



G20 Energy Efficiency Investment Toolkit

G20 Energy Efficiency Finance Task Group (EEFTG)

Established in 2014 under the G20 Energy Efficiency Action Plan
Coordinated by the International Partnership for Energy Efficiency Collaboration (IPEEC)
and with 15 participating G20 countries



The G20 Energy Efficiency Investment Toolkit is the product of the collaborative work of 15 participating country members of the G20's Energy Efficiency Finance Task Group, co-chaired and coordinated by France and Mexico. This toolkit is published under the content direction of the International Energy Agency (IEA); the International Partnership for Energy Efficiency Collaboration (IPEEC); and the UN Environment Finance Initiative (UNEP FI). It provides a voluntary framework and tools for G20 countries to enhance capital flows for energy efficiency investments in their economies. This toolkit is the culmination of three years of detailed technical work of the G20's Energy Efficiency Finance Task Group, with its participating countries, as constituted under the G20's Energy Efficiency Action Plan in 2014 and reinforced through the 2016 Energy Efficiency Leading Programme.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Please cite this publication as: "G20 Energy Efficiency Investment Toolkit (2017)" published by the G20 Energy Efficiency Finance Task Group under the content direction of the International Energy Agency (IEA), the UN Environment Finance Initiative (UNEP FI) and the International Partnership for Energy Efficiency Collaboration (IPEEC).

© IEA, IPEEC, 2017. All rights reserved. Certain parts are licensed under conditions to the IEA and IPEEC jointly. Reproduction is authorised provided the source is acknowledged.

Legal Disclaimer

This document has been prepared by the EEFTG Secretariat and contributing partners for the benefit of IEA, IPEEC and UNEP FI and with input and collaboration provided by nominated experts and the country participants of the G20's Energy Efficiency Finance Task Group ("EEFTG") as listed herein and is a consensus publication. The views and opinions expressed herein are wholly those of IEA, IPEEC, UNEP FI and the EEFTG Secretariat reached by consensus and at the time of writing. This consensus view does not necessarily reflect, in its entirety, the individual view of each of the IEA, IPEEC, UNEP FI, EEFTG nor any EEFTG member country or participant; nor does membership or participation in EEFTG bind any member or participant to the consensus views described here. IEA, IPEEC, UNEP FI, EEFTG and EEFTG Secretariat views and opinions are subject to change without notice. Neither EEFTG, the IEA, the IPEEC, UNEP FI, the EEFTG Secretariat nor any individual member therein nor Climate Strategy (as expert consultant to IPEEC and EEFTG) or any individual member or participant of these bodies may individually or collectively be held responsible for any use which may be made of the information contained herein. The examples and case studies described in this document and its appendices have been based upon specific inputs from participants to EEFTG meetings and are based upon information gathered by the EEFTG Secretariat, its partners and from public sources; the references used to develop this report (which are quoted) should always be considered as the most accurate and complete source of information.

Executive Summary

The G20 represents 84% of the world's total economic output, more than 80% of primary energy consumption and 80% of greenhouse gas (GHG) emissions. G20 countries recognise that both energy efficiency and increased energy productivity are critical to boost sustainable economic growth in an increasingly resource constrained planet. Energy efficiency investments deliver multiple private and public benefits and can be scaled-up significantly to decarbonise economies and deliver these multiple national economic benefits and the goals of the Paris Agreement in the most cost-effective way.

This G20 Energy Efficiency Investment Toolkit (the "Toolkit") represents the culmination of three years of collaborative work, by participating countries, international organisations (IOs), financial institutions and country experts, to enhance capital flows for energy efficiency investments as compiled and supported by the G20 Energy Efficiency Finance Task Group ("EEFTG"). Launched by the G20 Energy Efficiency Action Plan in 2014, the EEFTG delivered the core policy component of this Toolkit (the *Voluntary Energy Efficiency Investment Principles*) as welcomed by G20 Energy Ministers in 2015. Since then EEFTG and its collaborators have rallied 122 banks, more than USD 4 trillion of institutional investors, leading public financial institutions and insurance companies in support of G20 countries' ambitions to redouble their efforts and scale-up energy efficiency investments as articulated in the G20's Energy Efficiency Leading Programme endorsed by G20 Leaders in 2016 and creating the platform for this Toolkit.

Greater collaboration is essential to addressing the G20 energy efficiency investment challenge, which transcends individual domains and sectors - be they policy, regulatory, public or private. It requires unprecedented levels of coordination and collaboration to identify and unlock the benefits resulting from a significant scale up of energy efficiency investment. Financing flows are global, and the multiple benefits through increasing and prioritising energy efficiency investment will accrue nationally and locally, making countries stronger, more resilient and more energy-secure. Financial and technology innovation and up-take will also accelerate through the greater awareness and promotion of "best in class" instruments and approaches. This is because leadership and successful business models that flourish in one jurisdiction can, through the global nature of finance, be shared and copied in other countries, despite the specificity of national contexts.

Throughout its chapters, this Toolkit offers a new perspective on the challenge of scaling-up energy efficiency investments by defining and separating "core" energy efficiency investments (those stand-alone projects where the delivery of energy savings is the lead driver) and "integral" energy efficiency investments (where overall asset performance is the lead driver, yet multiple benefits -including improved energy performance- are delivered by an incremental "embedded" investment). The Toolkit also provides insights into national policy developments, showcasing good practices, as well as an insight into policy tracking databases, using the *Voluntary Energy Efficiency Investment Principles* as a frame for their comparison. Finally, the Toolkit reveals how public and private sector financial institutions are tackling the energy efficiency investment challenge, through their commitments, approaches, tools and by sharing the areas that they identify for further joint development.

As no single stakeholder group can deliver the challenge of scaling-up G20 energy efficiency investment challenge alone, this Toolkit provides a collaborative architecture through which G20 policy makers can engage in a structured dialogue with investment providers and jointly develop and deliver the targeted economic, social and environmental benefits that G20 Leaders seek together, in their national interests and for the benefits of the global community. The value to G20 policymakers of this Toolkit, and its collaborative architecture, is greater than the sum of its parts - precisely because of the network effect created by convening and connecting the multiple stakeholders responsible for its components, and uniting them in the pursuit of a shared objective with benefits for all.

Acknowledgements

The work of the G20 Energy Efficiency Finance Task Group has been a collaborative effort with the fundamental support and committed engagement from its 15 participating country members (Australia, Argentina, Brazil, Canada, China, European Union, France, Germany, India, Mexico, South Africa, South Korea, Russia, United States and UK) under the leadership of its co-chairs France and Mexico. As a key work stream under the G20 Energy Efficiency Action Plan (2014), and with renewed support from the G20 Energy Efficiency Leading programme (2016), EEFTG has benefitted from the visionary direction of its co-chairs France and Mexico and the strong support of the highly committed and resourceful teams at IPEEC, led by Benoît Lebot, and at IEA, led by Brian Motherway.

The daily operation of EEFTG and its technical activities are managed, on behalf of the Co-chairs and the Steering Group, by a small secretariat formed of key individuals selected for their specific technical input and relevant networks that they brought to EEFTG. The members of the EEFTG Secretariat are: Mr Santiago Creuheras Díaz (Ministry of Energy, Mexico), Ms Rocio Palacios Espinosa (Ministry of Energy, Mexico); Ms Clementine Renevier (Ministry of Ecology, Sustainable Development and Energy, France); Ms Ailin Huang (IPEEC); Ms. Annie Degen-Neuville (UNEP FI); and - in the role of EEFTG rapporteur and content lead - Mr Peter Sweatman (Climate Strategy & Partners). Special mention is reserved for Tyler Bryant and Sam Thomas (IEA), Sarah Challe and Martin Schoenberg (UNEP FI), Tatiana Bosteels (for IIGCC) and Mauricio Yrivarren (Climate Strategy), in addition to the EEFTG Secretariat, for their diligent support of various aspects of the co-ordination, organisation and drafting of this Toolkit.

The structure of this Toolkit was presented for comments to the G20 Energy Sustainability Working Group (ESWG) in Berlin and G20 countries were offered an opportunity to review and comment on its contents. Drafting was coordinated by the EEFTG Secretariat and co-delivered by the IEA, UNEP FI and the IPEEC with crucial support, direct inputs and comments from very many International Organizations and collaborators. These entities performed a variety of roles including content provision and review, expert support, convening and hosting EEFTG meetings, workshop coordination, identifying experts, resourcing and networking on EEFTG's behalf. In 2017, EEFTG particularly thanks:

Alliance to Save Energy, French Agency for Environment and Energy Management (ADEME), , Basel Agency for Sustainable Energy (BASE), Bloomberg New Energy Finance (BNEF), CDP (Carbon Disclosure Project), CERES Investor Network on Climate Risk (INCR), China Quality Certification Centre (CQC), Clean Energy Ministerial/ Clean Energy Solution Center (CEM/ CESC), ClimateWorks Foundation, Climate Advisors, International Energy Charter, Energy Efficiency Finance Institutions Group (EEFIG), Energy Foundation China, European Bank for Reconstruction and Development (EBRD), European Mortgage Federation / European Covered Bond Council (EMF/ECBC), Global Investor Coalition (GIC), International Energy Agency (IEA), Institute for Energy Efficiency in Production (EEP) International Energy Forum (IEF), International Institute for Sustainable Development (IISD), Institutional Investors Group on Climate Change (IIGCC), International Partnership for Energy Efficiency Cooperation (IPEEC), Investor Group on Climate Change (IGCC) National Development and Reform Commission (NDRC), Latin American Energy Association (OLADE), Organisation for Economic Cooperation and Development (OECD), Principles for Responsible Investment (PRI), Sustainable Energy For All (SE4All), UN Environment, United Nations Environment Finance Initiative (UNEP FI), UNEP FI Principles for Sustainable Insurance (PSI), UN Environment Inquiry into the Design of a Sustainable Financial System, and the World Bank Group.

EEFTG wishes to acknowledge all of the hard work and dedication from many individuals and institutions who have helped to deliver this Toolkit and key G20 energy efficiency investment outcomes.

Table of contents

Executive Summary	1
Acknowledgements	2
G20 Energy Efficiency Investment Toolkit	4
Summary for Policymakers	6
I. Energy Efficiency Investments: Assessment by Sector and Region	15
II. G20 Energy Efficiency Investment Policy Framework	22
III. G20 Energy Efficiency Investment Toolkit:	
Engaging with Banks, Institutional Investors and Insurers	31
1. Role of Private Sector Banks: Commitments to Actions	34
2. Role of Institutional Investors: Building on the G20 Energy Efficiency Investor Statement	41
3. Role of Insurance Companies: Catalysing energy efficiency solutions and enabling market development through new insurance products and services	51
IV. Role of Public Finance in G20 Energy Efficiency Investment	60
Annexes	67
Voluntary Energy Efficiency Investment Principles for G20 Participating Countries – Implementation, good practice cases and voluntary options	68
EEFTG Background	76
Acronyms and abbreviations	78
Bibliography	81

G20 Energy Efficiency Investment Toolkit

Energy efficiency is a long-term priority for the G20 Leadership from the world's 20 leading economies is critical to double the global rate of improvement in energy efficiency¹ and to better understand and help fill the annual energy efficiency investment gap. Increased G20 collaboration on energy efficiency can drive economic activity, growth and productivity gains, strengthen energy security and improve environmental outcomes. Moreover, since its founding the G20 has offered a strong platform for members to share their accumulated experiences and good practices to accelerate energy efficiency improvements globally.

In July 2016 in Beijing, China, G20 Energy Ministers welcomed the G20 Energy Efficiency Leading Programme (EELP), the G20's first long-term framework for energy efficiency. The EELP builds on the success of the G20 Energy Efficiency Action Plan endorsed by G20 Leaders in November 2014.

G20 EELP calls for enhanced capital flows into energy efficiency investments

- As the world's major economies, the economically attractive opportunity to invest in energy efficiency creates market demand for finance in G20 members that requires enhanced capital flows into energy efficiency investments.
- Like all programmes, energy efficiency needs to be adequately resourced by dedicated human, institutional and financial resources, to allow its deployment at all levels of national and local economies. Support is needed to: i) create an enabling national policy environment; and ii) generate direct investments by public and/or private stakeholders into energy efficiency solutions, systems and technologies.
- G20 members will work to significantly improve energy-efficient technologies and equipment coverage, as well as effectively work to enhance capacity building and the policy and regulatory environment for energy efficiency investments, taking into account different national realities, capabilities and levels of development within countries, and respecting national policies and priorities.

In September 2016, G20 Leaders encouraged members to significantly improve energy efficiency, based on their specific needs and national circumstances, and G20 Energy Ministers recognised the particular opportunity provided by voluntary collaboration to scale-up energy efficiency investment, since financing institutions within the G20 represent the majority of the global financial system. This heightened interest in increasing the rate of deployment of energy efficiency can enhance productivity, improve energy security and enable low carbon growth. While this will require new core energy efficiency policies, it also requires a review of existing energy architecture to better integrate energy efficiency considerations and a market transformation that supports and facilitates energy efficiency investments and expands financing toward energy efficiency-backed products.

The structure of this Toolkit was presented for comments to the G20 Energy Sustainability Working Group (ESWG) in Berlin and G20 countries were subsequently offered an opportunity to review and comment on its contents. Drafting was coordinated by the EEFTG and co-delivered by the International Energy Agency (IEA), United Nations Environment Programme - Finance Initiative (UNEP FI) and IPEEC with direct inputs and comments from other IOs and other G20 work streams, where relevant. The voluntary options presented in this Toolkit comprise tools, actions and case studies, that together present an integrated and sustainable approach towards enhancing capital flows to energy efficiency, and can be taken up by G20 countries voluntarily and in accordance with their national circumstances and priorities and is divided to four sections:

1 One of the three pillars defined by SEforAll to deliver UN SDG #7, SEforALL. (2015). SEforALL provides "strong global framework" for energy SDG – Ban Ki-moon. Retrieved from http://www.se4all.org/2015_09_17_se4all-provides-strong-global-framework-for-energy-sdg-ban-ki-moon
SEforALL. (2015). Our Value Added. Retrieved from http://www.se4all.org/our-vision_our-value-added

1 An assessment of current energy efficiency investment by sector and region

- Global investment in energy efficiency was estimated to be USD 221 billion in 2015, an annual increase of 6%, with over half of this investment occurring in the buildings sector.
- Section 1 of the Toolkit considers energy intensity improvement trends and geographical contexts to frame incremental energy efficiency investment needs and make the case for additional attention from G20 policy makers and markets.

2 Showcase of good practice exchanges on (i) enabling national policy framework design and (ii) implementation of the voluntary Energy Efficiency Investment Principles for G20 participating countries

- An enabling national policy framework is critical to mobilise and effectively channel finance to energy efficiency investments. The *Voluntary Energy Efficiency Investment Principles* (VEEIP) for G20 participating countries offer a guiding framework for designing and implementing policies that stimulate both the demand for and supply of energy efficiency investments and finance.
- Section 2 of the Toolkit identifies gaps and bottlenecks for energy efficiency investment growth, and provides relevant experiences and case studies to address these through an extensive review of existing policies and policy databases through the lens of the VEEIP.

3 Report on “best in class” instruments and approaches to encourage and increase energy efficiency investments among different types of private sector financial institutions (banks, long-term investors and insurance companies)

- Private sector banks, long-term investors and insurance companies are gradually making energy efficiency investments a focus area. This is demonstrated by the energy efficiency declarations and commitments made by 122 banks from 42 countries and the managers of more than USD 4 trillion of long-term investment funds, and the collaboration under the Principles for Sustainable Insurance (PSI). Insurance companies also have a unique facilitating role through targeted energy efficiency insurance products and services improving the risk profiles of investments.
- Section 3 of the Toolkit presents existing financial instruments and approaches that can be applied by different types of private financial institutions to scale up affordable energy efficiency financing across different sectors and regions. The financial instruments and approaches selected have been identified as “best in class” based on results from a survey of banks and the work of UNEP FI, Principles for Responsible Investment (PRI), the Global Investor Coalition (GIC) and PSI.

4 Facilitate consensus building among public banks and development institutions around “best in class” instruments and approaches to scaling-up their energy efficiency activities

- International financial institutions, public banks and multilateral development banks are principals in the promotion of energy efficiency finance best practices, energy efficiency investments and new instruments that can crowd-in other sources and help fill the energy efficiency investment gap.
- Section 4 of the Toolkit presents a joint G20 statement endorsed by leading public financial institutions identifying key areas and collaborative activities that they will undertake to scale up energy efficiency. These include the deployment of technical and project development assistance, alongside targeted energy efficiency credit lines, as well as opportunities to lever retail distribution channels and build capacity and investment activities among local partner financial institutions, taking into consideration countries’ national circumstances and priorities.

Summary for Policy Makers

The G20 Energy Efficiency Investment Toolkit frames the critical challenge of scaling-up energy efficiency investments in a way that is helpful to policy makers by sorting and simplifying these otherwise complex issues into insights and actionable voluntary options for policy makers drawing on the experiences of private and public financial institutions. This G20 Toolkit recognises that joint actions are required from multiple stakeholders (policy makers, regulators, banks, long-term investors, insurance companies and public financial institutions). The Toolkit also recognises that to deliver multiple benefits of energy efficiency to G20 economies, energy efficiency investment needs to increase (independent of source), and energy efficiency financing is a mechanism (means to an end) that, if adequately deployed, can rapidly accelerate the growth of energy efficient business models and therefore enable the scaling-up of energy efficiency investments in buildings, transport and industry where hosts do not have easy access to the necessary investment capital.

A pattern that emerges independently in each section of this Toolkit is the division of investments and policies into three clusters: “core”, “integrated” and “inefficient” (or hidden). Energy efficiency is “core” to certain pure energy efficiency investors, ESCOs, specific energy efficiency standards, programmes or policies, targeted bank lending facilities and energy savings insurance products. Yet energy efficiency is also “integrated” and embedded in green real estate, sustainable investments, green and climate policies, investor ESG or SRI commitments and bank safeguard procedures. However, there are large clusters of on-going incremental investments and policy arenas where energy efficiency is not a primary consideration, but which have implications for energy efficiency outcomes: For example the lock-in of “inefficiency” through non-compliant buildings, plant and vehicles, energy price subsidies, finance instruments and asset designs which do not consider energy performance.

While there is no precise indicator of current trends across multiple sectors in multiple countries, “core” energy efficiency investments appear to represent “single digit” percentages of total investments (e.g. ESCO markets are just 10% of total energy efficiency investments, nearly zero-energy buildings a small % of total global building investment), whereas incremental energy efficiency investment is integrated or embedded in around 30% of assets (depending on region and sector). However, by far the largest proportion of assets (60%) are either inefficient or do not visibly consider energy efficiency. This provides a strong potential to deliver improved economic, social and environmental outcomes.

This Toolkit uniquely draws together learnings from multiple stakeholders engaged in energy efficiency investment, financing and policy-making to provide a single framework of reference for G20 policy makers and market participants to help deliver the multiple benefits available through the scaling-up of energy efficiency investments. In broad terms, the results from “core” energy efficiency policies and investments provide the necessary evidence and tools for countries to strengthen their energy efficiency policy framework and to mainstream “integrated” and “inefficient” segments, and for financial institutions to accelerate the mainstream integration of explicit energy efficiency criteria through a combination of standards, regulations, tools and requirements. The evidence from “core” energy efficiency policies and investments also offers a strong economic rationale to extend policy compliance and implementation resources to ensure that the majority of global infrastructure and asset investments are energy efficient.

Each section of this Toolkit provides insights and analysis from the best available data on energy efficiency investments and policies. Through this analysis, the Toolkit identifies common threads, best practices and delivery tools for G20 policy makers and financial institutions. A selection of over 30 best-practice case studies is provided in a separate annex to this Toolkit.

Conclusion: The collaborative framework provided by this G20 Energy Efficiency Investment Toolkit offers the right flexible and voluntary architecture to continue the joint development and sharing of G20 energy efficiency policy, investment and financing tools and best practices to enhance capital flows to and scale-up energy efficiency investments. Work in the framework of this Toolkit will strengthen G20 collaboration and provide periodic updates for country input and review.

G20 Energy Efficiency Investment Trends

The USD 221 billion global market of identifiable energy efficiency investments are focused in large G20 economies which have a combination of the necessary policies, income levels, institutional support and market sizes to stimulate and foster them. The U.S., E.U. and China represented nearly 70% of global (core and integrated) incremental investments in energy efficiency in 2015.

In the EU, the buildings sector accounted for over 80% of total efficiency investments (with over 90% in Germany, UK and France). In the U.S., buildings represented over two-thirds of energy efficiency investments and in Japan energy efficiency investments in buildings was over half of the total; yet in India, buildings represented just 19% of total investment, with 34% in China, and 15% in the rest of the world. Emerging economies had a larger share of efficiency investment in industry and transport sectors, with China, for instance, accounting for over 40% of global energy efficiency investment in light-duty vehicles (LDVs).

The largest source of “core” energy efficiency investments is the market for energy performance contracts (EPCs) which totalled USD 24 billion in 2015². EPCs, however, accounted for just 10% of the larger “integrated” energy efficiency investment market which, depending on the sector and region, is ca. 30% or less of total identifiable asset investments.

While the global energy intensity improvement of 1.8% in 2015 was three times greater than the decadal annual average of 0.6%, between 2003 and 2013, G20 energy intensity improvement must accelerate significantly. The IEA notes the need for it to further increase to 2.6% immediately and continue improvement at this rate until 2030, which is broadly in line with SEforAll’s call to double the rate of global energy efficiency improvement. This implies a considerable increase in energy efficiency investments which, at a time of limited public investment capacity, requires a historic mobilisation of capital from public and private sector financial institutions. An enabling policy framework, which seeks to embed energy efficiency across multiple investment segments, is crucial to achieving this.

However, absolute incremental investment levels can follow a similar path as total investments in renewables, where steep declines in the cost of renewables technologies have led to decreasing investment levels per MWh but greater deployment

of total renewables capacity. As energy efficiency supply chains adjust, technological improvement will accelerate and economies of scale will reduce costs, lowering the cost of delivery of energy savings and incremental investment needs. This is an effect that is already being observed in some key product categories, such as LEDs, and was driven by enabling policies which integrate support for energy efficiency investments across target sectors.

Most investments in energy efficiency occur without using specialised energy efficiency financing mechanisms, such as the self-financing of efficient air conditioners, energy renovations, industrial retrofits or electric vehicles, and cannot be measured by observing energy efficiency finance flows. This also means that current energy efficiency investment is supported by the existing sources of finance available to investors. Yet, where energy efficiency alternatives are only attractive when observed over the asset’s lifetime, new tailored low-cost finance mechanisms, supportive policies and business models which make them visible and accessible to asset owners, are critical to enable these owners to make the energy efficient choice over the “cheap” one.

Split incentives, poorly understood performance risks and the disaggregated scale of most energy efficiency investments hamper demand for these investments within the limits of conventional financing mechanisms. New technologies mechanisms that reduce transaction costs, like smart metering, on-bill finance, energy savings insurance and cost reductions in the underlying energy efficient technologies can help overcome these barriers.

The fast growing debt market for green bonds provides a useful example: While in 2015, green bonds financed just USD 8.2 billion of energy efficiency investments (less than 5% of the total energy efficiency market), banks were able to have significantly improved access to this new source of finance if they more aggressively identified and tagged the green characteristics of the assets on their balance sheets. Regulations which support the greater visibility of bank assets’ energy performance will help financial institutions to prioritise this internal identification and subsequently grow the market for green bonds in a virtuous circle, delivering greater energy efficiency investment to private and public investors.

Investment Trends Conclusions: G20 energy intensity improvement must accelerate significantly in coming years and an enabling policy framework, which embeds energy efficiency across multiple investment segments is crucial to achieving this. As energy efficiency supply chains adjust, technological improvement will accelerate and economies of scale will reduce costs and new data, smart meters and business models with tailored finance can reduce transaction costs and aggregation. Regulations which support the greater visibility of bank assets’ energy performance will help financial institutions to prioritise energy efficiency investments.

G20 Energy Efficiency Investment Policies

In 2015, the *Voluntary Energy Efficiency Investment Principles* (“Principles”) were developed based upon the experiences of G20 Participating Countries and welcomed by G20 Energy Ministers. These Principles provide a robust framework through which to assess G20 policy progress to scale-up energy efficiency investments, evidenced through the results of the 2016 EEFTG global expert survey. The degree of implementation of the Principles was assessed through this survey and through analysis of eight policy databases containing in aggregate 10,000 global policy records.

