ACCELERATING SDG 7 ACHIEVEMENT

POLICY BRIEF 3
FINANCING SDG 7

POLICY BRIEF #3

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Developed by

United Nations Development Programme (UNDP)

In collaboration with

UN Environment, SEforAll, the International Energy Agency, UN DESA, International Renewable Energy Agency (IRENA), African Development Bank, Islamic Development Bank, and the World Bank

KEY MESSAGES

Status of financing for SDG 7

- Power generation accounts for around 40 per cent of the world's CO_2 emissions and hence, decarbonisation of the power sector is of critical importance. Energy-related emissions in 2018 experienced a 1.7 per cent increase, due to a 2.3 per cent growth in energy consumption (IEA, 2019a; IEA 2019b). This only reinforces the dire urgency to accelerate investments in sustainable energy.

- The overall financing requirement to meet SDG 7—across renewable energy, energy efficiency and universal access - is estimated at US$ 1.3 to 1.4 trillion per year until 2030 (IEA et al, 2019)[1]. While progress is being made to scale-up financing, current annual financing levels are significantly below this level, at approximately US$ 514 billion (IRENA & CPI, 2018; IEA, 2017b). Moreover, investment is not spread equally, with developed countries and some middle-income countries accessing finance while many developing countries are left out. In 2017, power sector investments in China and the United States were above US$ 100 billion, while investments in Sub-Saharan Africa, Southeast Asia, and the Middle East/ North Africa were well-below US$ 50 billion (IEA, 2018).

- With the annual energy financing gap in the hundreds of billions of dollars, the available volumes of public and blended finance are not sufficient to meet needs. Recent data indicates that in low income countries, for every $1 of MDB or DFI resources invested, only $0.37 private finance is being mobilized (ODI, 2019). Hence, interventions from public finance institutions must be targeted to support and mobilise creation of viable commercial markets, as the scale-up of private sector financing will play a central role in financing SDG7.

Priority actions over the next 4 years

- A priority area is ensuring universal access to electricity and clean cooking fuels. To deliver universal energy access by 2030, IEA estimates that decentralized[1] solutions are the least-cost option for 60 per cent of people currently lacking access (IEA, 2017a). In electrification—given fast-moving, recent developments in digital finance and private sector models for off-grid solar solutions (Pay-As-You-Go (PAYG) solar, mini-grids)—there is an immediate need in many countries to put in place enabling policy environments, and to provide financial de-risking instruments to private sector actors. In clean cooking, current levels of access are far behind the stated SDG 7 objectives, and there is a need to dramatically increase investment levels, much of which is currently public finance.

Priority actions towards 2030

- A wide range of public measures exists to promote financing for low-carbon energy investment. In practice, context-specific combinations of measures are typically deployed for a technology and market. This policy brief describes several categories of public measures: demand-side interventions (policy de-risking, financial de-risking, and direct financial incentives (including carbon pricing and fossil-subsidy reform)) and supply-side interventions (financial system reform and new low-cost asset classes). A positive development is that a growing body of good practice examples and success stories for each of these categories is emerging. Looking ahead, while a number of countries already have enabling environments, the opportunity to 2030 is to continue to build on, and to spread, this good practice to the many countries that currently have gaps in their frameworks. This can be prioritized in the developing countries currently lagging in their ability to mobilize finance for SDG 7.

1 **Includes off-grid (stand-alone) systems powering individual households, and mini-grids powering a network of clustered homes and/ or businesses**

- Digital finance and 'fintech' solutions (mobile money, data risk analytics) have the potential to deeply disrupt finance in the years ahead, and are opening the door to new, scalable low-carbon energy business models, for example in universal electrification and small-scale, distributed energy. Digitalization, particularly in developing countries, further offers a future financial system which is more efficient, transparent, inclusive, and resilient. Policy-makers can embrace digital finance and seek to make it an integral part of their planning.

- There is a growing momentum to align financial systems with sustainable development through initiatives such as UNDP's Climate Aggregation Platform and the UN Environment Inquiry. One of the major barriers to scaling-up low-carbon energy is the lack of developed or liquid domestic financial systems. International finance can step in to a degree, but this in turn can expose investors to foreign exchange risk. Hence the long-term, sustainable solution is to fast-track reform of domestic financial sectors, bringing depth and liquidity, with the aim of a balanced mix of domestic and international finance flowing to low-carbon energy.

