



G20/OECD REPORT ON THE COLLABORATION WITH INSTITUTIONAL INVESTORS AND ASSET MANAGERS ON INFRASTRUCTURE: RECOMMENDATIONS AND THE WAY FORWARD IN THE CONTEXT OF THE PANDEMIC

FIRST DRAFT REPORT

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OECD

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Foreword

This first draft report presents the outcomes – to date – of a dialogue among private sector investors in infrastructure and the G20 Infrastructure community, represented mainly by the Infrastructure Working Group (IWG), supported by the OECD. The report, when finalised, will seek to convey the perspectives of asset owners and managers, identifying key issues and challenges and providing recommendations for G20 Finance Ministers and Central Bank Governors for improving the enabling environment for private investment in infrastructure. The potential for future G20/OECD collaboration with investors through a platform is also considered.

The draft report is based on discussions held over three seminars/symposiums: a workshop was held on 25 October 2019 in Paris, organised by the OECD and held back to back with the meetings of the G20/OECD Task Force on Long-term Investment; a Symposium was held on 17 December in Riyadh, organised by Saudi Arabia with OECD support, held back to back with the meetings of the G20 IWG; and a seminar was held in Paris on 10 February 2020, co-organised by the OECD and Saudi Arabia.

While the original intent was to continue the dialogue through additional seminars scheduled in the first half of 2020, the process has been adapted to the evolving COVID-19 outbreak. Conference calls and bilateral interviews with investors have been employed to continue the dialogue, along with written inputs, successively building on and refining the content and messages. These recent inputs are reflected in this first draft report.

This is a dynamic document; this version includes comments from asset managers and institutional investors on a zero draft version. This second version was also circulated to Saudi Arabia Presidency and IWG co-chairs, and already includes some of their comments while others will be reflected in following versions. Due to timing considerations this current version is circulated now to IWG members for comments by 20th May.

In order to help guide further comments and written inputs, some questions are provided below for consideration:

1. Do you have any high-level comments on the structure of the document or the organisation of topics related to the recommendations? (For the private sector) Are there topics not covered that should be added?
2. Do you have comments on the recommendations themselves, or the background text (e.g. issues and challenges, proposed solutions), in terms of substance?
3. Where could further clarity be brought to the text? Where could it be streamlined?
4. Do the key messages seem appropriate (see Introduction to the Recommendations)?
5. Key / priority recommendations will be prepared for the final draft report. The objective would be to select the recommendations that: (a) can feasibly be acted upon in the near term; and (b) would make a material difference to the development of the infrastructure space. (For the private sector) Which ones would you propose?

6. Regarding the recommendation on potential consensual building blocks for contractual clauses (see *Recommendation 1.10*), which should be the priority areas?
7. The impact of COVID-19 on infrastructure and its implications for the recovery response were discussed with investors. Some of the messages are contained in various recommendations. A new section has been added that reflects specific recommendations provided by investors on the role of infrastructure in the recovery. Are there lessons from the COVID-19 crisis in terms of impacts on infrastructure and elements needed in the policy response that you believe should be conveyed and reflected in the report or be given greater emphasis?
8. What would you propose as the way forward, including on how such collaboration should be continued going forward (see concluding section)?

Further input is welcomed, and additional group calls and bilateral interviews will be conducted. The timing of upcoming consultations will be communicated separately. Further written inputs are especially welcomed - the deadline for written inputs from IWG members and observers, delegates to the G20/OECD Task Force, and private sector investors is **20 May 2020**.

G20 IWG members are again invited to contact the Kingdom of Saudi Arabia and the OECD *urgently* should they wish to recommend that asset managers or institutional investors from their jurisdiction be included in the final round of consultations.

A final draft report is expected to be circulated toward the end of May for final comments from the private sector and from G20 members and observers, before being transmitted to G20 Finance Ministers and Central Bank Governors.

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Introduction

Context and objectives

Quality infrastructure is a driver of economic prosperity and provides a solid basis for strong, balanced and inclusive growth and sustainable development; these are key goals of the G20 and are critical for promoting global, national and local development priorities. In the context of the pandemic, these priorities have come under greater focus as societies face strained health systems, disruption in supply chains, surging unemployment, deflationary pressures in energy markets, and disruption in transportation services.

Well before the pandemic brought a renewed need to review infrastructure resiliency and adequacy, numerous statistics pointed to continued underinvestment in infrastructure in both developed and developing countries. At current investment trends, this is expected to translate into a cumulative investment gap of between USD 5.2 trillion until 2030¹, or as high as USD 14.9 trillion until 2040 when the achievement of the sustainable development goals (SDGs) is taken into account². Given that government investment alone may not be enough to meet key economic and development objectives, it is essential that countries work to improve the resources at hand and partner with the private sector to attract increased investment to meet some of these needs.

Investment in sustainable infrastructure can change the outcome of the recovery

To the extent that recovery efforts include sustainable government stimulus packages for increased investment in quality infrastructure, there is also a significant opportunity to partner with the private sector in order to close the investment gap by upgrading existing infrastructure stock and building new infrastructure to meet growing needs, while also addressing deferred maintenance. Evaluating the role of technologies and innovations, as described in the *G20 Infratech Agenda*, could be leveraged further in recovery efforts.

In the short-term, increased infrastructure investment could have an immediate effect by boosting employment and supporting economic growth. More importantly, investment decisions made now will impact the long-term competitiveness and resilience of societies and influence key environmental and social outcomes. Integrating investment decisions to meet immediate needs, such as in critical social infrastructure like healthcare, with other long-term goals such as the achievement of the SDGs and a decisive energy transition, can lay the groundwork for future gains and the ability to weather future crises. As an example, the European Green Deal³ could be integrated into recovery efforts for the European Union.

New infrastructure investment also presents a significant opportunity to modernise the economy by, for instance, expanding broadband services through fibre and 5G networks, cloud services, and investing in or funding research for innovative solutions in infrastructure, including in healthcare and critical social infrastructures.

¹ *Bridging Global Infrastructure Gaps*, 2016, McKinsey and Company, <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/bridging-global-infrastructure-gaps>

² *Global Infrastructure Outlook*, 2017, Global Infrastructure Hub, <https://outlook.gihub.org/>.

³ https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf

As stated in the *G20 Action Plan on COVID-19* efforts to promote quality infrastructure investment are essential for the recovery and for post-recovery resilience. The recommendations in this report could help guide governments in their response to the pandemic by mobilising higher levels of investment for faster recovery and better long-term preparedness.

Progress made on mobilising investment for sustainable infrastructure

The G20 and other fora, along with international organisations (IOs) and multilateral development banks (MDBs), have taken steps over the years to address the investment gap. Notably, in order to make infrastructure more of an investable asset, suitable for investment by a large and diverse pool of investors, including institutional investors, the G20 launched a *Roadmap to Infrastructure as an Asset Class* in 2018. This Roadmap established a number of workstreams seeking to improve project development, enhance the investment environment, and promote greater standardisation. A Progress Report on the Roadmap will be delivered under the Saudi Arabia G20 Presidency in 2020 and will provide relevant contextual information on efforts made by governments, IOs, and MDBs.

While progress has been made in recent years toward advancing the Roadmap, further efforts are needed. Interest amongst investors in the infrastructure asset class has been growing, and measures to promote investment have achieved moderate success. For large public and private pension funds, many of whom are active investors in infrastructure, the overall trend in investment levels in infrastructure has been slightly increasing, although this trend is uneven across countries and investors, with wide differences in investment levels, amount of experience, or amount of confidence⁴. Data also suggests that overall investment levels are low, for instance at just 1.3% of assets on average for the group of large pension funds surveyed by the OECD⁵. Considering there are many factors that drive investment behaviour, including investment regulations, fund operations, experience, governance, or fund size, investor appetite for infrastructure can vary significantly.

Underinvestment in the face of capital availability suggests that significant challenges remain in mobilising investment for infrastructure. For instance, data suggest low levels of large pension fund investment in developing countries and in greenfield investments, as well as reported obstacles to investment such as regulatory barriers, information asymmetries, or high perceived risks⁶. The availability of pools of long-term savings can vary significantly by jurisdiction as well. Emerging economies generally face an even greater challenge given the need to develop their institutional investor base as, with few exceptions, their financial systems are largely bank-based.

The effects of the pandemic on infrastructures and sectors has been severe in some instances (particularly airports), with the extent of severities yet to be fully understood. Increased financial risks or a protracted downturn could pose a further challenge for mobilising investment, with potential impacts related to counterparty risks, funding mechanisms, or debt sustainability also to be considered.

In this context, under the Saudi Arabia G20 Presidency in 2020, the aim is to promote an enhanced and sustained dialogue and collaboration with asset owners and managers which

⁴ *OECD Annual Survey of Large Pension Funds and Public Pension Reserve Funds*, 2019, <http://www.oecd.org/pensions/private-pensions/survey-large-pension-funds.htm>

⁵ Ibid.

⁶ Ibid.

is – and will continue to be – necessary to address, systematically and progressively, the challenges and issues that are impeding increased investment in quality and sustainable infrastructure. Accordingly, one of the main initiatives of the G20 IWG in 2020 has been the creation of a sustained policy dialogue between asset owners and managers and governments in order to identify the set of key challenges facing the private-sector, including regulatory aspects as well as broader impediments to investment in infrastructure, and to develop actionable recommendations for governments that could prove mutually beneficial and support the required investment.

The dialogue

The G20 dialogue with investors, supported by the OECD, has taken shape through a series of meetings and conference calls orchestrated over several months, hosted by Saudi Arabia and the OECD. It has aimed to illuminate the challenges that investors face and highlight potential solutions to overcome them. In the course of the discussion, investors were invited to provide comments on the *G20 Roadmap to Infrastructure as an Asset Class* and the *G20 Principles for Quality Infrastructure Investment* and their implementation.

Investors expressed their desire to engage with governments and regulators in order to ensure that infrastructure investment meets public expectations. In fact, private sector participants in infrastructure do not just see themselves as investors, but also as stewards of critical assets. Building a shared vision for long-term value creation in infrastructure amongst governments, regulators, and investors can help to ensure that public needs are being met. Indeed, the dialogue brought to light ways in which the private sector can more effectively contribute to key policy aims, such as through, for example, commercial solutions and partnerships amongst key public and private stakeholders.