While the coverage of the policy types included in the Principles is reasonably high - between 40-80%- it is surprising to see that none of the eight global policy databases has 100% coverage of the Principles, nor is it straightforward to sort the 10,000 policies which are recorded into the five policy categories identified in the Principles as supporting energy efficiency investments. This suggests that energy efficiency investment and finance, as a cross-cutting category, was not considered in the design of the current database tools available to policy makers to track policy developments in this area.

In terms of relative policy intensity of energy policies that support energy efficiency investments, EEFTG was able to map just 55 (3%) of core policies against the Principles for G20 nations in the IEA’s Policies and Measures (PAMS) database². This number would be 280 (or 80% higher) if EEFTG could identify a policy for each of the sub-Principles and every G20 nation in the vEEIP in PAMS, indicating plenty of opportunity for progress on both implementation and PAMS. This analysis, while imperfect, is also supported by the findings of the expert survey which indicates that there are areas for policy improvement identified by the Principles.

EEFTG work identifies key G20 policy gaps that correspond to Principles 2 (systematic balance of demand-side with supply-side policies), 3d and 3f (aggregation, standardisation and bundling support, and investment pipeline development assistance, respectively), 4a and 4e (accounting and regulatory treatment for EEI and blending public finance to lever private sector finance for EEI, respectively) and Principle 5 (building awareness and the use of voluntary targets within financial institutions).

Conclusion for policy makers: Continued implementation work on the Voluntary Energy Efficiency Investment Principles is recommended, with a focus on the areas highlighted through the “gap analysis” in this Toolkit. Countries can consider jointly developing further tools by Principle in these areas in annual revisions of this Toolkit. At the same time, the proven engagement mechanisms and bilateral approaches, led by EEFTG and its IO partners, can be reinforced and focus on the areas and tools highlighted by the G20 energy efficiency investment policy analysis. Finally, global policy databases are important tools for countries to take stock of and track progress. Improving data quality and search functions on existing policy databases would enhance G20 nations’ abilities to track and report progress on the G20 Energy Efficiency Investment challenge.

² PAMS is one of the oldest policy databases (launched in 1999) and covers c. 2,000 energy efficiency policies in 117 countries with extensive coverage of G20 countries. IEA. (2017). Policies & Measures Databases. [Website]. Retrieved from <https://www.iea.org/policiesandmeasures/>

Private Sector Contributions: Role of Private Sector Banks

Energy efficiency is not a defined financial asset class but is present in all manner of assets and across all forms of investment that use, transform or have embedded energy. This fundamental, “integrated” nature of energy efficiency, as seen from a financial perspective, means that “core” energy efficiency investment remains a niche market (small percentage of portfolios and business). However, incremental energy efficiency investments are (or should be) integral to large proportions of corporate investments, retail banking loans, public and private real assets (e.g. infrastructure), real estate and industrial investments.

Private sector banks have a collective balance sheet sized at well over USD 110 trillion, with long-term institutional investors managing USD 70 trillion and insurance companies (as the largest subset of institutional investors) around USD 31 trillion. To engage with as many and diverse a set of private sector financial institutions as possible, EEFTG has levered its relationships with formal networks³ and has developed commitment tools that, to date, 122 private banks and more than USD 4 trillion of institutional investors are using to embed energy efficiency considerations more deeply in their activities, in support and implementation of Principle 5 of the Voluntary Energy Efficiency Investment Principles.

In 2016, 818 companies (35% of the 2,300 global companies reporting to CDP) reported having undertaken an average of 2.9 energy efficiency projects each. In addition, 89 major companies that spend USD 2.7 trillion with over 2,500 suppliers saved USD 12.4 billion, of which half resulted from energy efficiency actions.

Yet evidence suggests that most companies are still focused on energy efficiency investments with a payback period of 3 years or less. This conclusion is echoed across all G20 countries, including Europe, the U.S., China, India, South Africa and Mexico. Economic returns do not seem to be a barrier for energy efficiency investments, so the Toolkit explores how financial institutions can play a role to unlock and improve energy productivity and the visibility of their assets’ energy performance.

EEFTG surveyed the leading banks making commitments to scale up energy efficiency to better understand their approaches. These banks start with a specific policy, strategy or target for the financing of energy efficiency -either standalone or as part of a larger sustainability or climate strategy. Nearly all of these banks (84%) indicated that energy efficiency finance has strong business potential and they identified the key drivers of energy efficiency business growth as including: energy prices, an anticipation of carbon taxes, public incentives, awareness, and the greater availability of technologies and professionals. Most of the banks active in energy efficiency finance focus on real estate and consumer and corporate lending, with two-thirds having at least one dedicated energy efficiency finance line or service. However, just one third of these banks take into account energy savings in credit terms and a similar proportion, or less, track the energy performance of their assets by category (real estate, industry, etc.).

Bank Conclusions for policy makers: The lessons of the “core” 122 banks – which represent less than one percent of all banks- committed to scaling-up energy efficiency activities can be enhanced and promoted to encourage the wider integration of energy efficiency into mainstream bank financing activities. Visibility of asset energy performance is key theme among core banks, as is having a bank-wide energy efficiency policy. The real estate and consumer and corporate lending departments should find ways to integrate the multiple economic benefits of energy efficiency for their customers into their regular finance products, thereby stimulating demand and enhancing their customers’ creditworthiness and resilience to energy shocks. Finally, banks can increase their use of “green tagging” as a mechanism to better track and report on the energy and environmental performance of their assets, also giving them expanded access to new financing markets (like green bonds) and enabling greater levels of transparency and disclosure.

³ UN Environment Finance Initiative (UNEP FI), the Principles for Responsible Investment (PRI), CDP, Investor Network on Climate Risk (INCR), Institutional Investors Group on Climate Change (IIGCC), Investor Group on Climate Change (IGCC) and UNEP FI Principles for Sustainable Insurance Initiative (PSI Initiative)

Private Sector Contributions: Institutional Investor Insights

Institutional investors can help scale-up energy efficiency investments in buildings, industry and SMEs by allocating long-term capital to the most efficient listed and private assets, and by directly engaging with their corporate investees to improve their energy efficiency. Leading institutional investors, managing over USD 4 trillion, share a common understanding of the positive economic and social benefits of energy efficiency and recognise the need to fully embed energy efficiency into their investment processes. This “core” group of 40 investors (representing around 5% of the sector by assets) are integrating energy efficiency considerations across their investments in different asset classes.

One of the main obstacles in assessing the effectiveness of institutional investors in capturing energy efficiency opportunities is finding out how energy efficiency information is integrated into investment practices and investment vehicles implicitly or directly. 60% of the 1,061 PRI reporting investors in 2016 considered climate change to be a long-term risk to investments. Energy efficiency is only implicitly integrated into such activities. One third of the managers reporting “optional indicators” for environmental and social themes to PRI referenced “green buildings” and “clean energy”, while just 15% referred directly to energy efficiency.

To improve institutional investor transparency, the PRI announced that it will align the PRI Reporting Framework with the final FSB Task Force Recommendations.

The task force targets disclosure to allow users to understand better the links between energy externalities and financial performance, thereby enabling improvement in the efficiency of their capital allocation. The task force identifies energy efficiency as a key opportunity for investors and a key component of its resource efficiency category.

Institutional investors have also started to embed energy efficiency considerations into their company assessments and corporate engagements, the better to raise the profile and visibility of energy efficiency. This Toolkit highlights the energy productivity tools and analysis that help reveal “best in class” company performers and uncover missed opportunities for improved profitability around which they can engage as shareholders. Investor-led collaborative corporate engagement activities are effective tools that can scale up energy efficiency investments. As real estate investors have a particular role to play in driving energy efficient real estate, UN Environment Finance Initiative, ASBEC and other partners have developed specific tools offering simple frameworks for capturing energy efficiency opportunities into each stage of real estate investment processes, accompanied by detailed case studies of investors implementing each step.

Institutional Investor Conclusions for policy makers: There needs to be better explicit measurement and reporting of energy productivity as it remains embedded in broader themes. More work is therefore required to make energy efficiency explicit and visible within investor and company disclosures. The FSB Task Force Recommendations provide an opportunity to scale up the existing voluntary work developed by the investment industry. G20 policy makers can continue to highlight these voluntary best practices, support and strengthen the visibility of energy efficiency investments in investor disclosure work and support those investors making commitments to scale-up energy efficiency investments. A consistent and appropriate regulatory framework for real estate and industry, through building codes, standards and mandatory certification schemes, would broaden coverage to a wider range of smaller investors in the heterogeneous investment industry.

Private Sector Contributions: Role of Insurance in De-risking Energy Efficiency

Insurance companies have a unique perspective, both as institutional investors managing USD 31 trillion of assets and as insurers of the uncertainties and risks relating to extreme weather events and climate adaptation. Insurance products and services can help remove technical uncertainties that can allow banks and non-specialist investors to focus on credit, process and corporate risks. Insurers can help increase energy efficiency investments through improved risk profiles of the underlying projects, through products like energy savings insurance, and also improve the understanding of these risks, through the need for more robust data and greater trust in the market for energy efficiency solutions. The high data intensity requirements for insurance products creates a requirement to augment the evidence base showing that projected energy savings will materialise and to reduce transaction costs.

Energy efficiency investments are often hampered by the uncertainty associated with risks in terms of the assets installed, the revenues resulting from the project, and the energy savings generated. In scaling-up energy efficiency investments, all these risks need to be addressed and better understood. The transfer of risks to insurance companies can lower the cost of carrying this risk and – by improving the risk profile of the project – lower the cost of capital. Energy savings insurance of this nature can enable business models for SMEs with limited balance sheets and abilities to write guarantees, even though the quality of their project work may be high.

Insurance Conclusions for Policy makers: Through engagement in the production of this G20 Toolkit, PSI members were given the opportunity to better understand the opportunities for energy efficiency insurance and their potential role in scaling-up energy efficiency investments. The growing awareness and integration of climate-related risks and opportunities by insurance companies can be strengthened by conducive legislative incentives, such as equipment, vehicle and building standards. Subsequent iterations of this Toolkit can encourage insurance companies and platforms, PSI and SIF, to develop a joint G20 insurance commitment to bring visibility to sector leaders and best practices.

Role of Public Finance in supporting the scale up of G20 Energy Efficiency Investments








Public financial institutions have had a leading role in promoting and scaling up energy efficiency investments, with a focus on: showcasing and replicating energy efficiency investment models that lever the partner networks of private retail banks for on-lending to their clients; the identification and implementation of new financial instruments designed to facilitate the replication and scale up of energy efficiency investments; and the identification of internal policies and safeguards that help mainstream energy efficiency investment across all activities of the organisations.

From 2012-2014, six leading public financial institutions invested over USD 7 billion in “core” energy efficiency investments representing 14% of their energy portfolios and 3% of their total investment portfolios, an amount equal to around half their investments in renewable energy. Working with these six and convening another ten public financial providers and stakeholders, EEFTG facilitated a public finance working group designed to identify and build consensus around the role of public finance in scaling-up energy efficiency investments. Public financial institutions do not have the additional amounts of capital required to fill the G20 energy efficiency investment gap, but they do have the patience and human capital to help develop the instruments and approaches required to lever more private capital and support policy makers in creating the regulatory frameworks which deliver the scale-up of energy efficiency investments required.

The public finance working group identified the seven key pillars of a joint G20 energy efficiency statement endorsed by many of its members. This statement provides a basis for continued engagement and joint development for G20 members with public financial institutions working in their geographies or at their behest. Four of the key areas identified for joint development with G20 countries are developed in greater detail in the Toolkit:

1. Increasing direct financing support of policy frameworks which require and promote energy efficiency and drive a life-cycle cost optimal approach to the procurement of new public infrastructure and buildings;
2. Working with stakeholders to increase the amount, availability and simplicity of technical and project development assistance facilities to lever own and partners’ investments;
3. Increasing on-lending activities with retail distribution networks, through partner commercial banks and other retail facing channels, to support aggregation of individual energy efficiency investments and lever on-bill finance and new repayment channels where available; and
4. Ensuring energy efficiency’s central role in the future of mobility, smart cities, energy grids and infrastructure.

Public Finance Conclusions for policy makers: Public financial institutions are working together to build a common understanding of the multiple benefits of energy efficiency and to share best practices in a more structured manner through this Toolkit. G20 countries can work to increase the amount, availability and accessibility of Technical and Project Development Assistance facilities to lever their investments and embrace a life-cycle cost optimal approach to the procurement of new public infrastructure and buildings. Countries can lever the experience of public financial institutions to strengthen policy frameworks for energy efficiency and facilitate aggregation mechanisms and ensure energy efficiency’s central role in the future of mobility, smart cities, energy grids, industry and infrastructure.

		Integrated	Core	
Market	 USD trillions	USD 221 bn	ESCOs (USD 24 bn); “Self-financed”	
Policy	 2000+ policies	Energy subsidies; Inefficient markets; Supply-led planning.	Energy Transition; National Renovation Strategies; Vehicle Fleet Standards; Transparent Energy Planning.	“EE First”; Mandatory targets/ standards; NZEBs; EE Obligation schemes; National EE Action Plans.
				
Private Sector	Banks  \$110tr	Finance undertaken without explicit consideration of energy “externalities” or cost effective energy improvements.	Green tagging; Green buildings lending; green lending; climate lending; Equator principles.	EE mortgages; Building renovation loan; EE credits/loans; EE tagging.
	Investors  \$70tr	Finance undertaken without explicit consideration of energy “externalities” or cost effective energy improvements.	Green tagging and company disclosure; Collaborative shareholder activism; Green funds; Sustainable real estate funds.	EE funds; Energy Productivity Indexes; Own real estate EE renovation; EE tagging.
	Insurers  \$31tr	Product and services without explicit consideration of energy “externalities”.	Green buildings insurance; Climate mitigation insurance and investments; Add- on coverage; Technical assistance, advisory services.	Energy saving insurance; energy performance guarantee; EE advisory services.
	Public finance  \$176 + bn	Finance undertaken without explicit consideration of energy “externalities” or cost effective energy improvements.	Resource Efficiency; Safeguards; ESG & Climate Commitments;	Direct EE Lending; EE Policy lending; EE targets; Technical assistance.
		\$33 bn	\$7 bn	

“The G20 Energy Efficiency Investment Toolkit provides a set of voluntary options to scale-up energy efficiency in G20 economies”

“G20 energy efficiency policies, financing tools and best practices developed through the flexible and collaborative architecture of this Toolkit provides an integrated approach to enhancing capital flows towards energy efficiency”

“Embedding energy efficiency in investment processes through an enabling policy framework is key to accelerating G20 energy intensity improvement”

“Energy efficiency supply chain tightening and technological improvement can drive economies of scale and reduce costs”

“Smart meters and new business models with tailored finance can reduce transaction and aggregation costs”

“Greater visibility of the energy performance of banks’ assets will help them prioritise energy efficiency investments”

“G20 countries show strong progress in implementing voluntary Energy Efficiency Investment Principles”

“Deep-dives by Principle in the voluntary Energy Efficiency Investment Principles is encouraged for groups of participating G20 countries”

“Global policy database analysis indicates areas for improvement for increased transparency and reporting on G20 energy efficiency investment scale-up challenge”

“122 banks lead on the integration of energy efficiency into mainstream bank financing”

“Integrating the multiple benefits of energy efficiency into real estate, consumer and corporate lending products can drive customer demand and improve creditworthiness”

“Having a bank-wide energy efficiency policy and increased visibility of asset energy performance are key themes for banks”

“Banks can increase their use of ‘green tagging’ to better track and report on the energy performance of their assets and get increased access to green bond markets”

“G20 Energy Efficiency Investment Toolkit is a strong vehicle to showcase best practices, strengthen the visibility of energy efficiency in investor disclosure and support investors making commitments to scale-up energy efficiency investments”

“Over USD 4 trillion of investors continue to drive greater visibility and engagement on energy efficiency”

“Energy efficiency remains an embedded theme and requires more explicit reference in company disclosures and investment portfolios”

“Continued G20 regulatory collaboration through building codes, standards and certification schemes can help to engage smaller real estate investors”

“G20 Energy Efficiency Investment Toolkit engagement with PSI members enabled better understanding of opportunities for energy efficiency insurance and insurers role in scaling-up G20 energy efficiency investments”

“Conducive legislative incentives, such as equipment, vehicle and building standards will strengthen insurers’ awareness of energy performance risks”

“Iterations of this G20 Toolkit can work with insurers to develop a joint G20 insurance commitment to bring visibility to sector leaders and best practices”

“Leading public financial institutions have come together to endorse a G20 Energy Efficiency statement with joint development priorities to increase energy efficiency investments”

“The G20 Toolkit provides a structure and focus to public financial institutions for the development of a common understanding of the multiple benefits of energy efficiency and to share best practices”

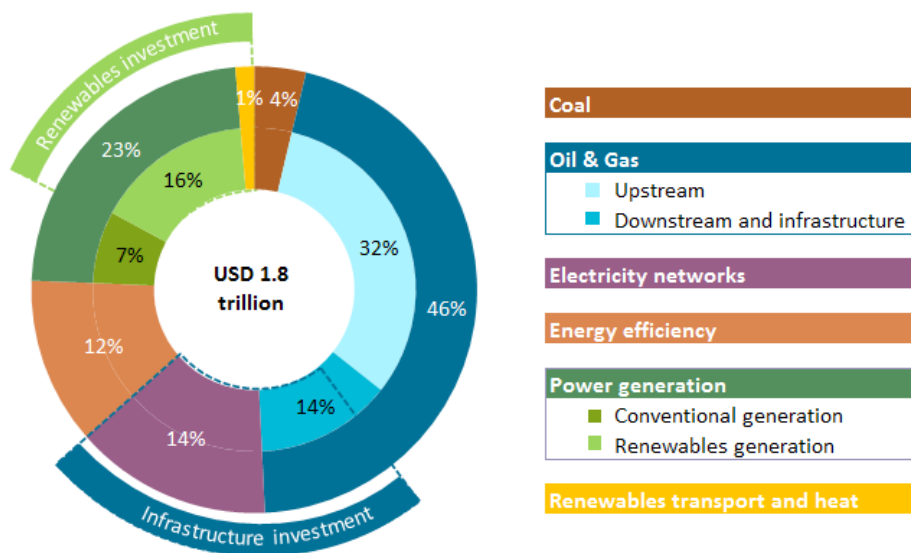
“Increasing the amount, availability and accessibility of Technical and Project Development Assistance facilities and a life-cycle cost optimal approach to the procurement of new public infrastructure are key tools”

“G20 countries can lever the experience of public financial institutions to ensure energy efficiency’s central role in the future of mobility, smart cities, energy grids, industry and infrastructure”

I. Energy Efficiency Investments: Assessment by Sector and Region

Total global investment in the energy sector amounted to US Dollar equivalent (USD) 1.8 trillion in 2015. While the large majority of investments (over 85%), was in the traditional energy supply sectors of fossil fuels and electric power, investment in demand-side energy efficiency was USD 221 billion representing just 12% of total energy sector investment. Notably, energy efficiency investment increased by 6% in 2015 standing out against the energy sector-wide decline in investment of 8%. Figure 1.1 shows these figures:

Figure 1.1 | Global Energy Investment, 2015



Source: IEA, 2016

Defining energy efficiency investment: What is it and why is it different?

Investment in energy efficiency has practical and conceptual differences from investment in energy conversion and supply. Practically, energy efficiency investment does not “produce” units of energy - instead it saves energy. This is done by reducing energy demand from the level it would have reached if less efficient technologies had been used – in other words it produces more output with same energy use. This means that energy efficiency investments can be integrated across all of the energy end-use sectors and each of the energy consuming technologies in those sectors – visibly or invisibly. Investments in energy efficiency are less easily specified than in energy supply.

6 IEA. (2016). World Energy Investments: Executive Summary. Retrieved from <https://www.iea.org/Textbase/npsum/WEI2016SUM.pdf>

7 IEA. (2016). Energy Efficient Prosperity: The “first fuel” of economic development. Retrieved from <https://www.iea.org/newsroom/news/2016/october/energy-efficient-prosperity-the-first-fuel-of-economic-development.html>

Further, an energy efficiency investor can be anyone who finances large building energy retrofit projects to an individual consumer who purchases LED lamps to replace their existing inefficient incandescent lighting.

When tracking investment in energy efficiency it is therefore important to look at energy efficiency from the investors’ motivational perspective. When investing in energy supply, investors are motivated primarily by the returns from supplying energy to consumers. Investments in energy efficiency, however, are often made without the asset owners even being aware that they have done so. Thus many such investments are in effect invisible to investors and policy makers. This is because an efficiency investment occurs whenever energy efficient equipment is chosen whether or not the investor was motivated to improve efficiency. When a consumer replaces their existing car with a new more efficient car, they have inadvertently become an energy efficiency investor. Conversely, a firm may specifically want to improve its energy performance and therefore contract an energy services company (ESCO) to install new systems and share in the energy savings it delivers as part or full compensation over the systems’ lifetime (through an Energy Performance Contract).

This raises the question of whether energy efficiency investments are only investments that have been specifically made to improve energy efficiency – which we describe as “core” – or all investments in which energy efficiency is embedded or integrated. Practically, determining the motivations of all investors is not possible in a systematic way. However, all energy efficiency investments, regardless of motivation are working to improve the efficiency of the energy demand sectors, and for this reason increasing their visibility in general is important. For the purposes of calculating the size and scope of energy efficiency markets, both the ‘autonomous’ and ‘motivated’ investments that improve efficiency are important to determining the full scale of energy efficiency investments and the resulting energy savings.

Investment in Energy Efficiency can be conceived in two ways:	
1. As the total capital outlay for goods and services made in order to reduce the amount of energy needed for the delivery of a particular energy service (whether or not the investment is made with the express intention of improving energy efficiency). This total spend therefore represents the market size for energy efficient goods and services.	2. The incremental difference in the investment costs associated with efficient versus inefficient goods and services. This is defined as “energy efficiency premium” (see text box below) imbedded in or integral to the overall investment. This “premium” is especially relevant when asset owners make energy technology choices that are integrated into their investments, as it is just the incremental premium that generates the energy savings. Additional issues arise as reducing costs of energy efficient alternatives reduce this “premium”, ideally to zero and potentially (with supportive policy frameworks) to a point that efficient choices are cheaper than inefficient ones.

The first concept is described as the “total spend” on energy efficiency and the second is referred to as the “incremental investment.” In the IEA’s (2016) Energy Efficiency Market Report both the total spending on energy efficient goods and the incremental investment are quantified where existing data allows. For example, in 2015 the total spending on energy efficient goods and services in buildings (method 1) was USD 388 billion while the incremental energy efficiency investments in buildings (method 2) were just USD 118 billion. For passenger vehicles the total spending was USD 330 billion (method 1) while the incremental energy efficiency investment (method 2) was USD 34 billion (10%).

Distinguishing these two definitions is important for G20 policy makers, consumers and businesses. The total spend (method 1) represents the market size for energy efficient goods and technologies, a metric important for businesses and financiers interested in entering the energy efficiency marketplace. The incremental investment (method 2) is the additional investment needs that would lead to energy efficiency improvements above business-as-usual levels. The concept of the energy efficiency investment “premium” (or even discount) is most relevant when comparing energy efficiency to other energy sources.

Box 1.1 | Understanding Energy Efficiency “Premium”

A consumer or business that decides to invest in energy-efficient equipment must pay the full cost of the equipment, which can conceptually be divided into two parts: the cost of a new but very standard and less efficient piece of equipment (the “base cost”), and the cost of the added increments of energy efficiency (the energy efficiency “premium”). The base plus this “premium” equals the full technology cost, or the “total spend” in efficiency.

This method works well for equipment: Using refrigerators as an example, the current stock of installed refrigerator units cost on average USD 350 and have an average annual consumption of 840 kilowatt hours (kWh) of electricity. This current stock constitutes the baseline for energy efficiency and determining whether an energy efficiency premium is present. Overtime, new more efficient units become available and are sold in the market and these refrigerators have typically cost more. A consumer who acquires a high-efficiency unit (which consumes 350 kWh per year) may pay USD 600 for this unit. The energy efficiency ‘premium’ in this case equals USD 250, namely the difference between the USD 600 price of the new unit and the USD 350 price of the average ‘base cost’ unit (this calculation assumes that all other aspects of the refrigerator remain unchanged). Even though the energy efficient model requires more up-front investment, the energy efficiency “premium” is paid back in about 4 years (assuming, in part, a price for electricity of about USD 0.16 per kWh). This means that the two alternatives when assessed over the useful life of the refrigerator (say 7-8 years) appear very differently than when judged only by the “initial outlay”.