FINANCING SDG 7

As more than two-thirds of the world's GHG emissions is attributable to the energy sector, SDG 7 is a key enabler for achieving SDG 13 (IEA, 2019b). The Energy transition from fossil fuel to renewables, energy efficiency measures and universal access through sustainable energy resources will significantly contribute to climate mitigation action. Hence, financing SDG 7 has direct implication on achieving SDG 13 targets. The urgency of ensuring financing requirements of the energy transition to tackle climate change has never been stronger. Driven by higher energy demand in 2018, global energy-related CO2 emissions rose 1.7 per cent to a historic high of 33.1 Gt CO2 (IEA, 2018). Limiting the global average temperature increase to 1.5°C would involve a 45 per cent reduction of global net human induced CO2 emissions from 2010 levels by 2030 (IPCC, 2019). This requires deep transformation of the energy sector in the next 10-12 years. A 20 per cent decline in emissions would be needed to limit global warming to below 2°C. This means accelerating the implementation of energy-related targets and raising ambition of the current national pledges made under the Paris Agreement, which are currently inadequate to ensure that global warming stays well below 2°C.

This brief addresses financing to achieve SDG 7's objective of ensuring "access to affordable, reliable, sustainable and modern energy for all" by 2030. SDG 7 has three interconnected sub-components: (1) ensuring universal access to electricity and clean cooking fuels, (2) substantially increasing the share of renewable energy in the world's energy mix, and (3) doubling the global rate of improvement in energy efficiency.

The financing universe

Financing for sustainable energy involves many actors, including public and private, domestic and international. Public actors include domestic governments and international actors (bilateral and multilateral agencies, development banks, and climate funds). Private finance in turn involves a full range of actors: households, businesses, banks, capital markets, institutional investors (such as insurance companies, pension funds, and asset managers) and philanthropy (foundations, endowments). National financial landscapes are diverse, with some countries relying on microfinance, while others have access to a full suite of financial services.

Given the scale of the investment needs, and the potential for energy investments to generate revenue and savings, a key characteristic of financing for SDG 7 is the central role of private finance and the role of public capital providers as enablers of private finance. If SDG 7 is to be met, limited public

finance will need to mobilize far larger sums of private finance that will meet the required investment volume in the order of trillions.

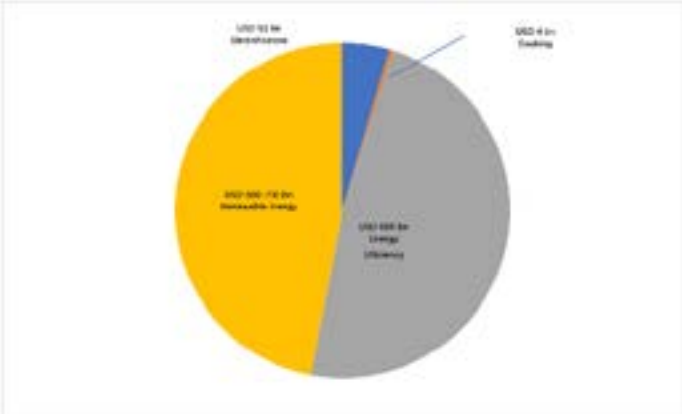
The use of economic instruments such as carbon pricing and energy and fuel subsidy reform can also play a critical role in achieving the financing needs for SDG 7 and the transition to a low-carbon economy.

Accessing finance at scale

The overall financing requirement to meet SDG 7 is estimated at US$ 1.3 to 1.4 trillion per year until 2030 (IEA et al, 2019) (Figure 1). While progress is being made to scale-up financing, present annual financing levels are significantly below this level, at approximately US$ 514 billion (IRENA & CPI, 2018; IEA, 2017b). Energy sector investment related to the SDG 7 targets will need to more than double from today's level in order to achieve the goals (IEA, 2018a). Annual investments need to increase to US$ 55 billion for electrification and clean cooking, US$ 600 billion for energy efficiency, and US$ 660-730 billion for renewable energy sector (IEA, 2018a; IRENA, 2019ac).

As such, there is currently an annual financing gap in the range of US$ 800 to 900 billion per year. Moreover, investment is not spread equally, with developed countries and some middle-income countries accessing finance while many developing countries lack access to finance for scale-up or face very high financing costs. In 2017, power sector investments in China and the United States were above US$ 100 billion while investments in Sub-Saharan Africa, Southeast Asia, and the Middle East/ North Africa were well-below US$ 50 billion (IEA, 2018).