Closer dialogue may help in identifying better and more sustainable solutions that meet public expectations and realise the full potential synergies between public and private stakeholders, which can build trust, lead to a better structuring of investment opportunities, and improved investment environments, and thus help unlock the financing to close the investment gap. Interaction and collaboration is all the more important given (i) the complexity and challenges of infrastructure investment and the need to identify innovative solutions while drawing on existing sound models, (ii) the growing convergence of infrastructure systems and services and expected increased role of technology and innovation, which may prove transformative for the sector and the economy, and (iii) the increasing role of infrastructure in delivering on ambitious and urgent climate and development goals and the need now to deliver a sustainable recovery from the pandemic.

The report

This G20/OECD report presents the outcomes of the initiative. It contains a set of recommendations informed by discussion with asset owners and managers for improving the enabling environment for private investment in infrastructure, based on identified key issues and challenges. These recommendations aim to encourage a long-term strategic and collaborative approach to enhancing the supply of investible infrastructure projects, and promote fair and transparent investment frameworks and strong regulatory institutions that are able to attract private investment, while mitigating investment risks and managing costs. The recommendations could help countries implement and coordinate recovery efforts from the pandemic, through mobilising higher levels of private sector investment to complement public investment, contributing to a faster recovery and building longer-term productivity

and economic growth. The recommendations could be relevant for national governments and agencies, as well as regional or local governments and regulatory authorities and the asset managers and owners community itself. The structure of this report is as follows:

- A section outlining the methodology and process for the dialogues and report, including the rationale for the focus on institutional investors and asset managers;
- A section containing the recommendations from asset owners and managers, including insights gained on the impact of the pandemic in infrastructure systems, and potential policy responses; and,
- A concluding section identifying next steps and the way forward.

This report has been developed and refined through an iterative and interactive process, primarily with asset owners and managers engaged in infrastructure investment, but also through consultations with G20 IWG members, other IOs, MDBs, and the G20/OECD Task Force on Long-term Investment.

The report will be presented to G20 Finance Ministers and Central Bank Governors for their consideration in July 2020.

Method and process for engagement with investors

Toward closer collaboration with institutional investors and asset managers⁷

This report reflects an effort under the Saudi Arabian G20 Presidency to establish a collaboration with infrastructure investors in cooperation with the OECD. The collaboration has been designed to be informal, voluntary, and broadly inclusive with an aim to capture diverse inputs from different types of asset managers and institutional investors active in markets around the world.

G20 member countries and IOs were invited to contribute to this collaboration by identifying investors and organisations to participate, which enabled broad support and coverage across markets and regions. To date, investors based in North America, South America, Europe, Africa, Asia, and Australia have contributed⁸. Support for facilitating this dialogue, which includes report preparation and consolidation as well as the organisation of numerous conference calls and interviews has been provided by the OECD together with the Saudi G20 Finance Track Programme. The OECD also provided support through leveraging its network of institutional investors and asset managers.

The significance of institutional investors and asset managers in infrastructure finance

Past work of the G20 has highlighted the importance of *institutional investors* and *asset managers* in promoting private sector investment in infrastructure. Institutional investors are key players in global markets – total assets under management in pension funds, insurance companies, and public pension reserve funds amounted to USD 63.7 trillion at the end of 2017; growth has been particularly strong in the pensions segment, where assets increased USD 10.7 trillion over the past ten years⁹.

At the inception of the collaboration, it was decided to focus on *institutional investors* (i.e. pension funds, insurance companies, sovereign wealth funds) and *asset managers* as these institutions represent key decision makers in long-term investment in infrastructure. Some of these investors have already built up significant experience in infrastructure investment, across jurisdictions and forms of infrastructure. Institutional investors and asset managers are able to invest over the long lifespan of infrastructure assets, often in portfolios

⁷ For the purpose of this report, asset managers are described as firms that act as financial intermediaries, investing in infrastructure assets (debt and equity) on behalf of their clients, often through fund structures like General Partnership agreements. Institutional investors like pension or insurance companies can invest directly in infrastructure debt and equity, or outsource asset selection and due diligence to asset managers. As “asset owners”, pension fund and insurance company investors ultimately own the decision to invest in infrastructure, how to include such investment as part of their long-term strategic asset allocation or asset-liability framework, and whether to invest directly or to select asset managers to invest on their behalf. Insurance companies could have varying liability structures based on the nature of their insurance product offerings. Life insurance companies typically have longer dated liabilities and more closely fit the narrative of this report on institutional investment in infrastructure.

⁸ Investors based in the following countries have participated in the collaboration contributing to this report: Australia, Bahrain, Brazil, Canada, Egypt, France, Germany, India, Italy, Japan, Luxembourg, Kuwait, Saudi Arabia, Singapore, South Africa, South Korea, Sweden, Switzerland, Turkey, United Arab Emirates, United Kingdom, United States.

⁹ Ibid 3.

across sectors and regions to diversify risk, through both equity and debt instruments, with the result that much focus has been placed in sourcing such investment to meet long-term investment needs. The G20 and OECD have also built a track-record of engagement with institutional investors, through the G20/OECD Task Force on Long-term Investment and the G20 IWG.

Institutional investors generally possess the following characteristics:

- Potential sources for long-term capital, which matches the long-term investment profile of many infrastructure assets. Furthermore, such investors, due to longer-term liability profiles, are able to maintain investment views spanning economic or political cycles, providing a stable source of capital. Large investment pools also facilitate diversification across portfolios of investment, providing the scale needed to finance capital intensive infrastructure projects.
- Potential sources of low-cost financing, often investing in both debt and equity, across multiple financial instruments and markets providing a potentially diverse source of financing options. Given the longer-term nature of their liabilities, institutional investors can provide long-term fixed-rate debt which reduces refinancing risk for project sponsors. Most large institutional investors also invest significant amounts in foreign markets.
- Ability to work with commercial banks, either through partnerships or by structuring investments, to secure long-term equity or debt investment in support of market-based bank lending.
- Ability to understand the economic importance of infrastructure and the role that it plays in society; a growing willingness to align environmental, social and governance (ESG) investment criteria with public sustainability objectives.
- Motivation to optimise investments through process improvement, cost savings, and maintenance. Investors also consider new technologies and approaches to deliver infrastructure services.
- Transacting in infrastructure markets, providing valuable insights into market dynamics, pricing, risk perception, challenges, and potential solutions to overcome barriers to investment.

While similar in many respects, institutional investors are not a uniform class of investor, given differences in the nature and time horizon of their liabilities, and differences in risk appetite and investment strategies, which are further evolving in light of ESG considerations. These differences should be understood when designing policies, institutions, and measures designed to attract institutional investment.

The asset management industry plays a key role in helping to support investment in sustainable infrastructure, as not all investors are able to make direct investments in, or perform due diligence on, infrastructure assets. By developing funds or offering managed accounts for institutional investor clients (“asset owners”) that would like to gain an indirect exposure to infrastructure assets, and by gathering relevant specialised expertise, asset managers can serve as intermediaries between asset owners and infrastructure investments. Asset managers active in infrastructure must work with project developers and identify suitable investment opportunities, while developing relevant strategies, investment portfolios, innovative instruments, platforms, and market vehicles catering to the different objectives, needs, and constraints of institutional and private investors.

Furthermore, investment funds offered by asset managers help to pool and diversify risks across projects and investments, attract a broader and more diverse range of capital, and scale up overall levels of financing. Certain asset managers have developed expertise in leading edge, innovative sustainable infrastructure projects. More recently, asset managers are investing in new projects during the construction phase, and are partnering with other investors such as banks or corporations (e.g. utilities). Certain asset management strategies also involve investment in both developed and developing countries. Given these actual or potential roles, asset managers are well-placed to provide insights on sustainable infrastructure investment, including at the policy and regulatory levels, and across economies.

While financial returns are a primary motive for asset owners and managers to invest in infrastructure, an increasing number of investors are evaluating investment opportunities using environmental, social, and governance criteria. These trends are impacting the investment landscape in infrastructure as investors are demanding greater transparency and information regarding investment impact. Furthermore, given the crucial role that infrastructure plays in achieving the SDGs, governments in both developed and developing countries are facing an opportunity to work more closely with long-term investors in infrastructure on sustainability goals.

These characteristics make asset managers and institutional investors as asset owners particularly well-suited for long-term investment in infrastructure, acting as both lenders and equity investors in infrastructure.

Recommendations

The recommendations below have been advanced by private investors, in particular institutional investors and asset managers, for consideration by governments and public sector institutions including national and sub-national governments, international organisations (IOs), and multilateral development banks (MDBs), as a means to deliver on the challenges of enhancing the mobilisation of private sector investment in infrastructure.

For each recommendation, background context provides further explanatory detail, in many cases also identifying the relevant issues and challenges facing investors. Implementation of these recommendations will, in many instances, require enhanced public and private sector engagement and dialogue.

The recommendations are currently structured around the following categories:

1. Strategies and frameworks for sustainable infrastructure and project development
2. Capital markets and regulatory frameworks
3. Risk mitigation
4. Data and benchmarking
5. Sustainable and ESG investment
6. Technology and innovation

Key messages from private sector investors in infrastructure

The public policy debate has maintained the right focus and various barriers to infrastructure investing have already been identified or reduced. The *G20 Roadmap to Infrastructure as an Asset Class* was a document that investors supported, particularly on work streams related to capital markets and regulation, and risk mitigation. Investors also acknowledged the progress made on the recognition and importance of sustainability considerations in infrastructure, including the *G20 Principles for Quality Infrastructure Investment*. Several key points were continuously brought up over the course of engagement throughout the collaboration. These issues were particularly important to participants, including:

- **The importance of collaboration:** Investors repeated their willingness to collaborate more closely with public sector counterparts, as well as through partnership models with governmental authorities and among like-minded investors. Given the complex nature of infrastructure investments, which is often reflected in their legal structure, effective means for risk allocation and risk sharing are paramount in order to structure long-term viable investment opportunities. Collaboration should be continuous over the life of the project, especially as projects must adapt to new circumstances (the pandemic, for example). Building a shared vision for long-term value creation ultimately strengthens partnership, including with civil society as investment models need to be socially acceptable.
- **The paucity of investible projects:** Investors supported further efforts by public sector counterparts to build pipelines of bankable projects, as private sector demand for investment remains high. Increased and ambitious investment programmes are

needed to help close the investment gap and draw in private investment. Consensual principles or standards on key elements of project structuring for investors, targeted de-risking of investments in projects as necessary to achieve market compatible risk/return expectations, or recycling of assets from MDB or ECA balance sheets were some ideas suggested by participants.

