

Inter-agency Task Force on Financing for Development
Technical Meeting on the thematic chapter of the 2018 report: Financing for
water, energy and ecosystems

Friday, 1 December 2017, 8:30 a.m. – 2 p.m., CR 9

Summary

Overview

The Inter-agency Task Force on Financing for Development (IATF) held a technical meeting on financing for water, energy and ecosystems on Friday 1 December 2017. These sectors cover three of the SDGs under in-depth review at the 2018 High-level Political Forum (HLPF), and form a coherent cluster around infrastructure and ecosystem commitments in the Addis Agenda. The IATF will explore financing challenges for these SDGs and their relation to broader financing frameworks in the thematic chapter of its 2018 report.

Experts from 13 member agencies took part in the discussion. Their deliberations were complemented by presentations from six external experts from academia and civil society, including from the University of London and the Institute for Development Studies in Sussex, the Brookings Institution, and Climate Policy Initiatives (see Annex 1 for the detailed programme and speakers).

The meeting, which was chaired and moderated by staff of the Financing for Development Office (FfDO), started with a discussion of the financing framework embedded in the Addis Agenda, including the specific roles of public, private and blended financing in addressing the major infrastructure financing gaps. This discussion built on earlier IATF work on financing needs, capital structures and financing options for the SDGs. In its [2016 report](#), the Task Force had highlighted the different roles and mandates of public and private finance. Drawing on this framework, the thematic chapter of the subsequent [2017 report](#) addressed challenges in mobilizing long-term and quality investments for sustainable infrastructure – focusing on public and private investments, the role of development banks, and the principles for the effective use of blended finance modalities (see Annex 2 for the meeting’s background note, which provides more detail on prior relevant IATF work).

The subsequent meeting sessions on water, energy and ecosystems applied this framework and sought to elicit how it could be used to address specific sectoral and sub-sectoral financing challenges. The meeting found that the characteristics of these investment areas vary greatly – between ecosystems on the one hand, which is mostly a public good that needs to be publicly financed, and energy provision, aspects of which have attractive returns associated with them – leading to different combinations of financing and service provision. The discussions underlined that financing solutions within the three SDG investment areas would need to address externalities and public good characteristics, risk profiles and potential returns as well as equity considerations.

SESSION I: Introduction and conceptual overview

In the opening session, Shari Spiegel provided a brief overview of the IATF's overall approach to SDG financing and infrastructure financing in particular, and laid out the rationale for choosing water, energy and ecosystem financing as elements of the theme of the 2018 Task Force report. Her presentation was complemented by Amar Bhattacharya, who provided further details on the scale of the infrastructure financing challenge associated with the SDGs.

The IATF is mandated to report on progress in implementing the Financing for Development outcomes, including the Addis Agenda, as well as the means of implementation of the SDGs. In response to requests by Member States to make IATF work more relevant to the HLPF, the thematic chapter of the 2018 report will review financing challenges for the SDGs under in-depth review at the 2018 HLPF – SDGs 6 (water and sanitation), 7 (affordable and clean energy), 11 (sustainable cities and communities), 12 (sustainable production and consumption patterns) and 15 (terrestrial ecosystems). These SDGs form a coherent cluster in the Addis Agenda, and lend themselves to be explored in the context of the broader financing framework of the Addis Agenda. Indeed, infrastructure is a major priority in the Addis Agenda, and closing the sustainable infrastructure gap is a precondition for achieving the SDGs. It would support economic growth, foster access to social services, and promote environmental sustainability. Significant efforts have been made since the adoption of the Addis Agenda to increase infrastructure investment. However, rather than expanding, in 2016 investments in infrastructure fell across regions.

The thematic chapter will explore this question by examining existing financing structures and challenges in the highlighted sectors. It will build on both the 2016 IATF report, which laid out the financing framework embedded in the Addis Agenda, and highlighted the different roles and mandates of public and private finance, and the 2017 report, which addressed challenges in mobilizing long-term public and private quality investments for sustainable infrastructure, including the role of development banks and principles for the effective use of blended finance modalities. The three sectors under review at the meeting (SDGs 6, 7 and 15) can be seen as case studies to further deepen our understanding of when and how to use public, private and blended financing to deliver the SDGs.

In delineating the roles of public, private and blended finance, previous IATF reports have taken several factors into consideration, including whether investments are private goods that can be effectively supplied by the market; whether such investments have sufficient return or cash flows to compensate private investors for risk; whether investments are public goods, or have public-good properties, such as positive or negative externalities; and whether there are any equity considerations.

In general, it is most efficient for private goods to be supplied by the market. However, incomplete information and other market failures often impede efficient private activity, and risk-return profiles may not be attractive enough to entice private investment, particularly in challenging country contexts. Public goods, e.g. network infrastructure, are generally undersupplied without public intervention. Many goods are also characterised by externalities, where production and

consumption has positive or negative spillovers on third parties that are not taken into account in private decision-making. Finally, equity concerns are strongly embedded in the SDGs, which often target universal provision of services, including to segments of the population that cannot afford user fees. In practice, few goods fall on the extreme ends of the public/private spectrum, implying that there is often a role for both private and public actors – including in infrastructure financing.

Public, private and blended finance all play important roles in infrastructure, as do public policies. The meeting identified several factors, including planning, private sector engagement and pricing as key impediments and entry points to scaling up infrastructure investments.

Public investment is often the dominant source of infrastructure finance, but in many countries, public balance sheets are constrained, and debt sustainability is a major concern. One key issue raised in this regard is whether the growth impacts of infrastructure investments would need to be better reflected in debt sustainability assessments. Public balance sheet constraints underscore the importance of increasing efficiency in public provisioning, including through improved infrastructure planning. Infrastructure planning has recently and rightly received growing attention, including by multilateral development banks which have expanded their capacity building efforts in this area. However, infrastructure plans still tend to be tied to the political cycle, and are often not sufficiently well articulated.