Figure 1: Annual financing needs to 2030 to meet SDG7



Source: IEA & WB, 2015; IEA, 2017a, IRENA, 2019a

The following is a breakdown of investment by sector.

Renewable energy[2]

Renewable energy financing requirements to meet SDG 7 are estimated at US$ 660 to 730 billion per year until 2030 (IEA et al, 2019)[i] (IRENA, 2019a). Actual renewable energy investment was US$ 263 billion in 2016 (IRENA & CPI, 2018), with solar and wind as the leading technologies. 2016 investment levels decreased 20 per cent with respect to 2015, however this was partly due to hardware cost reductions and 2016 nonetheless represented a record for annual new installed capacity.

Developing countries accounted for 48 per cent of 2016 investment with China the biggest recipient (REN21,

2 Large hydro is treated differently by reference source. (IRENA & CPI, 2018) figures, which include the headline 2016 investment figures quoted here of USD 263 billion, include large hydro (IRENA & CPI, 2018). (REN21, 2017) and (UN Environment, 2017) do not include large hydro.

2017). Globally, 90 per cent of direct renewable energy investment in 2016 was financed by private sources. However, public finance is still significant in many developing countries, accounting for a 49 per cent share of direct investments in renewable energy in Latin America and the Caribbean, 41 per cent in sub-Saharan Africa, and 24 per cent in South Asia (IRENA & CPI, 2018).

Utility-scale projects, using asset finance, contributed US$ 187.1 billion in 2016 investment, and small-scale distributed assets, a growing sector, US$ 39.8 billion (UN Environment, 2017).

Energy efficiency

Energy efficiency financing requirements to meet SDG 7 are estimated at US$ 600 billion per year to 2030 (IEA et al, 2019)[i]. Overall energy efficient investment[2] was US$ 231 billion in 2016, with energy efficient measures in buildings accounting for close to 58 per cent (Figure 2). Total 2015 investment grew by a rate of 5 per cent year on year (IEA, 2017b).

Figure 2: Global incremental investment in energy efficiency by sector and sub-sector

Source: IEA, 2017b

Energy efficient investments are largely via the cash and savings of households and businesses (REN21, 2017), with commercial bank lending, leasing, and ESCO models, amongst other approaches, also contributing. Private finance, depending on the sector, can be significant; for example, it is estimated to account for 94 per cent of global energy efficient investment in the building sector in 2015 (IEA & WB, 2017). Public finance can be channelled via various entities, including Green Investment Banks.

Universal access: electrification

The financing requirements for universal electrification to meet SDG 7 are estimated at US$ 51 billion per year to 2030. These are primarily needed in India and sub-Saharan Africa. Currently, investment levels are approximately half of this, estimated at US$ 19.4 billion per year in 2013-2014 in SEforAll's 20 high-impact countries, which accounted for 80 per cent of the global access deficit (SEforAll, 2018).

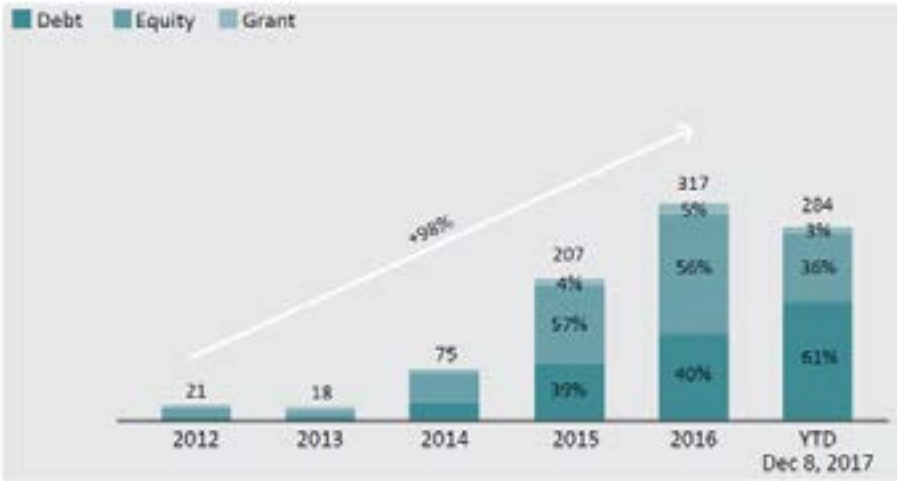
To date, nearly all investment has been directed to grid expansion, with donor financing accounting for 55 per cent of total investment in 2013 (REN21, 2017). Continued grid expansion is anticipated to remain a significant public funding need. However, this sector is in the midst of transformative change. Decentralized[3] solutions have been identified as the least-cost option for 54 per cent of the future connections to reach

