Chapter 5

Mobilising institutional investment in sustainable energy: Recommendations for policy makers

Building on findings from previous OECD reports and conclusions from the preceding chapters, this chapter proposes nine key policy recommendations for governments to address barriers and to facilitate institutional investors' investment in sustainable energy infrastructure. These recommendations are presented in abridged form and Annex 5.A1 provides the foundation for this list with a comprehensive discussion of policy recommendations, annotated and referenced against existing OECD policy guidance and G20 recommendations. Finally, the chapter proposes a map aligning the barriers with the relevant recommendations for government to consider in their efforts to ameliorate or overcome these barriers.

What are the key actions for governments?

To limit climate risks, governments will need to focus attention on the emissions footprint of proposed infrastructure decisions and ensure that the investment environment is one that will enable the allocation of capital to low emission options. Choices made today about the types, features and location of long-lived infrastructure will determine the extent and impact of climate change and the vulnerability or resilience of societies to it. According to the IEA (2012), four-fifths of the total energy-related CO_2 emissions permitted to 2035 in their "450 Scenario", which is consistent with the 2°C emissions path, are already locked-in by existing capital stock, including power stations, buildings and factories. Without further action by 2017, the lock-in would be complete. Given the long lifetime of CO_2 in the atmosphere, stabilising concentrations of greenhouse gasses would then require the costly retirement of infrastructure prior to the end of its economic life.

Governments have a central role to play in mobilising capital through implementing reform agendas that deliver "investment-grade policies" (Hamilton, 2009). In most countries, climate and investment policies have to date functioned quite separately and sometimes at cross-purposes, preventing or slowing investment in sustainable energy infrastructure. Integrating climate and investment policies can help different policy communities work together to achieve the common goal of achieving a low carbon-and climate-resilient (LCR) economy and greener growth.

In view of the diverse ways that policies in different domains create barriers to institutional investment in sustainable energy infrastructure, governments are recognising the need to understand what other policy initiatives are needed to reinforce and support efforts to scale up investment. For energy systems, this implies a more systematic and holistic analysis of the range of policy interventions that are required to undertake this challenge.

A number of efforts are underway, including in the G20 and through the G20/OECD Task Force on Long-Term Investment, to identify approaches for governments to remove barriers to greater infrastructure investment by institutional investors and to address infrastructure funding gaps (G20/OECD, 2014a and 2014b; G20/OECD, 2013; G20/OECD, 2012). Other OECD projects have focused on the challenge of meeting low-carbon climate-resilient infrastructure investment needs, including sustainable energy investments (e.g. Corfee-Morlot et al., 2012, OECD, 2013). These projects, including previous analysis on institutional investors and green infrastructure investment, have aimed to help policy makers create and improve domestic enabling conditions to shift and scale-up private sector investments and financing. These efforts have identified many elements that together provide a more complete view of a domestic enabling environment for sustainable energy infrastructure investments. These interdisciplinary efforts (see Table 5.A1.1) and their associated policy conclusions and recommendations inform this report's recommendations for governments.

A special emphasis is placed on the policy recommendations derived from the G20/OECD High-Level Principles of Long-Term Investment Financing by Institutional Investors (G20/OECD, 2013) and related G20/OECD work including the ongoing work to develop effective approaches to implementing the Principles (G20/OECD, 2014a and 2014b) and previous analysis on the related topic of pension fund financing for green infrastructure (G20/OECD, 2012).

This report proposes nine key policy recommendations for governments to address barriers and to facilitate institutional investors' investment in sustainable energy infrastructure. These recommendations are presented below in abridged form. Annex 5.A1

provides the foundation for this abridged list with a comprehensive discussion of policy recommendations, annotated and referenced against existing OECD policy guidance and G20 recommendations.

1. **Establish preconditions for institutional investment and favourable framework conditions for long-term investment financing.** Take steps to: *a)* improve the business climate, rule of law and investment regime underpinning sustainable energy infrastructure investments; *b)* strengthen competition policy through designing open and transparent procurement processes; unbundle vertically integrated network operators; establish a wholesale electricity market; and create a level playing field between independent power producers (IPPs) of sustainable energy and incumbent state-owned enterprises (SOEs); and *c)* improve the governance of institutional investors, including addressing "short-termism" and promoting long term investment while prompting disclosure of risks associated with long-term assets.
2. **Ensure a stable, transparent and integrated "investment-grade" policy environment addressing key barriers to investment by institutional investors.** Institute a "Green Investment Policy Framework"; avoid sudden or retroactive change to support policies in order to provide predictability to investors; examine the case for introducing barriers to policy change through legislation or contractual liabilities that make it unattractive to change policies retrospectively; address unintended consequences of policies that impede the mobilisation of institutional investment (e.g. "unbundling" regulation that forces investors to choose between owning transmission or generating assets); and ascertain whether regulatory and other financial market rules (e.g. accounting, solvency and investment restrictions) are unintentionally and unnecessarily hindering investment in sustainable energy.
3. **Improve risk-return profiles of sustainable energy projects by addressing market failures while improving electricity market design.** Put an explicit price on carbon; give a clear policy signal of a rising cost for CO_2 emissions over time through explicit and implicit carbon pricing policies; and phase out fossil fuel subsidies. Provide an electricity market context that assures a reasonable and predictable return for investors in power generation and associated enabling infrastructure. Promote well-designed and time-bound sustainable energy support policies, when needed, to improve risk-return profiles. Promote the use of contracts such as Power Purchase Agreements that provide the stable and certain revenue which is instrumental to attracting institutional investors who seek these cash flow characteristics.
4. **Establish a national infrastructure strategy and road map with project pipeline.** Develop a sustainable energy plan within a national infrastructure strategy which maps out timing, capacity needs and location for new assets; deployment targets; the duration and level of support policies; and technology-specific considerations. The strategy should be revisited and updated regularly based on periodic reviews to take into account evolving technology developments and views on policy needs. Create a credible sustainable energy pipeline to provide investors with confidence that investable projects will be forthcoming. Create and support facilities focused on improving the "bankability" of projects through preparation and selection and support initiatives aimed at facilitating partnership between the various actors along the project finance chain.

