a threat to farmers.

This chapter also puts into perspective that while CO2 rates remain high, the most immediate threat to the region – as identified in a series of recent reports from the Intergovernmental Panel on Climate Change (IPCC) and International Centre for Integrated Mountain Development (ICIMOD) – are short-lived climate pollutants, such as black carbon.

Despite its shorter life-span (approximately 50 years), black carbon is a warming agent with 1,500 times the warming effect of CO2. According to research, fossil fuel sourced black carbon appears to have twice the particle-specific warming potential of biomass sourced black carbon.

Based on conversations Dolma has had with regional climate scientists, prioritising the mitigation of short term climate pollutants is paramount to reversing Himalayan glacial melt – of which one third is expected to disappear by 2100 in a business-as-usual environment.

CHAPTER 3: TRANSMISSION AND DISTRIBUTION

Chapter 3 traces Nepal's energy infrastructure development and progress. Unlike energy generation, Nepal's transmission network grew at an annual rate of 8% from 2008 to 2012.

Electricity markets in Nepal are gradually un-bundling. Until 1990 all production, transmission and distribution were vertically controlled by the Nepal Electricity Authority.

Since 1990, Independent Power Producers have added ~500 MW to the grid.

Despite plans to un-bundle the NEA's transmission and distribution business following The Hydropower Development Policy 1992, it was only with assistance from the Asian Development Bank in 2015 that the National Transmission Grid Company was set up.

As this publication went to print, the newly-found distribution company had still not made any significant progress.

There are some USD 817 mn allocated to the enhancement of Nepal's transmission and distribution, mainly led by key donors such as ADB, Government of Norway, MCC and JICA.

A further USD 471.5 mn is being spent on policy and institutional reforms led mainly by the World Bank, ADB, and Canadian Government.

CHAPTER 4: REGULATORY ADVOCACY

Chapter 4 puts forward a number of recommendations to government that would facilitate the enabling environment for international investors.

Nepal has over the last five years (2013-2018) amended and introduced several regulations to facilitate public-private partnership and encourage further private sector investment.

Despite the government's best intentions to prioritise infrastructure, some have labelled the planning "erratic": since 2001 there have been five strategic documents on energy capacity targets, one every three years on average.

The most recent government plan, from 2016, calls for the construction of 10,000 MW by 2030.

The World Bank and others have argued that to attract and retain investment to the tune of tens of billions of dollars, an enabling environment is required.

"Quick-Win" regulatory reforms that would have a disproportionately positive impact on the infrastructure investment environment in Nepal:

Automatic route for foreign investment
Foreign currency power purchase agreements
Return on equity (ROE) clarifications
Alternative and auxiliary energy tariffs (new technologies such as batteries)

Long-term reform opportunities beyond the scope of this project:

Sovereign credit rating
Cost-plus approach
Competitive bidding
Protection for seasonality
Benefit sharing
Cooperation with regional partners

CHAPTER 5: INSTITUTIONAL INVESTOR INVESTMENT LANDSCAPE

Chapter 5 identifies three key catalysts for driving institutional investors into frontier markets like Nepal: low global interest rates; the commercial viability of renewable technologies; and heightened public, shareholder and regulatory opinion in relation to carbon emissions.

The need to attract large amounts of FDI to finance Nepal's power needs is well documented, both the Investment Board of Nepal and National Planning Commission agree that to meet just domestic demand, approximately USD 18 bn is required in capital investment (both debt and equity), or USD 1.5 bn annually.

The Dolma team interviewed some of the world's largest institutional investors, testing the risk and return mandate for Nepal against their current and emerging risk strategies. Interviewees included funds with

assets under management from USD 1 bn to 6 tn.

These were our findings:

Some investors suggested that the required return on equity for construction risk could be up to 20%, provided a Nepal project vehicle can demonstrate equivalency to investment grade status after successfully mitigating risks.

Among institutional investors there is a clear negative bias against credit and currency risk, suggesting that FX risk, real or perceived, prevents perhaps trillions of dollars from flowing to the poorest economies.

Dolma's findings also suggested that a country's credit rating is fundamental to getting an investment proposal through the first step of the investment procedure. In some cases, the lack of a sovereign credit rating and international sovereign bonds for Nepal has been too large a barrier to overcome in our discussions with some investors who are often restricted to considering countries that are at least investment grade (BBB-).

Some solutions to perceived risks included adopting Political Risk Insurance (PRI); Currency Hedging Mechanisms; and Bank Guarantees, amongst others.

Investors interviewed fell into two groups –leaders and followers – the former willing to take higher risk in search of greater yield and the latter less so; 2) there is no clear connection between Assets Under Management (AUM) and risk profile when it comes to investing in frontier markets like Nepal.

CHAPTER 6: COMPLEMENTARY INVESTORS

Chapter 6 discusses complementary investors (or blended concessional finance) which provide a new wind of opportunity for institutional investors – previously unable to invest in frontier market because of perceived risk. Blended capital works to de-risk perceived obstacles.

Investment instruments typically involve the deployment of grants, concessional lending, guarantees, and equity. These are deployed using adaptable programme, policy and sector investment loans, debt swaps, PPPs, advanced market commitments, and first loss reserve tranches.

Green bonds have recently also proven to be a potential solution by providing debt financing to eligible climate change projects. As of 2018, green bond issuance reached some USD 250 bn.

Complementary investors have played a key role in attracting investment to Nepal's renewable sector – these include Development Finance Institutions such as FMO, OEEB, DGGF and FINNFUND, as well as Multilateral platforms like IFC and ADB.

As stated in chapter 5, Dolma finds that at least two blended finance instruments are required for institutional investors to consider a renewable energy project in Nepal: political risk insurance and a currency hedge.

Dolma's research finds that countries successful in solving these risks for investors were able to make bold moves within their own domestic economies.

Nepal could follow the path of successful governments in doing so by creating its own government backed instruments and enacting reform.

CHAPTER 7: LEGAL STRUCTURING

Chapter 7 explains the legal structuring backdrop which is an essential component for foreign investors considering large infrastructure in Nepal.