3 Includes off-grid (stand-alone) systems powering individual households, and mini-grids powering a network of clustered homes and/or businesses

universal access by 2030 (IEA, 2018). Grid extension can be less favourable than decentralized off-grid systems in cases of complex terrain, low population density, institutional regulations, or high investment and maintenance costs that are not recoverable by utilities. It is estimated that grid extension in remote areas can cost around US$ 2,300 per connection while mini-grids cost consumers US$ 500-1000 per household connection (Brookings, 2017). A real opportunity exists in the coming years to meet this challenge with private sector solutions for off-grid renewable energy, either via solar mini-grids or solar home systems (UNDP, 2018). The three key trends converging behind this opportunity are reductions in hardware costs, improvement in appliance efficiencies, fintech solutions, and innovative business models such as Pay-as-you-go (PAYG).

According to the latest analyses, in sub-Saharan Africa, private sector models for off-grid solar solutions (solar home systems, mini-grids) are now estimated to be the lowest-cost option for 54 per cent of the future connections needed to meet SDG 7 (2019 SDG7 Tracking Report, forthcoming). In addition to being cost-effective, such systems are environmentally sustainable, rapidly deployable, and modular (IRENA, 2017). IRENA estimates that approximately 133 million people were served by off-grid renewable energy technologies in 2016 (IRENA, 2018a). Financing for private sector off-grid solutions has started to take off globally, albeit from a low base, in particular PAYG solar home systems (Figure 3). Recent illustrations are M-KOPA's US$ 80 million debt and equity financing (October 2017) and Off-Grid Electric's US$ 55 million equity round (January 2018). If off-grid electrification is to truly scale, there is a need to access commercial debt financing at large volumes, supported by dedicated policies and regulations and enabling institutional frameworks. A recent example is the energy access fund under the Facility for Energy Inclusion (FEI) which is providing debt financing for off-grid companies (AfDB, personal communication).

Figure 3: Annual financing for off-grid solar companies (US$ million)



Source: WB, 2018b

Universal access: cookstoves

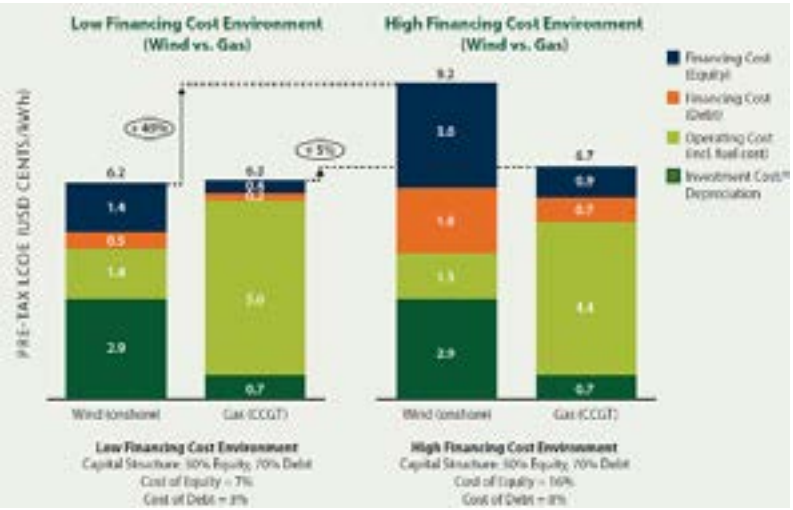
Residential cooking, heating, and lighting in rural areas in developing countries contribute to black carbon emissions also known as short-lived climate forcers. Reducing these short-lived climate forcers can in the short term contribute significantly to limiting warming to 1.5^{0}C (UNEP, 2017). The financing requirements for universal access to clean fuels and technologies for cooking to meet SDG 7 and contribute to SDG 13, are estimated at US$ 4.4 billion per year to 2030 (IEA & WB, 2015). The latest estimates of current investment levels show a reduction in annual investment from US$ 32 million in 2013-14 to US$ 30 million

in 2015-16 (SE4All, 2018), which is a small portion of the US$ 4 billion annual investment required by 2030. Private finance in this sector is very limited; SEforAll estimates that in 2013 public financing in the form of grants accounted for US$ 26 million of the total US$ 32 million per year, with international public finance predominating.