5. **Facilitate the development of markets for sustainable energy infrastructure financing instruments** (e.g. for debt in the form of green bonds) **and funds** (e.g. for equity in the form of listed YieldCo-type funds) tailored to investor risk profiles across the project lifecycle and developed in co-operation with investors. Evaluate the case for passing or amending legislation allowing for sustainable energy infrastructure to be included in existing vehicles that appeal to institutional investors (e.g. covered bonds, Master Limited Partnerships and Real Estate Investment Trusts).

6. **Facilitate the development and application of risk mitigants** where they would "crowd-in" private investment and result in more appropriate allocation of risks and their associated returns (e.g. credit enhancements and revenue guarantees, first-loss provisions, cornerstone stakes, and risk mitigants targeting different challenges across stages of the project lifecycle).

7. **Reduce the transaction costs associated with sustainable energy investment**. Support channels for securitisation of sustainable energy debt to pool small scale projects using a prudent and judicious approach (e.g. supporting efforts to standardise contracts and project evaluation structures, creating aggregation and "warehousing" facilities). Develop a sustainable energy project exchange network for large-scale projects; foster collaboration, innovation and knowledge-sharing amongst institutional investors and with other financial institutions.

8. **Promote market transparency and standardisation, and improve data** on performance, risks and costs of sustainable energy investments across available channels while promoting public-private dialogue. Strengthen, as appropriate, requirements for institutional investors to provide information on sustainable energy investments, following internationally agreed definitions, so as to enhance monitoring and understanding of the risk profile of these investments.

9. **Consider the case for establishing a special-purpose "green investment bank"** (GIB) or refocusing activities of existing public finance institutions to mobilise private investment for sustainable energy infrastructure. GIBs can facilitate the development of financing instruments and funds, risk mitigants and transaction enablers, and provide technical advice and project preparation and selection.

While the private sector has a major role[i] to play in addressing the barriers presented and discussed in Chapter 2, policy makers have an important role to play in harnessing the opportunities and overcoming the challenges of institutional investor involvement in sustainable energy infrastructure. These policy conclusions address the role of governments. To conclude, Table 5.1 proposes a map aligning the barriers (discussed in Chapter 2) with the relevant recommendations (drawn from Annex 5.A1) for government to consider in their efforts to ameliorate or overcome these barriers.

Table 5.1. **Barriers to institutional investment in sustainable energy infrastructure and recommendations for government**

Barriers			Recommendations
1. Issues with infrastructure investments	1.1 Direct investing challenges	a. Short term investment horizons of investors. b. Need for liquidity with many investors (low tolerance for illiquidity risk). c. Challenges with bidding process for assets on projects and timing; lack of investor best practice and expertise; smaller investors can lose out to more sophisticated, larger investors in bidding. d. Need scale > USD 25-USD 50 bn in AUM and dealflow to maintain costly direct investing team with expertise. e. Min USD 100-200 m deal "ticket" size; expensive and time-consuming due diligence; higher transaction costs.	a. Improve the governance of institutional investors, including addressing "short-termism" and promoting long term investment while prompting disclosure of risks associated with long-term assets. Align long-term interests of institutional investors, asset managers, companies and shareholders, thereby incentivising the latter to become more long-term engaged investors. b. Review financial and prudential regulations to ensure that they are compatible with the goals of financing for infrastructure and continue to monitor the possible effects of regulatory reforms on the supply of long-term financing. Facilitate the development of liquid markets for financing instruments and funds and develop a sustainable energy project exchange network which provides a standardised, consistent marketplace for large scale projects. c. Strengthen competition policy through designing open and transparent procurement processes. Publish an infrastructure roadmap and pipeline. d. Consider initiatives and platforms to pool institutional investor assets and transaction enablers such as securitisation. e. See c) and d)
	1.2 Regulatory and policy issues	a. Regulatory and policy uncertainty. b. Uncertain new policy application e.g. Solvency II for pension funds? c. Illiquidity and direct investment restrictions e.g. capital adequacy rules and higher charges (Solvency II, IORP II Directive). d. Accounting rules e.g. mark to market for illiquid assets.	a. Ensure a stable, transparent and integrated "investment-grade" policy environment. b. See a) c. Review financial and prudential regulations to ensure that they are compatible with the goals of financing for infrastructure and continue to monitor the possible effects of regulatory reforms on the supply of long-term financing. d. See c)
	1.3 Lack of "bankable" project pipeline and quality historical data	a. Few countries publish infrastructure road maps with project pipelines. b. Decreased participation of project finance banks (due to Basel III, deleveraging, structural factors) creates interruptions in project development and construction. c. Little historical pricing data or indices for benchmarking investments such as private placement debt. d. No liquid market to exchange financial stakes in projects.	a. Develop a sustainable energy plan within a national infrastructure strategy which maps out timing, capacity needs and location for new assets; deployment targets; the duration and level of support policies; and technology-specific considerations. The strategy should be revisited and updated regularly based on periodic reviews to take into account evolving technology developments and views on policy needs. b. Create and support facilities focused on improving the "bankability" of projects through preparation and selection and support initiatives aimed at improving enhanced partnership between the various actors along the project finance chain (e.g. to allow banks to offload operating projects to institutional investors and recycle their capital). c. Promote efforts to improve data on performance, risks and costs of sustainable energy investments across available channels. Strengthen, as appropriate, requirements for institutional investors to provide information on sustainable energy investments, following internationally agreed definitions, so as to enhance monitoring and understanding of the risk profile of these investments. d. Support the development of a sustainable energy project exchange network which provides a pipeline and marketplace for investors, improves co-ordination among participants, offers technical advice to local governments to improve identification, analysis, procurement and execution of public-private partnerships and other financing options.[a]