The private sector also has the potential to be a powerful driver of infrastructure investments. However, several challenges need to be addressed. First, private investors demand adequate risk-adjusted returns, which can come from user fees for direct users, charges to indirect users, or financing from general budgets. In many countries and sectors, current modalities do not charge even marginal costs to consumers. In areas such as electricity and telecommunications, user fees play a much more important role. In all cases, user fees need to be balanced with equity considerations and the call in the SDGs to leave no one behind. Where socially feasible, pricing can also serve to take into account any externalities from investment and usage. There is also potential to charge indirect users – e.g. owners of property adjacent to infrastructure development – through property taxes. Specific taxes such as gasoline taxes can be earmarked for roads, and general budget revenues can also be used to repay private investors, when deemed appropriate. Second, the cost of financing is often too high for private investors. Public policies can bring down financing costs – e.g. by strengthening the overall enabling environment to reduce macroeconomic risks, or through risk-sharing instruments such as blended finance.

To achieve results at scale – to significantly increase infrastructure investments from all sources – will require the introduction of scalable platforms both at the national and at municipal level. Such platforms can support public actors that are often hamstrung by limited capacities in addressing issues of pricing, planning and private sector participation.

SESSION II: Water and sanitation

Session II discussed financing challenges in the water and sanitation sector. Joel Kolker, Lead Water and Sanitation Specialist of the World Bank Group, laid out key revenue sources, concessional and commercial financing options and efficiency and performance challenges for water utilities to expand access and meet SDG 6. Fiona Gore, Team Leader for GLAAS at the WHO, introduced the GLASS initiative and its monitoring framework and assessment of global water financing, and

presented several case studies of national financing for the WASH sector. These presentations were followed by interventions by two discussants – Thomas Marois, Senior Lecturer at the University of London, SOAS, and Meera Karunanathan, Director at the Blue Planet Project, and an open discussion with participants.

SDG 6 aims to achieve universal, equitable and affordable access to safely managed water, sanitation and hygiene. Broader and more ambitious than the water-related MDG, the financing challenges to achieve SDG 6 are formidable – the World Bank estimates total annual capital investment needs at \$114 billion for water and sanitation alone, with current financing a mere \$16 billion, or less than 20 per cent of needs. UN GLAAS, which collects country level data on water and sanitation investments and outcomes, also finds that while national WASH budgets are increasing, investments fall far short of amounts needed to meet SDG 6.

The largest requirements are in urban sanitation, followed by rural sanitation and urban water. While rural water supply may require less funding, the demand is large and servicing those communities is a challenge due to low density levels.

Overall, there are two primary sources of revenue in the water sector – tariffs (user fees) and taxes levied by local and national governments and provided to the sector as grants or subsidies, along with international transfers provided through ODA. Together, they must cover recurrent expenditure and repayments for capital investments, whether they are financed from concessional loans or commercial finance.

While households are willing to pay for water services, equity considerations often severely limit the ability to apply tariffs and fees. A GLAAS survey found that in more than half of all countries, household tariffs are insufficient to cover even operation and maintenance costs, let alone capital spending. Taxes and transfers thus play an important role in filling the gap. ODA disbursements for water and sanitation have also been increasing, but donor surveys indicate that such transfers may have peaked.

The bulk of borrowing to finance capital investments in the water sector has traditionally come from concessional lending by development finance institutions. However, to significantly expand investment to achieve universal access as called for in SDG 6, operators (be they public or private) will need to increasingly tap commercial sources of finance. Given the drop in cross-border lending and due to differences in risk assessment by international and domestic institutions, participants noted the importance of domestic commercial finance. In this context, the potential of public commercial, retail and development banks to lend to municipalities was also highlighted.

To attract additional commercial finance and become credit-worthy, services providers need to strengthen their technical and financial performance, as well as governance, regulatory and institutional arrangements. Technical and financial efficiency pertains to operations, finance, customer service and organizational issues. Transparency and independence in the regulatory arrangements (e.g. in price, quality and competition regulation, consumer protection and pro-poor regulation) is equally important to attract commercial finance.

Several participants underlined the importance of maintaining public and local control over service provision, stressing the human right to water and the ambition of the 2030 Agenda to provide

universal access. They also raised concerns over the commercial viability of providing access to water and sanitation to the most marginalized groups, including through microfinance, and the difficulty of separating governance from financing arrangements, and thus stressed the important role of public finance, including through progressive taxation. Participants also noted that the interlinkages between water, energy, agriculture and ecosystems would need to be explored and addressed.

SESSION III: Energy

Session III focused on financing for energy. Rolf Traeger, Chief of LDC Section, UNCTAD, presented key findings from the 2017 LDC report, focusing on investments to close the electricity access gap in LDCs. Marcel Alers, Head of Energy of UNDP Global Environmental Finance, laid out financing challenges across various parts of the energy sector: rural and urban electricity access, cooking fuels, renewable energies and the energy transition. David Nelson, Executive Director for Energy Finance at the Climate Policy Initiative, discussed when and how to bring in private actors, which depends on whether they are better placed than the public sector to absorb risks arising within specific projects. David Rodgers, Senior Climate Change Specialist at the Global Environment Facility, underlined the importance of developing a project pipeline to better connect investors and project developers. Sam Leistner from the Institute for Development Studies served as a discussant, followed by a moderated discussion with all participants.

SDG 7 commits to access to affordable, reliable, sustainable and modern energy for all. Achieving this goal requires significant progress across the energy sector, with different aspects of the sector characterized by very different financing challenges. Around 15 per cent of the world population or 1 billion people remain without access to electricity. More than half of them live in LDCs, and the challenge is greatest in rural areas – 82 per cent of people in rural areas in LDCs have no access. Much progress has been made in recent years in expanding electricity grids, but rural and remote areas remain underserved, with significant promise for off-grid and distributed solutions to help close this gap.