To invest in Nepal through the FDI route, it is important to analyse and decide upon which country to invest from. To date there are 15 jurisdictions which hold a Dual Taxation Agreement (DTA) with Nepal which mitigates the risk of paying double taxation.

Dolma finds that Mauritius is generally viewed as the "gateway" to Nepal because both countries hold a DTA – Mauritius is

also known as a transparent jurisdiction that ranks well according to the financial services index. It also has experience fund management and administrative services which manage approximately USD 670 bn in assets.

Despite Mauritius' favourable positioning, the choice of domicile is based on the circumstances and preferences of individual investors.

Dolma views the UK as one of many strong locations to set up a fund manager, and has based the examples in chapter 7 on an English limited partnership or UK company as the fund vehicle.

CHAPTER 8: FINANCIAL STRUCTURING

Chapter 8 explores key regulated and non-regulated institutions that could act as potential sources of financing for energy projects in-country.

Nepal is yet to formulate specific regulatory provisions for private equity funds that invest in private companies.

There are a number of private equity players investing in renewable energy in Nepal, which include IFC, Dolma Impact Fund I and Equicap.

Dolma found that key exit issues for international investors include, but are not limited to the following:
Valuation at exit
Taxation in change of ownership
Repatriation issues

Dolma found that there could be some challenges for investors keen to invest through a project finance model, particularly for debt financing:

A limited tenor and floating interest rates on long term loans.
Generally, a limited capacity for banks to lend.
A limited scope for corporate bonds, which is still a nascent market.

The chapter also explores key financial issues for investors and how to integrate these solutions at the fund level: these include suggestions for currency risk, political risk, and debt risk.

CHAPTER 9: PROJECT DESIGN AND ENGINEERING

Chapter 9 focuses on the practical realities of executing renewables projects in Nepal, acknowledging that besides hydropower – Nepal's most mature energy asset class – other newer technologies such as solar and batteries could play a significant role in servicing growing supply, and providing auxiliary services.

Despite Nepal's installed generation capacity standing at 1,100 MW, there are some 7,000 MW in licenses that have been issued by the government to IPPs. The vast majority of these are for hydro-run-of-river (RoR) projects.

Dolma has identified a priority pipeline of hydro and solar projects that are optimal from a project execution perspective.

The chapter also includes a summary of leading battery technologies and which would be most suited in Nepal's context.

While there are no Nepali contractors that offer Engineer Procurement Construction (EPC) contracts this chapter analyses local firms that have a track record for hydro and solar projects in-country.

As financiers are increasingly aligning their investment mandates to the UN's Sustainable Development Goals, the chapter also outlines high level strategies for climate adaptation and resilience.

ABBREBIATIONS

TABLES

FIGURES

ABBREVIATIONS

AUM	ASSETS UNDER MANAGEMENT
DFI	DEVELOPMENT FINANCE INSTITUTION
ERAFP	LE RÉGIME DE RETRAITE ADDITIONNELLE DE LA FONCTION PUBLIQUE
FDI	FOREIGN DIRECT INVESTMENT
FMO	DUTCH DEVELOPMENT BANK
FRR	FONDS DE RESERVES POUR LES RETRAITES
GCC	GAS COMBINED CYCLE
GDP	GROSS DOMESTIC PRODUCT
GLOF	GLACIER LAKE OUTBREAK FLOOD
IMF	INTERNATIONAL MONETARY FUND
KFW	GERMAN DEVELOPMENT BANK
LCOE	LEVELISED COST OF ELECTRICITY
LDC	LEAST DEVELOPED COUNTRY
MIGA	MULTILATERAL INVESTMENT GUARANTEE AGENCY
OECD	ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT
O&M	OPERATION AND MAINTENANCE
PIDG	PRIVATE INFRASTRUCTURE DEVELOPMENT GROUP
PDC	PORTFOLIO DECARBONISATION COALITION
PV	PHOTOVOLTAIC
SDG	SUSTAINABLE DEVELOPMENT GOALS

1.1 INTRODUCTION

The investment opportunities and enabling environment in Nepal was analysed in Deliverable 1: Market Analysis. This document will examine the trends pushing institutional investors towards emerging and frontier markets – specifically, how Nepal's renewable energy sector stands to benefit from these developments.

Institutional investors are recognised as a pillar of the financial system in both developed and developing countries. Responsible for managing retirement savings and insurance premiums, they are expected to invest for the long term, follow market fundamentals, and provide liquidity to countries and companies sometimes overlooked by other actors in financial markets.

The Financial Times defines institutional investors as "a financial institution, such as a bank, pension fund, mutual fund and insurance company that invests large amounts of money in securities, commodities and foreign exchange markets, on its own behalf or on the behalf of its customers" . Institutional investors may be categorised into six groups: pension funds; endowment funds; insurance companies; commercial banks; mutual funds; and hedge funds.

Among them, such investors hold ~USD 100 tn under management – roughly 1,250 times the recorded Global GDP in 2017, and 2,000 times the infrastructure investment requirements in Asia until 2040.

SCOPE

This document will be divided into two sections. The first will highlight institutional investor trends and the catalysts pushing them towards emerging and frontier markets. The second section will cover Dolma's findings based on the last two years of research (as of September 2018). Our team interviewed the world's largest asset managers (see organisations and individuals consulted), aiming to better understand their existing investment strategies, perceived risks, and factors that would attract them to countries such as Nepal.

1.2 GLOBAL INFRASTRUCTURE AND INSTITUTIONAL INVESTOR TRENDS

Infrastructure, or lack thereof, is strongly connected to both economic growth and social progress.1 Weak infrastructure can slow a country's growth and competitiveness; it can also cause death, disease, and diminish overall quality of life. Over the last 20 years, 3.8% of world GDP has been spent on infrastructure, with annual spending trending down from 3.6% of GDP in 1980 to 2.8% in 2015.