Table 5.1. **Barriers to institutional investment in sustainable energy infrastructure and recommendations for government** *(continued)*

Barriers			Recommendations
2. Issues particular to sustainable energy infrastructure investments	2.1 Risk-return imbalance	a. Market failures: insufficient carbon pricing and incentives; presence of fossil fuel subsidies. b. Insufficient economic business case: cost of capital and perceived risk is too high and return is too low. c. Electricity market challenges (structure and design). d. Low natural gas pricing in some jurisdictions.	a. Put an explicit price on carbon through carbon taxes and emissions trading systems. Identify other cost-effective policy instruments that put an implicit price on carbon. Phase out or reform fossil fuel subsidies and support while addressing potential adverse impacts of subsidies reform. b. Facilitate the development of risk mitigants where they would "crowd-in" private investment and result in more appropriate allocation of risks and their associated returns while lowering the cost of capital across stages of the project lifecycle. c. Provide an electricity market context that assures a reasonable and predictable return for investors in sustainable energy and associated enabling infrastructure and promote well-designed and time-bound sustainable energy support policies when needed. Tackle regulatory and market rigidities that favour unabated fossil fuel incumbency in the electricity sector and which undermine demand-side options that could empower consumers to choose clean energy. Promote the use of well-designed Power Purchase Agreements or similar measures that achieve cash flow characteristics desired by institutional investors, i.e. stable, long-term cash flows linked to inflation. d. See a)
	2.2 Unpredictable, fragmented, complex and short duration of policy support	a. Instances of retroactive support cuts and support switching (FiT to FiP creates cash flow volatility) or start and stop (PTC). b. Unintended consequences of unrelated policies (e.g. can discourage investment by tax-exempt pension funds or EU unbundling preventing majority ownership of both transmissions and generation/production).	a. By better integrating climate and other environmental policy goals into investment policy frameworks and infrastructure planning, establish Green Investment Policy Frameworks in co-ordination with institutional investors, which provide investors with clear and long-term visibility, predictability and incentives. This helps provide the risk-return profile and confidence in future regulatory stability needed for investors to invest in long-term assets. Ensure that support policies are of adequate duration and tied to a technology's level of maturity. b. Analyse, determine and review policy-related barriers to institutional investment and fix unintended consequences of existing policies or issues arising from unrelated policy priorities that impact on the goal of mobilising institutional investment. • Fixes should evaluate the trade-offs between other policy priorities and the benefits of increased institutional investment. Fixes could include, inter alia, regulatory reform, carve-outs (exemptions) for institutional investment or structuring specific policy incentives designed to encourage institutional investment. Review financial and prudential regulations to ensure that they are compatible with the goals of financing for sustainable energy and continue to monitor the possible effects of regulatory reforms on the supply of long-term financing. • Ensure that any restrictions on long-term investment in sustainable energy infrastructure by institutional investors are consistent with diversification and financial regulation objectives. Review restrictions regularly and, where appropriate, ease them subject to necessary safeguards (see Annex 5.A1) being in place, such as strong governance and risk management mechanisms, effective supervision, and appropriate diversification. • Promote the use of well-designed Power Purchase Agreements or similar measures that achieve cash flow characteristics desired by institutional investors, i.e. stable, long-term cash flows linked to inflation.

Table 5.1. **Barriers to institutional investment in sustainable energy infrastructure and recommendations for government** *(continued)*

Barriers		Recommendations
2.3 Potential misalignment with climate change risk and the transition to a low carbon economy	a. Lack of a responsible investment code. b. Lack of clarity on fiduciary duty and stewardship with respect to environmental, social and governance and stewardship (ESG) issues. c. Carbon content of portfolios rarely disclosed.	a. Evaluate the case for establishing a "code for responsible investing" which gives institutional investors guidance on how they may execute investment and risk analysis and conduct investment activities to adequately take into account environmental and social considerations, and exercise ownership rights so as to promote sound governance. b. The governing body of an institutional investor should ensure that the institution can properly identify, measure, monitor, and manage the risks associated with long-term assets as well as any long-term risks – including environmental, social and governance (ESG) risks - that may affect their portfolios. The risks associated with long-term investments should also be carefully assessed, including climate and other environmental risks, and exposure to potential future climate regulation. c. Where appropriate (see Annex 5.A1), institutional investors should disclose with sufficient granularity information on the extent to which their investment strategies are in line with their investment horizon and how they address long-term risks associated with climate change.
2.4 Special species of risk and lack of data on the performance of sustainable energy investments across asset classes	a. Technology and volumetric risk management require expertise and special risk management tools. b. Lack of data.	a. Create stakeholder initiatives to design cost-effective tools to better hedge against technology and volumetric risk. b. Strengthen formal requirements to provide information on investments by institutional investors in sustainable energy, following internationally agreed definitions. This would allow for future monitoring on an international basis. This is necessary for institutional investors themselves to have the necessary data to analyse the performance of these investments and the confidence to then make allocations. It is also necessary for policy makers to be able to understand and monitor such allocations in order to be able to make appropriate policy responses. • Encourage institutional investors to report their recent allocation to and performance of different long-term assets following standardised classifications and methods, while ensuring the confidentiality of any market-sensitive or proprietary information. • Support investor led initiatives such as the Low Carbon Investment (LCI) Registry, a global public online database of low carbon investments made by institutional investors.
2.5 Competition for capital	a. Competition with traditional infrastructure assets and with transmission and distribution infrastructure.	a. No recommendation for government.
2.6 Small scale of assets	a. Distributed and micro-generation assets too small for institutional investors interest and few means exist to bundle them.	a. Support channels for securitisation of sustainable energy debt to pool small scale projects using a prudent and judicious approach (e.g. supporting efforts to standardise contracts and project evaluation structures, creating aggregation and "warehousing" facilities).
2.7 Market perception	a. Negative publicity created by bankruptcies of early-stage companies and poor performance of VC investments due to temporal industry consolidation and macroeconomic factors transfer to projects which were unaffected.	a. Create or support existing platforms for dialogue between institutional investors, the financial industry and the public sector to understand the barriers and opportunities to investment in sustainable energy projects.