- **The need for strong and stable regulatory and political environments:** Investors called on public authorities to promote policy, regulatory and institutional frameworks that are transparent, fit-for-purpose, and bring stability to infrastructure markets. This could also include governments providing forward guidance and transparency to stakeholders on expected policy and regulatory changes as they are developed over time, particularly in light of technological changes and innovation and other broader trends that may impact infrastructure. Investors stated that rigid or inflexible regulatory regimes were undesirable, particularly over long investment life spans. Risk mitigation may compensate where institutional frameworks are not sound or are weak but many investors will just steer clear.
- **Sustainability and ESG criteria are highly important to investors:** Selecting infrastructure investments that meet certain standards related to sustainability or environmental, social governance (ESG) criteria was a major trend discussed during the collaboration. Asset owners and investors are increasingly managing portfolio assets using an ESG lens - as one investor put it, the consideration of ESG factors has moved from being “nice to have” to being “must have”. There is a broader opportunity for public counterparts to align their own sustainability goals and objectives with those of investors, by building well-structured sustainable infrastructure projects that could attract financing from ESG-oriented investors.
- **The challenges for emerging markets and developing countries in accessing international capital:** While major institutional investors may allocate some portion of their investments to emerging and developing economies, many investors do not invest in these economies at all due to perceived risks and regulatory barriers; in fact, many institutional investors will invest only in OECD economies. Key perceived barriers include a lack of strong and stable institutions and legal, policy, and regulatory frameworks, higher risk of political interference (e.g. contract repudiation, creeping expropriation, transfer restrictions), lack of capacity to develop appropriate projects and frameworks, and currency risk. As it was regarded that some of these risks are perceived rather than real, and that the boundary between OECD and non-OECD countries was not necessarily appropriate, mechanisms and frameworks need to be found so as to make infrastructure projects presentable to international investors, which could include better project structuring and PPP frameworks, project preparation facilities, risk mitigation, blended finance, and other innovative financing techniques.
- **Infrastructure is at the centre of the economic relaunch from the pandemic and the reshaping of the economy for a sustainable and resilient future:** Investors welcomed stimulus spending in infrastructure – to address immediate and urgent needs to respond to the pandemic, and to build future resiliency and preparedness, particularly for health infrastructure. However, investment decisions made now will lock in long-term competitiveness of economies and determine key future social and environmental outcomes; as a result investment decisions need to be combined with other long-term goals such as the energy transition, clean air and water, and access and inclusiveness. It is an opportunity to rethink infrastructure

needs going forward, and to decide on priorities. For governments including increased investment as part of stimulus programmes in response to the pandemic, assuring adequate capacity within various levels of government to deploy investment and allocate resources is needed. Investment impact could also be augmented by promoting private sector participation, including through innovations or new technologies.

The recommendations are:

1. Strategies and frameworks for sustainable infrastructure and project development

Private sector participants expressed a strong willingness to work more closely with the public sector in order to ensure that infrastructure meets public expectations. Participants highlighted that governments are the traditional providers of infrastructure and that infrastructure is a core responsibility of government. Yet investors also saw that private sector investment could be complementary to public investment. They also recognised that the private sector owns a significant amount of infrastructure, such as privately-owned utilities in some countries, and highlighted the critical role of regulatory frameworks and institutions in shaping incentives and outcomes.

In order to attract private investment, governments need to ensure recurring, bankable investment opportunities that are cost effective for the public sector. Developing a strategic vision, ambitious and coherent investment plans and implementation steps, and proper policies and infrastructure decision-making frameworks, are supportive elements that signal to markets public sector commitment. It was stressed that developing and advancing projects for the purpose of building a pipeline requires time and money, as well as leadership, with the private sector also needing to dedicate resources to provide advice and take advantage of any investment opportunities.

Areas where the public and private sectors can work together to improve the supply of sustainable infrastructure are as follows:

Investment plans, project pipelines, and whole-of-government approach

1.1 Clearly define goals and elaborate ambitious and coherent investment plans and implementation steps across government at all levels that would increase the supply of bankable projects, with effective forms of private sector engagement and information sharing on existing and planned projects (pipeline)

Investors continually report a lack of bankable projects, particularly for greenfield projects, while at the same time investment capital waiting to be deployed is high. There is an opportunity for governments to seize on the availability of capital in order to advance their infrastructure programmes and deliver on economic and social objectives.

Yet there is a gap between governments' aspirations to deliver infrastructure and the funds they have been willing to deploy for this purpose. Participants called for an increased and regular supply of projects, as investors need to adjust their asset allocation strategies and build up expertise according to the available and expected investment options. Governments may however struggle to deliver readily investable projects. Concerted public-private efforts are often needed to advance projects, for instance to identify appropriate risk mitigation measures; ensuring project bankability is not always a task for the public sector alone to solve.

Participants emphasised that, as a starting point, governments need to clearly articulate their goals for sustainable infrastructure and establish ambitious long-term investment plans along with concrete implementation steps. This should involve all levels of government, including governments at the regional and urban levels that are often responsible for infrastructure decisions and may have full ownership stakes in local infrastructure

companies. Visibility and good communication on infrastructure pipelines is needed to send market signals and help build confidence amongst investors committing long-term capital.

Governance of delivery is often an issue in terms of how to take projects forward – whether it be through governments themselves, development corporations, or public/private partnerships. Once projects are in the pipeline, it is critical for their governance to be rapidly determined. Investors cited the European Fund for Strategic Investment (formerly known as the Juncker Plan) as an example of setting strategic investment goals through government, MDB, and private sector partnership.

Participants stressed the need for strong consistency across ministries and bodies in terms of their engagement with the private sector, and a common understanding of the partnership models and their expected benefits and risks, given the risks of different ministries adopting different and potentially contradictory positions. This could be accompanied by a “pipeline element” of standardisation, in which projects are developed in a comparable fashion across government and over time, building predictability and streamlining assessments. If delays are to be minimised in the project pipelines, ways to streamline or standardise processes and procedures in certain key areas, such as planning and permitting where delays often exist, would be beneficial, particularly given the higher environmental, social and governance standards demanded by investors.

Meanwhile, as part of their engagement with the private sector, governments could stand ready to respond to investor inquiries on Requests for Proposals, including training people and building up of skills and knowledge to respond to investors and understand their needs. Engagement with the private sector could, in advance of the project preparation phase (see also below), involve consultation and input on guidelines and policy tools, such as PPP frameworks, which have a broad impact on infrastructure development and financing.

Sustainability and resiliency considerations

1.2 Ensure the integration of sustainability considerations into government infrastructure decision-making frameworks, across the project life-cycle

Institutional investors and asset managers involved in infrastructure investment consider the long-term risk factors, including those related to sustainability, given the long infrastructure lifecycle and the need for stable returns over time and the preservation of value. Yet the sustainability features of this infrastructure, if publicly-owned, are ultimately determined by the government. Given the key role played by governments in the delivery of infrastructure, which may later be acquired or operated by the private sector, it is best for sustainability factors to be considered upfront, and thus integrated into the legal and regulatory frameworks governing infrastructure decision-making.

Such an approach will require that decisions on infrastructure implementation be made not only on a lowest-cost quantitative basis but also on a qualitative basis, taking into account longer-term sustainability and resilience factors such as impacts over time arising from climate change. This argues for a revision of approaches and potential redrawing of tender evaluation for greenfield projects to incorporate wider benefits for populations rather than just lowest cost, as is the case in a number of jurisdictions at the moment.

1.3 Consider the development of clear and shared principles for sustainable infrastructure across relevant government ministries and regulatory agencies

There are challenges regarding the integration of sustainability factors into infrastructure owned and developed by the private sector (e.g. utilities, infrastructure corporates), outside the realm of public procurement. Yet regulatory agencies (e.g. energy, water) established by government can play a role in promoting sustainable infrastructure. In this context, it may be beneficial for governments to develop clear and shared principles for sustainable infrastructure, which could be applied across government ministries as well as regulatory authorities in the different sectors where infrastructure is present, to ensure a common understanding across government and the integration of sustainability considerations in value-for-money assessments. These principles could draw on internationally developed principles and guidance.

Broader and more stable policies and regulatory frameworks for sustainable infrastructure and independence in regulatory decision-making

1.5 Ensure stable and appropriate policy frameworks, supportive institutions, and investment environments that can attract and drive sustainable infrastructure investment

Given their long-term nature, infrastructure investments require legal certainty and government support in the form of clear, consistent and stable policies and regulation. If there is a perception that rules might change, investment may not be forthcoming. Investors uniformly emphasised the importance of solid legal, policy, and regulatory frameworks and strong institutions, including an independent judiciary, which provide a setting conducive to long-term investment and reduce the need for risk mitigation instruments. Established and enforced rule of law, including examples of legal precedence are supportive for the investment environment. Further, investors emphasised the role of government frameworks in setting regulatory standards or providing incentives, such as subsidies or prices, that reflect externalities while limiting market distortions, providing the right signals for driving investment into sustainable infrastructure.

In this context, it is also important for public authorities to set out how public contributions into public infrastructure are to be set-out. For example, the use of subsidies that are targeted and output-based could be an important tool to deal with demand risk, and, at the same time, ensure that the private sector delivers against the prescribed service. Such schemes should be managed in a way such that subsidy payments cannot be arbitrarily withheld.

1.6 Ensure independent, well-resourced, and expert infrastructure regulators, and provide adequate consultation mechanisms

Private infrastructure is often subject to some form of regulation or regulatory oversight. Given the importance of well-developed and stable regulatory frameworks, and the risk of undue political interference in regulatory decision-making, it is critical to ensure that governing regulatory agencies are independent and well-resourced, with expert staff. Arguably, the robustness and strength of regulatory institutions may be more important than the stability of the regulatory framework per se, as these frameworks will inevitably evolve. Independence can be established through legislation, for instance by defining the authority and powers of the regulator, and by ensuring stable, adequate funding, but also by defining an appointment process and term lengths that help to insulate the heads of agencies.