Access to low-cost financing

A further challenge for financing SDG 7 is accessing low-cost financing. Given low-carbon energy's upfront capital intensity, low-carbon energy is penalized from high financing costs environments vis-à-vis conventional energy in (Figure 4). Such high financing costs can reflect a range of low-carbon energy investment risks that exist in early-stage markets. Providers of debt and equity capital price these risks into their cost of financing. Barriers limiting the availability of capital in developing countries can also raise financing costs.

Figure 4: Comparison of the levelized cost of utility-scale wind and gas in high and low financing cost environments



Source: (UNDP, 2017)

Actual financing costs for low-carbon energy vary widely depending on technology and context. In developed countries and certain developing countries, low financing costs are being secured for mature technologies, particularly for large, utility-scale renewable energy. However, financing costs for low-carbon energy can be prohibitively expensive in many developing countries. In such markets, UNDP estimates that financing costs can account for up to 60 per cent of the life-cycle cost of low-carbon energy (UNDP, 2017) (Figure 4).

POLICY IMPLICATIONS

In assessing policy implications to finance SDG 7, a range of public interventions are available. The suitability of public measures for a specific country and market depends on the national and local circumstances. Combinations of public measures are typically deployed, which will increasingly need to be holistic and more fully integrated across different sectors (power, heating and cooling, transportation). This brief describes the main categories of public interventions.

Demand for Capital

Given the central role of private finance, a key role for public finance for SDG 7 is to improve the risk-return

profile of investment opportunities that are seeking private capital—a mechanism also termed as 'demand-side interventions.' Public finance can be applied in the form of instruments that either reduce (policy de-risking), transfer (financial de-risking), or compensate (direct financial incentives) for risk.

Policy de-risking instruments

Policy de-risking instruments can be understood as programmes, policies, and regulations that reduce the risks the private sector faces when investing in low-carbon energy. These are typically implemented by domestic governments and can take a wide variety of forms. Well-designed policy de-risking instruments can provide the long-term stability, visibility and transparency that is critical to attract and sustainably scale-up private sector investment.

A growing body of evidence of good practice policy instruments for low-carbon energy is emerging, particularly for mature technologies. In utility-scale renewable energy, these instruments include auction processes (now also increasingly being used in the mini-grid space), which have recently been successful in developing countries, and reforms to ensure financially sound utilities (cost-recovery). In energy efficiency, these include the design, implementation, and enforcement of various minimum energy efficient standards such as green building codes, or in lighting and appliances. Public procurement, with its high volumes, can be used effectively to prime energy efficient product markets. Policy de-risking instruments, tracked by initiatives such as the World Bank's RISE (WB, 2017), and analysed by organisations such as IRENA, the IEA, and REN21 (2018), are increasingly being deployed (e.g. the Electricity Regulatory Index (ERI); by end of 2016, 176 countries had renewable energy targets and 137 countries had energy efficiency policies enacted (REN21, 2017). In end-use sectors, however, supportive regulatory measures are lagging, as only 68 and 21 countries had adopted transport, heating, and cooling regulations, respectively, as of the end of 2016 (IRENA, IEA and REN21, 2018).

In general, while a number of countries have well-designed policy environments, many countries still have gaps in their frameworks and can benefit from further improved instruments deployed in a more integrated manner across sectors.

A priority area is in universal electrification, where—given fast moving developments in digital finance, technology efficiencies, and private sector models for off-grid solutions—there is an immediate need in many countries to put in place enabling policy environments (including integrated energy planning and implementation) and lay the foundation for private sector entrepreneurship and investment.