The challenge is even greater in providing access to clean cooking fuels. More than 3 billion people use polluting fuels, mainly in rural areas and poor urban neighbourhoods. Even though global financing needs in this area are comparatively smaller, expanding access to clean fuels has proven to be extremely challenging, particularly in rural areas, and efforts have so far largely been financed through international grant finance. Jointly, annual investment needs for universal access to electricity and clean cooking are estimated at around \$45 billion by SE4All.

The transition toward renewable energy on the other hand requires additional investments of a much larger scale – around \$503 billion annually to achieve the transition toward renewable energy compatible with climate goals. Investments for energy efficiency would need to be even larger still. In all cases, this considerably exceeds current spending. In response, all sources of finance, policy and regulatory instruments will need to be exploited to close gaps and achieve SDG 7.

In terms of improving access to cooking fuels, beyond mobilizing additional grant finance, there may be opportunities for commercial finance and market development, particularly in urban areas. But critical challenges need to be overcome, including poor households' financing constraints. Distributed electricity solutions face similar challenges, with households already dedicating

significant resources to pay for lighting and cooking fuels, but many unable to finance capital investments for modern solutions. There are different models to overcome this challenge, such as pay-as-you-go systems, third party ownership models, or microloans, but they run up against affordability challenges, and need to address cultural and behavioural factors.

Investments in grid power generation, transmission and distribution have historically been undertaken by public utilities, which funded their operations and capital investments from end users (retained earnings from tariffs), transfers from the public purse and ODA. More recently, private sector participation has increased in developed and, to a lesser extent, developing countries. This is possible in principle because of sufficient cash flows and the competitive risk/return profile of electricity investments, as compared for example to the water sector, and has led to a diverse landscape with a wide range of ownership and financing structures.

Ownership and financing models range from pure public ownership to mutual ownership, public finance and construction followed by divestiture, private finance combined with regulation or long-term public contracts, and pure private ownership. The ideal structure depends on specific characteristic and risks of a project. These risks include development, construction and operating risks, as well as environmental risks, curtailment and utilisation risks, price, policy and currency risks. Their extent and the cost of bearing them will in turn depend on the nature of the energy technology (e.g. whether it is a mature technology or not, whether it is capital intensive or has higher operating costs), country and market contexts (e.g. whether markets are competitive), and the stage of the investment.

Ownership models that allocate specific risks to the party (be it taxpayers, private investors, or consumers) best positioned to manage them would help achieve cost-efficient service delivery. For example, private investors are generally well-placed to manage operational and construction risks, as shareholders generally exert pressure on management to be efficient. Private investors in combined cycle gas turbines (CCGT) are also well placed to hold price and curtailment risks due to the technology's flexibility, while onshore wind investors have limited ability to manage such risks, an argument for the public sector to take help manage these risks, e.g. through fixed feed-in tariffs. A range of finance and policy instruments can be added to the ownership model to further address mismatches between ideal and actual risk allocation – public finance instruments such as grant finance and guarantees, policy mechanisms such as feed-in tariffs, and other regulatory instruments.

There was agreement that a public role and public support remains critical for renewable energies. Despite the sharp drop in costs in renewables, discussions emphasized that investment in the transition to renewables remains risky and more expensive than fossil fuel alternatives in many situations. There is thus a continued need for the public sector to support the energy transition, including through public finance institutions and development banks, and through measures to derisk investments – with instruments such as those proposed in UNDP's DREI approach. Improvements in the regulatory environment, which can be more cost effective than using public capital, were also noted. Specific issues related to the transition – stranded assets, or newly arising challenges with higher market penetration of renewables, such as storage costs – would also need to be addressed.

Several participants also noted that enhancing energy efficiency is not getting required attention, and that energy efficiency issues should be highlighted as part of the solutions proposed in the report.

SESSION IV: Ecosystems

In the fourth and final session, participants discussed financing challenges for the protection and sustainable use of ecosystems. Onno van den Heuvel, Global Manager at UNDP BIOFIN, introduced the BIOFIN programme, which helps countries assess financing needs and develop financing plans for biodiversity protection. Yibin Xiang from the Secretariat of the Convention on Biological Diversity (CBD) noted the links to the 2020 Aichi biodiversity targets, which include means of implementation and targets on international support. Benjamin Singer, United Nations Forum on Forests, laid out the landscape for forest financing, while Paul Hartman, Senior Environmental Specialist at the Global Environment Facility (GEF) explored options for blended finance and private involvement in the sector. Simone Lovera of the Global Forest Coalition emphasized the importance of linking finance and governance, and to take into consideration the needs of marginalized groups.

Ecosystems provide humanity with services fundamental to well-being, health, and livelihoods – clean air, food security, fresh water – yet progress in preserving and sustainably using them is uneven. Estimates of financing needs to preserve ecosystems range from USD 150 to 400 billion annually¹, significantly exceeding current financing. The challenge thus is to increase available resources – by generating revenue from multiple sources of funding and by realigning existing expenditures – and to reduce needs by taking measures to avoid future expenditure. At the national level, these measures would then need to be brought together into a coherent plans to be embedded in broader national developing planning and budgeting processes. Developing such plans is a key goal of BIOFIN, and also responds to the Aichi biodiversity targets, which call for national resource mobilization and implementation strategies for biodiversity.

Protecting ecosystems and ensuring their sustainable use is a public good. Despite their large value provision to society, investments in ecosystems often offer no or little financial return. As a result, public finance and public policy play a critical role. Financing for ecosystems comes overwhelmingly from public, and to a lesser extent, from not-for-profit sources, either from domestic budgets or through international support such as ODA, particularly in areas where ecosystems represent global public goods.

ODA for biodiversity is monitored through the Aichi targets, which aim for a substantial increase in resources for implementing the Strategic Plan for Biodiversity 2011-2020. In 2014, the Parties to the Convention for Biodiversity decided to double biodiversity related financial aid to developing countries through 2020, and while some countries have reached this target, collectively donors still fall short. This trend is mirrored in forestry specific ODA, which has increased over the last 15 years, but only modestly so. Beyond international public finance, trends in domestic public spending for ecosystems are less well understood, due to data limitations.