According to McKinsey's "Bridging Infrastructure Gaps" report, USD 3.3 tn is needed globally every year until 2030 to support just upkeep of transportation, power, water and telecommunication infrastructure; today, the actual investment amount is some USD 2.5 tn. McKinsey is one amongst many arguing that we are chronically underinvesting in critical areas like power. If these gaps continue to grow, they put at stake countries' future growth potential and productivity.

WHY LDCS NEED INSTITUTIONAL INVESTMENT

The World Bank estimates that Least Developed Countries (LDCs) have an annual investment requirement of ~6.6% of GDP. This figure varies depending on income level, as seen in Table 1.

TABLE 1: INFRASTRUCTURE EXPENDITURE NEEDS (% OF GDP)

Country Income	Investment	Maintenance	Total
Low income	7.0	5.5	12.5
Lower middle income	4.9	3.3	8.2
Upper middle income	1.3	1.0	2.3
Total developing	2.7	4.3	6.6

Infrastructure requirements until 2030 are expected to rise to USD 19.2 tn, with Asia needing USD 15.8 tn.1 Amar Bhattacharya, Senior Global Economy and Development Fellow at the Brookings Institute, finds that 32 developing economies in Asia will need infrastructure investment of USD 8.2 tn until 2025, which breaks down to USD 776 bn worth of national investments annually. The World Bank states that two thirds of the latter is needed for new capacity and one third to maintain and replace existing assets; half of the USD 776 bn should go towards energy.

The World Bank estimates that an infrastructure gap of ~USD 1 tn per annum is projected for developing countries until 2030. This is an alarming figure which should serve as a rallying cry to attract additional investment and mitigate growing gaps highlighted in Figure 1.

WHY NEPAL NEEDS INSTITUTIONAL INVESTMENT

The need for Nepal to attract large amounts of Foreign Direct Investment (FDI) to finance its power needs is well documented. Both the Investment Board of Nepal and the National Planning Commission agree that to meet just domestic demand, over 9,000 MW of additional capacity will be required by 2030. This translates to approximately USD 18 bn required in capital investment (both equity and debt), or USD 1.5 bn annually. Given Nepal's relatively shallow capital markets, the vast majority of this investment must be sought through FDI channels.

The current FDI inflows to Nepal suggests there is still some way to go to fill this gap. According to Nepal Rastra Bank (Nepal's central bank), the total FDI in 2017 was ~USD 120 mn. Clearly, a radical change is required in Nepal's ability to attract capital and move beyond the limited capacity of donors and Development Finance Institutions (DFIs). In summary, the only way to fill the funding gap is to attract institutional investors to LDCs, including Nepal.

PROGRAMMES DESIGNED TO ATTRACT INSTITUTIONAL INVESTORS TO EMERGING AND FRONTIER MARKETS

What initiatives exist to help the world's asset managers invest in emerging and frontier markets? Many groups are working on this; some initiatives are detailed below.

MULTILATERAL PROGRAMMES

A UN-led programme to promote 17 goals, ranging from poverty alleviation to industry, innovation, and infrastructure in developing countries, the Sustainable Development Goals (SDGs) is one of the largest programmes – albeit one not specific to infrastructure – to attract investors to frontier markets.

The World Bank backed the "billions to trillions" programme when the magnitude of funding needed to achieve the SDGs came to light. The most substantial development spending happens at the national level in the form of public resources, while the largest potential is from private sector business, finance, and investment. According to the International Monetary Fund (IMF), this is the trajectory from billions to trillions, which each country and the global community must support together to finance; "Billions to Trillions", the IMF explains, "is shorthand for the realization that achieving the SDGs will require more than money. It needs a global change of mindsets, approaches and accountabilities to reflect and transform the new reality of a developing world with highly varied country contexts."

SMALLER MULTILATERAL

At the regional level, platforms such as the Private Infrastructure Development Group (PIDG), funded by a number of Development Finance Institutions (such as KfW and FMO) and Development Institutions (DFID, Australian Aid, etc.), mobilise private sector investment to assist developing countries in providing infrastructure vital to boost their economic growth and combat poverty. PIDG has thus far committed USD 37 mn in financing for three hydropower projects in Nepal: Lower Solu (82 MW), Kabeli A (36.7 MW), and Lower Manang Marsyangdi (140 MW).

BILATERAL

DFIs are the most known category of investor, with a solid track record of investing in the world's poorest economies. Institutions like FMO, the Dutch development bank, continue to reduce the infrastructure capital deficits in developing countries through direct and intermediary investments in renewable energy. FMO plays an instrumental role in supporting a network of DFI-backed initiatives such as TCX and Climate Investor One, aiming to facilitate investment into previously commercially unviable economies.