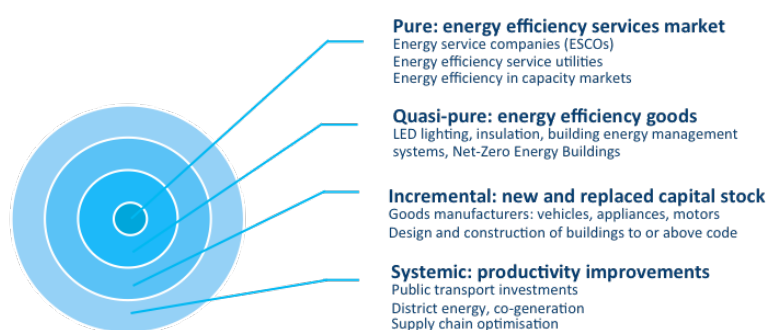
Importantly, some goods have the sole purpose of improving efficiency. This includes building insulation, energy management systems in buildings and industry and variable speed drives for motors. In this case, the full cost of these goods is counted as the energy efficiency premium.

Because energy efficiency is usually an embedded feature of equipment, only a portion of the equipment’s value-proposition is related to improved efficiency, and the delivery of energy savings, compared to other alternatives. Investments in energy supply, however, are all purposed to producing and delivering energy to consumers. In this sense, the entire capital cost of energy supply infrastructure is usually counted as investments in energy supply and only the incremental cost of efficient goods is counted towards energy efficiency investments.

In developing these two methods, IEA further sub-categorised in 2016 the energy efficiency marketplace by revealed investor motivation in order to improve the understanding of energy efficiency activities. The pure market (or “core”), are those investors that are specifically investing in energy efficiency improvements to achieve energy savings. This includes investments by energy services companies and policies that induce investment directly in energy efficiency. The size of the global ESCO market was approximately USD 24 billion in 2015, or a tenth of the USD 221 billion overall market. The quasi-pure market category are core investments in specialised energy efficient products such as LED lighting, energy management systems and nearly zero-energy buildings. Investors in this market may or may not be prioritising energy efficiency gains (as these products also provide a number of other services besides efficiency gains and in some cases, like LED bulbs, products are mandated for purchases eliminating investor motivations).

Thirdly, incremental investments, in buildings sometimes referred to as the “green premium”, represent the bulk of energy efficiency investments. Incremental investments are the regular transactions among consumers and firms to adopt products that are more efficient than their replacements. Whenever a product is purchased that replaces a less efficient product, this is counted as an incremental investment in which energy efficiency embedded. Finally, the systemic investments represent multitude of other investments in infrastructure and technologies that may not have an efficiency component but still lead to high-level efficiency gains such as investments in mass transit, or information and communication technology infrastructure, that deliver energy savings by changing behaviour. These systemic investments are not tracked in the IEA’s estimation of energy efficiency investments though they may have important impacts on the energy intensity of the economy and energy system as a whole.

Figure 1.2 | The Full Marketplace for Energy Efficiency

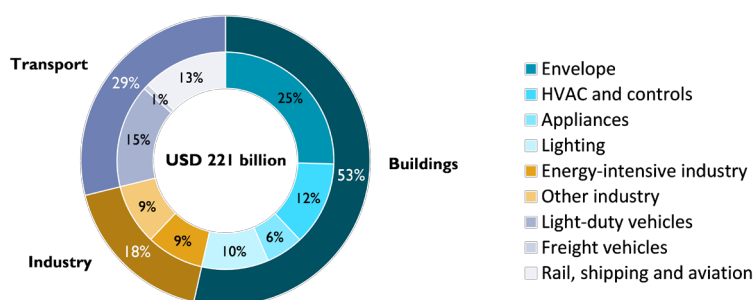


Source: IEA, 2016

Energy efficiency Investments by Sector and Region

The majority of investment in energy efficiency investment occurred in the buildings sector with USD 118 billion⁸ or 53% of all incremental efficiency investment. Transport was the next largest at USD 64 billion. Investment in transport was largely split between the passenger and freight sectors. Industry comprised USD 39 billion with an even split between heavy industry and lighter manufacturing.

Figure 1.3 | Energy Efficiency Investments by Sector (2015)



Source: IEA, 2016

Energy efficiency investment has risen in each sector. Incremental investment in buildings is dominated by spending on existing buildings. In industry the focus is on processes that would not have attracted investment without the energy efficiency intervention. Transport sector incremental investment is highly influenced by the annual volume of new vehicle purchases, changes in the annual cost differential of an energy efficient vehicle and government subsidies for energy efficient and electric vehicles (EVs).

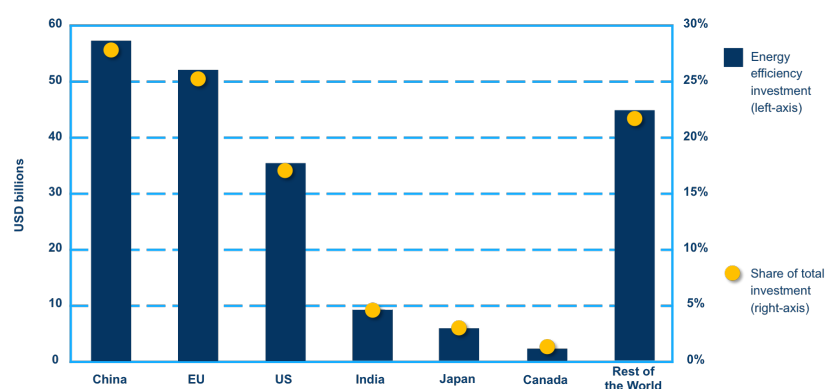
8 IEA. (2016). Energy Efficiency Market Report. Retrieved from https://www.iea.org/eemr16/files/medium-term-energy-efficiency-2016_WEB.PDF

Table 1.1 | Breakdown of Energy Efficiency Investments by Sector

	Total spending	Incremental investment	
	USD billion	USD billion	Change compared to 2014
Buildings	388	118	9%
Envelope	237	56	
HVAC and control	76	27	
Appliances	34	12	
Lighting	41	22	
Industry	--	39	4%
Energy-intensive industry		19	
Other industry		20	
Transport	--	64	3%
Light-duty vehicles	330	34	
Freight vehicles	--	2	
Other transport		28	

Sources: IEA, 2016 with analysis based on data from Navigant Research, Consortium for Energy Efficiency, IHS Polk, IEA 4E Technology Collaboration Programme.

Incremental energy efficiency investments were dominated by large G20 economies which have a combination of the necessary policies, the income levels and the market sizes to stimulate greater investment in energy efficiency. The US, EU and China made up approximately 69% of global incremental investment in energy efficiency in 2015. China leads at USD 57 billion making up over a quarter of global incremental energy efficiency investment. China also had the world's largest "core" energy efficiency market with revenues for energy performance contracts reaching USD 13 billion and made up over 50% of global revenues from these contracts. China also makes up the dominant majority of incremental energy efficiency investment in the transport sector at 41% of global incremental energy efficiency investment in light-duty vehicles (LDVs) followed by the US and EU (the next largest vehicle markets). It should be noted that these "incremental" energy efficiency investments can appear lower than energy efficiency measured using different methods (as described above).

Figure 1.4 | Incremental Energy Efficiency Investments in Selected Regions (2015)

Source: IEA, Energy Efficiency Market Report 2016.¹⁰

9 IEA. (2016). Energy Efficient Market Report. Retrieved from https://www.iea.org/eemr16/files/medium-term-energy-efficiency-2016_WEB.PDF

10 Note: Investments in energy efficiency appliances are excluded in this chart. Investment in Japan and Canada excludes the

There is clear divergence in the sectoral shares of efficiency investment between developed and emerging economies. In the EU, the incremental efficiency investment in the buildings sector eclipsed USD 42 billion and was the dominant sector at over 80% of total efficiency investments. Within the EU, G20 members Germany, the United Kingdom and France made up over 90% of the identified efficiency investments. In Japan, investment in buildings was over half of total efficiency investment. Conversely, buildings represented only 19% of total investment in India, 34% in China and 15% in the rest of the world. Emerging economies have a larger share of efficiency investment¹¹ in industry and freight sectors for which these sectors make up a larger share of gross fixed capital formation.

What do current investment trends indicate for future investment needs?

It is clear that the world needs to significantly step-up the rate of energy efficiency improvement. The IEA (2016) notes that while the 2015 global intensity improvement of 1.8% in 2015 was three times greater than the decadal annual average of 0.6% between 2003-13 it needs to jump again to 2.6% immediately and endure to 2030. Latest analysis shows that energy efficiency investments need to scale up significantly in the long run (by 2050) in order to achieve a well-below 2 degrees scenario¹². This will require more assertive policies and greater market forces to increase the rate of efficiency gains. Consider the passenger transport sector which makes up the bulk of energy efficiency spending in the IEA's policy pathway scenarios. Electric vehicles (EVs) are currently more expensive than internal combustion engine vehicles. The difference in the costs of these vehicles and the assumption of how costs will evolve over time are critical to estimating the future investment needs. If the costs of EVs declines faster than anticipated then that will impact incremental energy efficiency investment needs. Further, other systemic changes occur such as investment in densification of cities and public transit which cost-effectively reduces levels of vehicle ownership and emissions then total investments would also decline.

Qualitatively, investment in the IEA's scenarios is a measure of intensity and commitment to action and clearly, more investment is needed in efficiency. But, actual investments levels could follow a similar path to renewables where steep declines in the cost of renewables have led to shrinking investment levels but greater deployment of total capacity. As supply chains adjust, economies of scale kick-in, and technological improvement increases, the energy efficiency "premium" will reduce and therefore the required incremental investment needs. This is an effect that is being observed for some key product-types and promoted through prioritising energy efficiency investment policies.

Data on vehicle prices suggest that the energy efficiency premium of light-duty vehicles has been declining over the past five years. It is possible that with technological improvement, investments in productive capacity, and shifting consumer preferences that EVs may have lower lifetime costs than current internal combustion engine vehicles. With mass deployment, high efficiency new buildings could be less costly than the average costs of new buildings. Nowhere is the role of declining costs of efficiency as evident than for LED lighting where costs have declined by 90% since 2010 and LEDs which are 75% more efficient than incandescent lighting now look poised to dominate the global lighting market.

Energy efficiency investment is not the same as energy efficiency finance

The Toolkit recognises that to deliver the multiple benefits to G20 economies, it is energy efficient investment which needs to increase (independent of source) and that energy efficiency financing is a mechanism (means to an end) whose adequate deployment can rapidly accelerate the growth of energy efficient business models and therefore enable the up-scaling of energy efficiency investments in buildings, transport and industry where hosts do not have easy access to the necessary investment capital.

11 IEA. (2016). Energy Efficiency Market Report. Retrieved from https://www.iea.org/eemr16/files/medium-term-energy-efficiency-2016_WEB.PDF

12 IEA & IRENA (2017). Perspectives for the Energy Transition: Investment Needs for a Low-Carbon Energy System. Retrieved from http://www.irena.org/DocumentDownloads/Publications/Perspectives_for_the_Energy_Transition_2017.pdf

Identification and differentiation between investments in energy efficiency and energy efficiency finance are important to engage with public and private sector financial institutions. Most investments in energy efficiency occur without using specialised energy efficiency finance mechanisms, a theme highlighted by public and private sector banks (see chapter 3). However, to increase overall flows of energy efficiency investments, financial institutions and policy makers do need to embrace and facilitate new business models that support asset owners and managers make energy efficient choices that are supported by tailored energy efficiency finance mechanisms with the right accounting and regulatory treatment.

The global market for energy performance contracts, the largest specialised “core” energy efficiency finance source was USD 24 billion in 2015¹³, approximately 10% of the total incremental investment market. Green bonds, another fast growing finance source, financed just USD 8.2 billion of energy efficiency in 2015¹⁴, less than 5% of global incremental energy efficiency investment. This means that most current energy efficiency investments are happening with existing sources of finance available to investors. However, where energy efficiency alternatives are only attractive when observed over the asset’s lifetime, low-cost financial mechanisms and the business models which make them accessible to asset owners, are critical to allow consumers to make the energy efficient choice (over the “cheap” one).

Energy efficiency investments are often “self-financed” such as when businesses use their own balance sheets to finance efficiency upgrades instead of using ESCOs or turning to the corporate bond market (green or regular). Conventional sources of finance appear more than adequate and willing to invest in energy efficiency, however the demand for energy efficient products and renovations can be hampered by split incentives, poorly understood performance risks and the disaggregated scale of most energy efficiency investments. This limits how easily conventional finance can treat energy efficiency investments. It also speaks to the role of finding and promoting appropriate business models supported by tailored financial mechanisms to promote energy efficiency, but also other facilitating solutions such as new technologies to reduce transaction costs, like smart metering, to better sort data, identify and aggregate energy efficiency into suitable tranches of finance ready investments.

13 IEA. (2016). Energy Efficiency Market Report. Retrieved from https://www.iea.org/eemr16/files/medium-term-energy-efficiency-2016_WEB.PDF

14 Ibid.

II. G20 Energy Efficiency Investment Policy Framework

In 2015, G20 Energy Ministers welcomed¹⁵ a consensus agreement on the voluntary Energy Efficiency Investment Principles for G20 participating countries. These Principles provide the key elements for the creation of a supportive policy environment for enhancing energy efficiency investments:

Sharing a common understanding of the positive economic and societal benefits of public and private energy efficiency investments, we agree to collaborate and work together, on a voluntary basis, to:

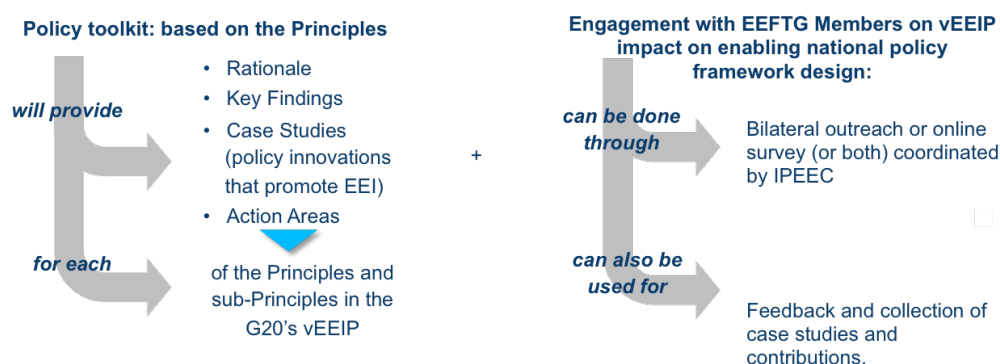
1	Recognise the importance of energy efficiency considerations in all relevant decision making to significantly increase and strengthen energy efficiency investments in our economies in the context of a balanced progression of the three dimensions of sustainable development;
2	Encourage energy efficiency investments and their positive impacts to be systematically considered alongside supply-side investments relating to our energy systems. This can be achieved through consideration of possible reforms relating to decision-making, planning, pricing and regulation of energy and infrastructure investments;
3	<p>Country-level review and consideration of measures and policies which will stimulate demand for energy efficiency investments, including the following;</p> <ul style="list-style-type: none"> a. The provision of clear regulatory and investment signals to encourage the uptake of energy efficiency investments within the development and upgrade cycles of our infrastructure, consistent with national development priorities and strategies; b. Appropriate national and regional incentives and mechanisms that: stimulate improved energy management; support energy efficient investment choices; and improve awareness of the value of energy efficiency investments with key decision-makers; c. Contribute to and facilitate national and, where appropriate, regional mechanisms that make the data needed for energy efficiency measures and investments easily accessible to market participants involved in the development of these investments considering in-country communication protocols and clear systems of labels and certificates; d. Support for the appropriate development, packaging, aggregation, standardisation, bundling and provision of tailored financing for energy efficiency investments through multiple national, regional or local retail channels (such as utilities, financial institution branches, and other retail distribution networks), to deliver a change of scale for consumer and SME energy efficiency investing; e. Review and identify policies at the national and local level that help to accelerate the replacement cycle for “worst in class” facilities and buildings with respect of their relative energy performance; f. Build a pipeline of bankable and replicable energy efficiency projects.

4	<p>Encourage collaboration to identify and explore how to unlock barriers preventing the supply of and access to finance for energy efficiency investments in local markets including:</p> <ul style="list-style-type: none"> a. Reviewing accounting and regulatory treatment for energy efficiency investments, where appropriate, to fairly reflect the net benefits and business risks of these investments; b. Developing national and/or regional standards and policies that will support energy efficiency investment processes in key market segments consistent with regional and national priorities and conditions; c. Developing finance mechanisms, where relevant, that can enhance the creditworthiness of the repayment streams to energy efficiency investments, such as including these repayments within existing payment collection mechanisms; d. Simplifying public support programmes, where relevant for energy efficiency, to enable their efficient combination with and mobilisation of private finance streams to maximise overall funding flows and delivered benefits; e. Involving public financial institutions, where appropriate, to help formulate lending policies to prioritise and mobilise private capital toward energy efficiency investments in the respective countries.
5	<p>Build greater internal energy efficiency investment awareness within public and private financial institutions, expand their use of tailored approaches to structure and facilitate energy efficiency investments, and develop their capacity through the pro-active sharing of good practice. This can be achieved through support for financial institutions which adopt their own systems based upon voluntary energy efficiency investment commitments. These would aim to appropriately govern their own internal decision-making processes, investments in, and interventions to mobilise greater investment in energy efficiency.'</p>

Review of G20 Progress on voluntary Energy Efficiency Investment Principles

This section of this Toolkit provides an update on the implementation of the *Voluntary Energy Efficiency Investment Principles* (“VEEIP”) for G20 Participating Countries, insights and voluntary options for the design of enabling national policy frameworks. Content has been developed through an EEFTG country-level expert survey, review of eight energy efficiency policy databases and bilateral consultations with various G20 EEFTG members.

Figure 2.1 | Incremental Energy Efficiency Investments in Selected Regions (2015)



Global databases are important tools for countries to take stock and track their progress in designing and implementing an enabling policy framework for energy efficiency investments as well as for investments themselves. EEFTG has reviewed nine existing policy databases to assess their coverage of the policy areas indicated in the vEEIP. Each database has international coverage yet a different geographic and sectoral focus as well as varying categorisations, degrees of comprehensiveness and functionality (eg. Search functions).

Table 2.1 provides a summary of each of the databases with key traits and how well their policy mapping covers the voluntary Energy Efficiency Investment Principles:

Table 2.1 | Summary of international Energy Efficiency Policy Databases

Database	Overview	Key traits
IEA PAMS ¹⁶	Coverage: Global # of policies: 1923 %of coverage of VEEIP: ca 60%	<ul style="list-style-type: none"> Provides global coverage with an advanced search system, yet coverage is uneven across countries (depending on data availability). Lacks full assessment of policies on EE finance (particularly supply drivers from vEEIP Principle 4).
World Bank RISE ¹⁷	Coverage: Global, covering 111 countries # of policies: N/A %of coverage of VEEIP: 80%	<ul style="list-style-type: none"> Provides a detailed global scorecard of indicators to help compare national policy and regulatory frameworks for sustainable energy that are important to mobilising investment. 12 indicators for energy efficiency, which cover most of the VEEIP, including demand and supply drivers of EE investment, but lacks reference to principle 2. Tracks countries' policy progress and allows users to easily compare scores of countries. Indicators that are fed through an extensive questionnaire provide a great overview of policies in place and to track policy progress, but does not provide more detailed description of individual policies in place, which other databases (e.g. PAMS and MURE) afford.
Odyssey MURE ¹⁸	Coverage: EU # of policies: 1,369 %of coverage of VEEIP: ca 40%	<ul style="list-style-type: none"> Policies broken down by topics with very detailed accounts and links to summaries of every policy measure registered. Presents percentage coverage of policies across different topic with a helpful overall structure European focus, lacks global coverage.
World Energy Council ¹⁹	Coverage: Global # of policies: ca 1000 %of coverage of VEEIP: ca 60%	<ul style="list-style-type: none"> Provides useful global macro-survey of where countries stand on institutionalising EE in national policy (targets, EE agency etc.). Extensive database is particularly strong on regulatory instruments such as standards and labels (prepared by ADEME and ENERDATA).
REEGLE Policy Database ²⁰	Coverage: Global # of policies: ca 2000 %of coverage of VEEIP: ca 50%	<ul style="list-style-type: none"> Offers detailed country profiles, including overview of regulatory framework and barriers, yet is hard to search and compare EE policies across different countries. Useful for users seeking to gain deeper knowledge about countries' wider energy context and general regulatory framework.
Clean Energy Solutions Centre ²¹	Coverage: Global # of policies: Many 1000s %of coverage of VEEIP: ca 70%	<ul style="list-style-type: none"> Wide coverage, including drivers of supply of EE finance. Searches can be conducted by sector or by policy, but not by country or EE by itself as EE data is combined with other clean energy measures. It is unclear whether all 'policy' measures listed are (sub) national policies or projects and programmes.

Institute for Industrial Productivity ²²	Coverage: Global, covering 15 countries # of policies: ca 150 %of coverage of VEEIP: ca 70%	<ul style="list-style-type: none"> • Content is limited, yet it has a very good coverage of vEEIP for industry, and is now managed by Copenhagen Centre on Energy Efficiency. • Searches can be conducted by country and the database provides a useful policy pyramid which allows to track progress of the policy framework stands in terms of: a) Effort defining; b) Supporting measures; and c) Implementation toolbox. • This IIP industry database also provides a useful policy timeline.
UNIDO ²³	Coverage: Global # of policies: 258 %of coverage of VEEIP: ca 40%	<ul style="list-style-type: none"> • Provides a sector focus on industry ordered by type of policy/ project measure (informational, institutional and regulatory, technological, financial) with highly granular categorization. • Search function can only order the columns alphabetically or by year.
ACEEE ²⁴	Coverage: US & Global # of policies: N/A %of coverage of VEEIP: N/A	<ul style="list-style-type: none"> • Database has an EE scorecard and ranks cities and states based on precise EE indicators. • International EE scorecard approach allows users to compare countries also quite easily.

In addition, DEEP²⁵, Europe's largest new investment project-level database contains over 7,800 data-points from real energy efficiency investments in buildings and industry illustrates the practical results of these policies in the EU. One of the oldest of these databases (launched in 1999), holds some of the most comprehensive coverage of energy efficiency policies in G20 countries. This IEA Policies and Measures (PAMS) database is updated twice a year, by the IEA and the International Renewable Energy Agency (IRENA), using information supplied directly from member governments covering 117 countries²⁶ with information on nearly 2,000 energy policies²⁷.

A review of the 2,000 policies in the PAMS database, focused on G20 countries, in combination with the results of EEFTG's 2016 global expert survey, permits a mapping (Table 2.2) of the 55 PAMS policies which correspond to the principles and sub-principles of the vEEIP in G20 nations and allows for the initial identification of the areas for greater policy activity.