¹ Such estimates include costs of activities to meet the Aichi biodiversity targets, administrative resources to manage such programmes, and opportunity costs of foregone revenue through conservation efforts.

In recent years, there is also increasing interest in mobilizing non-traditional sources of financing such as private and blended finance, even as they so far remain relatively small-scale. Existing models include investment structures that provide cash flows from user fees or licenses that sustain the conservation activity. However, interests of private investors may clash with interests of existing users of ecosystems, raising concerns over equity and inclusion. Payments for ecosystem services – where forest owners, farmers or communities are compensated for conservation, protecting watersheds, or carbon capture – are a related mechanism. In offset markets, polluters purchase a ‘carbon offset’ to comply with emission caps or to mitigate their own actions by funding emission-reducing projects. More recently, the GEF has introduced a public-private partnership fund, which combines GEF funds with funding from impact investors to finance small-scale and sustainable fishery enterprises. A key challenge remains to scale up such initiatives, and to go beyond public and philanthropic financing.

‘Green commodities’ – consumers pay a price premium for goods that are produced in a ‘biodiversity-friendly’ way – also bring the private sector into ecosystem preservation. They point to the broader need to realign existing expenditure and activities – both consumer spending and sourcing of intermediate goods in value chains, but also public finance and public policy. In the forestry sector for example, harmful subsidies to sectors such as soy, beef or palm oil dwarf public financing for preventing deforestation and forest degradation.

ANNEX 1: Agenda

8:30 – 9:00
a.m.

SESSION I: Introduction and conceptual overview

- Shari Spiegel, Chief, Policy Analysis and Development, Financing for Development Office
- Amar Bhattacharya, Senior Fellow, Brookings Institution

9 – 10:30 a.m.

SESSION II: Water and sanitation

- Joel Kolker, Lead Water and Sanitation Specialist, World Bank Group
- Fiona Gore, Team Leader, GLAAS, WHO (on behalf of UN Water)
- *Discussant: Thomas Marois, Senior Lecturer, SOAS University of London*
- *Discussant: Meera Karunanathan, Director, Blue Planet Project*

10:30 – 10:45
a.m.

Coffee Break

10:45 a.m. –
12: 15 p.m.

SESSION III: Energy

- Rolf Traeger, Chief of LDC Section, UNCTAD
- Marcel Alers, Head of Energy, UNDP Global Environmental Finance
- David Nelson, Executive Director, Energy Finance, Climate Policy Initiative
- David Rodgers, Senior Climate Change Specialist, Global Environment Facility
- *Discussant: Sam Leistner, Institute for Development Studies*

12:15 – 1:45
p.m.

SESSION IV: Ecosystems

- Onno van den Heuvel, BIOFIN Global Manager, UNDP
- Yibin Xiang, Cooperation and Outreach Support Division, Secretariat of the Convention on Biological Diversity
- Benjamin Singer, United Nations Forum on Forests
- Paul Hartman, Senior Environmental Specialist, Global Environment Facility
- *Discussant: Simone Lovera, Global Forest Coalition*

1:45 – 2 p.m.

Concluding session and way forward

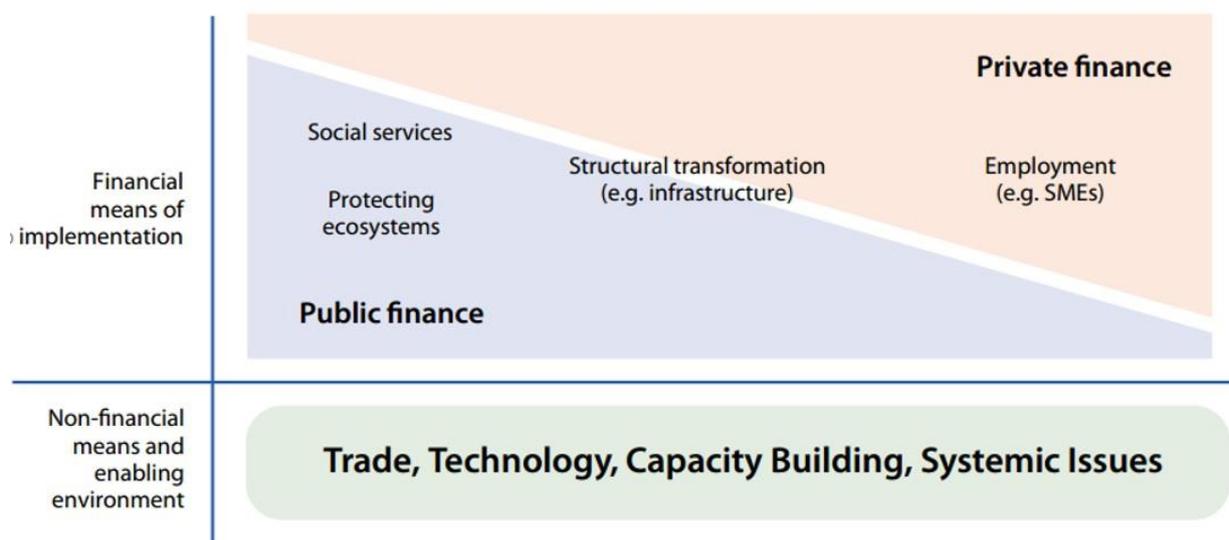
ANNEX 2: Background Note

SESSION I – Conceptual overview	10
SESSION II – Water and sanitation	14
SESSION III – Energy	16
SESSION IV – Ecosystems.....	18

SESSION I – Conceptual overview

The thematic chapter will build on earlier work of the Task Force on public, private and blended SDG financing. Drawing on the financing framework that Member States have agreed to in the Addis Ababa Action Agenda (see Figure 1), the Task Force has previously addressed challenges in mobilizing long-term and quality investments for sustainable infrastructure – focusing on public and private investments, the role of development banks, and the principles for the effective use of blended finance modalities for infrastructure investment. The 2018 thematic chapter will flesh out and further concretize this earlier work by looking at the priority investment areas under as case studies, and to find broader lessons about the appropriate financing mixes for SDG investments.