Where there is fragmentation of regulatory agencies in a sector, some level of harmonisation or consolidation may be beneficial.

As policy and regulatory decision-making can have significant impacts on infrastructure companies, investors, consumers, and other stakeholders, consultation mechanisms should be established. Such mechanisms will help to ensure a fair and transparent decision-making process and provide an opportunity for stakeholders to provide input and advice.

1.7 Avoid sudden changes in policy and regulatory frameworks and provide forward guidance and transparency on transitions, with investor safeguard mechanisms

Private investors repeatedly cited the damaging effects of sudden, unexpected policy or regulatory reversals and breaking of contracts, which undermine investor confidence and increase the perceived risks of the regulatory framework, potentially contributing to lower investment levels and/or higher required returns on investment. In lieu of abrupt unforeseen adjustments or decision-making, forward guidance and transparency on transitions in policy and regulation are needed, with potential grandfathering of established projects. It was suggested that the use of mechanisms to reinforce public sector behavioural certainty would boost confidence; for instance, it was suggested assurance could be provided *ex ante* on the grandfathering of certain rights despite any transitions in policy frameworks.

1.8 Ensure continued relevant and up-to-date regulatory frameworks in light of broader developments and megatrends

Investors highlighted the need for regulatory frameworks to evolve in line with broader developments and megatrends, such as innovation and technology as well as climate change and consumer preferences. This allows for assets to take on value as regulatory frameworks evolve and become supportive of investments and new business models.

Participants stated that rigid or inflexible regulatory regimes were not desirable; given that investment often occurs over long asset lifespans, frameworks that are able to adapt to changing circumstances in a fair, transparent, and mutually beneficial way can be supportive of investment. Indeed, some investors believed that slow-moving regulatory frameworks or large regulatory gaps presented an important investment risk, given the potential for sudden policy changes and consequent asset stranding; these could deter or block investment. Quite a few investors pointed to the need to ensure reforms in the energy sector, given how renewables have scaled up so quickly and are altering the landscape for energy supply.

Project structuring, frameworks, and collaborative models

1.9 Ensure stable and high-quality legal and regulatory frameworks for PPPs, and pursue greater standardisation in PPP investment models where feasible

Although in some cases PPP models tend to be complex, PPPs offer a suitable investment format to attract financing from institutional investors. Successful models can also be replicated by authorities in other jurisdictions, providing the basis for a common framework for investors to evaluate projects. Participants pointed out that highly complex frameworks that are bespoke to a certain sector or project do not encourage investors to spend the time on due diligence to invest. Some amount of standardisation can be supportive of investment, especially related to processes, documentation, or counterparts. Investors also reported that it was sometimes challenging to work with different types of guarantees through different

ministries or government agencies in the same market, and that some level of harmonisation with counterparties could improve procurement frameworks for investment.

In well-procured PPPs, the involvement of experienced private sector players leads to project efficiency gains, while risk is effectively shared between the public and private sector. Good practices related to existing PPP formats initially spearheaded by the United Kingdom, Canada and Australia, but also in other jurisdictions, can be used to further harmonise and establish more widely accepted principles. However, a more balanced risk sharing between private sector, public sector, and end consumer is key to avoid the perception (and instances of backlash) that the model mostly favoured the private sector.

Participants also stated that significant strides can be made to bolster legal and regulatory frameworks for PPPs by broadening political support for investment frameworks. Otherwise, in many countries, especially in those with a limited or no track-record with PPPs, institutional investors would be less confident of ruling out any future negative government interventions in PPP frameworks in the event of a change in government.

1.10 Develop common, consensual principles on key contractual building blocks

Contractual frameworks provide the basis for value in infrastructure investments – they constitute the asset. Yet heterogeneity in infrastructure projects and contractual provisions renders infrastructure investment complex, costly, and time-consuming for investors, discouraging the investment of resources in a relatively small sector.

This has led to efforts to promote contractual standardisation at the global level. There was some discussion of this objective: many investors considered it to be overly ambitious as there is a need to take into account local market conditions and project specificities. However, some considered that there are common threads serving to protect investors and that some level of standardisation could speed up project negotiations, facilitate the dissemination of good practices, and enable countries to develop projects that are more robust, match the expectations of investors and gain capital market and institutional support, particularly in emerging markets and developing countries. Consistency and standardisation can create confidence and motivate stakeholders to invest time and effort in infrastructure transactions, while reducing the resources and time that institutional investors need to allocate to the assessment and negotiation of the finance terms of each transaction.

Recognising that full standardisation is unlikely to occur, a number of investors suggested that consensual principles or market practices could instead be developed across countries on key contractual building blocks. There may be value, in addition, in standardising a number of contractual clauses that materially affect investor risks, such as force majeure clauses, termination clauses, indemnity payments, or arbitration. Targeting such clauses for use as “model clauses” in contracts could become a reference for investors across multiple projects and across jurisdictions, while taking into account the idiosyncratic characteristics of infrastructure sectors and country legislative and legal frameworks. Standardisation of certain contractual clauses would enhance the stability and quality of PPP regimes, which are ultimately based on contractual arrangements.

The Covid-19 crisis has generated some uncertainty regarding force majeure clauses and what these clauses meant or how they are to be applied, particularly in countries with poor jurisprudence – compensation arrangements during construction can often be unclear. Investors considered that, with COVID-19, force majeure clauses should be a key area of focus for standardisation. There may also be a need to develop commercial insurance products to cover risks related to pandemics.

1.11 Consult with private sector investors and other stakeholders at the early stages of project development to identify a fair allocation of risks, and clearly define the role of private sector investors

Private sector investors emphasised that governments need to appreciate the constraints that institutional investors face, given their risk appetite and the regulatory framework. Governments may be inclined to extract as much value as possible from investors, with “pre-cooked” projects presented to investors; however, such an approach can lead to unpalatable contracts, thereby discouraging private investment.

Participants argued for the need for public sector communication and engagement with the private sector early in the process, including during the development of investment frameworks (e.g. guidelines, PPP frameworks). Participants expressed their willingness to engage during the tendering process, assisting with project structuring and risk assessments, helping to define the roles of the public and private sectors, and designing optimal structures for public and private counterparts. This could take the form of a working group that would engage with the public sector. Public sector counterparts could define their expectations of the benefits that the private sector can bring to infrastructure investment management, including potential long-term cost savings. As not all institutional investors would be capable of such early stage interaction, project by project, broader channels for input and advice could be developed, which could span infrastructure programmes and involve a range of selected institutions and stakeholders.

Citizens also increasingly want to be considered as part of the design of infrastructure, including how it will be funded and financed. The distinction between funding and finance should be better explained as part of the process of designing a project, as the concepts are often confused.

The consultation process with the public and stakeholders for public infrastructure projects is an essential exercise that must be done by the government at early stages and not be left to when the tendering or bidding process has commenced. This is a fundamental part of consultation and is essential for ensuring public buy-in, particularly for infrastructure projects where developers face a high level of exposure to the public at large.

Such early engagement with the private sector could help to build project bankability, and help decide which projects are suitable to be brought to the market. If conducted transparently, it could also help support social acceptance of public-private investment models.

1.12 Consider innovative collaborative models beyond PPPs that involve a long-term vision and a sharing of risks and rewards over time, especially at the local level where infrastructure needs are great

In light of the reluctance of a number of countries to adopt PPP models, and given the large infrastructure needs, a number of investors highlighted the need to consider various innovative partnership models with central governments and especially local authorities that would make them feel comfortable with private sector capital and support a long-term collaboration, that go beyond classic procurement methods or the need for standardised contracts or complicated capital structures and in which there is a long-term vision and in which risks and rewards are shared over time.

This could involve, for instance, a common ownership approach in which public sector authorities or publicly owned utilities recycle part of their assets yet maintain co-ownership

with a group of long-term investors (who may have formed a coalition structure to enable engagement), who are minority shareholders but who have enough influence on the governance to develop assets together with the authorities (effectively a partial privatisation). Another model could be a vehicle that resembles a social impact fund but in which there are risk-sharing metrics that would allow investors to benefit from the improvements flowing from their investments. Models can be found in other sectors, such as in real estate, where there are profit-participating loans, with certain requirements on governance and profit-sharing that would be agreed. Many existing models, such as energy savings companies (ESCOs), could also provide a source of inspiration.

Legislative and regulatory frameworks (including financial regulatory frameworks) may need to be adjusted to permit innovative models, for instance to enable a pension fund to have direct ownership stake in an unlisted infrastructure asset. A key condition for collaborative models would be some demonstration or level of confidence or trust that the investors would be there for the long-term and share the vision.

Funding models, financial resilience, and debt sustainability

1.13 Clearly define methods and models for funding infrastructure investment

Participants stated that governments could elaborate more on funding models in the *G20 Roadmap*, and also identify mechanisms for engaging with the private sector. More focus needs to be given to the vision and the nature of funding models that are being selected for infrastructure finance, including potential clarity on benefits and disadvantages. Some investors also reported difficulties in comparing investment models and aggregating projects in investment portfolios. For example, a windfarm in one jurisdiction (assuming a similar technology) compared to one located in another jurisdiction can have significantly different funding and contracting arrangements.

Private sector investors are keenly interested in understanding the long-term viability of funding models, as this is crucial to adequately assess risk/return profiles of investments, and to ensure long-term stability of revenue sources and visibility of any pricing or demand risk.

1.14 Promote financial resilience and debt sustainability, at the project level, through effective capital structure design and risk-sharing mechanisms, and consider possible governmental guidance and stress-testing

The specific economics of infrastructure projects drive capital structure and financing decisions; in some cases the nature of contracted cash flows, or predictable sources of revenue, can support higher levels of debt. Yet adequate levels of equity finance can form the basis of effective risk sharing mechanisms. Ensuring enough equity investment can also help to build more trust in investment models, promoting greater system-wide stability of infrastructure finance and public confidence. Adequate debt covenants can also help to support the overall financial viability of a project.