Table 5.1. **Barriers to institutional investment in sustainable energy infrastructure and recommendations for government** *(continued)*

Barriers			Recommendations
3. Lack of suitable investment instruments and funds	3.1 Issues with fund and vehicle design	a. High fees associated with fund structures. b. Liquidity trade-off with connection to underlying asset and associated benefits: difficult to offer liquidity without asset disconnect, churn and leverage in fund. c. YieldCos are new innovations for listed equity but depend on bankable pipelines of projects and experienced human resources and may need to evolve further to fulfill their potential.	a. No recommendation for government. b. No recommendation for government. c. Establish a national infrastructure strategy and road map with project pipeline. Support regulatory reforms which impact electric utility business models to accelerate deployment of sustainable energy sources and new financing models such as YieldCos.
	3.2 Nascent green bond markets, few indices/funds	a. Small pipeline of projects, high transaction costs, minimum deal size. b. Definitional uncertainty. c. Few liquid benchmark indices for listed debt and equity as market is still nascent or insufficient demand for products.	a. Establish a national infrastructure strategy and road map with project pipeline. Different levels of government can issue, and support the development of appropriate long-term instruments in line with debt management and capital market development objectives. Such instruments underpin the development of long-dated private sector securities markets and can support asset-liability management by institutional investors and complement long-term investment portfolios. Green bonds and YieldCos are examples of instruments and funds that have the potential to engage institutional investors at scale. b. Support the development of markets for instruments or funds with appropriate risk-return profiles for institutional investors. Such financing options should have an investment horizon in line with those of the underlying projects, should be tailored to investor risk profiles across the project lifecycle, and should be developed in close co-operation with institutional investors. c. Establish the necessary regulatory framework for pooled funds, vehicles and securities channelling financing for long-term investment in a sound and sustainable manner. • Support the development, rigour and adoption of emerging certification standards for green bonds such as the Climate Bond Standard and Certification Scheme and voluntary issuances guidelines such as the Green Bonds Principles. Rigorous standards, guidelines and procedures for verification can allow for straightforward certification and issuance of bond instruments that contribute to a low carbon economy leading to increased market liquidity, comparability and demand from institutional investors. Additionally, they can help prevent risk of so-called "greenwashing" whereby proceeds from bonds issued do not actually contribute to the intended projects or corporate activities.
	3.3 Restricted access to existing vehicles (Covered Bonds, MLPs and REITs)	a. Current national legislation does not enable sustainable energy to qualify for these vehicles.	a. Evaluate the case for passing or amending legislation allowing for sustainable energy infrastructure to be included in existing liquid vehicles that appeal to institutional investors.
	3.4 Challenges with securitisation	a. Lack of standardised project documentation and credit risk assessments. b. Lack of large enough portfolios of loans on bank balance sheets. c. Legacy reputational risk from the GFC.	a. Support channels for securitisation of sustainable energy debt to pool projects using a prudent and judicious approach (e.g. supporting efforts to standardise contracts and project evaluation structures). b. Create aggregation or warehousing facilities (e.g. via a Green Investment Bank). c. Support channels for securitisation prudently and judiciously.

Table 5.1. **Barriers to institutional investment in sustainable energy infrastructure and recommendations for government** *(continued)*

Barriers		Recommendations
3.5 Credit and ratings issues	a. Historical lack of ratings data, expensive process. b. Absence of monoline insurers since GFC.	a. Support collection of ratings data and efforts to create "mock" securitisation ratings processes. b. Consider the case for establishing a special-purpose "green investment bank" (GIB) or refocusing activities of existing public finance institutions to mobilise private investment for sustainable energy infrastructure including monoline insurance and credit enhancement.

Note: a. An example of this type of exchange at a regional level is the West Coast Infrastructure Exchange (WCX), comprising California, Oregon, Washington, and British Columbia (see http://westcoastx.com/).

Acronyms and abbreviations: Asset-Liability Matching (ALM), Assets under Management (AuM), Institutions for Occupational Retirement Provision (IORP II Directive), Feed-in Tariff (FiT) Feed-in Premium (FiP), Production Tax Credit (PTC), Global Financial Crisis (GFC), Master Limited Partnership (MLP), Real Estate Investment Trust (REIT).

Note

1. While it is beyond the scope of this report to describe all the research efforts and recommendations being provided by the private sector and academia, governments should consider the work done on this topic by, inter alia, Clark and Monk (2013a,b), Global Investor Coalition (2013), B20 (2014), Climate Bonds Initiative (2014), Fulton and Capalino (2014), Nelson (2014) and WEF (2014).

Annex 5.A1

Background to the policy recommendations

The recommendations derive primarily from lessons learned from OECD case studies of institutional investment in green infrastructure (Kaminker et al., 2013), which provided confirmation for a number of the OECD's previous policy recommendations to encourage green investments by institutional investors. For example, the note drafted for the G20 on *Pension Fund Financing for Green Infrastructure and Initiatives* (G20/OECD, 2012) offered recommendations to policy makers which can again be adapted based on the new analysis contained within this report.

From a much broader perspective, at the G20 Leaders Summit in St Petersburg in September 2013, G20 Leaders endorsed the High-Level Principles on Long-Term Investment Financing by Institutional Investors (G20/OECD, 2013), thereby recognising the importance of establishing conditions that could promote the role of institutional investors as sources of long-term investment financing, including for sustainable energy infrastructure. At the same time, G20 Leaders asked their Finance Ministers and Central Bank Governors to identify approaches to effectively implement the Principles, working with the OECD and other interested participants by the next Leaders' Summit, in November 2014 in Brisbane, Australia (G20/OECD, 2014a and 2014b).[1] This report's recommendations are consistent with this broader initiative and draw on some of the analysis and principles of most relevance.

