HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

POLICY BRIEF #5

FINANCING SDG7

Developed by:

UNDP and UN Environment

In Collaboration with:

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This document is a part of a series of Policy Briefs being developed to support SDG7 review at the UN High-Level Political Forum to be held in July 2018. The objective is to inform intergovernmental discussions by providing substantive inputs on SDG7 and its interlinkages with other SDGs prepared through inclusive multi-stakeholder consultation processes. The development of these Policy Briefs is coordinated under the auspices of the Ad Hoc Informal Multi-stakeholder Technical Group of Advisors on SDG7.

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KEY MESSAGES

Status of financing for SDG 7

- Given the scale of the investment needs, a key characteristic of financing for SDG 7 is the central role of private finance. If SDG 7 is to be met, limited public finance will need to catalyse, and be blended with, far larger sums of private finance.
- The overall financing requirement to meet SDG 7 – across renewable energy, energy efficiency and universal access - is estimated at USD 1,058 to 1,266 billion per year until 2030 (IEA & WB, 2015; IEA, 2017a). While progress is being made to scale-up financing, present annual financing levels are significantly below this level, at approximately USD 514 billion (IRENA & CPI, 2018; IEA, 2017b). Moreover, investment is not spread equally, with developed countries and some middle-income countries accessing finance, but many developing countries left out.

Priority actions over the next four years

- A priority area is ensuring universal access to electricity and clean cooking fuels. 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 SDG7 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 particular 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 which 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.
- Digitalization 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, inclusive and resilient. Policy-makers can embrace digital finance and seek to make it an integral part of their planning.
- Via initiatives such as the UN Environment Inquiry, momentum has been building around aligning financial systems with sustainable development. In low-carbon energy, many developing countries face challenges due to underdeveloped domestic financial systems. International finance can step in to a degree, but this in turn can expose investors to foreign exchange risk. 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

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) doubling 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, insurance providers, and philanthropy. National financial landscapes are diverse, with some countries relying on microfinance, to other countries with a full suite of financial services.

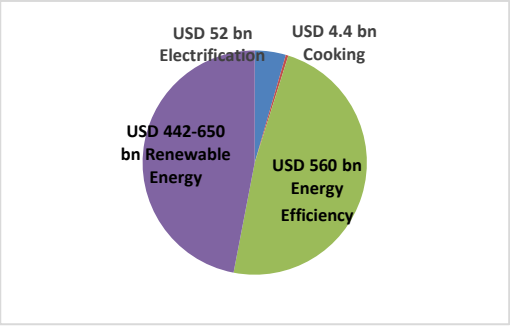
Given the scale of the investment needs, and energy investments' revenue and savings generating potential, a key characteristic of financing for SDG 7 is the central role of private finance. If SDG 7 is to be met, limited public finance will need to catalyse, and be blended with, far larger sums of private finance.

Accessing finance at scale

The overall financing requirement to meet SDG 7 is estimated at USD 1,058 to 1,266 billion per year until 2030 (IEA & WB, 2015; IEA, 2017a)[i] (Figure 1). While progress is being made to scale-up financing, present annual financing levels are significantly below this level, at approximately USD 514 billion (IRENA & CPI, 2018; IEA, 2017b).

As such, there is currently an annual financing gap in the range of USD 500 to 750 billion per year. Moreover, investment is not spread equally, with developed countries and some middle-income countries accessing finance, but many developing countries left out.

Figure 1: Annual financing needs to 2030 to meet SDG7



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

The following is a breakdown of investment by sector.

Renewable Energy

Renewable energy financing requirements to meet SDG 7 are estimated at USD 442 to 650 billion per year until 2030 (IEA & WB, 2015)[i]. Actual renewable energy investment was USD 263 billion in 2016 (IRENA & CPI, 2018), with solar and wind the leading technologies. 2016 investment levels decreased 20% with respect to 2015, however this was partly due to hardware cost reductions, and 2016 nonetheless represented a record for annual new installed capacity.