Figure 1: The continuum of public and private financing and the non-financial means of implementation



Source: Inaugural 2016 Task Force report

How to provide the SDGs under review most cost-effectively depends on several factors:

1. Is the good or service in question a private good, which can be effectively supplied by markets, or a public good?
2. For private goods, do investments have sufficient natural cash flows (or can such cash flows can be created) that compensate private investors for risk?

3. For public goods, what are the specific ‘public-good properties’ associated with the good or service that need to be addressed, and are there any positive or negative externalities in its provision?
4. Are there equity considerations that need to be considered?

Private goods are excludable and rival in consumption, and should be effectively supplied by the market. Even for private goods, risk-return profiles may however not be attractive enough to entice private investment, particularly in challenging country contexts, providing a rationale for (temporary) public support. Public goods are either non-rivalrous in consumption (so-called club goods, which includes network infrastructure in water and electricity), non-excludable (common pool resources such as fisheries and timber), or both (pure public goods such as clean air). They will be undersupplied without public intervention. Few goods fall on the extreme ends of this spectrum. Many goods have some public good properties and/or are characterised by externalities, where their production and consumption has positive or negative spill-overs on third parties, which have to be addressed by public policy.

Equity concerns are strongly embedded in the SDGs, which aim to leave no one behind and often target universal provision of services. This typically includes segments of the population that are not able to pay. Universal provision will thus require some form of public intervention. Merit goods such as education, whose consumption is socially desirable, represent a similar case.

Each of the SDGs under consideration will therefore require some form of public sector intervention - either in their provision or their financing, or through the regulatory framework.

How can the public sector contribute to provision and financing?

What form can this public role take? The public sector can (1) publicly own and produce goods and services, or (2) provide public financial support to create a risk-return profile attractive enough for private investment, through blended finance mechanisms, and (3) sets the regulatory framework in which such investments take place.

Goods and services can be owned and provided directly by the public sector, often by municipalities or state-owned enterprises. Public procurement falls under this category. Public providers also tap commercial sources of financing to fund such investments. The major advantage of public provision are lower financing costs when public entities have stronger credit ratings than private entities, and the ability to directly address public policy goals, such as universal access.

In the case of private provision, investors evaluate investments in terms of expected returns adjusted for associated risks. They will invest only if a project is attractive on a risk-return basis compared to alternative investment opportunities. If a project falls short on this score but is socially desirable, there is a role for the public sector. It can lower risks and costs and/or increase expected returns by providing financial support, in the form of grants or concessional loans, subsidies, targeted tax reductions, compensation of specific costs, ex-post deficit coverage or other guarantees. The regulatory framework can also be used do so – e.g. by providing exclusive rights, a temporary monopoly position, or by regulating user fees. The regulatory framework is also used to address equity concerns, for example through universal service provision obligations.

Public-private partnerships are an ‘intermediate’ modality – situated conceptually between public provision/procurement and full privatization. While the asset in question remains in, or is ultimately returned to, public control, the private sector provides financing *and* takes on its design, build and management. The operational risk is thus transferred to the private sector, incentivizing efficient provision. If successful, efficient provision more than offsets the typically higher financing costs of such structures.²

Which model fits best, and when?

The key question is which actor is best placed to provide the SDG investment in question equitably and in a cost-effective manner in the presence of market failures, externalities, or equity concerns as described above. Ultimately, this decision will also depend on country circumstances, which can differ substantially, but several general observations can be made.

First, the assessment of which actor – the public sector or private investors – is best placed to finance or provide the good/service in question, often rests on a trade-off between efficiency and financing costs. Private participation can bring efficiency gains, but is often associated with higher costs, because private investors generally face higher financing costs and demand a competitive return. For example, a public guarantee for a specific private project will bring down financing costs, but could also reduce incentives for efficient delivery.

Second, equity concerns often provide a rationale for public provision, or alternatively for public interventions through financing, subsidies or regulation. Such a public role is often indispensable to reach poor households. In this context, it is important to note that ultimately, goods and services are paid for by households and taxpayers, complemented in some cases by international transfers such as ODA. Depending on the sector, this takes the form of tariffs or fees, targeted taxes (such as gasoline taxes to fund investments in road), or public financing from general budgets. The latter in particular is well placed to address equity concerns where households are unable to pay for access. In countries with insufficient domestic resource mobilization, this leaves a critical role for ODA. The progressivity of the tax code is also important in determining whether budget financing ultimately addresses equity issues.

Beyond these overarching observations on public vs. private provision, we can expect financing costs to be minimized and efficiency to be maximized if specific risks are allocated to the party best positioned to manage and control risks, but also to understand risks (e.g. policy risks) and to share them. Whether public or private actors are better placed to do so will depend on (i) the specific type of risk within a project/investment, (ii) on country and sector contexts, and (iii) on the presence of public policy objectives and goals.

Risks arise in project development and construction (e.g. exploration activities, capital expenditure on construction) and operation and maintenance. There are also specific price risks, environmental risks, policy, currency and other risks, which may be borne either by the public sector or by private entities. To give one example, once the capital investment is made, renewable energy operators have limited

² Treblicock, Michael and Michael Rosenstock (2015). *Infrastructure public-private partnerships in the developing world: lessons from recent experience*. *Journal of Development Studies* 51:4.

ability to manage fluctuations in generation associated with external factors out of their control (e.g. wind). Fixed feed-in tariffs provide them with long-term price certainty that limits their exposure to price volatility associated with fluctuations in generation. Exposure to this risk would raise their cost of capital, but would not lead to better risk management on their part. Feed-in tariffs instead socialize this specific risk.