A key issue is whether governments should prescribe the required levels of debt and equity finance, and thus the degree of leverage. There has been a tradition of allowing transaction advisers to set the parameters for debt and equity levels *ex ante*; for some investors, the heterogeneity of infrastructure projects necessarily requires a flexible approach, while others believe that such an approach may not lead to the optimal financing mix, with some recommending limits on leverage, given the broader ramifications of infrastructure.

COVID-19 has demonstrated the fragility of some financing structures, particularly where high leverage has meant that projects are not resilient to shocks. On the one hand, while leverage could reduce the cost of a project, and lead to a low bid, it could on the other hand lead to more vulnerability to shocks; this trade-off could be managed through limitations on the leverage of assets. For instance, in Spain, the government limits leverage on new assets to 80% which provides a level playing field; otherwise, competitive processes may lead to higher leverage rates on the expectation of lower cost outcomes without taking into account longer term consequences.

Instead of a fixed limit, it was suggested that the consultative process for projects could provide an avenue for securing input on the appropriate mix of debt and equity, with guidance later provided to bidders. One participant highlighted the need for governments to stress test proposed capital structures, particularly for projects with availability-based payments, to ensure their robustness to various possible shocks.

Guidance may also be provided by regulatory agencies for private infrastructure, for instance on the degree of leverage or on the capital structure. While such guidance may not be law, the government may impose strong disincentives on those who choose not to adhere. While it may be complicated to provide such guidance given the diversity of projects, it was regarded as being feasible.

2. Capital markets and regulatory frameworks

Expanding the infrastructure asset class to a wider range of investors and, in particular, increasing the role of institutional investors, is key to mobilising larger amounts of private financing. However, in order to appeal to a broader set of investors, financing instruments covering a spectrum of risk-return and liquidity characteristics that match the diverse profiles and risk preferences of these investors need to be made available. Further, as a foundation, the development of domestic credit and equity markets is essential to enable efficient market-based financing for infrastructure projects and companies.

The OECD's *Infrastructure Financing Instruments and Incentives: a Taxonomy* (2015)¹⁰ outlines a range of equity and debt financing and risk mitigation instruments, as well as incentives and support measures that are applied within OECD and G20 countries. It is being updated under the Saudi Arabian G20 Presidency and is expected to include a new section on regulatory approaches. Infrastructure financing is a dynamic field and both governments and investors have in recent years been developing innovative new financing approaches. While private investors indicated that existing capital market frameworks in OECD economies are for the most part adequate, with each country having its own system of instruments and market channels, they also proposed novel approaches to infrastructure finance (such as considering more collaborative models like partnerships and platforms – see *Recommendation 3.4* below).

Investment and solvency regulation was a key focus of interest in terms of constraints. Balancing appropriate regulation of institutional investors (like pension fund and insurance company portfolios) while not hampering their ability to invest in long-term opportunities, and realising the benefits that the private sector could bring to the provision of infrastructure services, were some of the areas covered. Pension fund regulation, for instance, can vary significantly by jurisdiction, with different forms and methods in place by regulators. Quantitative limits on certain portfolio investments, such as in equity investment, or in

¹⁰ <http://www.oecd.org/finance/private-pensions/Infrastructure-Financing-Instruments-and-Incentives.pdf>

private markets, could limit a pension fund's ability to invest in certain infrastructure assets. For those funds that do invest in infrastructure, it is useful to point out that pension plan participants and beneficiaries themselves are stakeholders in infrastructure investment, as their pension benefits are partially funded through such investment. In addition to helping secure retirement income, such investments can deliver long-term economic, social, and environmental benefits, benefiting workers later in life and future generations.

Financial markets, instruments and channels for infrastructure investment

2.1 As relevant given country circumstances, deepen market-based financing to support long-term infrastructure investment, with appropriate reporting frameworks

Capital resources within the local market context can vary significantly by jurisdiction. For example, countries or jurisdictions may have well developed banking sectors, which can be a source for infrastructure finance, but may lack market-based financing instruments and channels that could tap the resources of a broader set of investors that are well placed to invest over a longer-term horizon, provided that infrastructure risks can be properly allocated in the form of a bankable projects.

Local sources of capital, particularly in developing countries, are best placed to invest in local infrastructure projects as currency mismatches between project cash flows and financing can be minimised. Furthermore, policymakers may be concerned as to where capital for infrastructure may be coming from, highlighting the need for a domestic investor base that is capable of undertaking infrastructure investment. Foreign institutional investors may be highly constrained in terms of their ability to invest in emerging markets and developing economies, or may seek higher returns to reflect high perceived risks. Thus, for a variety of reasons, developing deeper domestic credit and equity markets would be beneficial for infrastructure finance. In emerging markets, diversifying finance for infrastructure should be co-developed with longer-term policies aimed at deepening the pool of institutional capital and local investment channels, such as establishing or expanding mandatory or funded pension systems. Further, innovative partnership or coalition models among investment may allow investors to build proper scale and expertise for infrastructure investment.

As part of capital market development, appropriate financial and non-financial reporting frameworks should be put in place, reflective of the nature of the investment and investor type, which would enable an evaluation of investments and, for fund structures, a “look-through” so that investors can understand the nature of the underlying investments (see also below). Participants highlighted the need for standardised reporting frameworks.

2.2 For brownfield infrastructure, consider innovative financial instruments and models for financial intermediation, such as forms of securitisation and trust funds, focusing on scalability and replicability but also on transparency

Given the cost, complexity, and risks of infrastructure investment, requiring investment in specialised staff, not all investors are able to invest directly in infrastructure projects. A number of institutional and retail investors seeking to gain exposure to infrastructure assets prefer instead to invest through publicly listed securities, fund structures, and pooled vehicles. As for securitisation models, as based on past examples (such as in Residential Mortgage-Based Securities (RMBS) or Commercial Mortgage-Backed Securities (CMBS)), these may not always be a viable option for infrastructure; the heterogeneous

nature of infrastructure assets, lack of standardisation, lack of viable collateral, high risk charges for securitisation products, and diversity of governing sectoral regulation are key barriers.

However, borrowing concepts from securitisation as an effective method for financial intermediation could be a model to explore further. For example, credit support or enhancement instruments (like first loss positions), bundling projects, maturity and credit tranching, and breaking up cash flows are some of the instruments that can help to reach different pockets of investors with different preferences. Such approaches, if executed in a prudent and risk-controlled fashion, could help to mobilise investment by pooling risks and diversifying across various countries and projects. Securitisation could be a way to tap capital markets liquidity when projects need to refinance and provides capital relief for banks, allowing them to recycle lending capacity into new projects.

Investors pointed out some examples of collateralised loan obligations (CLOs) which have been launched to pool infrastructure project loans in Asia, and below investment grade loans in the United States, for resale to investors through the capital markets.

It was recommended that MDBs and Export Credit Agencies (ECAs) could recycle infrastructure loans from their balance sheets into capital markets, insofar as the assets have been de-risked and have reached operational status and proved a good operational track-record. Some of these loans may be on terms that are overall in line with the current market, and thus could attract interest from investors, freeing up capacity for new projects.

Fund structures listed on public equity exchanges, such as trusts, and open or closed-end funds are other options that investors considered for brownfield investments, although appropriate redemption mechanisms would be needed to manage the underlying illiquidity of infrastructure investments. Such approaches could be particularly relevant for smaller projects, focusing on vehicles that can achieve adequate diversification for investors.

2.3 For greenfield infrastructure, consider innovative financial instruments and models

New approaches may be needed for financing greenfield projects, as investor demand or willingness to invest in construction stage infrastructure remains muted. Bank lending remains a significant component of construction stage private sector financing. That said, there is scope to tap interest from a growing class of institutional investors seeking to provide financing for the entire lifecycle, both greenfield and brownfield.

Private sector investors also pointed out that refinancing risk is a significant challenge for early stage investors. Some investors argued that if governments were inclined to take a portfolio approach to their infrastructure investment (i.e. managing risks across different projects, sectors or regions, staggering debt maturities and refinancings), providing bridge financing facilities, or the willingness to share refinancing risk, this could help with transitioning from construction stage to operations when projects often seek to secure long-term financing, also providing an exit for early stage investors in private equity-style funds. On the other hand, other investors cautioned on the use of such public support, arguing that it might skew the market toward short-term engagement; it was suggested that it would be preferable to allocate public resources towards the provision of guarantees for specific risks.

Financial regulatory frameworks

2.4 Review financial sector policy and regulations to determine whether unnecessary barriers to infrastructure investment exist, keeping in mind protections for beneficiaries and prudential and market integrity objectives

Private sector investors note varying regulatory treatment across jurisdictions of portfolio-level unlisted infrastructure debt and equity investments amongst pension funds and insurance companies. While investment regulation has important prudential considerations, effective regulation balances the need to protect beneficiaries, while supporting risk management practices and the ability to provide adequate return on investment to fund pension and insurance liabilities. Unintended barriers to investment in infrastructure could be the result of some regulatory regimes. Regulatory restrictions can be particularly acute in relation to emerging markets, with clear distinctions being made between OECD and non-OECD economies. Seeking a way for non-OECD economies meeting certain criteria or thresholds so as to put themselves in scope for the large institutional investors would open access to significant new capital.

Legislative and regulatory frameworks may need to be sufficiently flexible or evolve to allow for, or encourage, innovative models and partnerships, enabling new sources of capital for infrastructure to be tapped and a better deployment of capital. For instance, efforts among like-minded pension funds to pool assets dedicated to infrastructure and build economies of scale (“coalition model”) for investments in real assets, have been witnessed in several countries, sometimes at the encouragement of government, as a way to build up expertise in private investment, including for infrastructure, ensure a long-term vision in asset management, and enable partnerships with authorities (see *Recommendation 1.12*). As noted earlier, there may be constraints on institutional investors taking direct ownership stakes in real infrastructure assets.

Recognising that institutional investors, such as pension funds and insurance companies, are increasingly becoming active in direct lending to infrastructure projects, promoting competition for lending arrangements can help to drive costs down. However, there may regulatory barriers to institutional investors making debt investments in projects. In some countries, institutional investors cannot always invest in all forms of infrastructure debt without having a banking license; furthermore, in some countries, the investment in a loan by an institutional investor can only happen if it is sold by a bank. While keeping in mind the key role that banks play in structuring and mitigating risks, and bringing opportunities to investors, lifting regulatory restrictions on the form of infrastructure debt in which institutional investors such as insurers can invest would increase the amount of funds available to invest in infrastructure in some countries.