Looking specifically at investment policy for infrastructure, OECD Investment Policy Reviews (IPRs) are an example of work that uses an investment policy lens to assess policy frameworks for sustainable energy investment. The OECD has undertaken IPRs based on the OECD *Policy Framework for Investment* in nearly 30 countries (OECD, 2006) and aim to help host governments assess and reform their investment regimes. In the recent past, they have increasingly focused on green investment at the request of partner countries, and notably on sustainable energy investment.[2]

Drilling down to the sub-category of sustainable energy within infrastructure investment, and building on the OECD *Policy Framework for Investment* (OECD, 2006), on the paper "Towards a Green Investment Policy Framework" (Corfee-Morlot et al., 2012), and on other OECD guidance and policy instruments; the OECD *Policy Guidance for Investment in Clean Energy Infrastructure* is a non-prescriptive tool to help governments – particularly in developing and emerging countries – identify ways to mobilise private investment in clean energy infrastructure (OECD, 2013).[3] The *Policy Guidance* benefited from substantial contributions by the World Bank and UNDP and was annexed to the Communiqué of G20 Finance Ministers and Central Bank Governors at their meeting of 10-11 October 2013. It goes into greater depth on the "investment policy" element of the Green Investment Policy Framework, focusing on energy infrastructure questions and raising issues for policy makers' consideration in key areas relevant to institutional investment.

Another consideration for the development of a robust domestic framework for sustainable energy investment is the prevalence and effects of international trade and investment restrictions. In the post-crisis recovery context, the perceived potential of sustainable energy to promote growth and employment has led several governments to design policies aimed at supporting domestic manufacturers. The OECD report *Overcoming Barriers to International Investment in Clean Energy* aims to take stock of policy measures that could hamper international trade and investment in sustainable energy, with a focus on solar PV and wind energy. These measures include local content requirements, preferential access to financing and technical barriers to trade (OECD, 2015a, forthcoming). The report will assess possible impacts of such measures across the solar PV and wind energy value chains, and discuss policy options.

Cutting through all of these issues, another OECD case study examines the role of Public Finance Institutions (such as the European Investment Bank, KfW and others) in financing the transition to a low-carbon, climate-resilient economy in OECD countries (Cochran et al., 2014). And finally, Eklin, et al. (2015, forthcoming) reviews how "green investment banks" (GIBs) have sought to mobilise capital from institutional investors.

Table 5.A1.1. **OECD and G20 initiatives on long-term investors and infrastructure investment, and contributions to policy recommendations to facilitate investment in sustainable energy infrastructure**

Initiative or report	Description	Contributions
Case studies of Institutional Investment in Green Infrastructure	• The report examines the channels through which institutional investors can access green infrastructure, assesses the extent to which this is currently happening, and identifies the barriers to scaling up these investment flows. • The report examines positive factors that facilitated these deals, how barriers were overcome and draws out broader lessons for governments on the policy settings which may support investment in green infrastructure by institutional investors.	• The report provides policy guidance on a number of key actions which governments can take to address the barriers and facilitate institutional investors' investment in green infrastructure projects. • The report was submitted and annexed to the G20 Finance Ministers and Central Governors' meeting on 10-11 October 2013.
G20/OECD High-Level Principles on Long-Term Investment Financing by Institutional Investors	• The principles address regulatory and institutional impediments to long-term investment by institutional investors and aim to avoid interventions that may distort the proper functioning of markets.	• The principles are intended to help governments facilitate and promote long-term investment by institutional investors, particularly among institutions such as pension funds, insurers and sovereign wealth funds, that typically have long duration liabilities and consequently can consider investments over a long period.
OECD Policy Guidance for Investment in Clean Energy Infrastructure	• The policy guidance raises issues in a non-prescriptive manner for policymakers' consideration in the areas of investment policy; investment promotion and facilitation; and competition, financial market and public governance policies.	• The policy guidance is intended to assist policymakers in developing and emerging economies to address investment barriers and identify ways to mobilise private investment in renewable energy and energy efficiency in the electricity sector. • The report was submitted and annexed to the G20 Finance Ministers and Central Governors' meeting on 10-11 October 2013.

Green Investment Policy Framework	• The report develops elements of a Green Investment Policy Framework to help governments create and improve domestic enabling conditions to shift and scale-up private sector investments in green infrastructure.	• The policy framework can guide domestic reforms to steer use of limited public funds while also enabling and incentivising private investment to simultaneously deliver climate change and local development goals.
Overcoming Barriers to International Investment in Clean Energy	• The report takes stock of policy measures that may distort international competition and hamper international investment in solar photovoltaic (PV) and wind energy value chains, with a focus on local content requirements.	• The report provides policymakers with evidence-based analysis to guide their decisions, with the view of optimising policy support to green energy and levelling the playing field for international investment in green energy.
Public Finance Institutions in Financing the Low Carbon Transition	• The report analyses the role of five public finance institutions (PFIs) in fostering the low-carbon energy transition through domestic climate finance activities.	• The study provides policymakers with analysis on key tools and instruments currently used by PFIs to mobilise private sector investment, principally in OECD countries, in three areas of activity: 1. facilitating access to long-term financing, 2. reducing project and financial risks, and 3. filling the capacity gap.
Green investment banks (Green Investment Financing Forum)	• The green investment bank initiative takes stock of green investment banks, and examine what they do, the reasons for their establishment, what they have in common, and how they vary.	• The green investment bank initiative promotes dialogue and enhance understanding a wide range of countries and institutions interested in mobilising private investment financing for low-carbon and climate-resilient infrastructure.