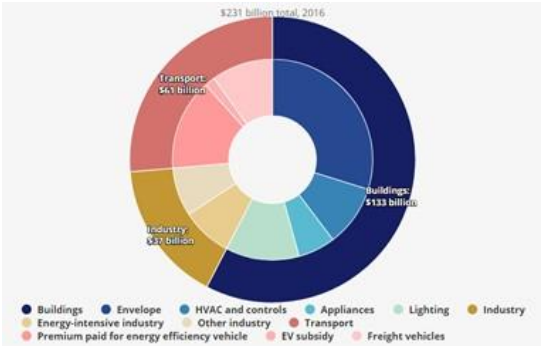
Developing countries accounted for 48% of 2016 investment with China the biggest recipient (REN21, 2017). Globally, 90% of renewable energy investment in 2016 was financed by private sources. However, public finance is still significant in many developing countries, accounting for a 49% share in Latin America and the Caribbean, 41% in Sub-Saharan Africa, and 24% in South Asia (IRENA & CPI, 2018).

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

Energy Efficiency

Energy efficiency financing requirements to meet SDG 7 are estimated at USD 560 billion per year to 2030 (IEA & WB, 2015)[i]. Overall energy efficient investment[ii] was USD 231 billion in 2016, with energy efficient measures in buildings accounting for close to 60% (Figure 2). Total 2015 investment grew by a rate of 5% 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 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% 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.

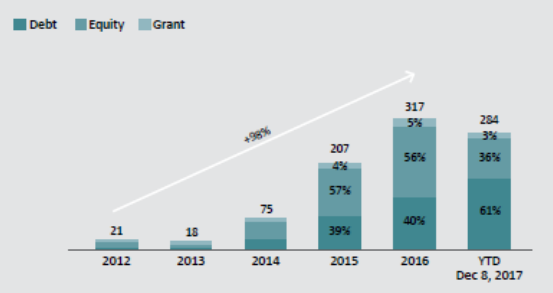
Universal access: electrification

The financing requirements for universal electrification to meet SDG 7 are estimated at USD 52 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 USD 19.4 billion per year in 2013-2014 in SEforAll's 20 high-impact countries (SEforAll, 2017).

To date, nearly all investment has been directed to grid expansion, with donor financing accounting for 55% 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, with private sector models for off-grid solar solutions (solar

home systems, mini-grids) now estimated to be the lowest-cost option for 75% of the future connections needed to meet SDG 7 (IEA, 2017a). Financing for private sector off-grid solutions has started to take off, albeit from a low base, in particular for pay-as-you-go ("PAYG") solar home systems (Figure 3). Recent illustrations are *M-KOPA*'s USD 80 million debt and equity financing (October 2017), and *Off-Grid Electric's* USD 55 million equity round (January 2018).

Figure 3: Annual financing for PAYG solar companies (USD million)



Source: WB, 2018

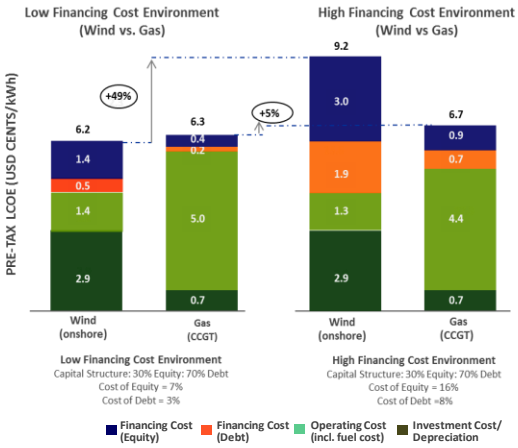
Universal access: cookstoves

The financing requirements for universal access to clean fuels and technologies for cooking to meet SDG 7 are estimated at USD 4.4 billion per year to 2030 (IEA & WB, 2015). The latest estimates of current investment levels, for 2013, range from USD 32 million for residential cookstoves (SEforAll, 2017) to USD 240 million (GACC, 2014). Private finance in this sector is very limited; SEforAll estimates that in 2013 public financing in the form of grants accounted for USD 26 million of the total USD 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 highly sensitive to financing costs, and is penalized vis-à-vis conventional energy in high financing costs environments (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 the 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, in many developing countries financing costs for low-carbon energy can be prohibitively expensive. In such markets, UNDP estimates that financing costs can account for up to 60% 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 particular national and local circumstances. Combinations of public measures are typically deployed. This brief describes the main categories of public interventions.

Demand-side interventions

Given the central role of private finance, a key role for public finance for SDG 7 is in improving the risk-return profile of investment opportunities which are seeking private capital – here termed '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 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, 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*, are increasingly being deployed; by end of 2016, 176 countries had renewable energy targets; and 137 countries had energy efficiency policies enacted (REN21, 2017).