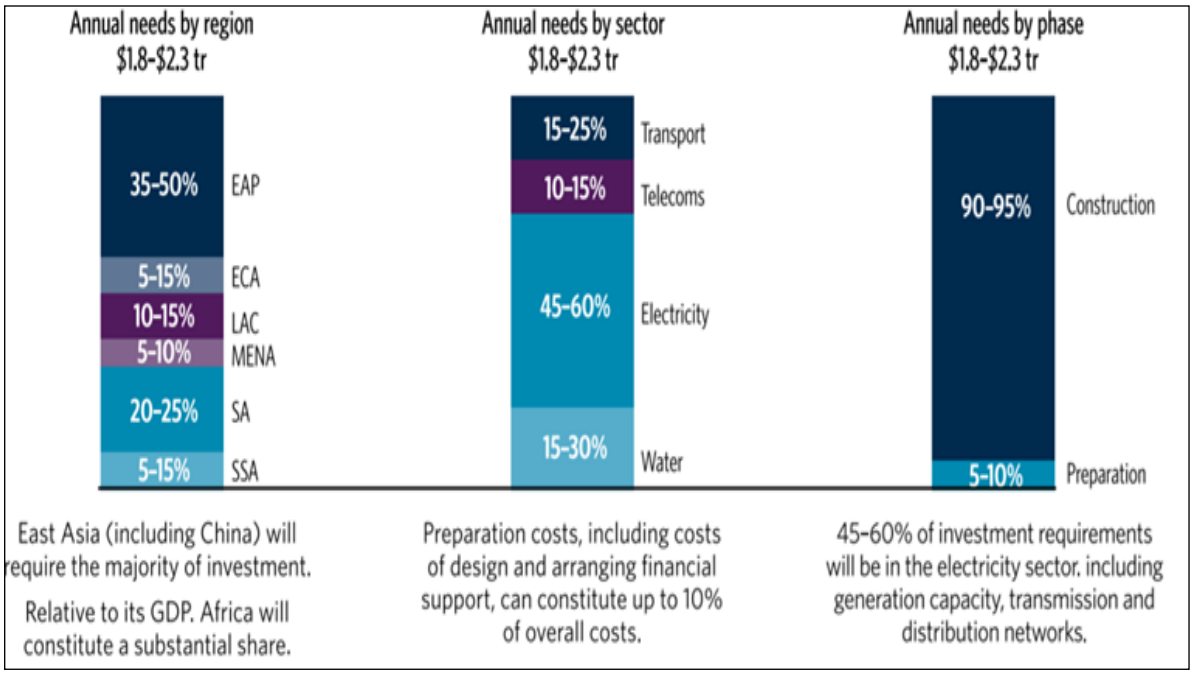
TCX is an exotic currency hedging firm that contributes to sustainable development in emerging and frontier markets. Its aim is to develop local capital markets by using financial instruments – swaps and forward contracts – that enable its investors and clients to provide

their borrowers with financing in their own currency while shifting risk to TCX. It is the only known currency hedging firm that offers a 20-year forward on the Nepalese rupee.

Climate Investor One is a new approach to funding infrastructure – one through which environmental impact, economic returns, and operating infrastructure will be delivered more quickly and simply. It aims to encourage private sector investment in renewable energy projects in developing countries. Its approach is unique in how it combines three investment funds into one facility to finance renewable energy projects at specific stages (development, construction, and operation) of the project lifecycle.

FMO is also active in running various platforms, like Making Solar Bankable, an annual conference that discusses trends and opportunities in emerging and frontier markets for solar PV development.

FIGURE 1 ESTIMATED INFRASTRUCTURE INVESTMENTS IN DEVELOPING COUNTRIES




SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

1.3 CHANGING WINDS, TIDES AND UV RAYS: THE CATALYSTS

Three independent but converging trends are moving leading institutional investors to evaluate infrastructure investments, including renewable energy, in markets previously considered too risky for their mandates:

1) Low global interest rates, which has led to asset liability mismatch issues for institutional investors, leading in turn to investors increasing allocations to higher yielding asset classes such as Alternative Investments (including private equity) and infrastructure.
2) The commercial viability of renewables compared to conventional alternatives.
3) Heightened public, shareholder, policy-holder and regulatory opinion in favour of "green" investments, which has led institutional investors to mainstream their strategies in favour of renewable energy developments.

LOW GLOBAL INTEREST RATES

Following the global financial crisis, a number of OECD economies (see Figure 2), including the United States, United Kingdom, Germany, and France, witnessed a drop in the interest rates set by their central banks. In Japan, rates went negative in 2016, and have since remained at -0.2%.

As central banks hope to witness more consumer spending and general investment in the real economy, the low interest rate environment poses a risk to the long-term financial viability of pension funds and insurance companies as they seek to generate sufficient returns to meet commitments to policyholders and beneficiaries.

According to the OECD Business and Financial Outlook, lower interest rates will lead to lower returns for pension funds, which invest around 40% or more of their assets in fixed income securities, including lower-yielding government bonds. While the same report advises pension and insurance funds to "remain vigilant to prevent excessive search for yield", preserving existing contracts with their policy holders is crucial.

THE COMMERCIAL VIABILITY OF RENEWABLES

Rapid declines in installation costs and increased capacity factors have improved the economic competitiveness of solar PV, onshore wind, and other renewable energy technologies around the world. The global weighted average levelised cost of energy (LCOE) of utility-scale PV plants is estimated to have fallen by 73% between 2010 and 2017, from around USD 0.36/kWh to USD 0.10/kWh.11

Figure 3 places this declining trend in perspective, highlighting PV utility scale cost trends in several OECD and non-OECD countries. Compared to conventional energy, renewable energy has made significant strides over the last decade. Figure 4 provides an up-to-date snapshot (2017) of how wind and solar PV (both crystalline and thin film) are competitive with gas combined cycle (GCC) and coal on an LCOE basis.

HEIGHTENED PUBLIC, SHAREHOLDER, REGULATORY OPINION

Although the least easily measured catalyst of the three, public outcry over climate change temperatures has been instrumental in pressuring governments and institutional investors across the board towards more renewable sources of energy, and ultimately away from fossil fuels.

While the success of the Paris Climate talks in November 2015 in setting a clear path towards maintaining rising temperatures within a 2 C cap is debatable, it engaged swathes of civil society to collaborate and raise awareness of the potential negative impacts of continued reliance on conventional forms of energy. This has implications for governments and pension funds, which are, after all, representing citizens – whether voters or policy holders.

As a result, it is unsurprising that OECD governments have issued plans in recent years to phase out fossil fuel generation and internal combustion engines. On a similar front, institutional investors are acting: Norway's sovereign wealth fund plans to ditch its oil and gas investments in due course; Britain's Walham Forest and a number of others have already followed suit.