Looking to the future, countries can benefit by introducing well-designed policies for small-scale, distributed energy solutions in both renewable energy and energy efficiency. Relatedly, standardized contracts, indicators, and terms for low carbon energy can reduce transaction costs and facilitate emerging aggregative investment vehicles and asset classes. In more mature renewable energy markets, investors will increasingly seek well-functioning, innovative policies around grid planning for variable renewable energy, which calls for an increased flexibility of power systems through enabling technologies (storage, digitalisation), business models (aggregators, peer-to-peer trading), market design (time-of-use tariffs, regional markets), and system operation (advanced forecasting, co-operation between transmission and distribution operators) (IRENA, 2019b). In the future, a new frontier in renewable energy—moving beyond power—will be applications in heat and transport.

Financial de-risking instruments

Financial derisking instruments can be understood as financial products which transfer risk around investment opportunities to those market players who are best able to manage such risks. These instruments are provided by a variety of institutions, including development banks (multilateral (MDBs), bilateral or national)), national governments (ministries of finance), and agencies (export credit agencies), as well as

private insurance companies and banks. Instruments can take many forms, such as guarantees for political, credit and liquidity risks, currency and interest rate hedging instruments (swaps, forward contracts), and other products (IRENA, 2016). When implemented, financial de-risking instruments can bring comfort and engage the commercial financial sector in early-stage markets and be key to achieving first-of-a-kind investments. According to an OECD and Milken Institute (2018) study, guarantees are the most effective leveraging instruments, achieving 45 per cent of all private capital mobilisation while representing only 5 per cent of development finance commitments.

In terms of deployment, MDBs[3] committed US$ 35.2 billion in climate mitigation finance products in 2017, with a 28 per cent increase from the previous year. Of the total amount, US$ 27.9 billion, or 79 per cent, was committed to climate change mitigation finance and US$ 7.3 billion, or 21 per cent, was committed to climate change adaptation finance (AfDB et al, 2018).

MDBs reported that 81 per cent of total climate finance was committed through investment loans and the rest comprised of instruments such as policy-based lending, guarantees, grants, equity, line of credit, and others. The breakdown of the total climate finance by instrument type is shown in Figure 5.

Figure 5: MDB Climate Finance 2017 Breakdown by Instrument Type

Source: AfDB et al, 2018

In the future, there is a clear need for the continued and much scaled-up provision of financial derisking instruments by development banks. Multilateral and bilateral development banks can increasingly structure their products to attract the private sector. The MDB's Maximizing Financing for Development initiative is building momentum towards this objective. Innovation in products and alignment in activities with areas of emerging SDG 7 private sector activity, such as small-scale renewable energy and universal electricity access, can also be beneficial. MDB's should also explore optimizing their balance sheets to free up headroom for new lending by the securitization of their non-sovereign financial sector and infrastructure loans (see Room 2 Run initiative by AfDB).

However, this shift in the policy landscape of development assistance incurs the risk of steering away from low income countries (LICs), as it is easier to mobilize private finance in more stable and mature markets. Thus, it is critical that MDBs and bilateral organizations understand and manage risks to ensure that blended finance does not contribute to poor targeting of development assistance and that investments support the LICs to meet the 2030 Agenda.

Direct financial incentives

Direct financial incentives can be understood as direct financial transfers or subsidies to low-carbon energy investments. These instruments compensate the private sector for the higher real or perceived investment risks in early-stage markets, help level the playing field with fossil fuel sources that continue to receive more subsidies, and increase the financial return component in an investment's risk-return profile. These instruments are intrinsically results-based and can take a variety of forms, including premium tariffs, up-front capital subsidies, tax credits, waiving of VAT, and tradable renewable portfolio standards.

Significant resources can be allocated to direct financial incentives for renewable energy. For example, in 2015, expenditures for such instruments in Europe and Norway amounted to US$ 66 billion, considerably more than direct public investment in these markets (IRENA & CPI, 2018).

In general, direct financial incentives for low-carbon energy can be a costly approach to catalysing private finance and should be well-designed, and used sparingly in a targeted fashion (UNDP, 2013). Sub-optimally designed incentives can generate fiscal burdens and result in policy-reversal, creating uncertainty and additional risk for the private sector.

Within SDG 7, there are two areas meriting particular consideration for direct financial incentives. The first is universal access to energy, particularly for financial support to private developers providing energy services via mini-grids and solar home systems, or similar programmes targeting consumers. The second is energy for public infrastructure in rural areas (clinics, water pumps, public lighting, etc.), where improved energy access can contribute to a number of SDGs. Recent trends in public investment suggest this is already starting to occur to some extent (IRENA, 2018b).