Country and sector contexts affect the ideal allocation of risk. This includes the level of competition, the efficiency of public providers, the nature of the technology, and the maturity of financial markets. For example, when competition is limited or absent (e.g. provision of network infrastructure), the incentives for efficient provision provided by competitive markets are absent or incomplete as well, providing a case for public ownership or regulatory interventions. Any efficiency gains from private provision would depend on appropriate design of the public intervention and an effective regulatory framework, which in turn requires institutional competence. One corollary to this point is that financing cannot be looked at in isolation, but must be considered as part of the broader regulatory and policy framework in a sector. The presence of externalities and/or social and environmental policy objectives also influences the ideal allocation of risk – as discussed above in the case of universal access goals, which call for a greater public role, if not public provision.

SDGs under in-depth review

- *SDG 6 (Water and sanitation): The SDGs have broadened focus and heightened ambition in the water and sanitation sector. The goal is to achieve universal, equitable and affordable access to safely managed water, sanitation and hygiene, which significantly increases financing needs.*
- *SDG 7 (Energy): Ensuring access to affordable, reliable, sustainable and modern energy for all requires providing electricity to the remaining 15 per cent of the world population (1 billion people) that currently remain without access, to vastly increase access to clean cooking fuels, and enhance energy efficiency and the share of renewable energy.*
- *SDG 11 (Sustainable cities): SDG 11 aims to build inclusive, safe, resilient and sustainable settlements and cities. This places high demands on subnational governments, particularly in the context of rapid urbanization. SDG 11 is a cross-cutting priority – investments in urban infrastructure will support many other SDGs, including for example on water and energy. A 2013 survey of 90 countries found that subnational governments accounted for nearly 40 per cent of all public investments.*
- *SDG 12 (Sustainable consumption and production): Sustainable consumption and production patterns mitigate the environmental degradation and resource depletion that result from unsustainable growth. Achieving SDG 12 is another key cross-cutting priority of the SDGs, and will rely on integrating sustainable consumption and production considerations into policies, business practices and consumer behaviour across all sectors.*
- *SDG 15 (Ecosystems): Terrestrial ecosystems provide humanity with services fundamental to well-being, health, and livelihoods – some estimate the value of annual global ecosystem services as high as USD 75 trillion, comparable in size to gross world product. SDG 15 aims to ensure their preservation and sustainable use.*

SESSION II – Water and sanitation

SDG 6 aims to achieve universal, equitable and affordable access to safely managed water, sanitation and hygiene. In contrast to the MDGs, which focused on basic water supply and sanitation, SDG 6 is broader, aiming for safe and affordable drinking water, adequate sanitation and hygiene, and covers water resource management and irrigation. Safely managed drinking water implies water available on premise, when needed, and free of contamination – whether piped, or collected from boreholes, rainwater or protected wells. Safely managed sanitation can be achieved either through a sewer connection or on-site (e.g. septic tanks or pit latrines).³ Access to water and sanitation has to be provided to all households independent of their ability to pay. Large positive externalities from universal provision across the SDGs (e.g. health benefits) provide additional rationale for public involvement.

Financing needs to meet SDG 6 are considerable. The World Bank estimates global total capital costs of achieving universal access to safely managed water and sanitation services and hygiene at USD 114 billion annually (or three times the historical financing trend), with needs well above average in Sub-Saharan Africa and Southern Asia.⁴ Investment needs are highest for sanitation in urban areas at 40 per cent of the total, with urban drinking water accounting for a further 20 per cent, and rural sanitation and water needs for the remaining 40 per cent. Financing for operations and maintenance would also have to progressively increase as access is extended, and irrigation and water resource management require additional large investments.

Several key characteristics shape service provision in the water and sanitation sector: first, water and sanitation infrastructure has natural monopoly characteristics, as it is not economical to lay competing sets of pipes, which are indispensable to safely managed water and sanitation in urban areas in particular. This severely limits competitive pressures on providers.⁵ (For basic services – such as wells or on-site sanitation – households themselves are the primary investors). Second, the network infrastructure also makes the sector very capital intensive, with high-up front investment needs.⁶ A key challenge is thus to mobilize finance for large upfront investments. Third, water services are usually locally provided, with limited options for wider-scale networks, so that service provision is often set up at the municipal level. Fourth, while households are willing to pay for water services, equity considerations often severely limit the ability to apply tariffs and fees.

³ WHO/UNICEF (2017). *Joint Monitoring Program for Water Supply, Sanitation and Hygiene (JMP) – 2017 Update and SDG Baselines*. Available from: <http://www.unwater.org/publications/whounicef-joint-monitoring-program-water-supply-sanitation-hygiene-jmp-2017-update-sdg-baselines/>

⁴ Hutton, Guy and Mili Varughese (2016). *The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene*. World Bank. Available from: <https://openknowledge.worldbank.org/bitstream/handle/10986/23681/K8632.pdf?sequence=4>

⁵ Panaotou, Theodore (1999). *Innovative financial mechanisms for sustainable sector financing*. Available from: https://sustainabledevelopment.un.org/content/dsd/resources/res_pdfs/publications/sdt_fin/nairobi_meeting_part4.pdf

⁶ World Water Panel (2003). *Financing Water for All*. Available from: <https://www.oecd.org/greengrowth/21556665.pdf>

A note on financing needs estimates

Estimating financing needs for specific SDGs is extremely challenging, due to uncertainties over key policy parameters, unit costs, technological developments, absorptive capacities and other factors. Results will depend on assumptions made in all these areas. On the other hand, financing needs estimates help to spell out a 'production function' of the goods and services in question, and thus help to identify specific public and private investments, actions and policies that are necessary, as well as to assess macroeconomic implications of a concerted investment push. Of the SDGs under in-depth review, estimates for water, energy and ecosystems are available. Investments for both sustainable cities and sustainable production and consumption cut across sectors and overlap with other SDG investment areas to a very large degree.