FIGURE 2: COMPARATIVE GLOBAL INTEREST RATES (2008–2018)

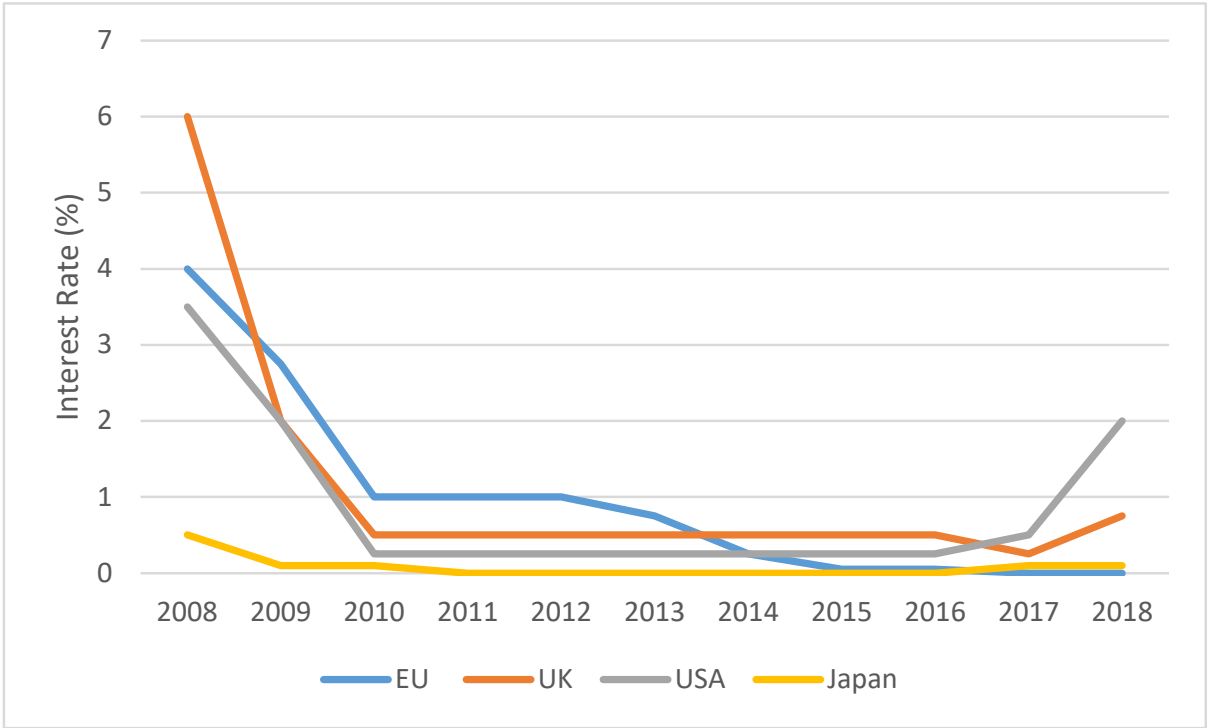


FIGURE 3 UTILITY SCALE SOLAR PV TOTAL INSTALLED COST TRENDS IN SELECTED COUNTRIES, 2010–2017

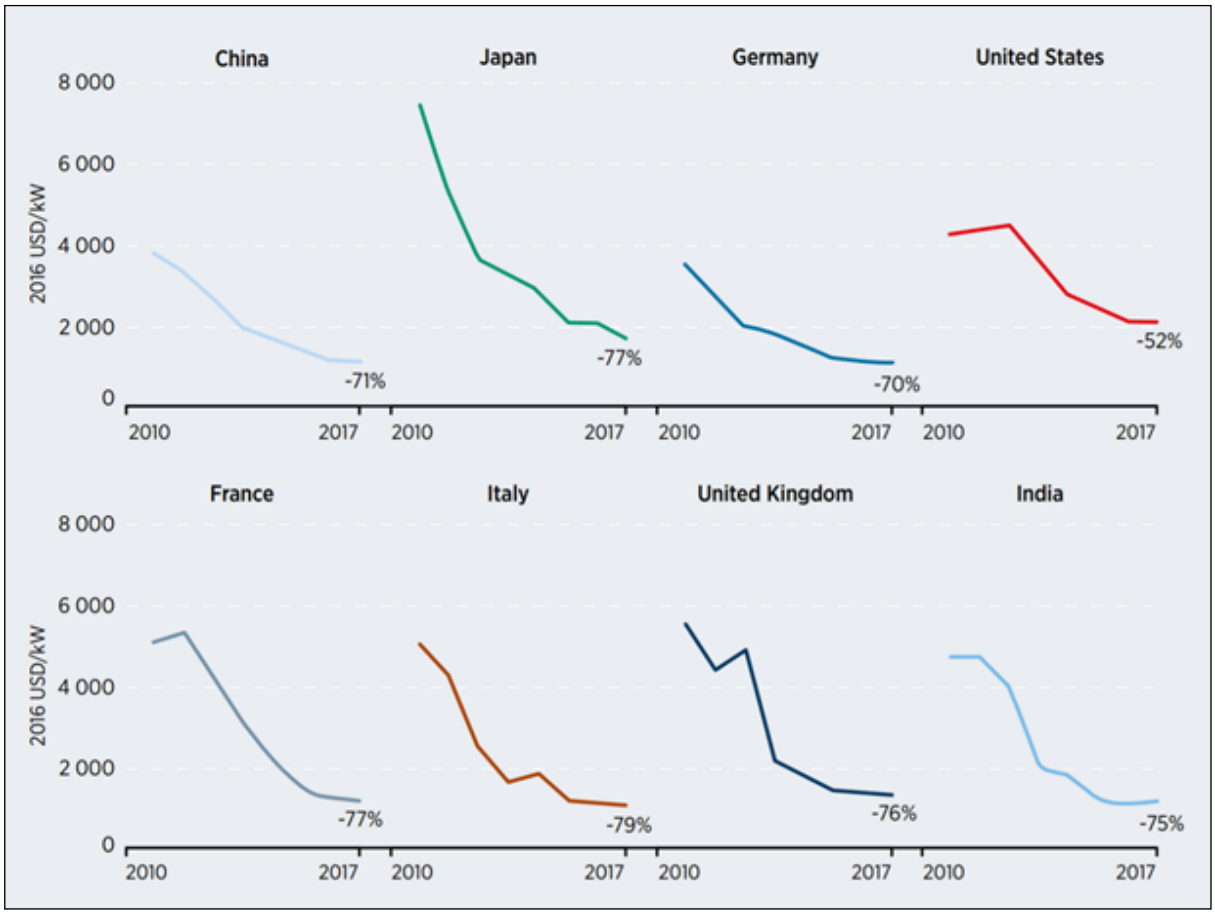
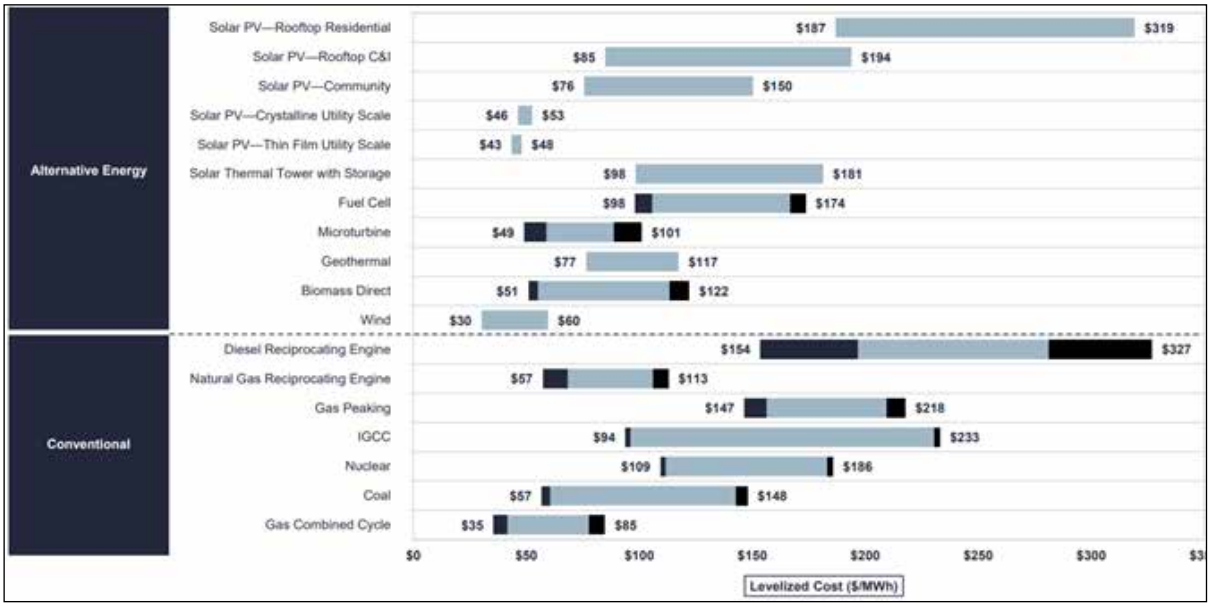