21 Clean Energy Solutions Center. (2017). Retrieved from <https://cleanenergysolutions.org/>

22 Institute for Industrial Productivity. (2017). IPP Industrial Energy Efficiency Databases. Retrieved from <http://www.iipnetwork.org/>

23 UNIDO. (2017). Statistical Databases. Retrieved from <http://www.unido.org/resources/statistics/statistical-databases.html>

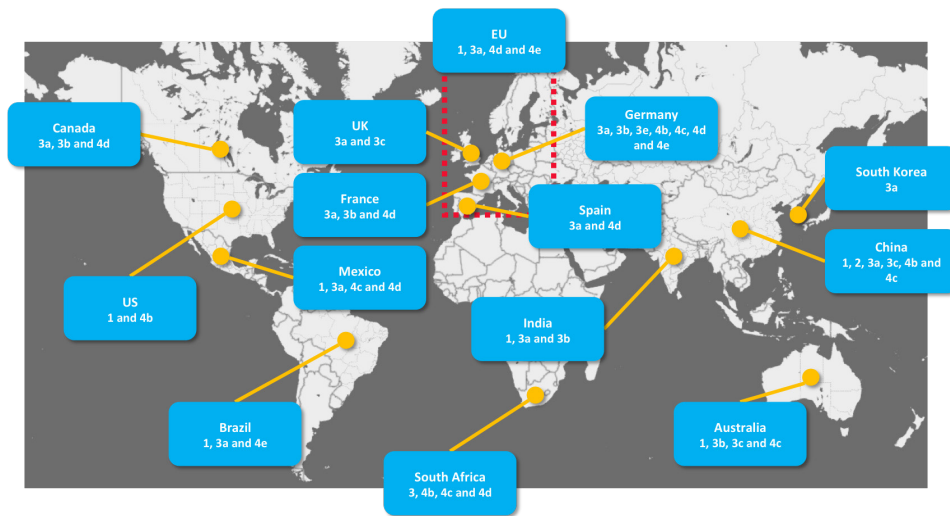
24 ACEEE. (2017). State and Local Policy Database. Retrieved from <http://database.aceee.org/>

25 DEEP. (2017). De-Risking Energy Efficiency Platform (DEEP). Retrieved from <https://deep.eefig.eu/>

26 IEA. (2017). Policies & Measures Databases. Retrieved from <https://www.iea.org/policiesandmeasures/>

27 Ibid.

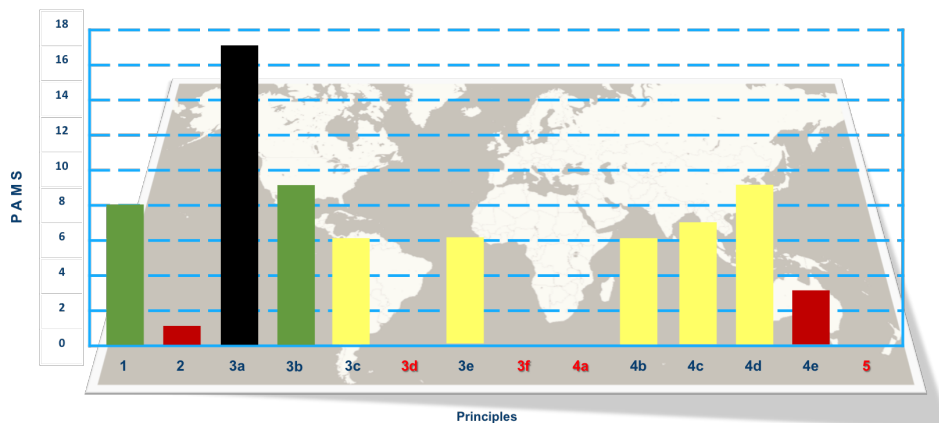
Figure 2.2 | Map of 55 PAMS policies coinciding with vEEIP definitions for G20 Countries



Graph by EEFTG based on data from IEA, 2017

If the PAMS data is then sorted by principle and sub-principle of the voluntary Energy Efficiency Investment Principles for G20 participating countries, it provides an approximate view of those Principles and sub-principles that are widely implemented in existing policies (the taller columns in Table 2.3) and therefore identifies the gaps where further progress can be made:

Figure 2.3 | Concentration of PAMS policies in the vEEIP Framework for G20 countries



Graph by EEFTG based on data from IEA, 2017

To identify best practices, classify case studies and review the state of implementation of the voluntary Energy Efficiency Investment Principles for G20 participating countries, EEFTG combines an analysis of the PAMS data with the 2016 EEFTG expert survey results in a detailed Principle by Principle review included in the appendix of this Toolkit. The following (Table 2.4) is a summary of G20 participating country progress in the implementation of their energy efficiency investment policy frameworks:

Table 2.2 | Guide to G20 implementation of voluntary EE Investment Principles

1	<p>Principle 1 is an area where G20 countries are more advanced. Many countries already recognise energy efficiency within their broader national decision-making processes and strategies, with some having embedded this through concrete quantitative targets and/or an energy efficiency law and corresponding action plan for implementation.</p> <ul style="list-style-type: none"> • However, in general, the framework is most advanced for large energy intensive industries, with a strong potential for improvement in all sectors.
2	<p>Principle 2 requires action by policy makers as energy efficiency opportunities are inadequately reflected in lower level planning processes and regulation of energy markets.</p> <ul style="list-style-type: none"> • Opportunities exist through improving the systematic integration of energy efficiency in generation capacity planning and transmission infrastructure, energy markets and general infrastructure investment planning and scenario analysis. In addition, this perspective is required to prevent “over build” and reduce the risk of stranded assets - for this reason, the Toolkit provides a “deep dive” on Principle 2 in this section.
3	<p>Principle 3 implementation requires a multi-sectoral framework of complementary policies and instruments to stimulate the demand for energy efficiency investments across multiple sectors. Survey results and an assessment of PAMS underlines that members are experienced in the provision of regulatory signals and incentives. However, there remains significant potential to improve their design and drive new energy efficient business models.</p> <ul style="list-style-type: none"> • Many of the drivers for demand in energy efficiency investments are still under-developed and this is a high impact action area for G20 policy makers to consider. • Actions include the provision of easily accessible data platforms, support for appropriate project development, project packaging, aggregation and standardisation and channelling tailored financing through a variety of retail channels as well as providing policy support to stimulate the building of project pipelines.
4	<p>Principle 4 provides insights into the drivers of the supply of energy efficiency financing. There are a range of opportunities that can enhance the supply of energy efficiency finance through appropriate instruments, tools and facilities.</p> <ul style="list-style-type: none"> • Analysis suggests that the areas for improvement with the most potential include a framework of standardisation for energy efficiency investment processes and a diversification of the portfolio of tailored finance mechanisms.
5	<p>Principle 5: Public financial institutions play a critical role in mobilising capital for energy efficiency investments – both by re-allocating investments within their own portfolios through policy lending, providing capacity building and technical assistance, as well as using a variety of available financial instruments to crowd in private finance and reach through partner banks.</p> <ul style="list-style-type: none"> • Energy efficiency investing practices have been highly fragmented across those public financial institutions with significant potential for mutual cooperation and replication of best-in-class public-private syndication and on-lending models.

This analysis is in line with the overview of country’s policy progress according to the World Bank’s RISE indicators (Regulatory Indicators for Sustainable Energy), which are updated biannually. RISE indicators enable countries insight into their policy progress and highlight successful actions that governments can take to enhance their frameworks to support energy efficiency programming and implementation. On energy efficiency alone, RISE has twelve indicators, which are fed through data from an extensive questionnaire. In 2016, RISE issued a report, which captures the policy progress of 111 countries’ (including many G20 members) and identifies potential gaps in their frameworks. The global overview and insights generated complement the IEA PAMS database well, which offers a more detailed overview of individual policies implemented in countries.



Developing Tools to Systematically Balance Demand-side with Supply-side Investments (Principle 2)

The Toolkit assessment identifies the need to scale-up G20 policy activity under VEEIP Principle 2: The systematic consideration of demand-side energy efficiency investments. This is a core driver of lower future energy consumption, energy infrastructure, energy imports and generation needs and is taking root in some G20 countries through the regulatory development of energy efficiency as the “first fuel” and the “efficiency first principle”. The “efficiency first” principle (1) ensures that the cost-benefit of energy efficiency is systematically evaluated against alternative options, however the detailed energy market regulations and national planning systems in most G20 nations are yet to be fully adapted to this “cost optimal” approach. Principle 2 is one of the VEEIP where experts and countries see the most potential for development.

Energy efficiency opportunities are often recognised in high level public policy processes, however experts consider that it remains easier to raise finance for supply-side investments than demand-side, as these may not be properly reflected in the lower level planning instruments and regulation of energy markets. Some EEFTG members (eg. EU and Canada) are developing the principle of “energy efficiency first», cutting across diverse regions’ energy markets, to embed cost-optimal decision making. Raising the profile of assessing energy efficiency first in the energy planning processes results in better cost-benefit analysis and to the increased mobilisation of investments through tailored financial mechanisms and products and better strategic allocation of public and private investment funds.

Building on Principle 2 of the *Voluntary Energy Efficiency Investment Principles* for G20 participating countries, there are potential tools, or policy elements, that can turn this principle into more effective public policy across participating G20 nations and beyond. Core to achieving this is the need for energy efficiency to receive a regulatory treatment as a tangible resource, not just the absence of demand. This involves acquiring energy efficiency in ways that are equivalent to the manner in which economies acquire traditional or renewable energy supplies (e.g power purchase agreements or capacity auctions).

Table 2.3 | EEFTG’s Approach to Principle 2 Tool Development:

<p>Identify the high-level approaches that help turn the ideal of a balanced approach to demand and supply side investment into a governance principle, these include:</p> <p style="text-align: center;"></p> <ul style="list-style-type: none"> • Energy Efficiency First principle in Europe • History of “least-cost” utility planning in the US • The “loading order” in California • Energy conservation first in Canada 	<p>Identify priority areas to be addressed by the toolkit where decision-making, policies and regulation typically result in:</p> <p style="text-align: center;"></p> <ul style="list-style-type: none"> • Energy efficiency resources being overlooked relative to supply-side energy resources.
---	---

Recognising the varying national energy contexts and the diversity of G20 countries, particularly key factors such as the extent of energy market liberalisation, tailored policy approaches are necessary. Attention is also needed around the effective management of risk, uncertainty, trade-offs and the rebound effect. To develop detailed tools for G20 countries to begin a detailed assessment of their progress against Principle 2, there are some key policy areas and questions which can be considered in Table 2.4:

Table 2.4 | EEFTG's Approach to Principle 2 Tool Development:

Reforms to energy system planning practices.	<p>These include network planning and resource adequacy assessment methodologies. Effective reforms can prevent energy regulators and power system operators over-procuring and over-paying for energy supply and services.</p> <ul style="list-style-type: none"> • This is particularly important to reduce the risk of stranded fossil assets. • In countries with goals to increase energy access, such reforms could help energy supply reach many more consumers for the same public funds.
Improving policy planning practices and impact assessment rules.	<p>Energy policy planning tools often use discount rates, cost curves, resource adequacy rules, and risk values that favour supply-side solutions. These tools need to be examined and adjusted to ensure that they do not systematically undervalue efficiency resources. Externalities and multiple benefits also need to be fully assessed and incorporated into decision-making.</p>
Cost-benefit assessment and public finance of energy infrastructure.	<p>New, additional, large-scale energy efficiency investments should be considered alongside energy supply infrastructure assessments and new long-term fuel supply contracts.</p> <ul style="list-style-type: none"> • Public funds can go further in serving consumers, through lower bills and through increasing energy access in developing economies, if both supply-side and energy efficiency resources can compete for this public funding earmarked for developing the energy system. • Examples include: Strategic Environmental Assessment (SEA), Regulatory Impact Assessment (RIA), and Impact Assessments that assess the environmental, economic, and social consequences of major proposals.
Reforms to the regulation of power and gas distribution companies.	<p>Energy efficiency can result in net revenue erosion in both monopoly systems and in competitive retail environments – regulated revenues can be restructured to ensure that such companies are strongly motivated to deliver efficient energy systems.</p>
Capacity markets in liberalized power markets.	<p>Where capacity markets exist, their design often excludes energy efficiency resources but evidence from US capacity markets, which allow energy efficiency resources to fully participate, shows that consumers have saved billions of dollars²⁸.</p>
Improving the cost-effectiveness of energy policies.	<p>Policies can risk favouring relatively expensive supply-side solutions to lower emissions, while missing opportunities to reduce emissions at lower cost through energy efficiency investments.</p> <ul style="list-style-type: none"> • Reforms to energy planning policies and mechanisms could tap efficiency savings to lower the cost of meeting climate goals.

Framework and Approach to Develop G20 Energy Efficiency Investment Policy Tools

Policy databases are an important means to track policy progress and identify areas for improvements in the policy frameworks of individual countries. There is room to improve the structure and framework of existing policy databases to better enable the access and exploitation of the tremendous knowledge they contain. G20 participating countries may consider investing to strengthen the IEA's PAMS database to improve its coverage, and the visibility, of the policies described by the voluntary Energy Efficiency Investment Principles for G20 participating countries.

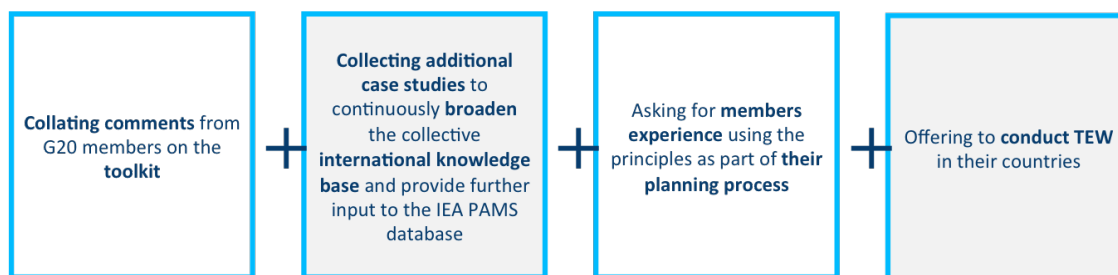
EEFTG has developed a series of engagement tools with its IO partners and participating G20 countries. These include the reception and preparation of case studies, bilateral and multilateral finance and investment stakeholder engagements, in-country multi-stakeholder “Technical Engagement Workshops” and the on-going support of global networks of financial institutions. These engagement tools have substantially contributed to the development of this G20 Toolkit as illustrated in Table 2.5.

Table 2.5 | EEFTG’s Tools for Bilateral Engagement with G20 Countries

<p>I</p> <p>Supporting the development of an enabling national policy framework</p> <p>↓</p>	<p>II</p> <p>Providing an engagement platform and mechanism through its Technical Engagement Workshops (TEWs)</p> <p>↓</p>	<p>III</p> <p>Exchanging knowledge of good practices</p> <p>↓</p>
<ul style="list-style-type: none"> • Reviewing the current policy framework against the voluntary Energy Efficiency Investment Principles • To propose recommendations for improvement based on international good practices 	<ul style="list-style-type: none"> • Bringing together policymakers, financial institutions, project developers and energy services companies • To understand better and together improve the domestic framework for energy efficiency finance 	<ul style="list-style-type: none"> • Sharing its extensive international expertise with partners • To gain deeper country insights in exchange

EEFTG has developed its engagement tools through in-depth exchanges in Mexico, China, the US, and the EU, holding TEWs and structured discussions with over 1,200 policymakers, financial institutions and other experts. Through these activities, EEFTG has contributed to the processes of review and planning of national energy efficiency policy, and enables shared knowledge and input from financial institutions on the tools and mechanisms to identify and enable necessary energy efficiency finance instruments. EEFTG has developed its engagement tools with the support and input of its collaborators: IPEEC, IEA, UNEP FI, OECD, SEforAll, IIGCC, International Energy Charter, PRI, Ceres and PSI.

Figure 2.4 | Outline Approach for the Development of G20 Tools



This Toolkit contains an appendix with over 30 G20 case studies that have been prepared by the EEFTG, with input from participating countries, to illustrate best practices in each of the Principles. The collaborative architecture of the Toolkit provides a powerful yet flexible framework for engagement with necessary stakeholders in the joint development of further tools and approaches to significantly up-scale energy efficiency investments in G20 countries.

III. G20 Energy Efficiency Investment Toolkit: Engaging with Banks, Institutional Investors and Insurers

Since the launch of the G20's Study Group on Financing for Investment in 2013, long-term investments in G20 economies have been tracked, by the OECD and other IOs, through observation and analysis of three sources: financial institutions, capital markets and institutional investors. The world's 1,000 largest banks have balance sheets containing USD 110 trillion of aggregate total assets²⁹, institutional investors manage around USD 70 trillion³⁰ of investment funds and assets with Insurance companies are one of the largest sub-segments of these with USD 31 trillion³¹ of the institutional investor total. For energy efficiency investments, the same approach can be used except that each long-term investment source must be addressed in the context of the energy efficiency project host (homeowner, industrial company, SME, commercial property developer, infrastructure procurement etc.) and that host's overall access to each capital source. The project host is also a potential source of investment capital when projects are "self-financed".

The disaggregated and heterogeneous nature of energy efficiency investments accentuates the role of financial institutions that fund or have contact with "end clients" (like commercial banks or retail insurance providers). However, given that these retail facing financial institutions have to refinance their portfolios through access to the capital markets and institutional investors, the refinancing criteria and relative focus of these wholesale, long-term investment capital providers has a strong influence over the asset origination and acquisition strategies of the retail facing entities. In addition, there are strategic sectors of the economy for energy efficiency investments, those key contributors to national GDP as well as those with high and cost effective emissions reduction potential.

To facilitate this process, EEFTG has developed this G20 Toolkit offering a guide with recommendations for specific stakeholder groups that consider the risks, opportunities and financial impacts of investments in energy efficiency. As an integral part of EEFTG's secretariat, UNEP FI leverages its access to private sector financial institutions, with banking, investor and insurance members, and encouraging the cooperation with other international institutional investor networks. These networks represent institutions from over 50 countries, and have aggregated inputs from their members and experts for the relevant financial institution groups in the Toolkit, including: Banks (UNEP FI, 120 bank members³²); Institutional Investors (UNEP FI, CERES/INCR, IGCC's investment members, IIGCC³³ with 130 members and USD 19 trillion of assets, PRI³⁴ and its c. 1,700 signatories with USD 62 trillion of invested assets); and Insurance Companies (UNEP FI PSI Initiative³⁵, 83 organisations covering 20% of world's insurance premia and USD 14 trillion invested assets).

This chapter of the G20 Energy Efficiency Investment Toolkit is ordered by proximity to the project host and after some scene setting, the analysis starts with banks, then assesses activities of institutional investors, including corporate investment, and ends by looking at insurers as facilitators to help better manage energy efficiency investment risks and unlock greater capital flows from the wholesale levels to retail, public and commercial project hosts.

29 The Banker Magazine. (2017). 2016 Top 1000 World Banks Ranking.

30 World Economic Forum. (2014). Direct Investing by Institutional Investors Implications for Investors and Policy-Makers. Retrieved from http://www3.weforum.org/docs/WEFUSA_DirectInvestingInstitutionalInvestors.pdf

31 Ibid.

32 UNEP FI. (2017). Banking. Retrieved from <http://www.unepfi.org/banking/banking/>

33 IIGCC. (2017). About us. Retrieved from <http://www.iigcc.org/about-us/our-members>

34 UNPRI. (2017). About. Retrieved from <https://www.unpri.org/about>

35 UNEP FI. (2017). About the UNEP FI Principles for Sustainable Insurance Initiative (PSI Initiative). Retrieved from http://www.unepfi.org/fileadmin/documents/Commercial_Real_Estate.pdf

When addressing energy efficiency finance and investment one of the main structural elements to consider is that energy efficiency is not a formal bank or investor’s asset class. Rather energy efficiency investment opportunities can be identified through a whole set of asset classes, whether listed corporate equities, private equity investments, retail banking, public and private real assets, such as infrastructure, real estate and industrials. Therefore when assessing the coverage and uptake of energy efficiency investments there is a lack of direct references and reporting of activities focused solely on energy efficiency, rather it tends to be embedded in other more mainstream banking products, asset classes and investment themes. Investors do not often separate the investment value, and even less so the incremental investment cost, of energy efficiency.

This chapter addresses this by analysing activities and reports on broader themes and financial products, focused on climate and resource efficiency across various asset classes, and digs into these initiatives to identify direct and indirect references and disclosures of energy efficiency investment activities. The analysis shows the progress being made in starting to track energy efficiency investment and finance more effectively. It also points to the wide gaps, and the hidden investments and initiatives made in energy efficiency, because of the difficulty for financial institutions to tag and track their incremental energy efficiency investments, and energy efficiency “premium” embedded in their asset decisions. The analysis also highlights the challenges to further the depth and scope of these tracking initiatives.

Setting the Scene: CDP data reveals a strong business case for energy efficiency investments

CDP provides global disclosure for companies, cities, states and regions to manage their environmental impacts and for investors or purchasers to access environmental information for use in financial decisions. CDP requests information from the world’s largest companies on behalf of 827 institutional investor signatories with a combined USD 100 trillion in assets³⁶. Over 2,400 companies from 89 countries responded to CDP in 2016³⁷, covering around 1/5th of global emissions and together these companies reported annual emission savings of 174,630,967 metric tonnes of CO₂e.

While more focused on emissions, CDP has been working with companies and cities collating data on energy efficiency. In 2016, 818³⁸ of their companies reported 2,373 individual energy efficiency projects – saving a total of 1,705,990 tonnes of CO₂e. Companies also engage with their suppliers, showing that, for over 2,500 suppliers³⁹, who disclosed combined energy savings of USD 12.4bn⁴⁰, almost half of the top 100 projects by savings were related to energy efficiency. Finally, among the companies and ca. 20 financial institutions committing to Science-Based Targets⁴¹ energy efficiency is a central element of the actions taken by these member institutions. These insights into the corporate, city and regional approaches to energy efficiency and their recent results are summarised in Table 3.1 (below).

36 CDP. (2017). Climate. [Website]. Retrieved from <https://www.cdp.net/en/climate>

37 Ibid.

38 CDP. (2017). Carbon Action. [Brochure]. Retrieved from <https://b8f65cb373b1b7b15feb-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/001/384/original/carbon-action-infographic-2016.pdf?1481208408>

39 CDP. (2017). Companies. [Website]. Retrieved from <https://www.cdp.net/en/companies>

40 Ibid.

41 Science-based Targets Initiative (SBTI) is spearheaded by CDP, the World Resources Institute (WRI), the World Wide Fund for Nature (WWF), and the United Nations Global Compact (UNGC). The SBTI is one of the We Mean Business Coalition commitments.

Science Based Targets. (2017). About. [Website]. Retrieved from sciencebasedtargets.org/about-the-science-based-targets-initiative/

Table 3.1 | Monitoring Corporate Energy Efficiency Investments (CDP 2016)

Initiative	Description	Landmarks
Carbon Action⁴²	Carbon Action is an investor-led initiative to accelerate company action on climate change, including energy efficiency activities which deliver a positive return on investment.	<ul style="list-style-type: none"> The program comprises of 329 investors representing USD 25 trillion in assets under management who ask the world's highest-emitting publicly-listed companies to take specific actions on climate change. In 2016, 818 of these companies reported 2,373 individual energy efficiency projects – thereby saving a total of 1,705,990 tonnes of CO₂e.
CDP's supply-chain program⁴³	Last year, 89 major corporations with a combined purchasing power of US\$ 2.7 trillion used CDP to ask their suppliers to disclose climate and energy information.	<ul style="list-style-type: none"> In response, over 2,500 suppliers disclosed combined savings of USD 12.4bn. Almost half of the top 100 projects by savings were related to energy efficiency, indicating that substantial savings opportunities exist for suppliers that initiate energy efficiency projects.
Cities, states and regions⁴⁴	Cities reporting to CDP have identified energy efficiency measures as their top emissions reduction activities.	<ul style="list-style-type: none"> Of the 533 cities disclosing to CDP, almost 300 have reported energy efficiency and retrofit measures, anticipating emissions reductions of 13,775,821 metric tonnes of CO₂e. Data from the Compact of States and Regions reveals that the 62 participating states and regions have set 38 region-wide and 9 government operation energy efficiency targets.

As is often the case for energy efficiency, it is tracked through the CDP company disclosure platform as a sub-set of climate change activities, however the drivers for energy efficiency investments in G20 economies, and inside companies, are much broader. Recently - in November 2016 - the EU launched the largest pan-European database (DEEP⁴⁵) tracking over 7,800 energy efficiency investments in buildings and industry. This new database, designed to add transparency to energy efficiency investment data and thereby de-risk these investments, shows preliminary results indicating that these selected energy efficiency projects deliver median energy paybacks with investments per kWh saved significantly lower than the cost of production in EU Member States while only 20% of projects reported GHG emissions reductions in DEEP as measured outputs. This illustrates that, 80% of energy efficiency investments represented in DEEP are being undertaken based on energy savings alone, and with such short median pay-back periods this is understandable.

These findings around the relatively attractive returns on energy efficiency investments are also echoed by analysis of CDP's disclosure information for developing economies, as illustrated for selected EFTG member countries in Table 3.2:

Table 3.2 | CDP Energy Efficiency Highlights on Energy Efficiency in G20 countries (2016)

China⁴⁶	<ul style="list-style-type: none"> Chinese companies have reported attractive paybacks through energy efficiency projects last year; almost 4 in 10 measures implemented to save energy are expected to make a return on investment in less than one year, with ¾ paying back in under three years.
India⁴⁷	<ul style="list-style-type: none"> Of all Indian companies' emissions reduction activities reported in 2015, 70% pertain to energy efficiency, representing 1.5 million tonnes of CO₂e saved.
South Africa⁴⁸	<ul style="list-style-type: none"> Reporting on a range of different types of investment opportunities, South African companies disclosed that energy efficiency projects provided the highest carbon emission reductions and financial payback. This was the case in 2016 as in previous years.