As a result, water and sanitation services are usually provided by publicly-owned (often at the municipal level) utilities – with privately-owned utilities the exception even in developed countries. These utilities fund operations from tariffs (end users), taxes (public support for service provision) or transfers (ODA, in developing countries). Tariffs can account for up to 90 per cent of financing in the sector in some developed countries, but they tend to make up a much lower share of funding for utilities in developing countries, where they often do not suffice to cover operation and maintenance costs, let alone capital expenditure.⁷ Equity and affordability considerations in the push to achieve universal access severely limit cost recovery opportunities from tariffs going forward.

Utilities can access commercial finance to fund capital investments if the risk-return profile is attractive for private investors. In developed countries, the sector is perceived as low-risk, which allows utilities to attract investment despite relatively low returns. In developing countries, the combination of low and uncertain returns makes the sector a challenging proposition for private investors. Private financing accounted for only 7 per cent of total financing in the sector in 2012 in developing countries, with sub-Saharan Africa coming in at less than 1 per cent.⁸ Instead, they borrow from governments or development banks to finance capital investments.

What are the options to mobilize additional financing for water and sanitation to meet SDG 6, keeping in mind the key considerations of equity, efficiency and cost laid out above? Equity concerns will severely limit cost recovery from households, implying a continued large role for public finance to support operations and to complement revenue from tariffs – both in the form of taxes and ODA. There may be opportunities to mobilize additional commercial funding to finance capital investments by using blended finance, which could in turn free scarce public resources for other investments. This is attractive particularly if the use of such instruments leads to greater transparency, accountability and efficiency gains in utilities.

⁷ OECD (2011). *Meeting the Challenge of Financing Water and Sanitation*. Available from: https://www.pseau.org/outils/ouvrages/ocde_meeting_the_challenge_of_financing_water_and_sanitation_2013.pdf. Whereas tariffs accounted for 90 per cent of funding in France, they only raised 30 per cent of funds in Mozambique and 10 per cent in Egypt.

⁸ Leigland, James, Sophie Tremolet and John Ikeda (2016). *Achieving Universal Access to Water and Sanitation by 2030 The Role of Blended Finance*. Available from: <https://openknowledge.worldbank.org/bitstream/handle/10986/25111/Achieving0univ0e0of0blended0finance.pdf?sequence=1&isAllowed=y>

SESSION III – Energy

SDG 7 commits to ensure access to affordable, reliable, sustainable and modern energy for all. Achieving this goal requires to provide electricity to the remaining 15 per cent of the world population (1 billion people) that currently remain without access, to vastly increase access to clean cooking fuels, and enhance energy efficiency and the share of renewable energy.

Financing needs in the energy sector are vast. SE4All reports estimated annual investment needs of USD45 billion for universal access to electricity and clean cooking, USD 503 billion for achieving the transition toward renewable energy compatible with climate goals, and even larger investments for energy efficiency.⁹ In all cases, this considerably exceeds current spending.

The targets under SDG 7 and thus the components of the energy sector have different financing structures and challenges. Cooking fuels are the first energy resource used by households, even before lighting. Yet, more than 3 billion people remain without access to clean cooking and instead use polluting fuels, primarily in rural areas and poor urban neighbourhoods and slums.¹⁰ Currently, international public finance in grant form is the major source of finance for the distribution of clean cooking technologies, such as biogas digesters, to households. Current levels of financing fall far short of levels required to close the access gap however. In addition to mobilizing additional grant finance, there are opportunities for commercial finance and market development, but critical challenges need to be overcome. On the demand side, overcoming households' financing constraints in capital investments in clean technologies is challenging as clean cooking technologies are often too expensive for households but not expensive enough to be cost effective for even microfinance providers.¹¹ Options include asset finance or micro-leasing. Similarly, SMEs providing clean cooking services need access to financing options. Lastly, the overall policy environment matters greatly – this includes price incentives (e.g. subsidies for clean fuels rather than for polluting fuels), infrastructure for distribution of clean cooking fuels, and awareness raising.

Distributed electricity solutions, which are well suited for providing access to electricity for households in remote and rural areas (many of the 1 billion remaining without electricity at this point), hold great promise for accelerating energy access. They share some of the characteristics of clean cooking and thus face similar challenges however, with households already dedicating significant resources to pay for lighting and cooking fuels, but unable to finance capital investments for modern solutions. Energy enterprises offering such solutions often struggle to mobilize financing, and there is a role for the public sector, including for development finance institutions. So far, off-grid solutions receive a very small share of overall development financing for electricity access.¹²

⁹ SE4All (2017). *Global Tracking Framework. Progress toward Sustainable Energy 2017*. Available from: http://www.se4all.org/sites/default/files/eegp17-01_gtf_full_report_final_for_web_posting_0402.pdf (p.100)

¹⁰ United Nations (2017). *Progress towards the Sustainable Development Goals*. Report of the Secretary-General E/2017/66

¹¹ Granoff, Ilmi and Ryan Hogarth (no year). *Universal energy access: can we make it sustainable?* Available from: <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9866.pdf>

¹² See for example SE4All (2017). *Energizing finance – scaling and refining finance in countries with large energy access gaps*. Available from: http://www.se4all.org/sites/default/files/2017_SEforALL_FR4_PolicyPaper.pdf

While distributed electricity solutions have an important role to play, they cannot replace development of a modern grid and expansion of power generation capacity necessary for growth and development. Similar to the water sector, investments in power generation, transmission and distribution of electricity are characterized by high upfront capital needs, network effects and natural monopoly characteristics in transmission and distribution. Historically, public utilities have generated and distributed electricity, and have funded their operations and capital investments from end users (retained earnings from tariffs), subsidies by the public sector, and, in developing countries, development assistance. In recent decades, many countries, particularly developed countries, have increased private sector participation in the sector, initially in generation, but increasingly in transmission and distribution as well. This is possible because of sufficient cash flows and the competitive risk/return profile of electricity investments. Greater private sector participation was also motivated by concerns over the operational and financial performance of public utilities.¹³

Nonetheless, the public sector remains prominently involved in financing and provision, and/ or in a regulatory role. Globally, around 60 per cent of energy investments are carried out by private entities (the public share is around one third in generation investment, but 70 per cent in network investment), but state-owned entities still own almost half of global installed electricity generation capacity, and this share is higher in developing countries.¹⁴ There are significant opportunities to attract additional private investment, but equity considerations, network effects and environmental externalities call for a careful consideration of public and private roles depending on specific country circumstances and policy goals.