FIGURE 4 UNSUBSIDISED LEVELISED COST OF ENERGY (2017)



1.4 INSTITUTIONAL INVESTOR STRATEGIES

While it may be too early to measure the institutional investor response to the trends mentioned in the previous section, several examples indicate a change. One is the Portfolio Decarbonisation Coalition (PDC), formed in 2014, consist of a group of institutional investors that has pledged to withdraw capital from particularly carbon-intensive companies, projects, and technologies and invest in carbon-efficient alternatives.

In line with the discussion in the previous sub-section, institutional investors are refining their mandates to accommodate increased investments in renewable energy. Table 3 gives examples from a selection of PDC members.

PROJECT EXAMPLES

Though there is ample media coverage of institutional investor pledges to invest in renewable energy outside of OECD countries, this section highlights some of the programmes and projects that have materialised as a result of this response.

TABLE 2: TOP 20 PDC MEMBERS AND AUM

Member	Assets Under Management (AUM), GBP bn
ABP	320
Allianz	734
Ap4	32.8
Caisse des Dépôts	216
Environment Agency Pension Fund	2.1
Fonds de reserves pour les retraites (FRR)	31.6
KLP	40
Le Régime de Retraite additionnelle de la Fonction publique (ERAFP)	17.2
NYS Common Retirement Fund	142.4
Storebrand	56
A Capital	1,200
Amundi Asset Management	1,103
BNP Paribas Investment Partners	1,724
Hermes Investment Management	261
Inflection Point Capital Management	40
Mandatum Life	32
Mirova	2.9
Öhman	7.3
RobecoSAM	68.4
TOTAL	6,030

TABLE 3: EXAMPLES OF TARGETS SET BY SELECTED PDC MEMBERS

Organisation	Targets
A CAPITAL	• Invest 50% of portfolio in carbon negative projects (energy and environment technologies) • Reduce the carbon footprint of portfolio companies by 10% per annum
ABP	• Reduce the carbon footprint per euro invested in ABP's listed equity portfolio by 25% by 2020 compared to a 2014 baseline, with an interim target of 10% reduction by 2017
Allianz	• Double investments in photovoltaic and wind parks across Europe from EUR 3 to 6 bn in the medium term
AP4	• Invest 100% of global equities portfolio in low-carbon strategies by the end of 2020
Caisse des Dépôts	• Allocate EUR 15 bn between 2015 and 2017 to areas such as sustainable city and mobility projects, renewable energy production, storage and smart networks, energy efficiency solutions, and companies operating in green energy and environmental sectors
Environment Agency Pension Fund	• Invest 15% of the fund in low carbon, energy efficient and other climate mitigation opportunities by 2020
Hermes	• Reduce absolute and relative (to area) carbon emissions from real estate portfolio by 40% by 2020 compared to 2006 baseline

TABLE 4: INSTITUTIONAL INVESTOR INVESTMENTS IN DEVELOPING MARKETS SINCE 2016

Organisation	AUM (GBP bn)	Project	Amount (GBP mn)
Caisse de dépôt (Canada)	216	India's renewable energy sector expansion plans in Gujarat (solar PV)	120
Pension Danmark (Denmark)	25.7	Emissions reduction projects in developing countries in Latin America and Asia (unspecified)	176
Santander (Spain); Ontario Teachers Fund; and PSP Investments (Canada)	922.8 (combined)	Cubico Sustainable Investments established to manage and invest in renewable energy and water infrastructure assets in the developing world	2,000
Allianz (Germany); IFC (Multilateral)	736.5 (combined)	"Co-Lending Portfolio Programme" established to co-invest alongside IFC debt financing for infrastructure projects in emerging markets worldwide	400

1.5 OUTCOMES OF DOLMA'S RESEARCH

The Dolma team interviewed some of the world's largest institutional investors, testing the risk and return mandate for Nepal against their current and emerging risk strategies. Interviewees included funds with assets under management from USD 1 bn to 6 tn. Our team did not solicit funds as part of this exercise.