42 CDP. (2017). Carbon Action. Retrieved from <https://www.cdp.net/en/investor/carbon-action>

43 CDP. (2017). Supply Chain. Retrieved from <https://www.cdp.net/en/supply-chain>

44 CDP. (2017). Cities. Retrieved from <https://www.cdp.net/en/cities>

45 CDP. (2017). States and Regions. Retrieved from <https://www.cdp.net/en/cities/states-and-regions>

46 CDP. (2017). Missing link: Harnessing the power of purchasing for a sustainable future.

1. Role of Private Sector Banks: Commitments to Actions

In recognition of private sector banks' proximity to energy efficiency project hosts (commercial and retail) and the sheer scale of their balance sheets, USD 110+ trillion⁴⁹, this toolkit develops their role in financing energy efficiency investments first. EBRD and UNEP FI coordinate the following mobilisation of 122 banks from 42 countries in support of energy efficiency:

Box 3.1 | G20 Bank Statement on Energy Efficiency (122 Bank signatories)

We, the signatories of the Statement:

- Acknowledge that the financial sector is uniquely placed to channel finance to activities that promote energy efficiency
- Understand there are many unaddressed energy efficiency financing opportunities in our markets
- Are already providing finance to support our clients with energy efficiency investments
- Will actively contribute to scaling up energy efficiency financing
- Without taking on undue burden, are willing to work towards tracking our deployment of energy efficiency finance
- Recognise the need to further embed energy efficiency investment principles into the way in which we engage with our clients
- Have a special interest in guiding our clients towards best practice financing decisions, including on modernisation and competitiveness strategies that instil enhanced energy efficiency
- Are willing to work with institutional and public financiers seeking to deploy climate finance to our clients

Welcome the opportunity to share our experiences and acquire knowledge of successful business strategies for integrating energy efficiency across our financing operations

ABN AMRO	CREDO	Ohridska Banka Ohrid
ACBA - Credit Agricole Bank	Daegu Bank	OTP Bank Romania
ACCESSBANK	Demir Kyrgyz International Bank	Pireaus Bank
Agjencioni Per Financim NE Kosove	Demirbank	Postbank—Eurobank
Agricultural Development Bank of	DenizBank	Procredit Group
China	Desjardins Group	Raiffeisen Bank Aval
AKBank	Development Bank of the Philippines	Raiffeisen Bank Bosnia and
Ameriabank	Ecobank	Herzegovina
Armsswissbank	Erste & Steiermarkische Bank	Raiffeisen Bank Romania
ASN Bank	Eurobank	SEF International Universal Credit
Bai Tushum & Partners	Findeter	Organization
Banca Intesa Serbia	Firststrand	Şekerbank
Banamex	Garanti Bankasi	Shinhan Bank
Banca Transilvania	Garanti Leasing	Slovenska Sporitelna
Bancolumbia	Global Bank	Societe Generale Group
Bancompartir	Halkbank Skopje	Societe Generale Banka Beograd
Bank Eshkata	Hana Bank	State Export Import Bank of Ukraine
Bank Millennium	HSBC Bank Armenia	Sudameris Bank
Bank of Georgia	Humo MDO	Sumitomo Mitsui Trust Holdings
Bank of India	Huaxia Bank	Tatra banka
Bank of Jiangsu	ICBC	Triodos Bank
Bank of Valletta	IDLC Finance Limited	TuranBank
Bank Republic	Imon International	Türkiye Ýp Bankası
Basisbank	Industrial Bank	Türkiye Sinai Kalkinma Bankasi
BBVA	ING Group	UK Green Investment Bank
Belgazprombank	KRK Kosovo	Ukrsibbank
Belvnesheconombank	Kyrgyz Investment and Credit Bank	Unibank
BMCE Bank of Africa	La Banque Postale	Unicredit Bank Mostar
BNP Paribas	Megabank Public Joint Stock	Unicreditbank Serbia
Bpifrance	Company	Unicredit Bulbank
BPS-SBERBank	Microinvest	Unicredit Tiriack Banka
BRAC Bank Limited	Minsk Transit Bank	United Bulgarian Bank
BRD -Groupe Societe Generale	Mobiasbanca	Vakiflar Bankasi
CASA DE Economii SI Consemnatiuni	Moldincombank	VTB Georgia
CenterInvest Bank	Moldova Agroindbank	VUB Slovakia
CIBanco	Mutualista Pichincha	Xac Bank
Connecticut Green Bank	Munchnerhyp	Yapý ve Kredi Bankasi
Commercial International Bank (CIB	National Bank of Egypt	YES Bank
Egypt)	Nationwide Building Society	Zagrebacka Banka
Credit Agricole	Nord/LB	Zhujiang Financial Leasing
Credit Coopératif	NLB Tutunska Banka Skopje	
Credit Foncier	NRW Bank	

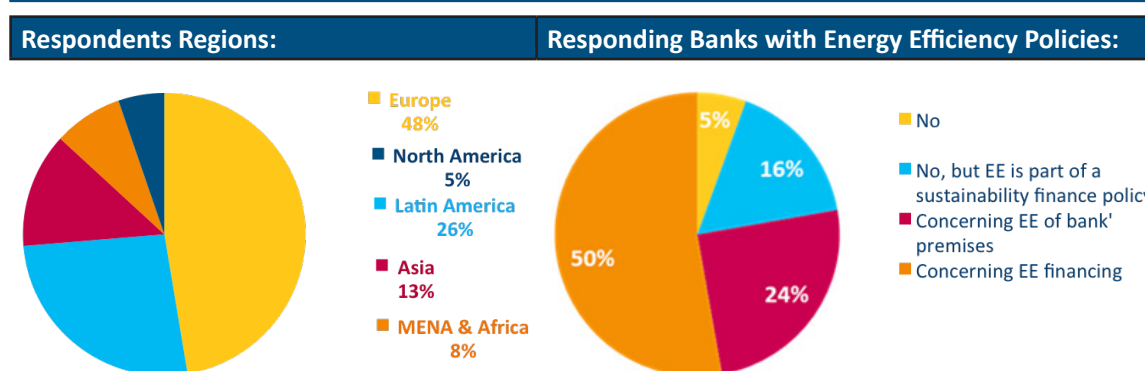
In order to assess bank progress in financing energy efficiency, EEFTG commissioned a survey in late 2016, through UNEP FI, for the bank signatories of the G20 Statement by Financial Institutions, and others, to provide insights as to how banks were integrating energy efficiency in their investments and financial products. Structured in three parts, this survey received high quality responses from a total of 38 banks (32 private and 6 public) hailing from different regions including 25 from G20 countries. In addition, responding banks provided precise data on energy efficiency related products and processes, as well as finance volumes and their business impacts.

Table 3.3 | Structure of EEFTG Energy Efficiency Survey of Banks

I	General information on energy efficiency finance practices in each bank	→	Focused on understanding the position of energy efficiency finance in the strategy and business operations of financial institutions
II	Dedicated energy efficiency products or initiatives of each bank	→	Aimed to gather information on any products or services of banks that are specifically dedicated to financing energy efficiency.
III	Integrating energy efficiency considerations across general financing operations	→	Intended to collect information on how energy efficiency considerations are mainstreamed across general financing activities of your institution.

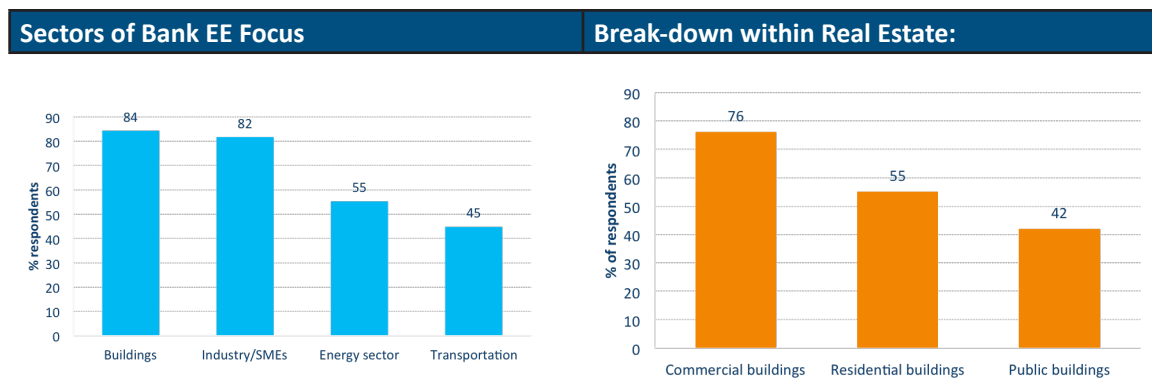
While the majority (95%) of banks have a specific policy, strategy or target for the financing of energy efficiency -either standalone or as part of a larger sustainability or climate strategy- close to a third of the respondents did not have a policy for energy efficiency financing in terms of financing specific EE projects or always including EE in their due diligence. Notwithstanding this, the survey results are promising as they reveal a series of cross-cutting topics whose development ensures that energy efficiency will play an increasingly important role within respondent banks as they recognize its potential and specific areas for improvement. EEFTG notes that bank survey responders are self-selecting from 122 leaders and therefore provide an insight into the actions of leaders and not the entire banking sector.

Figure 3.1 | EEFTG Survey's



Survey Part I: Overview of Banks' Energy Efficiency Finance Activities

Banks were asked to indicate the sectors and client segments in which their institutions presently financed energy efficiency: There is a clear focus in real estate (84% of respondents) and Industry & SMEs (82% of respondents). Within Real Estate over two thirds (76% of respondents) highlighted commercial buildings as their main area for energy efficiency finance, while residential and public buildings ranked second and third respectively. For 58% of banks, the potential of energy efficiency is very high in at least one sector, and for 97% of banks, the potential is high in at least one sector.

Figure 3.2 | Overview of Banks' Energy Efficiency Finance Activities

Most banks (74%) noted that the division leading on energy efficiency finance activities was corporate banking, with half reporting energy efficiency activities in retail banking (50%) and project finance (50%) with over a third having energy efficiency reported in real estate finance groups (34%), CSR and sustainability (34%) and leasing (34%). Interestingly, energy efficiency was only reported in 16% of Green bond / capital markets teams.

Of the responding banks, 84% indicated that energy efficiency finance has strong growth potential and they identified key drivers of energy efficiency business growth including: energy prices, an anticipation of carbon taxes, public incentives, awareness, and the greater availability of technologies and professionals. However, most banks (59% of responders) felt that the current demand for their energy efficiency finance was only “medium” with just under a third of banks considering current energy efficiency demand as “weak” – highlighting a greater need for policy focus on the demand drivers for energy efficiency investments rather than on the supply-side of energy efficiency finance. Over a fifth of banks already offer energy audits or assessments to their clients in order to stimulate demand.

A significant number of banks (42% of responders) reported a lack of support from regulation or public incentives to finance their energy efficiency activities. Notwithstanding this, 45% of banks cited credit lines from public financial institutions as their principal form of support when financing energy efficiency. Also, over a third (34%) and a quarter (26%) of banks respectively cited regulatory frameworks and technical assistance as their prime source of support. Guarantees were mentioned to a lesser degree, as just 5% of responders stated that their efficiency activities benefited from them.

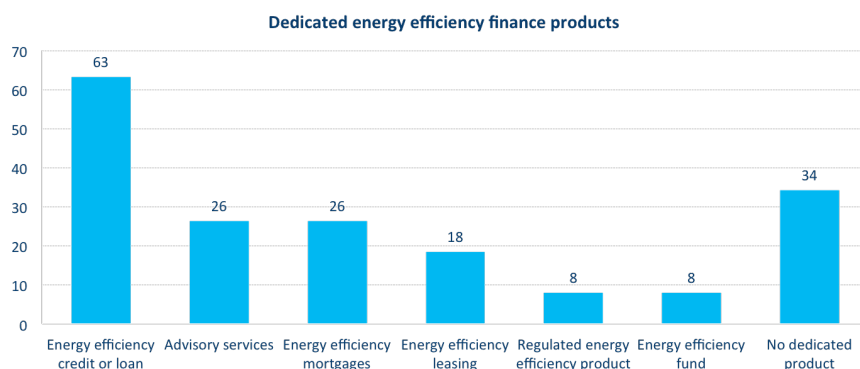
Survey Part II: Banks' Dedicated Energy Efficiency Products and Initiatives

Two thirds of banks surveyed by EEFTG offer at least one type of financial product or service dedicated to energy efficiency (Figure 3.3). Most of these offer an energy efficiency credit or loan and just under half of these banks also offer energy efficient mortgages and energy efficiency advisory services. Energy efficiency is seen as a multi-stakeholders activity by banks with technical providers, governments, other banks, insurance companies and many others, which underlines the importance of partnerships in order to upscale the involvement of banks further.

Just over half of bank respondents verify the energy performance of their investments and around a third (32%) of banks use third party verification and energy audits for this purpose. Others used invoices (6%), energy bills (6%) and tracking energy labels or relying on an in-house technical engineering team. Only 45% of bank responders deploy measures to track their energy efficiency financing beyond regulated or publicly subsidised products and those deploying tracking mostly carry it out in their real estate loan portfolio to comply with green buildings' energy performance standards and or reporting requirements.

Interestingly, only 24% of bank respondents track the aggregate environmental impact of their energy efficiency finance in terms such as GHG emissions avoided – a proportion which also corresponds to the 20% proportion seen in the data from the 7,800 energy efficiency projects available in the EU’s DEEP database⁵⁰.

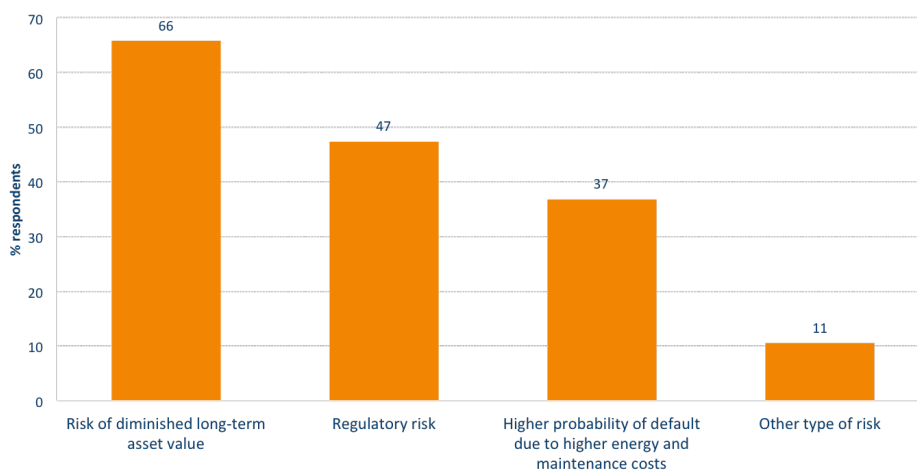
Figure 3.3 | Dedicated Energy Efficiency Finance Bank Products



Survey Part III: Mainstreaming EE across Banks’ General Financing Operations

Nearly all bank respondents (94%) reported that financing energy inefficient assets carried at least one key risk (Figure 3.4). These long-term market signals such as diminishing asset value (identified by 66% of banks), regulatory risks (47%) and higher defaults among those paying higher costs (37%) were identified as key drivers for banks to extend energy efficiency as a general theme across all its general financing operations.

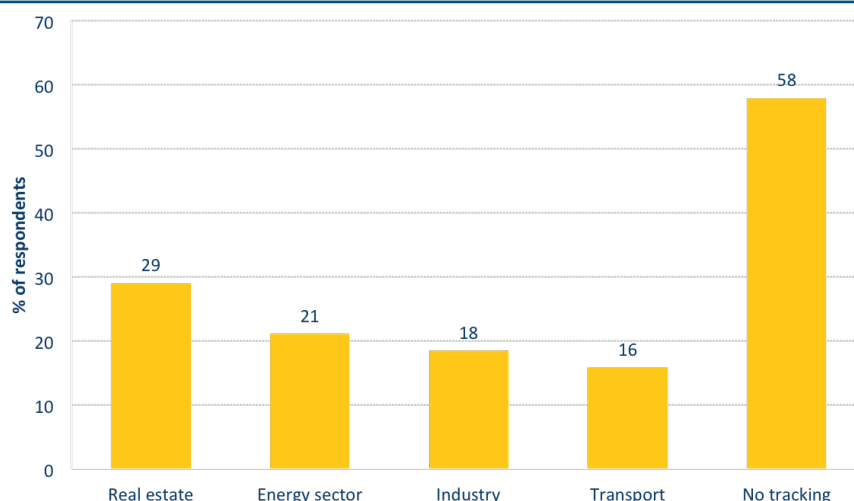
Figure 3.4 | Risks of Financing Energy Inefficient Assets (according to Banks)



Over a third (34%) of banks stated that they take into account energy savings when defining credit terms for energy efficiency improvements (as also highlight in the US SAVE Act), mostly for project finance and corporate finance transactions, yet 79% of banks indicated their interest in keeping track of the energy performance of the assets in their portfolios.

The emerging concept of “green tagging⁵²” has arisen from the increasing interest from banks to understand the energy performance of the assets which they finance as a risk mitigation measure, coupled with the need to access growing sources of green finance. The growth in green tagging offer a clear signal of banks growing momentum and could enable banks to significantly scale-up their green and, within this, energy efficiency financing. From EEFTG’s survey, 42% of banks reported tracking the energy performance of their financed assets in at least one sector: Real estate was the most prevalent with close to a third (29%) of responses; with other sectors including energy (21%), industry (18%), and transport (16%) shown in Figure 3.5:

Figure 3.5 | Green Tagging to Track the Energy Performance of Assets Financed by Banks



51 “The SAVE Act” introduced to US Senate on June 6, 2013 by Senators Isakson (R-Ga.) and Bennet (D-Colo.), is legislation to improve the accuracy of mortgage underwriting used by federal mortgage agencies by including a home’s expected energy cost savings when determining the value and affordability of energy efficient homes. Institute for Market Transformation. (2017). The SAVE Act: Making Homes Efficient and Affordable. Retrieved from <http://www.imt.org/finance-and-real-estate/save-act>

52 “Green Tagging” entails tagging loans to the energy efficiency of particular assets. Sourced from: Environmental Finance. (2016). How green tags could boost finance for energy efficiency. Retrieved from <https://www.environmental-finance.com/content/analysis/how-green-tags-could-boost-finance-for-energy-efficiency.html>

Box 3.2 | How Green Tagging can Catalyse Banks' Energy Efficiency Financing

The European Mortgage Federation – European Covered Bond Council (EMF-ECBC⁵³) represents the interest of mortgage lenders and covered bond issuers in the EU and beyond and brings together over 130 members, covering an estimated 2000 banks. In 2016, the EMF-ECBC launched an Energy Efficient Mortgage Initiative, which aims to incentivise households to improve the energy efficiency of their homes by way of a pan-European private bank financing mechanism which links financial incentives to the mortgage.

The EMF-ECBC Energy Efficient Mortgage Initiative rests on two assumptions:

1. Improved energy efficiency of the property lowers the probability of default of the borrower as energy savings are recovered through the energy bill, leaving more disposable income in the household. A renovated house that moves from an 'E' to a 'B' grade in its energy performance certificate (EPC) will save an estimated EUR 24,000 over 30 years, according to an analysis of 365,000 house sales in Denmark last year.
2. Improved energy efficiency increases the value of the property. From a price perspective, an increase in energy performance can correspond to adding an extra 10-15 m² to the size of a property.

By its very nature, the EMF-ECBC Energy Efficient Mortgage Initiative creates incentives for banks to tag and, therefore, make visible already existing and future green assets which would further facilitate the development of the green financing market.

Drawing from the experience of Energy Efficient Mortgages in the United States

The United States have been leading the development of Energy Efficient Mortgage (EEM) loans from as early as 1980. They have since expanded to all mortgage programs sponsored by the US government, including Fannie Mae, Freddie Mac, the Federal Housing Administration (FHA) and the Veterans Administration (VA), which have all adopted special underwriting guidelines to take into account energy efficiency in the mortgage underwriting process for homes. Experience from the US also shows that there is a significant correlation between mortgage and portfolio performance with green rating of the home – controlling for other loan performance variables, a study⁵⁴ by the Institute for Market Transformation showed that owners of Energy Star homes were, on average, 32% less likely to default on those homes compared to comparable homes without such a rating. To account for the lower risk of default associated with EE, the FHA has launched two initiatives to further encourage energy efficiency improvements in homes: 1) homes with better home energy scores will qualify for a 2% “stretch ratio” on a new or refinance mortgage: and 2) FHA approval of Property Assessed Clean Energy (PACE) financing on homes.

53 UNC Center for Community Capital & Institute for Market Transformation. (2013). Home Energy Efficiency and Mortgage Risks. Retrieved from http://www.imt.org/uploads/resources/files/IMT_UNC_HomeEEMortgageRisksfinal.pdf

54 EMF & ECBC. (2017). Energy Efficient Mortgages Initiative Energy Efficiency (EE) Financing Key Parameters Survey: Preliminary Analysis. Retrieved from <http://figbc.fi/wp-content/uploads/2017/02/2017-00008.pdf>

How to Scale-up Energy Efficiency Financing from Private Sector Banks

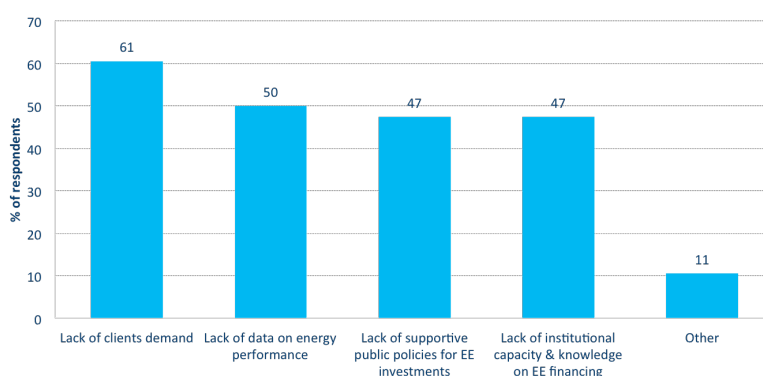
In broad terms, those banks committing to concerted action on energy efficiency seem to see these activities as a key future area of potential business growth, especially in buildings, SMEs and industry. Increased transparency on the energy performance of banks' assets and measurement of energy efficiency project savings and performance will help de-risk this business growth.

Table 3.4 | Key Conclusions from EEFTG Bank Survey (2016)

A	A well-recognized opportunity	Large majority of respondents have energy efficiency financing activities and see it as an area of future growth.
B	Awareness raising and supportive policies	Deemed by respondents as crucial to stimulate demand and overcome barriers to market development.
C	Tracking of energy efficiency finance	Banks are deploying efforts to better track the volume of financing going to energy efficiency assets and projects.

In terms of the key barriers preventing the scale-up of banks' energy efficiency finance activities: Lack of client demand was an issue for nearly 2/3rd of banks surveyed; followed by the absence of energy performance data and the lack of proper policies or institutional capacity for the promotion of energy efficiency investments stood as dominant barriers.

Figure 3.6 | Main Barriers to Up-Scaling Banks' Energy Efficiency Financing



In addition, some banks have also identified a lack of standard contracts, the fact that there is often no recourse to an asset (or savings) underlying EE lending (meaning that EE lending becomes more about standard credit metrics), lack of trust in the suppliers of energy efficiency projects and technologies to deliver savings (a sign of an immature market) and companies under-estimating the returns from energy efficiency and therefore not prioritising those investments in their capital expenditure plans.

In terms of the tools and policies needed to develop the energy efficiency markets in their regions, 60-70% of banks surveyed cited increasing public awareness, greater enforcement of energy efficiency standards, an increased priority for energy efficiency in public policies and better data as the four key ways to enhance financing flows to energy efficiency investments.

While the private bank networks contributing to this G20 Energy Efficiency Investment Toolkit see an increased role for national policymakers in stimulating the demand for energy efficiency finance, they also see value in establishing appropriate legal and institutional frameworks that prioritize and mandate the implementation of energy efficiency improvements. EEFTG also notes that the conclusions from responding banks to its 2016 survey resonate very well with those documented by over 100 financial institutions as members of Europe's Energy Efficiency Financial Institutions Group⁵⁵.

2. Role of Institutional Investors: Building on the G20 Energy Efficiency Investor Statement

Institutional investors can have a significant impact in enhancing the energy efficiency of buildings, industry and SMEs by allocating long-term capital to the most efficient listed and private assets, scaling-up energy efficient investments in real asset portfolios and engaging with their investees to improve their energy efficiency. Owning and managing properties, real estate investors have a particular role to play in driving the development of sustainable and efficient real estate both through the construction of new energy efficient buildings and the retrofitting of existing ones.

The following investor statement, drafted by EEFTG, and jointly promoted by UN Environment Finance Initiative, the American network of investors for sustainability “Ceres” and the PRI, captures the key actions required by institutional investors to embed energy efficiency in their operations and investment processes.

Box 3.3 | G20 Energy Efficiency Investor Statement⁵⁶ (Endorsed by more than USD 4tn of Investors)

As our contribution to the work of the G20 Energy Efficiency Finance Task Group, as managers and investors, we share a common understanding of the positive economic and societal benefits of energy efficiency. In order to ensure that our activities promote and support energy efficiency, and in consideration of our fiduciary responsibility: We recognize the need to fully embed energy efficiency into our investment process.