Renewable energy sources face additional challenges. These technologies are characterized by high upfront costs relative to ongoing operating costs as compared to conventional technologies, and they thus require access to long-term finance.¹⁵ They also face high exposure to regulatory and political risks as long as they are not cost competitive and thus dependent on public support, and they still compete with fossil fuels that benefit from explicit or implicit subsidies.¹⁶ In light of the clear public good character of transitioning to renewables, public sector support is warranted – either financially or through regulatory means.

¹³ Stegals, Will, David Nelson and Gaia Stigliani (2017). *Financing clean power: a risk-based approach to choosing ownership models and policy & finance instruments*.

<https://climatepolicyinitiative.org/publication/financing-clean-power-risk-based-approach-choosing-ownership-models-policy-finance-instruments/>

¹⁴ International Energy Agency (2017). *World Energy Investment 2017. Executive Summary*. Available from: <https://www.iea.org/Textbase/npsum/WEI2017SUM.pdf>

¹⁵ World Bank (no year): *Financing renewable energy. Options for developing financing instruments using public funds*. Available from:

http://siteresources.worldbank.org/EXTENERGY2/Resources/SREP_financing_instruments_sk_clean2_FINAL_FOR_PRINTING.pdf

¹⁶ UNDP (2013). *Derisking Renewable Energy Investment*. Available from:

[http://www.undp.org/content/dam/undp/library/Environment%20and%20Energy/Climate%20Strategies/UNDP%20Derisking%20Renewable%20Energy%20Investment%20-%20Full%20Report%20\(April%202013\).pdf](http://www.undp.org/content/dam/undp/library/Environment%20and%20Energy/Climate%20Strategies/UNDP%20Derisking%20Renewable%20Energy%20Investment%20-%20Full%20Report%20(April%202013).pdf)

SESSION IV – Ecosystems

Ecosystems provide humanity with services fundamental to well-being, health, and livelihoods. While difficult to quantify, estimates in the scientific literature have valued annual global ecosystem services as high as USD 145 trillion, around twice the size of gross world product.¹⁷ Yet progress in preserving and sustainably using them is uneven. The pace of forest loss has slowed and improvements continue to be made in managing forests sustainably and protecting areas important for biodiversity. However, declining trends in land productivity, biodiversity loss and poaching and trafficking of wildlife remain serious concerns.

Estimates of financing needs to preserve ecosystems range from USD 150 to 400 billion annually. They significantly exceed current financing available for the sector, which amounted to around USD 50 billion on average in the period from 2010 to 2015.¹⁸ In contrast to water and energy, which are characterised by significant externalities but are private goods which users are willing to pay for, ecosystem protection and ensuring their sustainable use is a public good. Beneficiaries of such investments are difficult to identify and to charge, and exclusion of non-payers is therefore difficult or even impossible. As a result, despite their large value provision investments in ecosystems often offer no or little financial return.

The difficulty in quantifying the value that ecosystems provide adds to this challenge. Yet, once sufficiently diminished, restoration is often impossible and the services that ecosystems provide must be replaced at high cost. Due to these properties, financing for ecosystems comes overwhelmingly from public, and to a lesser extent, from not-for-profit sources – either from domestic budgets or through international support, particularly in areas where ecosystems represent global public goods.¹⁹

Philanthropy also plays an important role. More recently, efforts have been made to increase additional private sector involvement, but they remain relatively small-scale. Existing models include investment structures that allow the private investor to earn financial returns from cash flow mechanisms (user fees, hunting licences) that can sustain the conservation activity. However, these revenue streams are seldom competitive with alternative opportunities, and often clash with interests of existing users of ecosystems. Other private finance mechanisms include ‘green commodities’ (consumers pay a price premium for goods that are produced in a ‘biodiversity-friendly’ way) and offset markets (polluters pay for the negative impact on the environment by purchasing an offset, such as the Clean Development Mechanism and REDD+).

¹⁷ Costanza, Robert, et al. (2014). *Changes in the global value of ecosystem services*. Global Environmental Change 26 (2014). Available from: <https://community-wealth.org/sites/clone.community-wealth.org/files/downloads/article-costanza-et-al.pdf>

¹⁸ UNDP (2016). *BIOFIN Workbook*. Available from: [file:///C:/Users/oliver.schwank/Downloads/BIOFINWorkbook2016%20\(2\).pdf](file:///C:/Users/oliver.schwank/Downloads/BIOFINWorkbook2016%20(2).pdf)

¹⁹ WWF, CreditSuisse and McKinsey (2014). *Conservation Finance: Moving beyond donor funding toward an investor-driven approach*. Available from: <https://www.credit-suisse.com/media/assets/corporate/docs/about-us/responsibility/environment/conservation-finance-en.pdf>

A note on the treatment of SDGs 11 and 12

SDG 11 on sustainable cities is discussed in a separate technical meeting of the Task Force on Wednesday 29 November. SDG 12 is a key cross-cutting issue – achieving it will rely on integrating sustainable consumption and production considerations into all national and sectoral policies and plans. The thematic chapter will focus on sustainable consumption and production in the energy sector in particular, including by discussing financing challenges related to renewable energy and energy efficiency.