In addition, financing SDG 7 will benefit from engagement on two policy areas—carbon pricing and fossil fuel subsidy reform—which are closely related to direct financial incentives. These two areas each improve the relative competitiveness of low-carbon energy investment opportunities, removing distortions and creating a level playing field vis-à-vis conventional energy. More broadly, both instruments can be fiscally beneficial, and create overall economic efficiencies.

Carbon pricing, in the form of a carbon tax or an emissions trading system (ETS), economically internalizes the climate externality of greenhouse gas emissions. To date, there are 57 national and sub-national carbon pricing initiatives in 46 countries, covering 19.6 per cent of global GHG emissions, up from less than 5 per cent in 2005 (WB, 2019; WB and Ecofys, 2018). Future opportunities include expansion of carbon pricing to new jurisdictions; digitalization or fintech application to improve monitoring, reporting, and verification standards; and deployment of carbon pricing in conjunction with other economic policies (energy, environment, fiscal, and others) and in alignment with divestment from fossil fuel subsidies (WB, 2018).

The IEA estimates global **fossil-fuel consumption subsidies** in 2017 at US$ 300 billion (IEA, 2018), with oil subsidies representing the largest share (45 per cent) at US$ 137 billion, while IRENA's estimate of global fossil fuel subsidies in 2015 is around US$ 451 billion (IRENA, 2019 forthcoming). Current fossil fuel subsidies are often regressive, benefiting higher income households and can be a barrier to the development of sustainable energy sector through market distortion. In turn, reform can be politically challenging and proceeds may need to be rechannelled to compensate vulnerable social groups. In recent years, a number of countries have begun reform processes; further progress in this area will be an important contribution to facilitating financing for SDG 7.

Inequality, energy pricing, and environmental taxation

Environmental taxation applied to consumption goods, such as heating and cooking fuels, could represent a higher proportion of a poor household's income than a rich household's income, depending on the design and national circumstances. There is a popular perception that the regressive effects make such taxes

undesirable, particularly in relation to energy and fossil fuel pricing, as many countries use fossil fuel subsidies to try to reduce the price of necessities. In the last few years, many national efforts at fossil fuel subsidy reform and environmental taxation have been derailed by popular protest against the policies' perceived inequities, while other countries have successfully implemented reforms. Despite the perception of regressivity, if properly structured, the effect of reforms on the poor can be offset by using the revenue for redistributive expenditure, similar to other taxes. A large portion of the value of some subsidies may be captured by the rich. For example, they may have greater access to vehicles, often with low fuel efficiency. Country experiences show that the likelihood of success in subsidy reform almost triples with strong political support and proactive public communications. Clear communication about beneficiaries is important because political acceptability may be tied to the use of the revenue. Despite much analytical work and many practical guidelines, some countries proceed without coherent plans that encompass: (a) timetables for slowly phasing in reforms; (b) administration mechanisms; (c) mitigation measures for the poor or vulnerable; and (d) strategies for consultation and communication. Implementation of mitigation measures before subsidies are fully phased out or taxes fully phased in—such as larger cash transfer programmes—can demonstrate the political commitment to using revenue to reduce inequality. Such approaches can be summed up in the concept of just transition, a principle that is embedded in the Paris Agreement. Examples of successful just transitions from both developed and developing countries can serve as useful references for countries planning reforms (United Nations, 2019).

Supply of Capital

Public policy can also seek to shape the availability of private financing for low-carbon investment opportunities in SDG 7—here termed 'supply-side interventions.'

Financial system reform

Domestic financial systems are varied and complex, involving a mix of actors (private and public), regulations, norms, and dynamics. In recent years, increasing momentum has been building around **aligning financial systems with sustainable development**, including low-carbon energy. Initiatives such as the UN Environment Inquiry into the Design of a Sustainable Financial System have provided global leadership, accompanied by country-level strategies and actions.

In low-carbon energy, many developing countries are currently held back by underdeveloped domestic financial systems. This limits access to affordable, local currency financing. International finance can step in to a degree, but this in turn can expose investors to foreign exchange risk. A long term, sustainable solution is to develop the depth and liquidity of domestic financial sectors, with the aim of a balanced mix of domestic and international finance flowing to low-carbon energy.