In light of this wide body of existing and ongoing OECD work, this report presented nine key policy conclusions for governments to address barriers and to facilitate institutional investors' investment in sustainable energy infrastructure. These nine policy recommendations are grouped in 5 categories and referenced according to their roots in OECD policy guidance in the next section.

A) Preconditions for Institutional Investment[4]

Before even considering sustainable energy as a subset of infrastructure investment, investors will only be willing to commit their funds when they have some assurance that financial markets and institutions are safe and sound, and operate according to rules and procedures that are fair, transparent, and free from conflicts of interest and other agency problems (G20/OECD, 2014a). A separate precondition relates to the formation of institutional savings that can be invested in the first place.

1. Establish preconditions for institutional investment and favourable framework conditions for long-term investment financing[5]

- Framework conditions include a stable macroeconomic environment, responsible fiscal management, a strong financial sector, and a well-developed system of channelling public and private savings to longer-term investments (see G20/OECD, 2013, p. 6).

- A favourable business and investment climate and the consistent and effective enforcement of the rule of law are essential for long-term investment. Governments should create predictable, stable, transparent, fair and reliable business regulation and supervision and administrative and procurement procedures. They should also promote an effective framework for fair competition and sound corporate governance, and clear and reliable creditor rights and insolvency regimes (see G20/OECD, 2013, p. 6). The investment regime underpinning infrastructure investment should include, inter alia, sound measures for access to land and protection against expropriation, contract renegotiation, settlement of disputes, and tax policy (see OECD, 2015b, forthcoming).
- Steps can be taken by governments to better align long-term interests of institutional investors, asset managers, companies and shareholders, thereby incentivising the latter (e.g. through performance management) to become more long-term engaged investors (see G20/OECD, 2013, p. 7).
- Licensed administrators of institutional investors have a fiduciary duty to members, beneficiaries and other relevant stakeholders to act in their best interests. This duty supports the adoption of a responsible investment approach to deploying capital into markets that will earn adequate risk-adjusted returns suitable for the institution's specific member profile, liquidity needs and liabilities. The implementation of this fiduciary duty can also be supported by appropriate transparency and reporting on financial indicators as well as on environmental, social and governance (ESG) relevant topics (see G20/OECD, 2014a).
- Governments may establish a "code for responsible investing" which gives institutional investors guidance on how they may execute investment analysis and conduct investment activities, and exercise ownership rights so as to promote sound governance. As such, the "code" may contain sustainability considerations in addition to many other issues. Such a code may serve as a minimum reference point for the institutional investor and should not be deemed to preclude higher standards of behaviour. Governments may also assign different definitions of fiduciary duties to different categories of institutional investors (see G20/OECD, 2014a).
- The governing body of an institutional investor should ensure that the institution can properly identify, measure, monitor, and manage the risks associated with long-term assets as well as any long-term risks – including environmental, social and governance risks – that may affect their portfolios (see G20/OECD, 2013, p. 8). The risks associated with long-term investments should also be carefully assessed, including climate and other environmental risks, and exposure to potential future climate regulation (see G20/OECD, 2013, p. 4).
- Where appropriate, institutional investors should disclose with sufficient granularity information on the extent to which their investment strategies are in line with their investment horizon and how they address long-term risks (see G20/OECD, 2013, p. 10).

B) Investment-grade Policy Environment

The lack of a stable regulatory environment discourages long-term investments. In the case of sustainable energy investment, rapid (and even retroactive) changes to support policies are particularly damaging to investor confidence, especially when they are undertaken without advance notice to allow investors and businesses time to adjust. Existing

incentives often provide limited or no pricing of carbon (i.e. the cost of environmental externalities are poorly reflected or not reflected in prices), subsidise fossil fuel use, or do both. The OECD has developed elements of a "green investment policy framework" to help governments create and improve domestic enabling conditions to shift and scale-up private sector investments in green infrastructure including from institutional investors (see Corfee-Morlot et al., 2012).

2. Ensure a stable, transparent and integrated "investment-grade" policy environment addressing key barriers to investment by institutional investors.

- This policy environment may be developed in co-ordination with institutional investors, which provides investors with clear and long-term visibility, predictability and incentives. This helps provide the risk-return profile and confidence in future regulatory stability needed for investors to invest in long-term assets.
- Governments may ensure that policies are of adequate duration, tied to a technology's level of maturity, and matched to the geography and diversity of markets and institutional investors (see Kalamova, et al., 2011).
- Though prudential regulation is important for protecting pension fund members, policy holders and beneficiaries, it sometimes may have unintended consequences, creating barriers to long-term investments by institutional investors which may need to be addressed.
- Governments should review financial regulations to ensure that they do not unduly hamper financing for sustainable energy (see UNEP, 2014) and they should continue to monitor the possible effects of regulatory reforms on the supply of long-term financing (see FSB, 2013).
- Where applied, restrictions on long-term investment in sustainable energy infrastructure by institutional investors should be consistent with diversification and financial regulation objectives. They should be reviewed regularly and, where appropriate, they should be eased subject to necessary safeguards being in place, such as strong governance and risk management mechanisms, effective supervision, and appropriate diversification (see G20/OECD, 2013, p. 9).
- The use of well-designed Power Purchase Agreements or similar measures that achieve cash flow characteristics desired by institutional investors are particularly important and may be considered by governments (IEA, 2014).

3. Improve risk-return profiles of sustainable energy projects by addressing market failures while improving electricity market design.

- Market failures can create risk-return investment profiles that favour polluting or environmentally damaging infrastructure projects over sustainable energy investments.
- Phasing-out inefficient fossil fuel subsidies and implementing regulations that impose a price on environmentally damaging activities (implicitly through standard setting, or explicitly through carbon taxation or emissions trading while providing a clear policy signal of a rising cost for CO_2 emissions over time) are important elements of improving the risk-return profile of sustainable energy investments (OECD, 2013b).