Based on these conversations, some suggested that the required return on equity for construction risk could be up to 20%, provided a Nepal project vehicle can demonstrate equivalency to investment grade status after successfully mitigating the risks listed in Table 5. Given limited resources in Nepal to reach this rate of return, Blended Finance (see Deliverable 6 – Complementary Investors) may be an opportune way to temporarily crowd in institutional investors. As projects are built and the perception of risk reduces, required returns will, hopefully, fall in line with the rates for power that the Nepal Electricity Authority is prepared to pay.

This section will reveal which risk areas were of most concern to our interviewees, and whether their appetite for investing in Nepal was swayed after contemplating risk mitigation tools. Feedback from investors has led us to categorise our sample interviewees as either "leaders" or "followers", based on their risk profile and track record on frontier markets.

INSTITUTIONAL INVESTOR PERCEIVED RISKS

We were eager to better understand how institutional investors might perceive risk in frontier markets like Nepal. Figure 4 is a matrix of the 15 investors we interviewed, listing each investor by their AUM for anonymity.

An analysis of these qualitative outputs reveals a clear negative bias against credit and currency risk. This comes as no surprise: recent reports, including "Expanding Institutional Investment into Emerging Markets via Currency Risk Mitigation" by SARONA and USAID, have picked up on this barrier, arguing that FX risk, real or perceived, prevents perhaps trillions of dollars of institutional investment from flowing to the poorest economies, which "severely inhibits private sector-driven developments and growth".

Our meetings also suggested that a country's credit rating is fundamental to getting an investment proposal through the first step of an investment procedure. On some occasions, Nepal was not taken seriously as it has no sovereign credit rating. This issue has, in the past, been too large a barrier to overcome in our discussions with some investors, who are often restricted to considering countries that are at least investment grade BBB-.

Most investor concerns were about credit and currency risk. Investors were relatively more relaxed about Nepal's political stability. They were understandably cautious when the issue of power execution and evacuation came up, considering Nepal's poor track-record in energy asset classes beyond hydro, or its track record in exporting power to its neighbours.

Most investors recalled the earthquake that struck Nepal in 2015, and while they were not very aware of topographic realities on the

FIGURE 5 INSTITUTIONAL INVESTOR RISK MATRIX

No	AUM (bn)	Credit	Currency	Political	Execution	Power Execution	Power Evacuation	Seismic	Environmental and Social	Climate Change	Asset/O&M
1	585	1	1	3	2	3	3	3	3	3	3
2	734	1	2	4	3	3	3	3	4	5	3
3	1	3	4	5	3	3	3	4	4	4	4
4	70	2	2	2	1	2	3	3	3	4	3
5	13	3	3	4	3	3	3	3	5	5	4
6	60	2	2	3	3	2	2	2	4	4	4
7	6,317	1	2	3	2	2	2	4	4	5	4
8	190	2	2	3	3	3	3	3	4	5	4
9	23	2	2	1	2	1	2	2	2	3	3
10	1,000	1	1	3	2	3	3	4	4	3	4
11	5.3	2	2	2	2	2	2	2	2	2	2
12	78	2	2	3	3	3	3	3	4	4	2
13	740	1	1	2	1	1	2	2	2	2	1
14	102	2	2	2	2	3	3	3	3	3	3
15	300	2	2	2	3	3	2	3	3	3	3

ground, they appeared cautious about the execution risk. However, given the focus on solar PV development – which is less affected by seismic activity – the earthquake would not be a showstopper.

Given the limited lifespan of solar PV panels, investors were relaxed about the environmental- and climate change-related risks posed by the project. There was less agreement over asset upkeep/O&M as Nepal does not yet have a strong network of experienced engineers capable of addressing technical faults on-site.

RISKS AND MITIGATION APPROACHES

This sub-section explores how perceived risks may be best addressed in the context of Nepal using a combination of efficient project management skills and by purchasing insurance and hedging products. It is noteworthy that investors generally warmed to products that addressed certain key concerns outright – in particular, MIGA's Political Risk Insurance and TCX's 20-year forward on the Nepalese rupee. Table 5 below describes these risks in detail as well as the mitigation tools available.