Potential financial system reforms are wide-ranging, including policies addressing barriers related to capital allocation, risk assessment, and improving transparency. Reforms can be carefully considered, weighed against the need for overall system stability. An example is central bank reform of liquidity or collateral requirements for commercial bank lending, facilitating longer-term loans for low-carbon energy.

Green bonds and impact investment

Emerging asset classes and sources of capital for low-carbon energy, such as green bonds and impact investment, are a growing source of low-cost, high impact, and longer-term financing.

Global **green bond** issuance reached US$ 167.3 billion in 2018 from US$ 155.5 billion in 2017. Although the market growth slowed compared to year-on-year increase in 2017, the year 2018 experienced a significant rise in the issuance of sustainability, SDG, and social bonds, highlighting increasing diversification of the market. Taking into account all the above-mentioned issuance categories, the market saw a 13 per cent

increase in 2018 from US$ 199.3 billion to US$ 226.3 billion in 2018 (CBI, 2019).

the United States, China, and France topped the market accounting for 47 per cent of the global issuance in 2018, while the Asia-Pacific region achieved the highest year-on-year growth rate at 35 per cent. Eight new countries had their debut green bond issuances in 2018: Iceland, Indonesia, Lebanon, Namibia, Portugal, the Seychelles, Thailand, and Uruguay (CBI, 2019).

Impact investment represents investments made with the intention to generate social and environmental impact, alongside a financial return (GIIN, 2017). Impact investors range from banks, to institutional investors, to family offices and foundations. The market for impact investment is growing rapidly both in terms of new entrants and investment volume from existing investors (OECD, 2019).

According to Global Impact Investing Network (GIIN)'s 2018 Annual Impact Investor Survey consisting of 229 respondents, the impact investment market was valued at US$ 228.1 billion in assets under management (AUM), of which 56 per cent was allocated to emerging markets (GIIN, 2018). The main sectors for impact investments in 2017 were financial services (excluding microfinance), which received 19 per cent of AUM; energy in second at 14 per cent; microfinance at 9 per cent; and housing at 9 per cent (OECD, 2019).

To scale up these low-cost energy asset classes, policy makers play a key role in creating a conducive environment for attracting larger and more diversified pool of private investors. For green bonds, there is a need to continue to raise awareness, build capacities within local regulators and financial institutions, provide incentives, and strengthen certification and disclosure requirements in existing and new markets. Emerging new green bonds include aggregative asset classes for small-scale, low-carbon energy assets. Development banks can co-invest in green bond funds and provide credit enhancement to new issuances.

For impact investment, a variety of actions can be taken. For example, in January 2017, members of the UNEP Finance Initiative launched the "Principles for Positive Impact Finance" (PRI), a framework for investors to analyse, monitor, and disclose the social, environmental, and economic impacts of the financial products and services they deliver (UNEP FI, 2017). Complementing this framework is the OECD Policy Framework for Social Impact Investment, which is intended to assist governments in their efforts to design impact investment conducive policies in the context of private sector financing for the SDGs (OECD, 2019), as well as the increasingly popular TCFD (Task Force on Climate-related Financial Disclosures) framework developed by the Financial Stability Board and supported by over 500 companies (TCFD, 2018). UNDP's Climate Aggregation Platform is another initiative that helps countries create policy and market architecture to achieve an increasing pipeline of low carbon energy assets and develop low cost source of financing by tapping into new and diverse investor base.

Digital finance

Finance is constantly evolving and technology has always been a central driver of this evolution. However, recent developments in **digitalization** and 'fintech' solutions have the potential to deeply disrupt finance, acting in unprecedented and transformative ways. These new digital technologies have multiple applications, from mobile money, to enhanced data risk analytics, to the Internet of Things (IoT), to advances in artificial intelligence (AI).

In low-carbon energy, digitalization is opening the door to novel business models and value propositions, with opportunities in both new private sector models and enhanced end-user experiences in universal electrification and small-scale, distributed energy (both renewable energy and energy efficiency). More generally, digitalization offers a future financial system which is more efficient, inclusive, and resilient, and for developing countries to accelerate their financial system development.

Policymakers can embrace digital finance and seek to make it an integral part of their planning. Some early lessons in low-carbon energy are emerging. For example, in universal electrification, experiences with

mobile money indicate that an initial light touch policy approach, leaving the space for innovation and consulting regularly with fintech actors, can result in a vibrant and competitive market. In turn, as markets mature, policy measures can begin to address related issues such as consumer protections and privacy.

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