Participants proposed that the G20 and the OECD initiate a review of treatment for infrastructure investment in investment regulatory frameworks for pension funds, such as reviewing ceilings and floors on investment asset classes, vehicles, or other categories (including direct ownership of unlisted assets), identifying where infrastructure investments fall in regulatory regimes. Infrastructure investment can also occur in many forms, for example, the use of special purpose vehicles (SPVs) in project finance is widespread, various fund structures (such as general partnerships) are common, along with corporate investment, which would necessitate a structured process for reviewing the treatment of regulations across multiple channels of investment.

Beginning in 2015, the European Commission, acting on technical advice received from the European Insurance and Occupational Pensions Authority (EIOPA), reviewed the treatment of certain qualifying infrastructure assets under the Solvency II Directive (which are the main laws for the European Union governing insurance company solvency). Risk calibrations for insurance company investments were eventually adopted for qualifying assets, which were designed to more closely resemble the risk/return characteristics of infrastructure debt and equity investments. These changes allowed for less penalising risk charges. Other countries seeking to review insurance company investment regulation could study the process undertaken by the European Commission in order to address potential barriers to investment by insurance companies. Investors highlighted the dramatic positive impact of these changes in the EU solvency regime for insurers on the landscape for insurer investment in infrastructure, leading to an increased allocation of capital (including from smaller insurers), although no study has been conducted to assess outcomes.

A number of investors made a link between ESG factors in infrastructure and solvency and investment regulation. While recognising the improvements have been made in the EU to develop differentiated risk charges for infrastructure, as noted above, it was suggested for instance that, through some form of high-quality certification for sustainable infrastructure projects, an avenue could be created to provide more favourable but still market consistent regulatory capital charges. Alternatively, asset owners such as insurers could be given capital relief if they adopt ESG methodologies in their infrastructure investments.

Insurance industry associations could also become partners in infrastructure finance and investment. In Italy, the Italian insurance association ANIA has worked with a local asset manager to set up an investment fund for infrastructure that is regulation ready – investments in the fund are selected by the asset manager and automatically comply with Solvency II requirements, given the use of specific criteria for selecting the investment. Such an approach benefits smaller insurers that have fewer resources to allocate to compliance matters; applying Solvency II processes to infrastructure can be burdensome for some, to the point where it is not beneficial to undertake infrastructure investment.

3. Risk mitigation

The issue of risk in infrastructure was a major item identified by the private sector as a key challenge to overcome. Appropriate risk mitigation, allocation, and management arrangements are crucial to facilitate investment. Challenges remain related to the perception of risks in infrastructure projects, along with ways to mitigate risks in a scalable or replicable way.

While for OECD countries institutional investors will often take a view on certain risks, outside of the OECD they either cannot invest or may have limited tolerance for exposure to these risks. Certain key risks were highlighted for emerging markets, namely political risks and currency risks. For these markets, the perceived risks may exceed the risk appetites of institutional investors; at the same time, however, perceived investment risks may be unwarrantedly high, exceeding actual risks, with consequent demands for high rates of return. Issues of risk perception highlight the need to enhance non-OECD infrastructure projects so that they can satisfy global investor requirements.

Risks in infrastructure are dynamic and can change over time, this is especially important as infrastructure is characterised by long asset life spans. Long investment horizons therefore require continuous monitoring and assessment of risk, as well as refinement of assumptions, particularly in the context where the margins for infrastructure lending can be

thin. Additionally, investors need to understand the risk impact (using risk quantification frameworks) and how different risks may affect each other. Modifying one risk could have knock-on effects on other risks, thus it is crucial to understand how risks are related.

Risk mitigation strategies and dispute resolution

3.1 Differentiate and promote risk mitigation strategies and methods for infrastructure at the project level, as well as for infrastructure at the system-wide or programme level

A distinction can be drawn between micro- and macro-level risks, along with how risks affect infrastructure assets at the project level, and at the system-wide level. Participants stated that it can be helpful to step back and look more holistically into investment plans and pipelines, rather than just individual projects, to get a broader sense of the investment landscape, seeking to identify where risks exist and whether they represent barriers to investment. It also could be more efficient or cost effective to manage and mitigate certain risks at the macro level as opposed to the individual project level. For instance, lengthy or convoluted permitting processes can cause delays and increase risks system-wide; ineffective mechanisms for dispute resolution, or frequent changes in tariff regulation, can increase the cost of finance for all projects. Micro-economic risks are important as well, as failure of one project can undermine the programme as a whole, and will consequently raise the cost of capital for all other projects.

3.2 Ensure efficient, independent dispute resolution mechanisms, preferably at the international level

Effective, fair, and expeditious dispute resolution procedures can be supportive of investment. Although used only as a very last resort, from a private sector perspective, expedited dispute resolution procedures can play an important role in reducing entry risk perception. Such expedited dispute resolution procedures managed by a third party can include the use of external or neutral parties that are not nationals of the country where the project is taking place and where the enforceability of their determinations cannot be interfered with by the granting authority. From a private sector perspective, the dispute resolution procedures *per se* do not reduce the overall risk. In other words, it is desirable to avoid such procedures as they are time consuming and costly. However, if a dispute is pursued, it cannot be protracted and there needs to be a mechanism by which early resolution can be achieved. If no resolution can be found by the parties, then early termination provisions need to step in.

Investors also called on the need for the sharing and communication of common or good practices related to dispute resolution, and also legal frameworks for the treatment of assets in distress.

3.3 Promote diversified risk mitigation instruments, particularly for emerging markets, with the goal of promoting scalability and replicability where possible, and adaptation to institutional investors

Private sector investors noted that political risk is increasing in all regions, but that political and currency risks were often a concern for investments in emerging markets. Participants also noted that perception of political risk is a significant factor affecting private sector investment appetite in emerging markets, which could be the result of a lack of experience of investing in emerging markets, difficulties or costs associated with due diligence on

investments, or higher levels of political and macroeconomic instability. Greater currency risks in emerging markets arise from volatility in exchange rates and a lack of currency hedging instruments for thinly traded currencies (the case for emerging markets and developing countries). There may also be potential barriers on currency convertibility due to exchange controls. Investors also cited the need to develop other hedging tools such as interest rate derivatives to help manage risks in emerging markets.

The private sector highlighted the need for expanding MDB and export credit agency capacities for risk mitigation (more MIGA-like operations) in order to mobilise investment in developing countries, with some calling on the MDBs to take on more risks. Private investors considered that there could be greater cooperation among the MDBs regarding their de-risking products, as they are perceived as offering their proprietary approach.

It was regarded that, in many instances, there are competing products offered by MDBs. For example, MIGA's cover for the non-honouring of government obligations is viewed as very similar to the World Bank's partial risk guarantee instrument (now called, simply, risk guarantee). While in practice there are some differences in their applicability, for example MIGA will cover only projects that are bringing in foreign capital, and MIGA's cover tends to be priced commercially, having such similarity in products can confuse private players.

Guarantees for specific bond issuances, provided by national governments, development financing institutions (e.g. Guarantco), or MDBs, were advanced as a way to stimulate the use of debt instruments. While there is support for seeking scalability and replicability in risk mitigation instruments, it was also recognised that risk mitigation instruments may need to be tailored to each transaction, based on the type of asset and jurisdiction.

Investors pointed out that the *strategic* use of de-risking tools should be explored. As an example, foreign equity investors in emerging markets may be more willing to accept some amount of currency risk as opposed to debt investors. Thus securing foreign equity investment, paired with local sources of debt, could be an option to optimise capital structure and scarce de-risking resources. Due to limited capacities, investors also suggested to use de-risking tools on critical projects, or particularly difficult projects to finance. There may be a tendency for MDBs, when equipped with de-risking tools, to deploy them for easier projects, when the purpose of such instruments is to tackle difficult projects.

Participants also noted that risk mitigation instruments are not always adequately adapted to the needs of institutional investors and may not be available in many countries. Instruments for mitigating risks (e.g. political risk insurance) were developed initially for the banking sector. They are only slowly being adapted to the needs of institutional investors. Existing cover to mitigate political risk still requires full arbitration awards which is not practical given the length of time that it can take to get an award which sometimes can take many years. Moreover, such cover does not really provide the necessary protections to institutional investors which would like to understand how and when they can access funds payable under such political risk event.

Participants suggested to expand the use of private insurance company products for political risk, though some participants pointed out that such products are not always cost effective, nor are they always available.

Pooling and partnerships

3.4 Promote partnership and collaboration models as a way to effectively allocate and manage risks in infrastructure, including leveraging the capabilities of MDBs, DFIs, and ECAs

Partnership models such as between banks and insurers, MDBs, or amongst lending institutions, for instance, an international lender partnering with a credible and expert local bank, or the pooling of private and MBD investments in dedicated vehicles, could be an effective way to leverage private capital, draw on competencies, and manage risks. Such partnership models could also include national governments or development finance institutions (DFIs). De-risking solutions that originate in the target market, such as through partnership with a local markets partner, or perhaps another local investor that provides credit support, could be a solution to help build confidence. Such an approach may be an attractive risk mitigation strategy for foreign institutional investors, as governments may be less inclined to make decisions adverse to local infrastructure investors.

Some countries have promoted partnership models for equity investors, bringing together pension funds, corporate investors, insurance companies, or other sources of finance. Some participants viewed such models as an alternative to a traditional PPP arrangement and as a way to stimulate collaboration in a long-term sustainable manner.. Refer also to *Recommendation 1.12*.

Blended finance (MDBs, DFIs, or export credit agencies, investing alongside the private sector) to crowd-in investment could also be considered, particularly at the early stages of an infrastructure project. Another way to leverage MDB expertise and capacity is for MDBs to finance feasibility studies and preparation of projects, including elements of commercial viability, in preparation for private sector investment at later stages. While project preparation support would be beneficial, a champion (public sector or a public-private partnership) is needed to bring the project forward.

Education, capacity building, and incentives

3.5 Invest in education and capacity building across institutions and markets, including promoting government readiness for project preparation, planning, and risk mitigation and management

Public training programmes for professionals in infrastructure services could be a way to overcome capacity bottlenecks. This is particularly relevant for PPPs. The importance of education and capacity building may be relevant for other areas, for instance for technology and innovation in infrastructure (see below). Strengthening the expertise of local market players could also be considered, with the possible support of international partners, if they believe that the infrastructure market will grow and provide some eventual deal flow.