We, the undersigned, undertake to:

1. Embed material energy efficiency considerations into the way in which we evaluate companies;
2. Include energy efficiency as an area of focus when we engage with companies;
3. Take into consideration energy efficiency performance, to the extent relevant to the proposal being considered, when we vote on shareholder proposals.
4. To the extent relevant, incorporate energy efficiency investment considerations when we select managers;
5. Assess our existing real estate assets and managers and monitor and report on their energy efficiency performance;
6. Seek appropriate opportunities to increase energy efficiency investments in our portfolios.



56 G20. (2016). G20 Energy Efficiency Investor Statement. Retrieved from <http://www.unepfi.org/fileadmin/investment/EnergyEfficiencyStatement.pdf>

To develop relevant tools for institutional investors in the framework of this G20 Energy Efficiency Investment Toolkit, EEFTG is working with the investors' initiative Principles for Responsible Investments (PRI)⁵⁷ and the Global Investor Coalition (GIC)⁵⁸, IIGCC (Europe), INCR (North America), IGCC (Australia and New Zealand) and AIGCC (Asia), and UNEP FI from whose ranks 40 investors managing more than USD 4 trillion of assets have endorsed the G20 Energy Efficiency Investor Statement.

Therefore, in assessing the coverage and uptake of energy efficiency investments by institutional investors for the G20 Energy Efficiency Investment Toolkit, EEFTG has worked with these leading investor initiatives to shed light on their and their members' energy efficiency investment activities. Their progress in supporting the scaling up of energy efficiency investment can be assessed, and areas for the development of specific tools can be identified, through a focus on the activities undertaken, or available to undertake, by leaders in each component of the G20 EE Investor Statement. This is achieved by the analysis of activities and reporting on broader themes, in particular climate and resource efficiency across asset classes for direct and indirect references and links to energy efficiency investment activities.

Progress in each of the six component commitments made by investors in their G20 EE Investor Statement was assessed with the support of the contributing networks and through voluntary disclosures by several of the leading investors in each component area. Table 3.13 provides a component by component review of institutional investors' reporting and progress in the implementation of their energy efficiency investment activities and identifies some of the most relevant tools which are emerging in the sector to promote the uptake, monitoring and reporting of energy efficiency investments.

For long term investors, there has been good initial progress in starting to track more effectively energy efficiency investment, with numerous initiatives measuring and reporting energy efficiency activities embedded in broader asset themes, such as climate change and resource efficiency. It also points to the wide gaps, and sheds light on hidden investments, which point to the additional work required to make energy efficiency explicit within investors and company disclosures. This analysis highlights the challenges to further the depth and scope of these tracking initiatives. The FSB climate-related financial disclosures climate taskforce recommendations⁵⁹, provide a strong opportunity to scale the existing voluntary work developed by the investment industry.

57 The Principles for Responsible Investment (PRI) is a major initiative that has been driving integration of Environmental, Social and Governance principles in investment activities. The PRI were developed by investors, for investors. They are a voluntary and aspirational set of 6 investment principles that offer a menu of possible actions for incorporating ESG issues into investment practice. In implementing them, signatories contribute to developing a more sustainable global financial system. PRI has nearly 1,700 investors' signatories, both asset owners and asset managers, from over 50 countries, representing US\$62 trillion. The PRI is truly independent. It encourages investors to use responsible investment to enhance returns and better manage risks, but does not operate for its own profit; it engages with global policymakers but is not associated with any government; it is supported by, but not part of, the United Nations.

58 The Global Investor Coalition on Climate Change is a joint initiative of four regional climate change investor groups: IIGCC (Europe), INCR (North America), IGCC (Australia & New Zealand) and AIGCC (Asia). The coalition has come together to provide a global platform for dialogue between and amongst investors and governments on international policy and investment practice related to climate change. The four investor groups that make up the Global Investor Coalition on Climate Change have agreed to partner on global carbon policy initiatives, agreements and projects to deliver better investor and climate outcomes.

59 Task Force on Climate-Related Financial Disclosures. (2017). Recommendations. Retrieved from <https://www.fsb-tcfd.org/publications/recommendations-report/>

Table 3.5 | Institutional Investor Progress under G20 EE Investor Statement

	<p>Review of “Energy Efficiency Investments” in Investors’ Portfolios, The Global Investor Coalition’s “Low Carbon Investment Registry⁵⁹”; “PRI Investor Survey⁶⁰” and Montreal Carbon Pledge⁶¹.</p> <p>This section shows that while there has been some progress on energy efficiency tagging and reporting, more work is required in investors and company disclosures, which should be helped by the FSB climate-related financial disclosures climate taskforce recommendations.</p>
11	<p>Embedding Energy Efficiency into Company Assessments Climate Works’ Energy Productivity Index; CDP’s climate change program; CERES energy benchmarking tool</p> <p>In our review of leading reporting frameworks recognized by the institutional investor community, energy efficiency has slowly but steadily been incorporated, and today it can be seen as a growing feature of investor’s companies assessment and reporting tools. This demonstrates the progress made in tagging and measuring the impacts of energy efficiency performance on investments.</p>
2&3	<p>Embedding Energy Efficiency into Company Engagement and Resolution Voting PRI Collaborations board; IIGCC “Investor Expectations on Companies”; Ceres’ Shareholder Initiative on Climate & Sustainability (SICS); CDP - Carbon Action</p> <p>Company engagement on ESG (Environmental, Social & Governance) is a strong and healthy practice of responsible investors. Only recently are direct references to energy efficiency emerging, however, more often than not we have found that for investors energy-efficiency improvements are typically embedded in the broader climate and resource efficiency goals. More work is require on tagging and disclosure to enable a proper assessment of the scale and impact of engagement initiatives. However, given that the companies targeted, are in the oil & gas and natural resources sector, the impact can be significant as they represent the bulk of carbon emission footprints of the FTSE and MSCI indices.</p>
4&5	<p>Reporting on Energy Performance in Real Estate Investments UN Environment FI “Seven-step Process for Real Estate Investors to Drive Value via Energy Efficiency Retrofits”; UN Environment FI and partners“ Sustainable Real Estate Investment Framework”; The Australian Sustainable Built Environment Council (ASBEC); The Global Real Estate Sustainability Benchmark .</p> <p>As real estate and buildings are core investable asset classes held directly by institutional investors and represent a huge opportunity for incremental energy efficiency investments. There have been a growing number of initiatives and tools led by investors to promote greater transparency and sustainability in real estate investment activities that make specific references to energy efficiency current investment and future opportunities. This confirms the growing interest by investors towards energy efficiency, however there remains a large part of the industry that needs to be brought along through voluntary or regulatory schemes to scale up the present success.</p>

60 Global Investor Coalition on Climate Change. (2017). Low Carbon Investment Registry Introduction. Retrieved from <http://globalinvestorcoalition.org/introduction/>

61 PRI. (2017). How to Report. Retrieved from <https://www.unpri.org/report>

62 PRI. (2017). Montreal Carbon Pledge. Retrieved from <http://montrealpledge.org/>

63 ‘Energy Productivity’ refers to the amount of economic output per unit of energy input. Sourced from: ASE. (2016). Energy Productivity Playbook: Roadmaps for an Energy Productive Future. Retrieved from https://www.ase.org/sites/ase.org/files/gaep_playbook-energy-productivity_alliance-to-save-energy.pdf

64 CDP. (2017). Climate Change Program. Retrieved from <https://www.cdp.net/en/climate#d53aa2946499cb9b8af5b7d5cf29233b>

65 CERES. (2016). Clean Energy Utility Benchmarking Report. Retrieved from <https://www.ceres.org/resources/reports/clean-energy-utility-benchmarking-report-2016/view>

66 PRI. (2016). Collaboration Platform. Retrieved <https://www.unpri.org/about/pri-teams/esg-engagements/collaboration-platform>

67 Investors’ expectations guides cover the following sectors: Oil and Gas companies 2016; Automotive Companies 2016; Electric Utility Companies 2016, Mining Companies 2015.

IIGCC. (2017). Investor Expectations on Corporate Climate Risk Management. Retrieved from <http://www.iigcc.org/corporate/programme/investor-expectations-on-corporate-climate-risk-management>

68 Investor Network on Climate Risk. (2017). INCR Working Groups. Retrieved from <https://www.ceres.org/investor-network/incr/incr-working-groups>

Disclosure of “Energy Efficiency Investments” in Institutional Investors’ Portfolios

One of the main obstacles in assessing how effective institutional investors have been in capturing energy efficiency opportunities is finding the information on how energy efficiency information is embedded into their investment practices and identifying which investment vehicles incorporate energy efficiency measures implicitly or directly. Energy efficiency investing tends to be embedded in other themes and the investment value of the incremental energy efficiency investments is frequently unavailable. However there has been some progress in the acknowledgment of the need to incorporate direct reporting on energy efficiency in the existing reporting tools.

In 2016, of the 1,061 PRI reporting investors, 60% considered climate change a long-term risk to investments. Energy efficiency is implicitly included in these activities rather than identified directly. PRI also includes optional indicators for investors to report dedicated Environmental and Social themed investments (E&S). 2% of the total PRI investor assets (USD 1.2 trillion) were reported as E&S themed investments, in 2016, and while specific references to investments in “green buildings” and “clean energy” represented 33% of these E&S investments, just 15% of these referred directly to energy efficiency. This underlines how energy efficiency remains implicit in most investors’ reporting – rather than explicit.

The Global Investor Coalition’s “Low Carbon Investment Registry” contains data from 53 investors managing USD 57.5 billion, with a presence in 21 countries, and provides a detailed, although not exhaustive, public overview of these investor’s climate mitigation actions. From the 301 registry entries, 41 entries, representing USD 21 billion (or 37% of total), make an indirect reference to energy efficiency within broader themes, especially green buildings and industry, or directly in the investment description.

How Improved Disclosure can promote Energy Efficiency Investments

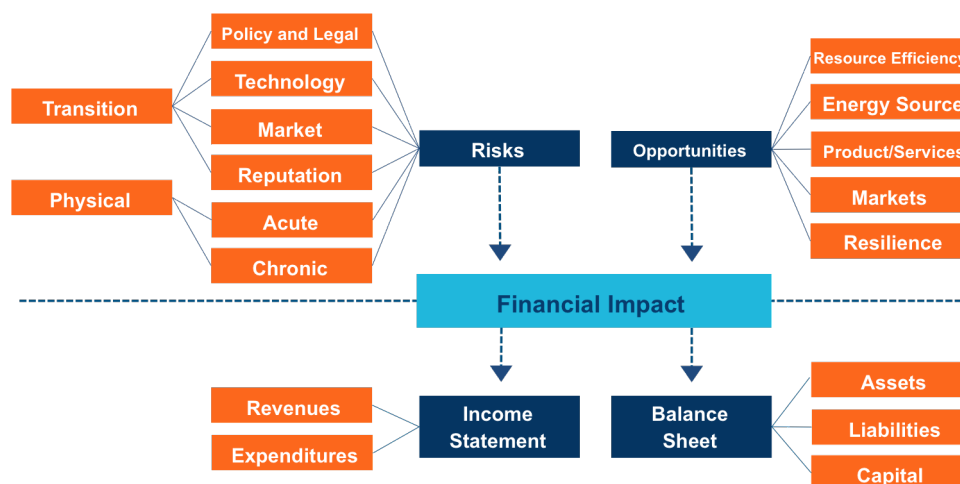
While there has been some progress on energy efficiency tagging and reporting, more work is required in investors and company disclosures. In April 2015, G20 finance ministers⁷³ and central bank governors mandated the Financial Stability Board (FSB) to “to convene public- and private- sector participants to review how the financial sector can take account of climate-related issues.” To implement this mandate, the FSB has established an industry-led taskforce on climate-related financial disclosures which recently published its full recommendations report, the FSB Task Force Recommendations⁷⁴ follows an extensive consultation process with market participants on a geographically diverse basis.

The market participants who form part of the task force recommend the mainstreaming of climate disclosures into financial filings, thereby ensuring that disclosure users such as institutional investors and finance providers can understand the financial impact resulting from investee company’s response to the risks and opportunities generated by the transition and the impacts of climate change. The major contribution of the task force is that with the disclosure framework, disclosure users will be able to understand the link between climate change and financial performance (in a similar way that green tagging links financial asset performance to energy performance), thereby enabling an improvement in the efficiency of capital allocation.

- 69 CDP. (2017). Carbon Action. Retrieved from <https://www.cdp.net/en/investor/carbon-action>
- 70 UNEP FI. (2014). UNEP FI Investor Briefing: Commercial Real Estate Unlocking the energy efficiency retrofit investment opportunity. Retrieved from http://www.unepfi.org/fileadmin/documents/Commercial_Real_Estate.pdf
- 71 UNEP FI, the Global Investor Coalition, PRI, & RICS. (2016). Sustainable Real Estate Investment: Implementing the Paris Climate Agreement: an Action Framework. Retrieved from <http://www.iigcc.org/files/publication-files/Sustainable%20Real%20Estate%20Investment%20Framework%20FINAL.pdf>
- 72 GRESB. (2017). Who we are. Retrieved from <https://www.gresb.com/who-we-are>
- 73 University of Toronto. (2015). Communiqué G20 Finance Ministers and Central Bank Governors Washington DC, April 17, 2015. Retrieved from <http://www.g20.utoronto.ca/2015/150417-finance.html>
- 74 Task Force on Climate-Related Financial Disclosures. (2017). Recommendations. Retrieved from <https://www.fsb-tcfd.org/publications/recommendations-report/>

The task force has identified energy efficiency as a key opportunity inherent in the transition, contextualising energy efficiency as the key component within the resource efficiency category (see below chart). Likewise, energy efficiency also offers the opportunity of strengthening resilience. A comprehensive disclosure framework would enable institutional investors to better assess and encourage the alignment of corporate behavior with the transition and build resilience to the physical impacts of climate change which would also encourage the analysis and full utilization of energy efficiency opportunities.

Figure 3.8 | Climate-Related Risks, Opportunities, and Financial Impact



Source: FSB, 2016

To improve transparency, the PRI and CDP will be aligning the PRI Reporting Framework with the final task force recommendations which cover energy efficiency explicitly. Presently, PRI only has climate change reporting indicators, but these will be reviewed and strengthened to enable consistent investor disclosures, including an assessment of material climate opportunities.

This complements the 120 investors (USD10 trillion) that are participating in PRI's Montreal Carbon Pledge⁷⁵, a voluntary investor commitment to measure and disclose portfolio emissions - a first step towards acting on key issues such as energy efficiency. PRI will be encouraging investors participating in the Montreal Carbon Pledge to use their portfolio carbon foot-printing results to inform further action, including active ownership on material climate opportunities (eg. energy efficiency) and reallocation.

How Investors can drive Efficiency by Embedding Energy Efficiency into Company Assessments

In a review of leading reporting frameworks recognized by the institutional investor community, energy efficiency has slowly but steadily been incorporated, and today it can be seen as a growing feature of investors' company assessment and reporting tools. This demonstrates the progress made in tagging and measuring the impacts of energy efficiency performance on investments.

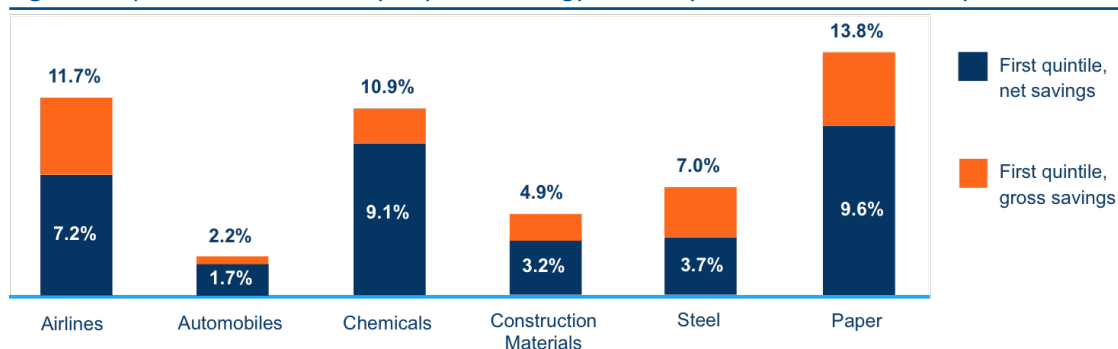
ClimateWorks Australia, in collaboration with CalSTRS and UNEP FI, developed a global energy efficiency benchmark tool⁷⁶ which helps investors identify listed industrial companies for whom improving energy efficiency presents a material opportunity. The work is available to all investors and has received strong support since its launch. This tool develops three metrics which can then be compared against each other: energy cost resilience; energy productivity outcome and energy efficiency performance. Full details of the assessment tool structure and approach are described in the Case Study annex to this Toolkit.

75 Montréal Carbon Pledge. (2017). About the Montréal Carbon Pledge. Retrieved from http://montrealpledge.org/wp-content/uploads/2017/03/MontrealPledge_A4-Flyer-2017.pdf

76 ClimateWorks Australia. (2016). Energy Productivity Index for Companies. Retrieved from <http://www.energyproductivity.net.au>

For over 70%⁷⁷ of the companies assessed, analysis indicated significant opportunity to improve energy productivity and compelling evidence of the benefits of doing so. The index showed that by reducing energy costs and growing efficiencies in line with their best performing peers, industrial companies stand to gain between 2% and 13% growth in annual profits from each year of implementation depending on their sector as shown in Table 3.15. Moreover many of the initiatives with this potential require little to no capital investment, largely thanks to recent improvements in technology which have made significant operational improvements possible. Overall, only 29% of the activities implemented by companies require capital investment greater than three years-worth of energy cost savings.

Figure 3.9 | Potential Profitability Impact of Energy Efficiency Investments in Industry



Source: ClimateWorks Australia, 2016

CERES is piloting a new benchmarking tool which allows investors to assess companies and help them improve in their energy management thanks to a simple survey that can be completed rapidly by an experienced corporate energy manager regarding the adoption of state of the art energy data analytics, energy management systems such as ISO500001, capital allocation strategies, ESG-related activities and the adoption of energy productivity goals.

Driving Energy Efficiency Investments through Company Engagement and Resolution Voting

The Principles for Responsible Investment⁷⁸ (PRI) are a voluntary global framework to which over USD 100 trillion of funds under the management of 827 investors subscribe to. PRI's second principle reads "We will be active owners and incorporate ESG issues into our ownership policies and practices". Investors can act in their own right by exercising their voting rights, monitoring compliance with voting policy and developing corporate engagement capabilities.

Company engagement on ESG (Environmental, Social & Governance) is a strong and healthy practice of responsible investors. In their engagements with companies on ESG practices, investors have typically focused on seeking goals to reduce GHG emissions or to increase the use of renewable energy. Only lately has there been an emergence of direct references to energy efficiency and more often than not it is covered by the assumption that energy-efficiency improvements are typically embedded in the broader climate and resource efficiency goals.

In the 2016-17 engagement season, there was an increase in investor engagements that included specific calls to assess impacts of and improve energy efficiency or energy productivity as part of broader company engagements. The trends emerging can be assessed through the PRI Collaborations Boards⁷⁹. Among the active collaboration as of March 2017, a total of 1,064, 20% or 217 actions⁸⁰, focused on climate change and resource efficiency, with the larger share of engagement focusing on governance practices.

77 Ibid.

78 PRI. (2017). The Six Principles. Retrieved from <https://www.unpri.org/about/the-six-principles>

79 PRI. (2016). Collaboration Platform. Retrieved <https://www.unpri.org/about/pri-teams/esg-engagements/collaboration-platform>

80 Ibid.

Of these, 6% or 13 specific calls, make a direct reference to energy efficiency in the resolutions calls. However, given that the companies targeted, are in the oil & gas and natural resources sector, the impact can be significant as they represent the bulk of carbon footprints of the FTSE and MSCI indices.

IIGCC has also developed a series of “Investor Expectations on Companies⁸¹”, which provides a guide to investors on how to build a constructive engagement with the Boards of companies to consider and direct more sustainable strategies with the aim of mitigating the long term risks of climate change to investors. In these guides, energy efficiency standards are a recognised mitigant of these risks. IIGCC is providing the framework for its members to collaboratively engage with the most carbon intensive European companies and BP and Shell have both recognised the Investor Expectations guides publicly.

Part of the IIGCC corporate engagement programme, the “Aiming for A” initiative is a shareholder resolutions group which aims to incorporate the selective use of institutional quality shareholder resolutions as part of meaningful and effective dialogue with companies. This group is currently undertaking in-depth engagement with the ten largest UK-listed extractives and utilities companies and has filed resolutions at several of the companies based on the “Investor Expectations” guides, alongside expanding to become pan-European.

Work to date has focused on “strategic resilience for 2035 and beyond”, while using CDP performance bands and sector analysis as an initial benchmark. These calls include requests to the companies to commit to setting targets for improvements in energy efficiency over the short, medium and long term. The following Table 3.6 summarises these and other investor led engagement activities that can scale-up energy efficiency investments:

Table 3.6 | Investor led collaborative company engagements covering Energy Efficiency

Ceres’ Shareholder Initiative on Climate & Sustainability (SICS) ⁸²	<ul style="list-style-type: none"> In 2016/2017, six institutional investors that participate in Ceres’ Shareholder Initiative on Climate & Sustainability (SICS) initiated engagements with 40 more than two dozen publicly traded, US-based companies to encourage adoption of energy-savings goals and other energy-efficient practices.
IIGCC’s “Aiming for A” shareholder engagement group ⁸³	<ul style="list-style-type: none"> Following the absorption of Aiming for A into the IIGCC corporate programme, IIGCC has set up a shareholder resolutions group to incorporate the selective use of institutional quality shareholder resolutions to as part of meaningful and effective dialogue with companies. Resolutions have sought enhanced disclosure and requested Major oil and Gas companies to commit to setting targets for improvements in energy efficiency over the short, medium and long term, together with details of the investment required.

81 IIGCC. (2017). Investor Expectations on Corporate Climate Risk Management. Retrieved <http://www.iigcc.org/corporate/programme/investor-expectations-on-corporate-climate-risk-management>

82 Investor Network on Climate Risk. (2017). INCR Working Groups. Retrieved from <https://www.ceres.org/investor-network/incr/incr-working-groups>

83 Hermes. (2016). Anglo American: Managing the risks of climate change. Retrieved from <https://www.hermes-investment>.

<p>PRI Collaborations:</p>	<p>Eco-Efficiency and Climate Change Engagement (2016)⁸⁴</p> <ul style="list-style-type: none"> The engagement aims to encourage companies to achieve rapid, absolute reductions of greenhouse gas (GHG) emissions within their own operations and supply chains through more efficient use of energy, water and materials. <p>Low Carbon and 2 Degree Scenario Transition Planning Report (2017)⁸⁵</p> <ul style="list-style-type: none"> Signatories are invited to vote in favour of resolutions calling on Oil and Gas Majors to issue a report on the Company’s strategy for aligning their business plan with the well below 2-degree Celsius goal of the Paris Agreement, while continuing to provide safe, affordable and reliable energy. They are invited to publish an assessment of the long term impacts on the company’s portfolio, of public policies and technological advances that are consistent with limiting global warming to no more than two degrees Celsius over pre-industrial levels. Some resolutions emphasise the need to focus on impacts from, among others, changes towards increased fuel efficiency, through new requirements and standards, which hold the potential to reduce demand for petroleum-based fuels. Some call on more transparency regarding the significant capital resources spent expanding the operational activities, including investments in renewable energy projects and increased energy efficiency. While others resolution specifically calls on companies to assess the challenges and opportunities for growth provided by the rapid expansion of low carbon technologies including among others, energy efficiency.
<p>CDP - Carbon Action⁸⁶</p>	<ul style="list-style-type: none"> CDP - Carbon Action program comprises of 329 investors representing USD 25 trillion in assets under management who ask the world’s highest-emitting publicly-listed companies to take specific actions on climate change.

Driving Energy Efficiency Investments in Investors’ Real Estate Portfolios

As real estate and buildings are core investable asset classes held directly by institutional investors and represent a huge opportunity for incremental energy efficiency investments. There have been a growing number of initiatives and tools led by investors to promote greater transparency and sustainability in real estate investment activities that make specific references to energy efficiency current investment and future opportunities. This confirms the growing interest by investors towards energy efficiency, however there remains a large part of the industry that needs to be brought along through voluntary or regulatory schemes to scale up the present success.

There has been a number of sector and regulatory initiatives in various jurisdictions to improve, measure and report the energy performance of buildings. These initiatives have produced numerous robust and details investor-led tools. These help track how institutional investors are working to deliver a better understanding and reporting of energy efficiency activities in their real estate investments.