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 deployment of good practice instruments.

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 laying the groundwork 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 (capacity markets, demand side management).

Financial de-risking instruments

Financial derisking instruments can be understood as financial products which *transfer* risk around investment opportunities, from the private investor to the public sector. These instruments are typically provided by development banks (multilateral (MDBs), bilateral or national), and/or national governments (ministries of finance). They can take many forms, most often investment loans, but also guarantees, public equity and other products. 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.

In terms of deployment, in 2016, MDBs[iii] committed USD 21.2 billion in climate mitigation finance products, nearly all directed to low-carbon energy. Public recipients accounted for USD 14.2 billion of this total, and the private sector USD 7.0 billion. Investment loans accounted for 71% of the USD 21.2 billion total. These products are central to blended finance approaches, and co-financing amounted to USD 39.9 billion (IDB et al, 2016).

In the future, there is a need for continued and scaled-up provision of financial derisking instruments. 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.

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 outstanding investment risks that exist in early-stage markets, increasing 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 USD 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, used sparingly and 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 the 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, 2018).

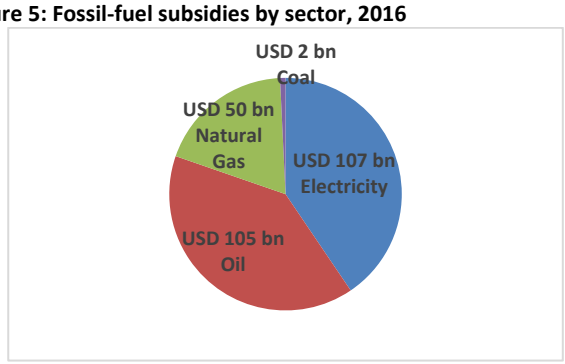
In addition, financing SDG 7 will benefit from engagement on two policy areas - carbon pricing and fossil fuel subsidy reform - which are closely related to direct financial incentives. These two areas each improve the relative competitiveness of low-carbon energy investment opportunities, removing distortions 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 a cap-and-trade regime, economically internalizes the climate externality of greenhouse gas emissions. As of end 2017, there were 47 national and sub-national carbon pricing initiatives in 42 countries, covering 14.6% of global GHG emissions (WB, 2018). Opportunities exist to expand carbon pricing to new jurisdictions, and to continue to refine and enhance the effectiveness of existing schemes.

The IEA estimates global **fossil-fuel consumption subsidies** in 2016 at USD 264 billion (IEA, 2017c), with electricity subsidies representing the largest share at USD 107 billion (Figure 5). Current fossil fuel subsidies are often regressive, benefiting higher income households. 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.

Figure 5: Fossil-fuel subsidies by sector, 2016



Source: IEA, 2017c

Supply-side interventions

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.

New low-cost asset classes

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, longer-term financing.

In 2017, **green bond** issuance – one of the lowest cost forms of capital due to the depth and liquidity of the bond markets - was a record USD 155.5 billion, a 78% increase over 2016 levels. Green bonds in renewable energy amounted to USD 51 billion, energy efficient buildings, USD 45 billion, and clean transport, USD 24 billion (CBI, 2018).

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, institutional investors, to family offices and foundations. According to GIIN, in 2016, new impact investment flows totalled USD 22 billion, and was anticipated to rise to USD 25. 9 billion in 2017 (GIIN, 2017).

Policy makers can play an important role in scaling up new low-cost energy asset classes. For green bonds, there is a need to continue to raise awareness, to strengthen certification, and to deepen and spread issuance and demand within 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 innovative 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", 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).

Cross-cutting interventions

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 can be applied in multiple ways, from mobile money, to enhanced data risk analytics, to the Internet of Things (IoT) and advances in artificial intelligence (AI).

In low-carbon energy, digitalization is opening the door to novel business models and value propositions, with particular opportunities in 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 in particular 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, related issues such as consumer protections and privacy, can also begin to be addressed by policy measures.