It was suggested that the project finance expertise at MDBs could be strengthened, as a way to improve risk mitigation strategies and the mobilisation of institutional investment. Further, there are no real incentives for staff to mobilise funds into PPPs except as direct loans that can help buy down the cost of capital for a particular infrastructure project. Generally, staff are evaluated on their ability to deploy funds.

4. Data and benchmarking

The provision of adequate data is necessary for infrastructure decision-making, both for governments as well as for the private sector, including private investors. For investors, the formation of benchmarks for financial and ESG performance analysis, which are needed for investors to perform due diligence on the asset class, model investment for asset allocation purposes, and correctly monitor and evaluate investment managers. Compared to other asset classes, such as fixed income, equities, or real estate, infrastructure suffers from a dearth of benchmarks or composites that describe market characteristics and historical performance, while gaps may exist amongst existing initiatives to provide a full picture of infrastructure performance across financial dimensions, geographies, sectors, or ESG elements.

The ambition to close the infrastructure data gap is a key element of the *G20 Roadmap to Infrastructure as an Asset Class*. An Infrastructure Data Initiative (IDI), which consists of a federation of initiatives led by multi-lateral development banks and international organisations, has been reporting to the G20 IWG on efforts thus far in meeting data needs in the infrastructure sectors.

The OECD conducts an annual survey of large pension funds, with portfolio-level information on infrastructure investments, both debt and equity, and at the corporate and project levels. The OECD is currently seeking to assess the need and scope for delivering improved, publicly available data on infrastructure investment performance. The first step, supported by asset managers and owners, will focus on qualitative data collection and methodology on ESG indicators.

The confidentiality of data on infrastructure assets represents a significant challenge. For instance, banks have data on transactions (and thus on asset prices) but they cannot disclose this data due to confidentiality clauses, with the exception to regulators. Data can also exist in many forms, across a number of sources, making harmonisation difficult.

4.1 Collect data on public infrastructure projects relevant for public sector decision-making and in support of the private sector

Data is critical for the public sector in terms of deciding their procurement methodology, be it public, private or PPP, providing evidence to enable decisions on the most beneficial approach. Data also helps to justify decision-making to the public. Yet the lack of reliable comparative data on outcomes following different procurement models in the past often delays decision-making on project implementation. Data collection would help to sell infrastructure investment to the public, such as operational performance and impact performance (e.g. employment creation and sustainability, including green impacts). Without proper data, policymakers are not necessarily able to explain why they made certain decisions, which may use or PPP or not, which can affect the level of public acceptance and trust. The infrastructure sector and private investors suffer when evidence-based decision-making is lacking. Additionally, if the government is seeking a partnership or PPP, then it will have the data ready for private sector due diligence and decision-making.

4.2 Promote standards for data collection in infrastructure, including a common template, in order to facilitate the comparison of investments

Participants in the collaboration discussed the value that data, at the project level, could bring to mobilising investment for infrastructure, and to describing infrastructure as an asset

class. In order to achieve that, it is necessary to create standards in data so that different projects across regions, sectors, and countries are comparable. This could include financial and non-financial (ESG) aspects.

Some participants mentioned that they do not have a basis for comparing infrastructure to other asset classes. Without adequate information on expected returns and volatility, it becomes difficult to justify allocating assets to infrastructure. The difficulty in measuring volatility in illiquid assets such as unlisted infrastructure equity represents a particular challenge. Unlisted infrastructure debt is also challenging to price.

It was suggested that certain macro-level data would be valuable for reviewing the general investment conditions in various markets, particularly emerging markets. Common reporting frameworks or databases on the cost of equity, cost of debt, or discount rates, as well as sources of data to help investors build and refine their own models to compute such inputs, would be beneficial to investors. Combining such data with indicators for the quality of infrastructure regulation would be helpful for decision-making.

4.3 Consider developing data disclosure frameworks (voluntary or required) for certain infrastructure projects, in coordination with regulators and key stakeholders

The push for greater disclosure could involve using a standardised approach, including through specifying the appropriate format for data or the use of templates. MDBs could insist that certain contractual details or financial performance data are made public. Public utilities could also publish data for use in the infrastructure asset class (e.g. at a project level). Ultimately, better financial information would help governments compare costs of capital and help capital flow to where it is needed. Such solutions would require a closer cooperation of private and public sectors, while respecting confidentiality.

Some further policy options to consider for facilitating the availability of data could be to develop disclosure requirements for PPPs/concessions; making disclosure a requirement at project tender; or promoting voluntary disclosure of asset performance. Governments or procuring authorities are already responsible for collecting data on how PPP contracts are performing; disclosure of this information could be helpful for market participants (for instance information on the achievement of milestones). Furthermore, regulatory authorities could use a systematic approach to collect data on PPPs, or make it a requirement to report certain information to them, developing methods to comply with confidentiality clauses and what type of information, and in what form, can be disclosed.

4.4 Recognising the challenges that investors face regarding data on emerging markets infrastructure, MDBs could share data and intelligence on these markets with the private sector

MDBs have lengthy track records and experience in investing in emerging markets. Greater disclosure of investment performance, including at the project level, would be beneficial for investors. In this light, the potential for sharing and publishing data and information from the GEMs consortium is broadly encouraged by the private sector. The sharing of expertise, intelligence, data, and information on emerging markets infrastructure investment could also include guidance on how this information could be tailored for commercial investors, as MDB track records of investment may not necessarily be representative of commercial investment opportunities intended for the private sector.

5. Sustainable and ESG investment in infrastructure

A main theme of the dialogue discussions was the extent to which investors increasingly take sustainability considerations and environmental, social, governance (ESG) criteria into account when making their infrastructure investment decisions. Participants reported increased demand for ESG-compliant investments, and some investors have aligned investment practices more broadly with the UN Sustainable Development Goals (SDGs). As one investor put it, the consideration of ESG factors has moved from being “nice to have” to being “must have”. The recent *G20 Principles for Quality Infrastructure Principles* highlighted sustainability considerations, with dedicated principles on environment, social, governance, and resilience considerations in infrastructure.

Investors also argued that the long-term nature of infrastructure investment makes it critical that sustainability considerations be taken into account in order to preserve and enhance the value of the asset over time. Thus, as a risk management framework, the evaluation of ESG criteria is gaining traction amongst investors in all regions. Most investors highlighted the importance of infrastructure as a tool for decarbonisation of the economy; for every infrastructure asset, there is strong investor demand for decarbonisation.

With the emergence of the pandemic and its wide reaching human impact, as well as its impact in infrastructure services, financial markets, and industries, such risks can indeed be systemic in nature, underscoring the importance of ESG criteria (in this case the social elements).

For governments seeking to attract investment, this is an opportunity to more strongly align their own sustainability goals, procurement processes, and recovery efforts, matching the need for investment in sustainable infrastructure with investors who themselves are strongly aligned, with for example the SDGs included in their investment process.

5.1 Encourage a common understanding of ESG criteria and infrastructure

There are a variety of market-driven strategies and approaches for including sustainability considerations in investment decision-making processes, including numerous private sector initiatives and platforms. Individual investors may also have their own internal processes, definitions, or standards in regards to sustainability and ESG. With many different sustainability reporting standards, each with their own objectives and set of stakeholders, asset managers and asset owners face a fragmented system that is increasingly burdensome.

Many private sector representatives stated that it would be useful for governments to develop guidance on which elements are most important, and whether there are common or shared elements of ESG criteria in infrastructure. Reference was made to the new EU Taxonomy that would provide, for the purposes of ESG labelled financial products, some clarity on environmental sustainability (especially climate), while also considering social and governance aspects in terms of them providing safeguards. The Taxonomy will effectively cover a wide range of infrastructure assets (e.g. transport, electricity, sewage treatment). The sharing of public sector sustainability assessments of infrastructure, including environmental reviews and impact studies, would be beneficial for investors as they undertake their own assessments and perform due diligence on prospective investment opportunities.

5.2 Promote the ability of investors to measure and compare sustainability and ESG performance in infrastructure investment, through better infrastructure project data disclosure

Currently, there is a lack of standardisation in data and information that describes or measures sustainability or ESG criteria in infrastructure. Private sector investors reported difficulties in measuring ESG performance of infrastructure investments, and argued that better data disclosure from asset operators was needed. They also acknowledged that some progress has been made in this space, particularly related to environmental sustainability. Yet social and governance factors are also often overlooked, and frameworks for measuring them are somewhat lacking. Private sector investors suggested that voluntary criteria could be based on an open and flexible checklist that describes the elements which might be taken into consideration to decide if an asset or investment may be considered as sustainable, or unsustainable, depending on specific circumstances.

6. Technology and innovation in infrastructure

The role of technology and innovation in achieving policy objectives in infrastructure is increasingly becoming an important topic for policy makers as well as private sector investors. Participants reported that opportunities related to innovation, as well as technological disruption are seen to have a substantial impact on infrastructure investment. Understanding the opportunities that new technologies present, while also addressing risks, are paramount in order to realise benefits. In fact, technology is already affecting how infrastructure priorities are set, investments are made, and services are delivered. Governments, in cooperation with IOs and diverse stakeholders, could benefit from sharing good practices related to technology and innovation in infrastructure, while also setting supportive policy frameworks in order to harness the benefits while mitigating risks.

Private sector investors, entrepreneurs, and innovative firms can also bring significant benefits to infrastructure through new business models and technology applications. Effective partnerships between public and private stakeholders could help to realise the benefits of technology more broadly in infrastructure systems.

Harnessing the benefits of technology

6.1 Respond in a proactive way to the shifting technological landscape, providing a vision for technology opportunities in infrastructure and developing long-term strategies to support the scaling up of opportunities and diffusion of knowledge

The pace of technological change is prompting significant structural changes in the global economy and in business models, and some new technologies may well become utilities and infrastructures of the future (e.g. fibre networks, data storage, energy storage, hydrogen gas, electrified transportation). This is changing how investors are looking at the infrastructure asset class, and its assumed predictability over the long term.