- Provide an electricity market context that assures a reasonable and predictable return for investors in sustainable energy and associated enabling infrastructure by promoting well-designed and time-bound sustainable energy support policies when needed and the use of contracts such as Power Purchase Agreements which provide institutional investors with revenue stability and certainty(IEA, 2014). Predictability of government programmes is necessary if investors are to initiate a project in clean energy; however, predictability should not be mistaken for permanence. It is important to provide "sunset clauses" for policies which support investment directly, since over time the financial markets will price risk efficiently and learning benefits will be exhausted (Kalamova et al., 2011).

4. Establish a national infrastructure strategy and road map with project pipeline.

- Develop a sustainable energy plan within a national infrastructure strategy with clear break points where further decisions will need to be made on the basis of technological and other developments, and create a credible sustainable energy road map and pipeline to provide investors with confidence that investable projects will be forthcoming. Create and support facilities focused on improving the "bankability" of projects through preparation and selection and support initiatives aimed at improving enhanced partnership between the various actors along the project finance chain.
- Governments may develop an infrastructure programme tied to a national strategic vision, which may include a comprehensive infrastructure development strategy based on clearly established guiding principles.
- Strategies and road maps would give confidence to investors in government commitments to the sector and demonstrate that a credible pipeline of investable projects will be forthcoming. This will reassure investors that it is worth building up their investment capability and constructing mandates for investment. Governments may establish, publish and deliver credible national infrastructure pipelines that have been rigorously assessed and prioritised by independent infrastructure authorities, and which take full advantage of private sector finance and expertise (see B20, 2014, p. 3).
- Where appropriate, governments should provide opportunities for private sector participation in sustainable energy projects via, for instance, public procurement and public-private partnerships. Investment opportunities should enable the different parties to earn returns commensurate to the risks they take. Proper planning and effective management of such initiatives is recommended in order to ensure a regular, coherent pipeline of suitable projects. These initiatives should be supported by a transparent, sound and predictable regulatory framework and subject to effective monitoring and accountability (see G20/OECD, 2013, p. 7).

C) Investment Channels

5. Facilitate the development of appropriate green financing instruments and funds:

- Governments should consider issuing appropriate long-term instruments in line with their debt management and capital market development objectives. Such instruments underpin the development of long-dated private sector securities markets and can support asset-liability management by institutional investors and

complement long-term investment portfolios (see G20/OECD, 2013, p. 7). Green bonds as a form of long-term instrument have the potential to engage institutional investors at scale.

- Governments can support the development of markets for instruments or funds with appropriate risk-return profiles for institutional investors.
- Governments should establish the necessary regulatory framework for pooled vehicles and securities channelling financing for long-term investment in a sound and sustainable manner (see G20/OECD, 2013, p. 9). This could apply as well to sustainable energy funds and securities described in this report.
- In markets with limited participation by institutional investors, governments, national development banks, and multilateral development agencies should consider the need for establishing and promoting pooled funds and vehicles for long-term investment, and supporting other instruments for long-term investment such as sustainable energy project bonds and securitised assets. Such financing options should have an investment horizon in line with those of the underlying projects, should be tailored to investor risk profiles across the project lifecycle, and should be developed in close co-operation with institutional investors (see G20/OECD, 2013, p. 9).
- Evaluate the case for passing or amending legislation allowing for sustainable energy infrastructure to be included in existing liquid vehicles that appeal to institutional investors (e.g. covered bonds, Master Limited Partnerships and Real Estate Investment Trusts).

D) Risk Mitigants

The expected return and risk of investment projects is a core consideration in the effort to attract private financing. Government intervention may be needed in some circumstances,[6] where the rate of return may be insufficient to compensate private sector investors for the perceived level and/or character of risk or to address key market failures that significantly impede the supply of funds (G20/OECD, 2014a).

6. Facilitate the development of risk mitigants where they would "crowd-in" private investment and result in more appropriate allocation of risks and their associated returns

- Governments may consider providing risk mitigants to long-term sustainable energy investments projects where it would result in more appropriate allocation of risks and their associated returns. Such risk mitigants may include credit and revenue guarantees, first-loss provisions, cornerstone stakes, public subsidies, and the provision of bridge financing via direct loans (see G20/OECD, 2013, p. 9).
- Governments may use public financing mechanisms to provide cover for risks that are new to investors and cannot be covered in existing markets. Such mechanisms may include loan guarantees, insurance-related options, and other credit enhancement tools to improve flow of financing to projects.
- Governments may use debt instruments such as loan and securities to cover the risks in both construction and post-construction phases of sustainable energy projects, while investment guarantees are provided during the post-construction period.

- Public intervention in sustainable energy projects – selected in light of socio-economic and environmental impact assessments – should be decided on the basis of identified market failures, should avoid crowding-out private investments, and should be selected by carrying out appropriate cost-benefit analysis of such interventions and ensuring that any public support is appropriately priced and is subject to fiscal considerations (see G20/OECD, 2013, p. 9).
- Governments may develop a standard methodology for allocating risks – a set of "guiding principles" to determine the level of risk allocation optimal to both deliver value for money and provide investors with an appropriate risk-return (see WEF, 2014, p. 4).