TABLE 5: RISKS AND MITIGATION METHODS

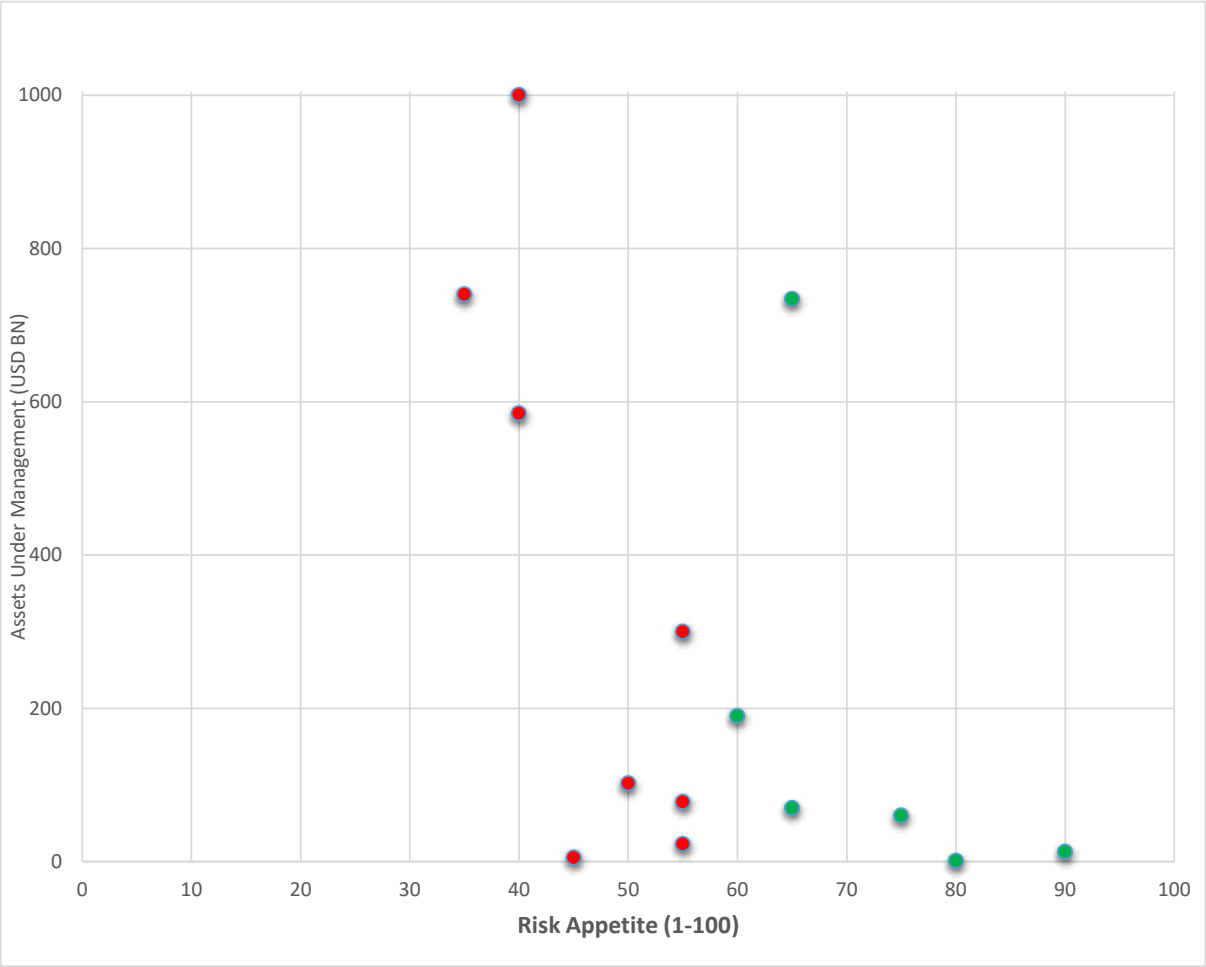
Risk	Description	Mitigation
Credit	Nepal has not issued international sovereign bonds and as such has no rating.	• MIGA (World Bank) Political Risk Insurance (PRI) is available in Nepal subject to project evaluation, wrapping sovereign/PPA credit risk. • Apply liquidity facility to cover claim period.
Currency	• NPR is pegged at fixed rate to INR. INR/USD non-deliverable forwards market has limited horizon, and a break in the peg cannot be hedged.	• Include partial USD PPA available from NEA (for foreign debt tranche) for projects above 100 MW and in certain projects below 100 MW. • NEA has not had an event of default since its inception in the 1990s. • Apply blended finance instruments such as a first loss/guarantee product.
Political	Despite durable peace and new constitution, political risk remains an issue.	• MIGA PRI also covers currency inconvertibility and transfer restriction, expropriation, war, terrorism, and civil disturbance.
Execution	Project execution may carry risks due to difficult and often remote operating locations.	• Create partnership between international and local engineering companies. • Conduct detailed investigation at design phase; sign clear Project Development Agreement (PDA) with Government of Nepal • Sign EPC or Risk-Shared contracts with international contractors.
Power Evacuation	NEA can be slow to deliver transmission capacity to project sites.	• Consider only projects with transmission lines/substations in place, or those planned well in advance of project completion.
Geological/Seismic	Nepal sits on a tectonic fault line and experienced two large earthquakes in 2015.	• Purchase project insurance (available in Nepal) and reinsure abroad. • High level of geological resilience built into engineering design. • (Note: all well-engineered plants survived the 2015 earthquakes.)
Environmental and Social	Hydro (especially storage plants) can involve resettlement costs and significant environmental impact.	• Focus on run-of river/peaking run-of-river (much lower impact). • Detailed assessments, compliance with international standards (e.g. IFC/World Bank Performance Standards.)
Climate Change	Nepal is prone to GLOFs (Glacier Lake Outburst Flood)	• Perform GLOF assessment, mitigation and warning systems. Long-range climate change modelling available at the International Centre for Integrated Mountain Development (ICIMOD)
Asset/ O&M	Damage to/interruption of generation asset during operation.	• Purchase asset and loss of income insurance (available in Nepal) and reinsure abroad.

INSTITUTIONAL INVESTOR SAMPLE: LEADERS AND FOLLOWERS

Having discussed the perceived risks and mitigation options available to institutional investors, we were left with a clear understanding of investors' frontier market risk profile, with Nepal as a case study. The findings leave us with two clear conclusions:

1) There are two groups, the "leaders" and "followers". The former group is willing to take higher risks in search of greater yield; the latter is either unaware or not interested, or interested but restricted by their investment mandate, to seriously consider frontier markets. From our sample of 15 investors, we identified seven leaders and eight followers – this is marked in Figure 5 below (leaders in green, followers in red).
2) There is no clear correlation between AUM and risk profile when it comes to investing in frontier markets. While smaller, dedicated, and arguably more nimble have thus far shown the most interest in Nepal, the country remains on the watch list of larger funds, assuming risks are appropriately mitigated using a cocktail of methods.

FIGURE 6: RISK APPETITE AND AUM FOR SAMPLE OF INVESTORS INTERVIEWED BY DOLMA



Note: the largest investor interviewed is not featured in Figure 5 because its AUM (USD 6.137 trillion) was off the scales. However, based on Dolma's interaction, we would classify it as a "leader".

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