Sector organisations have produced a number of Sustainable Real Estate Investor guides which help investors scale up energy efficiency initiatives within their real estate investment processes. Among them: UNEP FI published the **“Seven-step Process for Real Estate Investors to Drive Value via Energy Efficiency Retrofits”⁸⁷** pointing an investment opportunity in energy efficiency building retrofits of between USD 231-300 billion per annum globally by 2020.

84 PRI. (2016). Eco-Efficiency and Climate Change Engagement. Retrieved from <https://www.unpri.org/group/eco-efficiency-and-climate-change-engagement-2488>

85 PRI. (2017). Partnerships. Retrieved from <https://www.unpri.org/partnerships>

86 CDP. (2017). Carbon Action. Retrieved from <https://www.cdp.net/en/investor/carbon-action>

While, jointly with the Global Investor Coalition and RICS, UNEP FI also published in 2016 the “**Sustainable Real Estate Investment Framework**”⁸⁸ providing practical steps for implementing climate change mitigation strategies including energy efficiency across the investment process for asset owners, and managers of direct, equity and debt real estate funds. The **Australian Sustainable Built Environment Council (ASBEC) has developed recommendations for policy-makers**⁸⁹ how they can utilise the full potential of the buildings sector to contribute to the Paris Agreement objective of net zero emissions by using the experience of market leading companies. The modelling underpinning the report finds that it is possible to reduce building-related emissions by more than 50% by 2050 even without technological breakthroughs and secure the benefits of increased energy productivity.

In order to accelerate progress across the market, ASBEC proposes a range of actions including a national plan with supporting policy frameworks and governance arrangements, mandatory standards for buildings, appliances and equipment, targeted incentives and programmes, energy market reforms and supporting data, information, training and education measures.

There is a robust business case for energy efficiency investments whose cost-effectiveness fares better in buildings than in many other sectors of the economy. UNEP FI offers a 7-step framework for capturing energy efficiency opportunities in real estate investment portfolios, accompanied with detailed case studies of an example investor implementing each step shown in Table 3.7:

Table 3.7 | 7-step Process for Real Estate Investors to Drive Value via EE Retrofits

Information	1. Ensure senior executive awareness of the business case for energy efficiency 2. Measure and benchmark building energy performance
Incentives	3. Set portfolio energy efficiency targets 4. Link asset manager compensation to asset energy performance 5. Align lease clauses to enable retrofits (green leases)
Investment: an inclusive approach	6. Include impact of asset value in investment analysis 7. Take a portfolio approach to determine next steps

Building upon this framework, energy efficiency is a key theme in 2016 UNEP FI, PRI, the Global Investor Coalition and the RICS framework for the integration of ESG and climate risks into the business of real estate investment and management⁹⁰. This framework provides practical recommendations to all investors from the development of an energy strategy and setting energy performance targets through to selection of managers, execution, monitoring and reporting as shown in Figure 3.10:

Figure 3.10 | Integrating ESG in each Stage of the Real Estate Investment Process



UNEP FI, PRI, the Global Investor Coalition & RICS, (2016)

87 UNEP FI. (2014). Seven-step Process for Real Estate Investors to Drive Value via Energy Efficiency Retrofits. Retrieved from http://www.unepfi.org/fileadmin/documents/Commercial_Real_Estate.pdf

88 UNEP FI. (2016). Sustainable Real Estate Investment Framework. Retrieved from https://www.unpri.org/download_report/13715

89 ASBEC. (2016). Low Carbon, High Performance – How Buildings can make a major contribution to Australia’s emission and productivity goals. Retrieved from <http://www.asbec.asn.au/wordpress/wp-content/uploads/2016/05/160509-ASBEC-Low-Carbon-High-Performance-Full-Report.pdf>

90 The framework is available at: UNEP FI, the Global Investor Coalition, PRI, & RICS. (2016). Sustainable Real Estate Investment: Implementing the Paris Climate Agreement: an Action Framework. Retrieved from <http://www.iigcc.org/files/publication-files/Sustainable%20Real%20Estate%20Investment%20Framework%20FINAL.pdf>

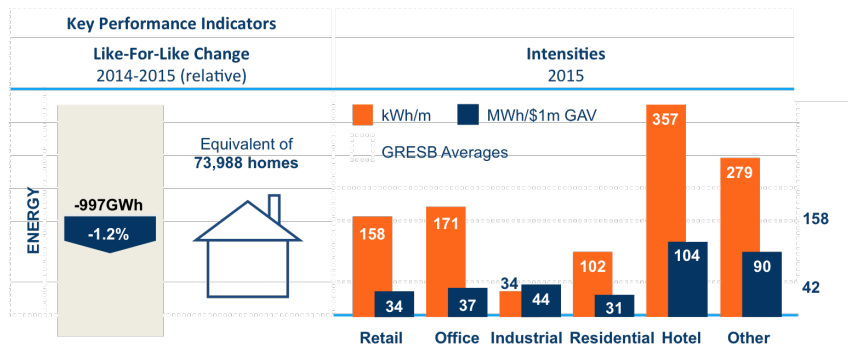
There has also been a continued rise in the number and quality of real estate sustainability benchmarks across various jurisdictions in the last 10 years, driven by both regulation and investors demand. These include government led schemes such as US Energy star, Australia’s Nabers, national schemes for Energy Performance Certificates schemes developed in the EU under the Energy Performance of Buildings Directive and numerous market led certifications LEED, BREAM, NABERS, HQE, and regional benchmarks.

Without undertaking a global review of these energy and sustainability certification mechanisms, EEFTG identifies one leading benchmark tool that provides a global view of energy efficiency uptake in real estate investment: GRESB⁹¹, is an investor-driven organization, which enables the monitoring, reporting and assessment of environmental, social and governance (ESG) performance of real assets globally, including real estate portfolios and infrastructure assets.

The GRESB survey measures actual energy performance of the funds and companies for USD 7.5 trillion of real estate assets under management, it also provides two complementary measures of portfolio-level resource productivity, including environmental impact (energy, GHG, water and waste) per floor area and per dollar of gross asset value (GAV). Resource productivity varies between property types. Lower intensities indicate relatively less environmental impact per unit floor area or per dollar of asset value. For the latest reporting period, the survey has identified a reduction in energy consumption on a like for like basis of -1.2% globally, representing just about 1,000 GWh of energy savings. Like-for-like measurements represent a relatively stable subset of a portfolio continuously owned by an entity for at least 24 months, and they may better reflect management actions to improve performance. The majority of those actions would be energy efficiency activities through responsible refurbishment, active property management and occupier engagement.

The scale and breath of the GRESB coverage and benchmark results, are clear indicators of the recognition of green building and energy efficiency as a major opportunity for the real estate sector. A consistent and appropriate regulatory framework, through building codes and mandatory certification schemes, can only strengthen the current momentum and broaden the progresses made to the cover the wider range of smaller investors in the heterogeneous real estate industry.

Figure 3.11 | Integrating ESG in each Stage of the Real Estate Investment Process



Source GRESB, 2017

91 GRESB has 250+ members, of which about 60 are pension funds and their fiduciaries who use the GRESB data in their investment management and engagement process, with a clear goal to optimize the risk/return profile of their investments. GRESB has assessed nearly 1,000 property companies and funds, jointly representing more than USD 7.5 trillion in assets under management, as well as almost 200 infrastructure assets and funds, on behalf of close to 60 institutional investors. GRESB. (2017). Who we are. Retrieved from <https://www.gresb.com/who-we-are>

3. Role of Insurance Companies:

Catalysing energy efficiency solutions and enabling market development through new insurance products and services

Insurance companies have a unique perspective, both as institutional investors managing \$31 trillion⁹² of assets and insuring the uncertainties and risks relating to projects and weather damage. The growing awareness and integration of climate-related risks and opportunities by insurance companies is shown in the disclosure of the multi-state survey of the US National Association of Insurance Regulators⁹³ led by the Commissioner of the Californian Department of Insurance to understand the consequences of climate change for insurance company operations, underwriting and reserving.

Insurance products can also help remove technical uncertainties that can allow banks and non-specialist investors focus on credit, process and corporate risks. Insurers can help increase energy efficiency investments through improved risk profiles of the underlying projects, through products like energy savings insurance, and also improve the understanding of these risks, thereby create data and trust in the market for energy efficiency solutions. The high data intensity requirements for insurance products creates a natural need to augment the evidence base showing that projected energy savings will materialise and to reduce transaction costs.

This section of the Toolkit primarily focuses on the role of targeted insurance products, services and business models that insurance companies have developed to address key barriers facing energy efficiency investments – such as improving the risk profiles of energy efficiency investments and protecting customers against the risks of dynamic policy frameworks also impacting energy prices. The role of insurers as investors is implicitly covered in the prior section on institutional investors. Insights into specific areas for further development to enable insurance companies to more fully develop their role in facilitating energy efficiency investments were provided through the inputs of members of the UNEP FI Principles for Sustainable Insurance (PSI), and the work of the Basel Agency for Sustainable Energy (BASE), a UN Environment partner.

Enabling energy efficiency investments through new insurance products and services

Energy efficiency investments are often hampered by the uncertainty associated with risks in terms of the quality and reliability of the assets installed, the revenues resulting from the project, and the energy savings generated. To scale-up energy efficiency investments, these risks need to be addressed and mitigated, providing a key role to insurers. Insurance companies, through their expertise and specialisation in different forms of risk management, can help both improve the assessment of risks and reduce the cost of carrying this risk.

Through tailored insurance products, services and models, insurers can help scale-up energy efficiency investments by addressing two categories of risks that stakeholders involved in energy efficiency investment transaction face - consequently building trust between the stakeholders:

- Technical risks - particularly during the implementation of the energy efficiency improvements as a multi-stakeholder process and when using complex equipment.
- Financial/performance risk - the level of energy savings and the financial value of these savings.

These risks are difficult to assess for project host entities, particularly for those who do not implement efficiency improvements on a regular basis, for homeowners as well as small and medium-sized enterprises (SMEs). They also have an impact on the risk perception and assessment of investors and lenders, and therefore on the accessibility and affordability of financing. Energy efficiency investment transactions require working in partnership adding a degree of complexity to investments and insurance processes.

92 Ibid.

93 Results analyzed in: CERES. (2016). Insurer Climate Risk Disclosure Survey Report & Scorecard: 2016 Findings and Recommendations. Retrieved from <https://www.ceres.org/resources/reports/2016-insurer-climate-risk-disclosure-survey/view>

The cumulative impact of risk assessment at both ends of the energy efficiency investment transaction explains the important role of insurance companies in contributing to de-risking. The need for a dialogue between the parties explains why insurance companies often, in addition to their product and service offers, provide technical advice to help clients fully understand the financial benefits of energy efficiency improvements. With the expected benefits of lowering the risk for the insurer.

Energy efficiency insurance can help remove technical uncertainty for the lenders, thereby allowing them to concentrate purely on credit risk. Insuring performance of the project with a highly rated insurer can also help to reduce the financial exposure which results in improved credit worthiness and may lower interest rates and funding costs.

Insurance Products for Energy Efficiency Investments

As energy efficiency investment has been increasing steadily, growing client demand has led insurance companies to develop a number of specialist insurance products. Table 3.8 presents a non-exhaustive selection of insurance products and services focused on energy efficiency. These products cover a broad range of clients from homeowners to commercial firms including manufacturers and Energy Services Companies (ESCOs).

Energy performance guarantees for performance and technology risks can improve the project credit rating and the remove technical risks for the lender. Insurance cover can deliver value by presenting a realistic picture of projected performance combined with the inherent risks. Further examples include products that cover “green rebuilding” standards after a loss or in the course of a renovation with link energy efficiency standards and insurance covering specific liabilities of energy efficiency services across different types of projects.

While the primary focus of insurance companies continues to be on insurance products, these are often accompanied by add-ons in a package of advisory services and technical assistance to further help clients improve energy efficiency. Insurance for energy efficiency can also be an extension or endorsement of existing standard insurance policies. In addition to dedicated energy efficiency products, insurers have also started developing insurance plans that are tied less to a specific energy efficiency investment/project, but provide incentives through behavioural change measures (fleet telematics) or beneficial coverage extensions (green coverage form).

In the long run, activities by insurers can help increase energy efficiency investments through improved risk profiles of the projects, but also improve understanding of risks, and create trust in the market for energy efficiency solutions between the different stakeholders – adding to the evidence base that projected energy savings will materialise and reduce transaction costs.

However to strengthen the current market, there remains a role for legislative incentives, whether through energy efficiency equipment or buildings standards. The complexity of the market development is also delayed by the diverse set of local level legislation making standardisation of products more difficult. The progress in smart technology penetration will also enable better measurement and risk assessment, and a conducive legal framework for smart appliances and buildings would enable a better development of insurance product and services.

Table 3.8 | Energy Efficiency Insurance products & services (non-exhaustive review)

Type of product	Description
<p>Energy Performance Guarantee (Performance risk, technology risk)</p> <p>Target market: commercial clients</p>	<p>Insurance companies active in this segment offer energy performance guarantee that cover the financial risk faced when energy efficiency improvements do not – contrary to projections – lead to levels of energy savings required by regulation. Coverage is available for construction companies, contractors or sub-contractors involved in the efficiency works and essentially enables these companies to take on this risk from the project sponsor.</p> <p>Similarly, other insurance companies offer energy savings warranty insurance to high quality EE contractors who themselves provide a guarantee on the amount of savings to be achieved. This frees up their balance sheets, freeing up capital for additional investment.</p> <p>Another innovation are solutions combining asset performance and technical risk insurance, enabled by a unique model maintained by the insurance company which gives a realistic projection of energy savings based on the interplay of all conversation measures in a building. This improves the project credit rating by removing the technical risk which is difficult to assess for lenders.</p>
<p>LED performance warranties</p> <p>Target market: Commercial clients</p>	<p>LED manufacturers face technology risks with every product they bring to the market. When extending warranties to their customers, LED manufacturers take on the risk of serial losses should an entire product line be faulty– they consequently need to make balance sheet provisions in order to protect their solvency should such an event occur. Insurance covering against faults caused in the manufacturing process and thus also frees up balance sheets for further investment.</p>
<p>Technical assistance, advisory services, and business development</p> <p>Target market: homeowners</p>	<p>Insurance companies provide energy efficiency recommendations and tools as an add-on or to other insurance products or as a stand-alone product to help clients achieve greater energy savings. Service offerings include advisory services on optimising energy efficiency through technical and operational measures.</p> <p>These services include energy audit, access to network of contractors to carry out retrofit, assistance in installing energy equipment and technology.</p> <p>The region of Normandy has established a platform matching project sponsors and professionals who are certified for the newest efficiency standard, combining this with some financial support. The region also created a new profession (essentially an energy efficiency coordinator) who oversees work by the various contractors and sub-contractors involved.</p>




<p>Technical assistance, advisory services, and business development</p> <p>Target market: commercial clients</p>	<p>Solutions also include the certification of project proposals or a framework contracts with suppliers. Once a project is certified the calculated energy savings are insured. The return is guaranteed plus the transaction costs to identify and select a suitable project are reduced significantly.</p> <p>The EU's Sustainable Energy Asset Evaluation and Optimisation Framework (SEAF) Project, is currently developing an online portal matching ESCOs and SMEs seeking to make energy efficiency improvements to enable them to develop investable proposals backed up by insurance solutions. The beta version of the portal was launched recently (http://www.seaf-h2020.eu).</p> <p>Solutions also include the usage of advanced telematics for corporate fleet insurance clients to track driving behaviour and other parameters to optimise the organisation of corporate fleets, thus improving fuel consumption and reducing emissions.</p>
<p>Add-on coverage to existing insurance policies</p> <p>Target market: homeowners</p>	<p>Solutions offered include coverage expansions of standard policies for homeowners undertaking green building construction or renovation – to cover additional value that results through “green” elements of buildings, after partial or total loss. These are often offered as endorsement (coverage expansion) of standard insurance policies.</p> <p>In the event of a full or partial loss, other solutions cover the upgrade of the building to standard, or they cover the replacement of lost property and possessions in a sustainable way.</p>

Integrating Energy Savings Insurance into the finance process to scale-up energy efficiency investments in SMEs

The Energy Savings Insurance (ESI) originally promoted by the Global Innovation Lab for Climate Finance, the Danish Government and the IDB, guarantees an expected level of energy savings for specific energy efficiency measures as agreed upon in a standard contract between small & medium businesses (SMEs) and energy efficiency services and technology providers. The insurance reimburses the project owner if this level is not reached. ESI forms part of the “guarantees” offered by the technical provider to its client (industrial company, SME or building owner) on the level of energy savings that will be achieved through the works. If the level of promised energy savings is not reached, the client is compensated through the insurance. This establishes trust between the technical provider and the final client that the financial benefit of the energy savings will materialize.

State governments have led ESI effort such as using the insurance in state own buildings and the promotion of this product by multilateral development banks⁹⁴. Several insurance companies already offer Energy-Saving Insurance (ESI), in collaboration with public institutions. The participation of local insurance companies and international reinsurers in the Program is secured by the fact that the solution integrates third party verifiers and energy efficiency services and technology providers, standardized forms, methodologies and protocols for the structuring of projects, their monitoring, reporting and verification, as well as a dedicated credit lines at adequate terms and conditions to promote a pipeline of EE projects.

Table 3.9 | Energy Savings Insurance (ESI) Characteristics

I Removes the technical uncertainty⁹⁵ 	II Enhances the credit worthiness⁹⁶ 	III Facilitates the so-called “deep energy retrofits⁹⁷” 
<ul style="list-style-type: none"> • This insurance product allows for increased trust and willingness of customers to invest in energy efficiency 	<ul style="list-style-type: none"> • From a lender’s perspective, ESI enhances the credit worthiness of energy efficiency projects • And could potentially unlock financing at lower cost. 	<ul style="list-style-type: none"> • This instrument facilitates the so-called “deep energy retrofits” that tackle all of the energy efficiency improvements at once • But require significant capital investment and have longer payback periods.

ESI aims to scale up investments in energy efficiency, facilitate the flow of financing for these technological solutions and address the untapped market potential. Capital intensive long-term investments with longer payback periods present significant untapped energy efficiency potential. For these projects with long investment horizons, ESI is critical to improve the risk profile.

Building on the specialised the Energy Savings Insurance products and services that insurance companies have developed, with the support of the IDB and the Danish Government, the Basel Agency for Sustainable Energy (BASE), a UN Environment partner, has designed a toolkit to scale up energy efficiency investments in SMEs which comprises a package of services and specifically integrates energy savings insurance⁹⁸. The scheme aimed to help how national development banks establish a program that is able to catalyse the EE market for SMEs, working with global and national insurance companies and brokers. The toolkit has been effective at scaling-up energy efficiency investments in SMEs. Table 3.10 gives an overview of the components of the BASE model that have been designed to work together to overcome the investment barriers, create trust and reduce the perceived risk of stakeholders.

94 Energy Savings Insurance Programme developed by the Capital Markets and Financial Institution division (CMF) of the Inter-American Development Bank. IDB. (2017). Energy Savings Insurance. Retrieved from <http://www.iadb.org/en/sector/financial-markets/financial-innovation-lab/energy-savings-insurance-esi,19717.html>

95 The Global Innovation Lab for Climate Finance. (2015). Energy Savings Insurance. Retrieved from <https://climatepolicyinitiative.org/wp-content/uploads/2015/02/Energy-Savings-Insurance-Lab-Phase-2-Analyses-Summary.pdf>

96 Ibid.

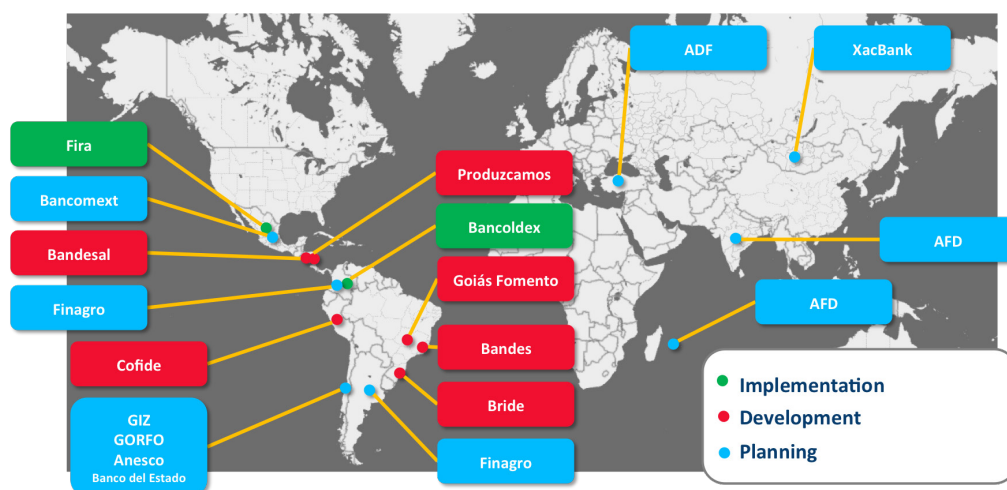
97 BEPAnews. (2011). Energy Savings Insurance and the New ASTM BEPA Standard. Retrieved from http://paceworx.com/wp-content/uploads/srm/Whitepaper_ESI_BEPA_11-15-11.pdf

Table 3.10 | Four Main Components of BASE’s Energy Efficiency toolkit for SMEs

Financing	Competitive credit conditions and suitable tenors is required to support SMEs in financing energy efficient technology solutions. Financial institutions are engaged and trained to understand the ESI mechanisms. The financial institutions benefit from the ESI mechanism by reducing the credit risk of their borrower.
Standardized contracts	The toolkit offers a clear and transparent framework for negotiations between key actors (SMEs, providers, FIs) to clearly define how project energy savings are guaranteed. This framework reduces the risks involved in EE projects, distributes the remaining risk to appropriate actors, and fosters trust among them. The framework also aids providers in approaching and engaging firms regarding potential EE projects by enabling them to offer a more trustworthy and reliable service.
Energy Savings Insurance	The strategy facilitates access to a risk coverage product provided by a third party to insure against the provider failing to fulfil its contractual obligations regarding the energy savings promised to the SME. The insurance forms part of the guarantees offered by the provider to the SME in the contract. ESI aims to create trust between the SME and the provider in relation to the EE offer.
Validation	An independent technical validation is integrated into the framework, to overcome the perceived high performance risk of EE projects. An independent validation entity has to evaluate the capacity of the project to generate the energy savings promised, and the capacity of the provider to deliver the project and fulfil its obligations. The validation entity also verifies the installation of an EE project, and acts as an arbitration entity if required.

The SME energy efficiency toolkit developed by BASE and its partners and working in collaboration with the private insurance sector is being planned, developed or rolled out in various countries across Latin America⁹⁹, Africa and Asia (shown in Figure 3.12).

Figure 3.12 | Implementation Map for the Energy Savings Insurance (ESI)



98 BASE. (2017). Scaling up energy efficiency financing for local banks in Latin America and beyond. Retrieved from <http://energy-base.org/project/scaling-up-energy-efficiency/>

99 BASE. (2017). Financing energy efficiency in the agribusiness sector. Retrieved from <http://energy-base.org/project/energy-efficiency-in-the-agribusiness-sector/>

BASE. (2017). Saving Energy in Hotels and Hospitals. Retrieved from <http://energy-base.org/project/energy-efficiency-in->

The UNEP FI Principles for Sustainable Insurance: From mobilising insurers to address climate risk to leveraging on their expertise to scale-up energy efficiency investments

The UNEP FI Principles for Sustainable Insurance (PSI)¹⁰⁰, launched at the 2012 UN Conference on Sustainable Development, are endorsed by the UN Secretary-General and insurance CEOs worldwide. They provide the insurance industry with a globally-recognised framework to address environmental, social and governance (ESG) risks and opportunities - such as climate change, natural disasters, ecosystem degradation, and social and financial inclusion - in its core business strategies and operations, and to strengthen its contribution to sustainable development.

Climate change represents a significant concern for insurers globally, as the short and long-term physical impacts to populations, livelihoods and economic assets become increasingly material. Total economic losses from natural disasters in the last decade were more than USD 1.3 trillion, with total direct losses in the range of USD 2.5 trillion so far this century. In the past decade, 80% of natural disasters were climate-related, and climate change is predicted to increase the frequency, severity and magnitude of extreme weather events such as floods, storms and droughts. Insurance companies play a major role in covering physical climate impact-related risks, transferring and managing these risks and absorbing losses after adverse events have occurred. This has led to a long-standing commitment of insurance companies to understanding the consequences of climate on their exposures and developing tools to integrate climate-related risks and opportunities into their investment practices.