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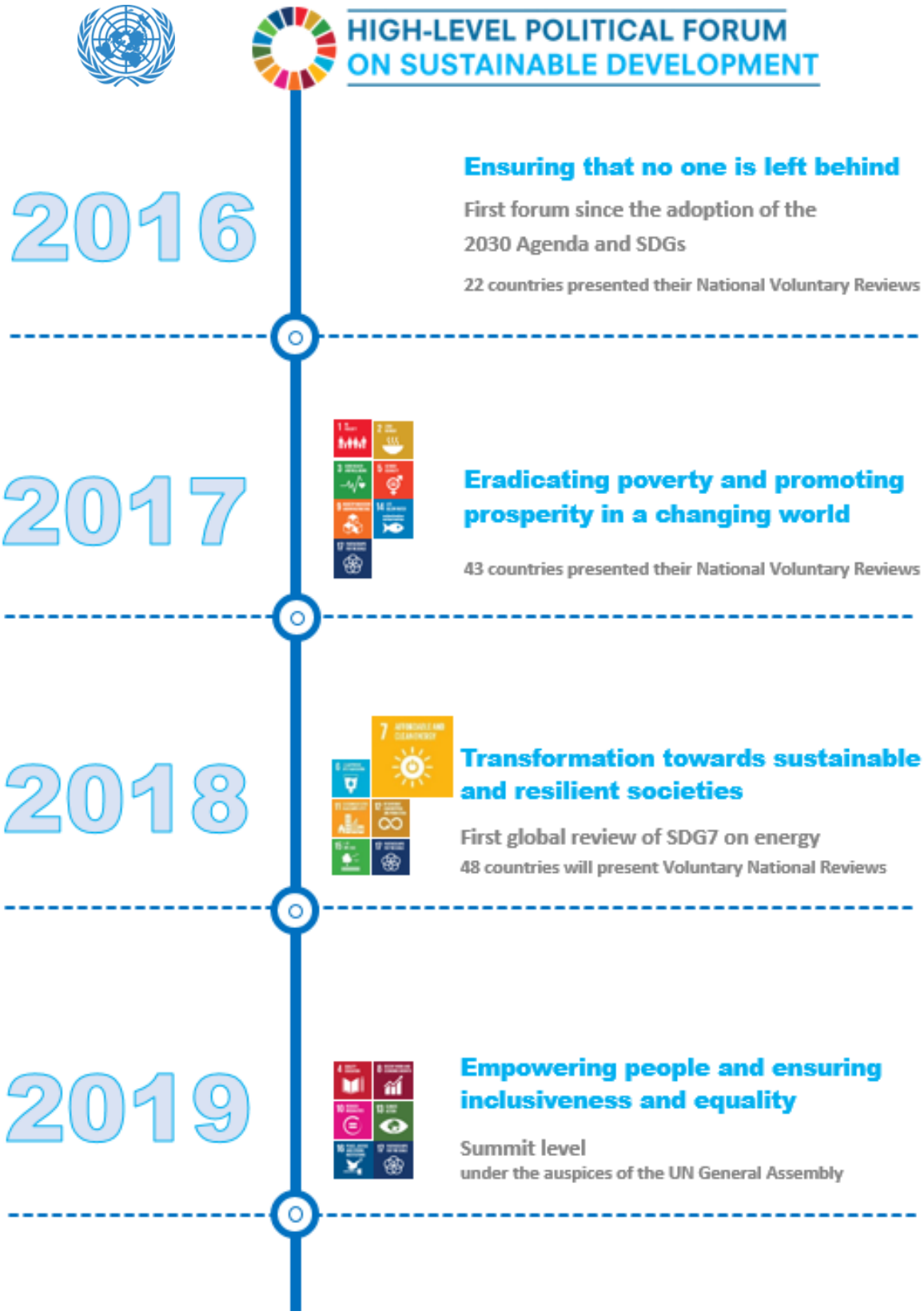
[i] Estimates for investment needs per year until 2030 are from the 2015 SEforAll Global Tracking Framework (IEA & WB, 2017). These estimates align with the SDG7/SEforAll objectives. In this brief, the estimates have been updated for electrification (IEA, 2017a). Other estimates of investment needs have been modelled, for example the *IEA New Policies* and *IRENA REMap Doubling Case* scenarios, as stated in the 2017 SEforAll Global Tracking Framework (IEA & WB, 2017). However, since these estimates do not all align with the SDG 7 objectives, they are not used in this brief.

[ii] The IEA counts investment in energy efficiency as the additional cost of an "energy efficient good" relative to an "average efficiency good." In effect, this efficiency premium is the additional investment required to drive efficiency improvements and subsequent energy savings. The efficiency premium is calculated in different ways for the sectors.

[iii] Figures for MDBs refer to WB, IDB, EIB, EBRD, AFDB, and ADB



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