E) Transaction Enablers

7. Reduce the transaction costs associated with sustainable energy investment.

- Collaborative actions and resource sharing amongst institutional investors and with other financial institutions should be encouraged and supported in order to facilitate the exchange of expertise, ensure the effective exercise of ownership rights and to allow sufficient scale and diversification to be reached for investment in large, long-term sustainable energy projects. This will also allow for capacity sharing and provide the scale necessary for smaller funds to participate in these projects.
- Support channels for securitisation of sustainable energy debt to pool small-scale projects using a prudent and judicious approach (e.g. supporting efforts to standardise contracts and project evaluation structures, creating aggregation and "warehousing" facilities).
- Governments can consider creating a sustainable energy project exchange network which provides a standardised, consistent pipeline and marketplace for investors, improves co-ordination among participants, offers technical advice to local governments to improve identification, analysis, procurement and execution of public-private partnerships and other financing options.[7]

8. Promote market transparency and standardisation, and improve data

- Governments may create or support existing platforms for dialogue between institutional investors, the financial industry and the public sector to understand the barriers and opportunities to investment in sustainable energy projects. Institutional investors require support and track records to invest in new asset areas. Learning from leading investors and the experience of peers could assist in building their confidence and the capabilities of other institutional investor service providers (Kaminker et al., 2013).
- Governments may consider conducting "market consultation" with potential investors. This interactive process is undertaken early in order to generate feedback on a project, learn more about investor preferences and determine refinements needed prior to the tender process. Market sounding must be carefully managed to generate useful information and prevent probity issues (WEF, 2014).
- Governments could, where appropriate and needed, strengthen formal requirements to provide information on investments by institutional investors in sustainable energy, following internationally agreed definitions. This would allow for future

monitoring on an international basis. This is necessary for institutional investors themselves to have the necessary data to analyse the performance of these investments and the confidence to then make allocations. It is also necessary for policy makers to be able to understand and monitor such allocations in order to be able to make appropriate policy responses.

- Institutional investors should be encouraged to report their recent allocation to and performance of different long-term assets following standardised classifications and methods, while ensuring the confidentiality of any market-sensitive or proprietary information. The reporting should have an appropriate frequency and should include performance measures calculated over sufficiently long periods. Such information should be at least available for members, policyholders and other beneficiaries as well as supervisory authorities. To fulfil those reporting requirements, adequate existing reporting sources should be used as far as possible (see G20/OECD, 2013, p. 9).
- Governments may also support investor led initiatives such as the Low Carbon Investment (LCI) Registry, a global public online database of low carbon investments made by institutional investors.
- Governments may support the development and adoption of emerging certification standards for green bonds such as the Climate Bond Standard and Certification Scheme and voluntary guidelines such as the Green Bonds Principles. Rigorous standards and guidelines can allow for straightforward certification and issuance of bond instruments that contribute to a low carbon economy leading to increase market liquidity, comparability and demand from institutional investors. Additionally, they can help prevent risk of so-called "greenwashing" whereby proceeds from bonds issued do not actually contribute to the intended projects or corporate activities.
- Governments and intergovernmental institutions may organise domestic and international summits and events with the key objective of exchanging ideas and experiences among institutional investors in order to develop best practices for sustainable energy investment.

F) New and Existing Public Finance Institutions

9. Consider the case for establishing a special-purpose, domestically-focused "green investment bank" (GIB) or refocusing activities of existing public financial institutions

- In recent years, at least a dozen special-purpose public "green investment banks" GIBs have been established. They are domestically-focused public institutions that seek to use limited public capital to leverage or "crowd-in" private capital, including from institutional investors, for LCR infrastructure investment (see Eklin et al., 2015, forthcoming).
- GIBs can facilitate the development of financing instruments and funds, risk mitigants and transaction enablers, and provide technical advice and project preparation and selection.
- Governments may consider the case for establishing a GIB, which can be a useful entity for governments to mobilise domestic private capital, including from institutional investors. As they are being used in different ways in different country settings, their varying operational models and focuses suggest a potential for their adaptation and replication at the national and sub-national level (G20/OECD, 2014b, p.18).

- To consider the case for establishing a GIB, governments should conduct a market assessment exercise to reveal market barriers, financing gaps and potential offerings and modalities.
- GIBs are making their place within a broader ecosystem of domestic and international public institutions engaged in catalysing private and institutional investment in LCR infrastructure. Such institutions include broader-scoped international financial institutions (including multilateral development banks and bilateral development banks), climate investment funds, national development banks and other public finance institutions. As such, governments may examine the roles played by those institutions and whether mobilising capital from institutional investors for sustainable energy investment has been sufficiently mainstreamed.

Notes

1. In order to develop implementation approaches for the Principles, the G20/OECD Task Force on Institutional Investors and Long-Term Financing decided to prioritise those Principles which members viewed as most important to focus on in the first instance to enable the Task Force, the OECD and G20 membership and other interested participants to utilise their resources effectively. The Task Force decided in this context to focus its work initially on a few of the principles that relate most closely to G20 priorities for investment. These reports were delivered to and welcomed by the September G20 Finance Ministers and Central Bank Governors Meeting, to be further reported to the subsequent November Leaders Summit.
2. The OECD is working on updating the PFI in the course of 2014, for completion by the MCM 2015, to take into account new policy developments since its inception in 2006, including considerations for governments to promote green investment.
3. The Policy Guidance was developed by the OECD Investment and Environment Policy Committees, with contributions from other policy communities.
4. Note that this chapter draws from the G20/OECD High-Level Principles on Long-Term Investment Financing by Institutional Investors (G20/OECD, 2013) and the Report on Effective Implementation Approaches to High-Level Principles (G20/OECD, 2014a). These G20/OECD Principles are designed to assist OECD, G20 and any other interested jurisdictions to facilitate and promote long-term investment by institutional investors. The High-Level Principles are intended to complement and do not substitute for any existing international principles and/or guidelines that may apply to particular categories of investors. Rather, they seek to foster consistency in approaches for long-term investment across different policies and jurisdictions (G20/OECD, 2014a and 2014b).
5. When evaluating policies to promote long-term investment by institutional investors, policymakers should ensure its consistency with the best interest of members, investors, beneficiaries, policyholders and other relevant stakeholders, and consider its wider potential public impact.
6. N.B. The provision of risk mitigation is not universal. Some governments do not offer risk mitigation as a matter of public policy.
7. An example of this type of exchange at a regional level is the West Coast Infrastructure Exchange (WCX), comprising California, Oregon, Washington, and British Columbia (see http://westcoastx.com/).

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