Technology has the potential to disrupt traditional infrastructure investment models and value chains. For instance, value may migrate from asset owners to those who control the data, and also to consumers using apps that enable choice. Investors are keenly attuned to understanding the impact of technology on their investments; they are concerned about ways to enhance -- and protect -- value and are also keen to invest in new innovations.

Responding to technological change requires a continuous process, although potential impacts can sometimes be difficult to predict or foresee. For instance, on how new technologies could enable the de-risking of infrastructure projects, or how technologies could affect the prospects for financing construction stage investment. Participants expressed a preference for assets that were adaptable to technological change, where software or digital applications and use cases could be value enhancing.

A government strategic response to the shifting technology landscape that supports transitions and transformations would be beneficial to long-term investors in infrastructure. This could include government planning and readiness that comprises a vision for the application of technology, including digital aspects, in the strategy, design and conceptualisation of infrastructure assets and services, as well as potential guidance on future impact. Nature-based solutions to infrastructure, which involve reinforcing infrastructure systems through natural infrastructure, like forest and wetlands, could also be considered as innovative approaches. Governments can support the emergence of innovative, transformational infrastructure by providing early stage funding, which enables profitability and the scaling-up of businesses and serves to attract institutional investor capital, which is equipped to support a long-term vision for the companies concerned. Knowledge diffusion should be promoted to build up industries and start-up ecosystems.

Strategic vision and long-term planning can also be applied to repurposing existing infrastructures, such as is the case with reusing natural gas infrastructures for hydrogen gas. Such planning can help to foster new industries that may eventually rely on such infrastructures.

6.2 Enable a more extensive roll-out of broadband in a secure and open manner, and ensure open data standards

Digital infrastructure is becoming the backbone of the economy, particularly in light of the current COVID-19 crisis and strong need for teleworking and remote collaboration and videoconferencing. Further, its role in infrastructure is expected to increase, for instance in monitoring usage and maintenance in road infrastructure. Accordingly, investments need to be made in fibre, 5G and broadband – as well as data centres (e.g. for cloud-based services) – to ensure that a high capacity, interoperable digital infrastructure is built, with open data standards. Ensuring enhanced access to digital infrastructure (e.g. for rural or low income households) will likely require some form of public-private partnership or regulatory measures which would provide the necessary incentives to enhance accessibility. It was noted that investment in new fibre and broadband technologies, in urban centres, was not without risks. Given the critical nature of digital infrastructure, strong cybersecurity measures are essential.

6.3 Assess the role of regulation and market design in incentivising innovation, including the creation of regulatory “test beds” for new infrastructure and business models

Private sector investors noted that there can be a disconnect between the pace of technological change and the evolution of regulatory frameworks. For example, distributed solar is impacting energy markets and energy grids which were designed for centralised power distribution. Participants suggested that setting up “regulatory test beds” in areas such as distributed solar and power distribution would be a way to test various business models and regulatory models in electricity markets, with an aim for better integration of distributed electricity generation, energy storage, and transmission.

Participants also noted that in some countries, regulation is increasingly taking into account short-term considerations, driven by reducing short-term costs and consideration of affordability for consumers, which can dis-incentivise innovation (unless technology is included in the regulated asset base). It was thus suggested that regulation and market design may need to be adjusted to incentivise technology deployment and innovation, and to close the “regulatory lag”. Close public-private sector collaboration, adequate – and more long-term – pricing models of regulators, and improved information provision, are key potential levers to use to improve favourable technology deployment and innovation.

6.4 Promote more broadly innovative firms and innovation ecosystems, cultivating creativity and knowledge to solve challenges in infrastructure systems

Technology often benefits from network effects – innovations that occur in one industry may have applications in others. This is true of infrastructure, which could benefit more broadly from the translation of innovations from other sectors of the economy (e.g. materials technology, machine learning). The accumulation of knowledge and human capital in innovative economies, industries, and creative communities could also be applied to infrastructure. Investment ecosystems that support start-up companies, venture capital, and technology commercialisation are well positioned to also realise spill-over effects in infrastructure.

Participants suggested that infrastructure investors and operators could work more closely with infrastructure technology developers, helping to develop use case incubation and commercialisation potential for technologies under development.

Managing potential risks and negative impacts

6.5 Proactively address the adverse effects of technology, including potential risks

Investors report that due diligence on prospective infrastructure investment is increasingly including a review of the digital environment, IT infrastructure, software, and data related to infrastructure assets (and who possesses the rights to data). Adequate security measures related to the technological environment are highly important, especially concerning critical infrastructure, such as measures promoting cybersecurity or work on standards in terms of responsibilities, e.g. who provides and controls technology. The use of “edge devices” such as sensors will significantly expand the use of digital infrastructure, making a proactive response even more needed to anticipate potential weaknesses in data and digital architectures.

Potential adverse (or beneficial) effects of new technologies on ESG factors should also be adequately assessed and understood. Participants stated that the emissions footprint of new, and especially digital, technologies (e.g. open blockchains) should not be neglected and should be measured and compared. Emissions reductions from technologies that are integrated into infrastructure could also be measured (e.g. smart traffic, pollution sensors).

Promoting information sharing and dissemination

6.6 Promote the sharing of information across ministries and any relevant regional national and subnational authorities and with stakeholders, including at the early stages of project development

Private sector investors highlighted the risk of information on solutions and risks being siloed within the government, and not being properly shared. They proposed promoting the systematic sharing of information on new technologies and innovations in infrastructure across ministries as well as promoting interaction with stakeholders, including ensuring that solutions and the right stakeholders are involved in the early stages of the procurement process.

7. The role of infrastructure in the context of the pandemic

There is an immediate and urgent need to lessen the human impact of COVID-19, as at its base, the pandemic poses a challenge to healthcare capacities, treatment, testing, and the need to limit transmission of the virus. Investors noted that social infrastructure, in healthcare - but also in emergency response or aged care facilities - are critical for building societal resilience, and that sometimes such needs are overlooked when the attention paid to infrastructure investment tends to be dominated by larger sectors such as energy or transportation. The pandemic has highlighted the fact that societies cannot be resilient without adequate social infrastructure.

The economic impact of the pandemic has been far reaching, with unemployment increasing substantially, growth abruptly reversing trend, and disruption of supply chains (particularly for medical equipment and food supplies). Investors noted that infrastructure sectors have proven to be fairly resilient in the resulting economic shock, with the exception of airports and transportation where a sharp drop in travel has had a significant impact. Investors broadly supported government stimulus plans targeting infrastructure, but noted that opportunities exist to partner with the private sector in delivering on ambitions. Investment should also be focused on long-term benefits as infrastructure is central to achieving the SDGs, and as a means for stimulus, infrastructure investment delivers greater long-term rather than short-term effects.

While other recommendations have addressed elements of the pandemic, where applicable, the following items represent actions needed to address recovery and resiliency, particularly in light of government stimulus plans.

7.1 Support operational resiliency of infrastructure services in response to the pandemic, contributing more broadly to economic and societal resilience

Crises can expose when structural, financial, operational, or contractual weaknesses exist within industries, sectors, or individual corporate entities. The recent volatility in markets due to the pandemic has exposed some infrastructure sectors and assets to significant risks, triggered by falling demand in some areas (i.e. airports, public transportation), to critical shortages of resources in others (healthcare). As infrastructure assets provide essential services, operations must continue despite these challenges. Assuring operational resilience of infrastructure, through maintaining adequate access to labour, liquidity (in some cases through reserves or working capital facilities), and the adequate funding of short-term operations through periods of volatility, is paramount in order to support recovery efforts.

Assuring adequate capacity within various levels of government to deploy aid and allocate resources is needed, particularly if actions need to be taken to meet urgent needs. Cooperation amongst various levels of government (national, subnational) is also needed as urban areas have been particularly hard hit by the pandemic. Governments could also consider programmes that are already in place (or that have been used before) to support infrastructure finance and investment, with a refocus for the current recovery.

7.2 Be strategic and innovative with stimulus spending in infrastructure and align with long-term objectives, partnering with the private sector to augment investment capital

While the continuity and maintenance of infrastructure services in response to the pandemic is important, economic stimulus spending, whether in new infrastructure or upgrading existing infrastructure stock, needs to be aligned with long-term strategic objectives. Participants strongly supported the notion of combining stimulus spending with the achievement of the SDGs, alignment of investment with the energy transition, and investment that contributes strongly to long-term competitiveness. For example, one investor mentioned that stimulus in Europe could be more broadly aligned with the European Green Deal. Others mentioned how important telecommunication services have become during the period of social distancing, which highlights the need for broadband services, fibre networks, and 5G to support connectivity, particularly in under-served areas. New technologies and innovations in infrastructure could also be explored to aid in the recovery.

Prioritisation of infrastructure development could be re-examined in the context of the response to the pandemic, along with high-level economic and development priorities. Investment decisions made now will lock in development pathways for many years, thus participants saw opportunity in changing the outcome of the recovery *and* in long-term resiliency, preparedness, and competitiveness.

Participants also expressed willingness to partner with the public sector in recovery efforts, in order to leverage private capital and innovation. The road to recovery post-pandemic may be long, thus focusing on efficiency of spending and effective delivery models is needed.

Main recommendations, Next steps and the way forward (to be expanded)

The outcomes of the collaboration between private sector investors in infrastructure and the G20 represent a key deliverable for the Saudi Arabia G20 Presidency. Following transmittal to G20 Finance Ministers and Central Bank Governors, in July 2020, and possible direction from Ministers, the policy recommendations – as especially those identified as being a priority – will be actively considered by policymakers, particularly the members of the G20 Infrastructure Working Group, but also other relevant international and regional organisations and institutions including the OECD.

The outcomes of this report will also provide valuable insights on potential ways forward on the global infrastructure investment agenda, with insights also on how to further advance the *G20 Roadmap to Infrastructure as an Asset Class* and the *G20 Principles for Quality Infrastructure Investment*. For instance, some of the discussions and proposed options would suggest that changes to the Roadmap could be warranted. The outcomes will also compliment the work on Saudi Arabia's Infratech Agenda under its G20 Presidency.

Going forward, the possibility of continuing this collaboration, through establishing a G20/OECD platform for further engaging with private sector investors, will be considered, as it could help to advance the consideration and implementation of the recommendations.