The four Principles for Sustainable Insurance, which include a list of possible actions to address ESG issues at present do not make explicit references to energy efficiency. Rather, as in the investor industry, energy efficiency is embedded in broader environmental themes of ESG. The principles represent a useful framework through which strategies, approaches, products and tools can be developed to support this G20 Toolkit and upscale G20 energy efficiency investments with the involvement of the insurance industry.

100 Principles for Sustainable Insurance. (2012). The UNEP FI Principles for Sustainable Insurance. Retrieved from http://www.uneppi.org/psi/category/publications/core_psi-documents/
PSI has more than 100 insurance and stakeholder member organisations across the globe. PSI member insurers account for more than 20% of the world's premium volume and USD 14 trillion in assets under management at the time of writing.

1	We will embed in our decision-making environmental, social and governance issues relevant to our insurance business
	<p>Company strategy</p> <ul style="list-style-type: none"> • Establish a company strategy at the Board and executive management levels to identify, assess, manage and monitor ESG issues in business operations • Dialogue with company owners on the relevance of ESG issues to company strategy • Integrate ESG issues into recruitment, training and employee engagement programme <p>Risk management and underwriting</p> <ul style="list-style-type: none"> • Establish processes to identify and assess ESG issues inherent in the portfolio and be aware of potential ESG-related consequences of the company's transactions • Integrate ESG issues into risk management, underwriting and capital adequacy decision-making processes, including research, models, analytics, tools and metrics <p>Product and service development</p> <ul style="list-style-type: none"> • Develop products and services which reduce risk, have a positive impact on ESG issues and encourage better risk management • Develop or support literacy programmes on risk, insurance and ESG issues <p>Claims management</p> <ul style="list-style-type: none"> • Respond to clients quickly, fairly, sensitively and transparently at all times and make sure claims processes are clearly explained and understood • Integrate ESG issues into repairs, replacements and other claims services <p>Sales and marketing</p> <ul style="list-style-type: none"> • Educate sales and marketing staff on ESG issues relevant to products and services and integrate key messages responsibly into strategies and campaigns • Make sure product and service coverage, benefits and costs are relevant and clearly explained and understood <p>Investment management</p> <ul style="list-style-type: none"> • Integrate ESG issues into investment decision-making and ownership practices (e.g. by implementing the Principles for Responsible Investment)
2	We will work together with our clients and business partners to raise awareness of environmental, social and governance issues, manage risk and develop solutions
	<p>Clients and suppliers</p> <ul style="list-style-type: none"> • Dialogue with clients and suppliers on the benefits of managing ESG issues and the company's expectations and requirements on ESG issues • Provide clients and suppliers with information and tools that may help them manage ESG issues • Integrate ESG issues into tender and selection processes for suppliers • Encourage clients and suppliers to disclose ESG issues and to use relevant disclosure or reporting frameworks <p>Insurers, reinsurers and intermediaries</p> <ul style="list-style-type: none"> • Promote the adoption of the Principles • Support the inclusion of ESG issues in professional education and ethical standards in the insurance industry

3	We will work together with governments, regulators and other key stakeholders to promote widespread action across society on environmental, social and governance issues
	<p>Governments, regulators and other policymakers</p> <ul style="list-style-type: none"> • Support prudential policy, regulatory and legal frameworks that enable risk reduction, innovation and better management of ESG issues • Dialogue with governments and regulators to develop integrated risk management approaches and risk transfer solutions <p>Other key stakeholders</p> <ul style="list-style-type: none"> • Dialogue with intergovernmental and non-governmental organisations to support sustainable development by providing risk management and risk transfer expertise • Dialogue with business and industry associations to better understand and manage ESG issues across industries and geographies • Dialogue with academia and the scientific community to foster research and educational programmes on ESG issues in the context of the insurance business • Dialogue with media to promote public awareness of ESG issues and good risk management
4	We will demonstrate accountability and transparency in regularly disclosing publicly our progress in implementing the Principles
	<ul style="list-style-type: none"> • Assess, measure and monitor the company's progress in managing ESG issues and proactively and regularly disclose this information publicly • Participate in relevant disclosure or reporting frameworks • Dialogue with clients, regulators, rating agencies and other stakeholders to gain mutual understanding on the value of disclosure through the Principles

The work conducted under the frame of this G20 Toolkit should identify tools for the committed insurers gathered in the Principles for Sustainable Insurance (PSI) to improve their role and opportunities to scale-up energy efficiency investment deployment. EEFTG believes that a survey of PSI members will create a more detailed understanding of the state of play and pro-actively develop the tools which will fit into the existing mandates of insurance companies:

This beneficial engagement with the PSI can deepen and expand in due course, through relevant surveys and the recommendations mentioned above. Similarly, the aims of this Toolkit can benefit from engagement with insurance regulators and supervisors across jurisdictions. In this context, the Sustainable Insurance Forum for Supervisors (SIF) provides a platform to engage with going forward. The SIF was launched by UN Environment—through its PSI Initiative and its Inquiry into the Design of a Sustainable Financial System—and insurance regulators and supervisors in December 2016. SIF is an international network of insurance regulators and supervisors that aims to promote cooperation on critical sustainability challenges and opportunities such as climate change, natural disasters, ecosystem degradation, and social and financial inclusion.

IV. Role of Public Finance in G20 Energy Efficiency Investment

Strengthening our efforts to support energy efficiency

As our contribution to the work of the G20 Energy Efficiency Finance Task Group, and as public financial institutions, **we share a common understanding of the positive economic, climatic and societal benefits of energy efficiency.** Together, we wish to ensure that our activities promote and support energy efficiency, and do not waste energy.

To reflect this we have come together to provide our collective insights to G20 leaders and to **jointly agree a series of priorities to guide our continued operations** through this **Joint G20 Energy Efficiency Statement**

We, the undersigned, within our respective institutional mandates, reaffirm our commitments to **strengthening our efforts to support energy efficiency** and jointly identify the following **priorities to increase our energy efficiency investments:**

- 1** **Embed energy efficiency** considerations into the way in which we consider investment and finance opportunities and interact with our clients
- 2** Increase our **activities** in support of **Policy Frameworks** which require and promote energy efficiency and drive a **life-cycle cost optimal approach** to the procurement of new infrastructure and buildings;
- 3** Work with our stakeholders to increase the amount, availability and accessibility of **Technical and Project Development Assistance facilities** to lever our and our partners' investments;
- 4** Work to ensure energy efficiency maintains a **high, cross-cutting internal profile** and, where possible, is **better monitored, measured and reported** throughout our activities;
- 5** Look to increase our work with **retail distribution channels** through partner banks and other innovative retail mechanisms, to support scaling up and aggregation of individual energy efficiency investments;
- 6** Work to ensure energy efficiency's central role in the **future of mobility, smart cities, energy grids, industry and infrastructure.**
- 7** Engage in a more **structured exchange of knowledge** and the **sharing of best practices** with one-another, with attention to innovative **financing mechanisms, definitions and eligibility criteria** to safeguard our energy efficiency performance standards in specific countries and subsectors.

Endorsed by:

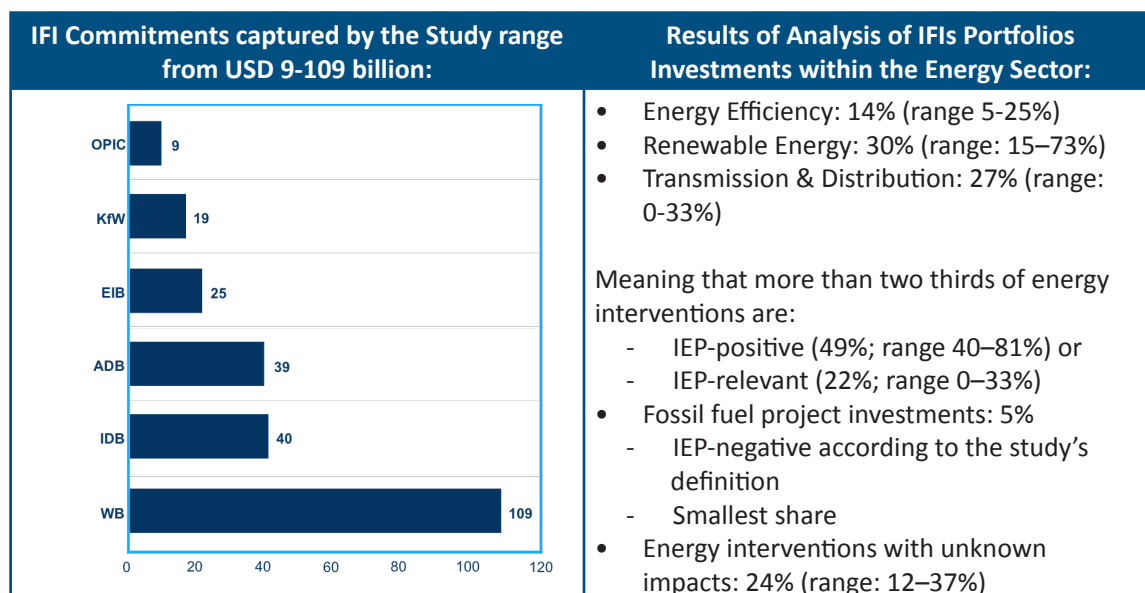


Public financial institutions, including national policy banks, multilateral development banks (MDBs) and International Financial Institutions (IFIs), are leaders in driving best practice and using their global reach to pilot new approaches and bring to scale supportive financial instruments that measure and deliver the multiple benefits of energy efficiency to their target economies.

Overview of the Energy Productivity of International Financial Institutions’ Energy Interventions

A 2017 report by the Climate Policy Initiative (CPI) and the South Pole Group “The Productivity of International Financial Institutions’ Energy Interventions” affirms that IFIs have the potential to reprioritise their investments to adequately meet global climate and environment related goals. The study’s dataset captures 107% of total energy investments detailed within the annual reports of a series of IFIs¹⁰¹ for the 2012 to 2014 time period.

Investments promoting energy efficiency accounted for around 14% of IFIs’ energy portfolios and 3% of IFIs’ total investment portfolios, an amount totalling half their investments in renewable energy. Impacts for each sector were assessed to determine whether they increase the use of energy, attain GHG emissions reductions, or deliver socio economic benefits. The authors classified those most beneficial investments on a qualitative basis, which revealed if interventions managed to improve Integrated Energy Productivity (IEP), the study’s new definition which builds on the traditional definition of energy productivity adding social and environmental benefits.



Source: CPI & South Pole Group, 2017

As non-energy investments represented over three quarters (80%) of total IFI interventions recorded in the study, this signals an opportunity for incepting energy efficiency and IEP efficiency across IFI’s portfolios. The study’s recommendations on how to do this are consistent with the actions undertaken by the public financial institutions endorsing the Joint G20 Energy Efficiency Statement (above) and the conclusions of the public finance working group launched and moderated by EEFTG to support this Toolkit.

101 107% of OPIC, KfW, EIB, ADB, IDB and World Bank energy investments reported in Annual Reports appear in OECD CRS database. OECD. (2017). Creditor Reporting System (CRS). Retrieved from <https://stats.oecd.org/Index.aspx?DataSetCode=CRS1>




Table 4.1 | Recommendations for IFIs to increase the IEP Impact of their Energy Sector Interventions

A	Mainstream energy efficiency considerations within operations	<ul style="list-style-type: none"> Interventions promoting energy efficiency can deliver significant economic, social, and environmental benefits across all economic sectors, and hence need to be mainstreamed in a standardized and systematic way.
B	Develop a set of operational ‘safeguards’ in project appraisals for key sectors	<ul style="list-style-type: none"> This aims to ensure only the most energy efficient projects are included in IFI portfolios of energy and non-energy investments. A checklist for different sectors could help guarantee that interventions improve energy efficiency in each focus area such as: siting and design, insulation, equipment, building operations, and overall building needs.
C	Promote knowledge sharing and dissemination of best practices.	<ul style="list-style-type: none"> Numerous existing policies, targets, and processes used by IFIs at present improve energy productivity, yet no IFI applies all best practices. Changing project design and sharing best practices with other project developers can lead IFIs to improve and increase energy and carbon savings within their energy investment portfolio.
D	Build a coalition of IFIs	<ul style="list-style-type: none"> A coalition of IFIs could harmonise approaches to tracking energy efficiency interventions and quantifying projects’ impact. By coming together, IFIs could demonstrate to governments and donors alike how to best direct resources to reduce emissions and grow economies.

Source: CPI & South Pole Group, 2017

EEFTG has been working bilaterally and through a co-hosted task force launched in 2016 with 16 public financial institutions¹⁰² to identify areas for joint development and to mobilise resources for energy efficiency capacity building, project development support, scaling up investments and “best in class” financial instruments that can lever additional private sector energy efficiency investments.

Table 4.2 | Public Financial Institutions have led Energy Efficiency in three main areas

1	 Showcasing and replication of energy efficiency investment models that lever private retail bank partner networks for on-lending to their clients.
2	 Identification and implementation of new financial instruments designed to facilitate the replication and scale up of energy efficiency investments.
3	 Identification of internal policies that help mainstream energy efficiency investing across all activities of the organisation.

102 Invitees and attendees to this WG include: Asian Infrastructure Investment Bank (AIIB), Asian Development Bank (ADB), Agence Française de Développement (AFD), African Development Bank Group (AfDB), Brazilian Development Bank (BNDES), Global Environment Facility (GEF), European Investment Bank (EIB), European Bank for Reconstruction and Development (EBRD), Sustainable Energy for All (SEforALL), Inter-American Development Bank (IDB), International Finance Corporation (IFC), Japan Bank for International Cooperation (JBIC), Japan International Cooperation Agency (JICA), KfW Development Bank, Overseas Private Investment Corporation (OPIC), and the World Bank (WB).

Together, and individually, these 16 institutions are looking to promote and support energy efficiency, and reduce wasted energy across their investment portfolio and operations. The approaches being considered by these public financial institutions include:

1. Embedding energy efficiency considerations into the way in which investment and finance opportunities are considered and how they interact with their clients;
2. Increasing activities in support of policy frameworks that require and promote energy efficiency and drive a life-cycle cost optimal approach to the procurement of new infrastructure and buildings;
3. Working with stakeholders to increase the amount, availability and accessibility of Technical and Project Development Assistance facilities to lever own and partners' investments;
4. Working to ensure energy efficiency maintains a high, cross-cutting profile and, where possible, is better monitored, measured and reported throughout their activities;
5. Looking to increase work with retail distribution channels through partner banks and other innovative retail mechanisms, to support scaling-up and aggregation of individual energy efficiency investments;
6. Working to ensure energy efficiency's central role in the future of mobility, smart cities, energy grids, industry and infrastructure.
7. Engaging in a more structured exchange of knowledge and the sharing of best practices with each other, to innovative financing mechanisms, definitions and eligibility criteria to safeguard energy efficiency performance standards in specific countries and subsectors.

Drawing on best practices, four areas were highlight by the working group and developed in greater detail to provide a framework of action for public financial institutions and country partners to accelerate activities in these areas and thereby scale-up energy efficiency investments:

1. Increase Policy-based Lending to Support Investment Grade Policy Frameworks that require and promote EE and to drive "Life-cycle Cost Optimal" Procurement of Public Infrastructure and Buildings

Thesis: The demand for EE finance depends upon a policy framework that promotes energy efficiency, establishes national codes, sets standards and polices adherence to them. Policy-based EE lending programmes can support investment grade EE policies and encourage a life-cycle cost-optimal approach to public procurement.

Set standards: Standard setting at the national level and imbedding energy efficiency into national infrastructure and energy plans (vEEIP Principle 2) are vital to encouraging demand for energy efficiency. Increased policy based lending targeting the creation of an enabling policy framework with codes and standards in various sub-sectors can help countries move forward, demonstrate political commitment to EE and attract public and private finance.

Apply market-based incentives: "Carrot and Stick" approaches to leapfrog low energy efficient technologies are recommended where regulation (and the threat of it) is the stick, and subsidies, low-cost finance and fiscal benefits are the carrots. Importantly, the removal of distorting subsidies and provision of transparent future formation of energy prices will significantly promote energy efficiency uptake.

Design tailored financing mechanisms: Buildings codes and standards can be developed together with tailored financing mechanisms to ensure new buildings are procured and constructed considering their life-cycle cost optimal design and efficiency. This will move the new build market away from "cheapest to construct" towards "life-cycle optimal" and will have the beneficial impact of reducing the "green premium" (like the energy efficiency premium defined in section 1, the supposed additional investment required to procure more environmental and energy efficient buildings with lower on-going costs for owners and to society) to zero. Experts from public financial institutions believe that there is a material miss-appreciation for this "green premium" at present with experienced participants recording it as

Improve procurement processes: Public finance conditions can influence public infrastructure and buildings procurement processes to better deliver life-cycle cost optimum assets and not lowest-cost to construct. Construction sector supply chains should also be incentivized to consider best-available EE technologies and to deliver finished assets which have lower maintenance and energy costs and smaller lifetime environmental footprints. In countries where significant numbers of buildings are in public ownership, national energy efficiency action plans can promote their energy efficient renovation to showcase approaches and finance facilities - as well as build capacity in local construction supply chains and markets for new EE technologies.

Greater sectoral understanding and specificity to financing facilities are necessary and appropriate: Large energy-intensive industries, cities, transport, buildings sectors, water, sanitation are examples of sectors that will require tailored and specific energy efficiency finance facilities.

2. Increasing the amount, availability, simplicity and connectedness of Technical Assistance/ Project Development Assistance facilities

Thesis: The availability of tailored grants, connected to EE finance facilities, that provide frameworks and resource capacity to develop an investment grade pipeline of EE projects is a key bottleneck in up-scaling energy efficiency investments.

There is a definitional clarification required to ensure clarity between “Technical Assistance” and “Project Development Assistance”:

- “Technical Assistance” (TA): Traditionally funding provided at the programme level “top-down” with the objective to design, structure, launch and operate Financial Instruments, vehicles or programmes and often provided to «programme managers» in countries or regions such as local authorities, energy efficiency agencies, national development banks); and
- “Project Development Assistance” (PDA): Funding provided directly to energy efficiency project promoters “bottom-up” for individual projects with the objective to develop and promote specific investment pipelines; PDA is often provided directly to project promoters to address the specific lack of individual project development and structuring skills (including financial structuring) among them and can relate to the development of energy audits, project contractual and financial set-up, establishment of a baseline needed to calculate the targeted energy and financial savings, development of specific energy service contracts and so on.

Existing public finance assistance TA and PDA grants tend to lie in the range of 1-4% of the total facility amount (depending upon programme size, market maturity and structure). There is a strong consensus that tailored and connected TA and PDA grant assistance facilities need to be tied to a tailored investment or finance facility in order to build healthy EE project pipelines, packaged with tailored delivery partners.

Donor providers of TA and PDA monies are fragmented, sub-scale and their application and origination procedures can be complex and time consuming for the public financial institution thereby slowing down the flow of energy efficiency investment and finance facilities. Ways to up-scale, standardize, simplify and harmonize these grant facilities and their origination procedures for institutions with a track record of success in their disbursement would help up-scale EE finance delivery.

In the longer-term, new sources of TA/ PDA should be identified as well as ways to make these facilities “self-financing” and public institutions can help up-scale capacity and technical expertise within private sector financial institutions to enable their faster origination and engagement to make EE loans.

3. Leverage Multiple Retail Distribution Mechanisms

Thesis: One of the major barriers to up-scaling energy efficiency investments is their small and disaggregated nature. Public Financial Institutions can expand their retail distribution networks through on-lending through partner commercial banks and other retail facing channels through increased "productization", retail packaging and on-bill finance techniques.

Leverage multiple retail channels: Commercial banks are helpful distribution partners for public financial institutions' energy efficiency facilities¹⁰³ (as well demonstrated by the success of EBRD's Sustainable Energy Finance Facilities and KfW's EE programmes¹⁰⁴) and yet the negotiation and launch of these programmes can be time consuming. Providing blended capital instruments and doing demonstration projects is part of the solution, as well as face-to-face technical assistance to build capacity and to help identify opportunities.

Facilitate aggregation: For the rapid roll-out of "single measure" and highly energy efficient technologies a "super-ESCO" approach to bulk technology procurement and direct retail distribution through multiple retail channels with on-bill repayments has been a breakthrough in some G20 economies for LEDs, ceiling fans, air conditioners and water pumps. Public financial institutions can help promote and replicate this approach in countries where the local environment and market conditions are appropriate. The necessary phase out of HFCs from white goods and air conditioners is also a clear opportunity for retail distribution of EE technologies and harnessing the power of MDB/ IFI experience and financing approaches in selected countries.

Mitigate risk through new financial products: Energy Savings Insurance (ESI) was highlight by selected public finance providers as a breakthrough product now being tested in six countries, by IDB in Mexico and Columbia, and which could be used in combination with new retail distributions channels to reduce the performance risks for consumers and therefore improve uptake of EE measures and related finance.

4. Energy Efficiency's Central Role in the Future of Mobility, Smart Grids and Infrastructure

Thesis: Energy efficiency is considerably more cheaply integrated into systems, buildings and infrastructure at the design stage – rather than as an asset "upgrade" once built. Technology driven revolutions in mobility and smart energy use and provision are opportunities for energy efficiency investments to be included "at source".

Encourage implementation of integrated planning: Over the medium to long-term, energy systems, transport systems, buildings intelligence and cities will have to be substantially revised to deliver services which the future consider demands and which are enabled by smart technologies and the internet of things. Energy efficiency must sit at the base of the planning and new organization which emerges through the opportunities created by these new technologies. New infrastructure, energy systems and buildings procurement processes and designs must consider energy efficiency investments first as they will drive greater utility, lower environmental impacts, better air quality and accelerate energy access for the 1.4 billion people presently without it. From more efficient air conditioning to better street lighting to stronger public transport systems, across the G20 countries, energy efficiency helps to promote development and improve standards of living.

103 EBRD. (2017). SEFF. Retrieved from <http://seff.ebrd.com/index.html>

104 IEA. (2015). KfW-Programme Energy-Efficient Rehabilitation (Energieeffizient Sanieren). Retrieved from <https://www.iea>.

EEFTG's work with public financial institutions identifies ways in which G20 nations can work together and unlock the multiple benefits of energy efficiency investments with focused energy efficiency considerations in five key areas: Policies and regulation, Institutions, Information, Technical Capacity and Finance. Critical components of such strategies may include the establishment of national energy efficiency targets and reporting mechanisms; creation of national, dedicated financing and incentive mechanisms for energy efficiency in key sectors (e.g. industry, transport, residential buildings); and the strengthening and harmonization of codes and standards, among others. Through this Toolkit's flexible architecture, EEFTG believes there is strong value for G20 participating countries to support the continuation of this joint public finance development endorsement to up-scale energy efficiency investments.

Annexes

Voluntary Energy Efficiency Investment Principles: Implementation, good practice cases and voluntary options

	Principle ¹⁰⁵	Rationale ¹⁰⁶
1	Recognise the importance of energy efficiency considerations in all relevant decision-making to significantly increase and strengthen energy efficiency investments in our economies in the context of a balanced progression of the three dimensions of sustainable development ¹⁰⁷ .	<p>Energy efficiency considerations and investments are integral to multiple national economic and development areas. Lifetime energy usage and operational cost considerations are integral considerations for infrastructure investment decisions and in their absence a tilt towards the lowest up-front capital expenditure can lock-in high future energy trajectories, particularly when energy is not the primary cost-driver.</p> <p>Integrating EE considerations in decision-making processes can be achieved in various ways: a) contextualising EE as a policy priority to reach cross-cutting objectives such as: sustainable development, energy security and green growth; b) setting a solid framework with relevant targets, programmes and activities, such as implementing cross cutting EE national policies with a framework that promotes new approaches and delivers multiple benefits, c) sending signals to companies and financial stakeholders that conveys EE as a national priority.</p>
2	Encourage energy efficiency investments and their positive impacts to be systematically considered along supply side investments related to energy systems. This can be achieved through the consideration of possible reforms in the decision-making, planning, pricing and regulation of investments in energy and infrastructure.	<p>Energy efficiency can add to the overall capacity of the energy system, through reducing energy demand, and thereby reduces the need for new energy supply. EE is often the most cost-effective option to 'add' capacity to the energy system and demand reduction can be considered alongside conventional supply additions and, being domestic, also contributes to national energy security.</p> <p>While EE opportunities are often referred to in high-level public policy processes, often EE is less well reflected in the lower level planning instruments and in the direct regulation of energy markets. An "enabling policy environment" requires a balanced approach to demand and supply-side measures in order to ensure that energy savings are systematically identified and valued on an equal footing with supply additions thereby delivering cost optimal energy systems.</p>
3	Stimulating the demand for energy efficiency investment requires a multi-sectoral framework of complementary policies and instruments.	
3a	The provision of clear regulatory and investment signals to encourage the uptake of energy efficiency investments within the development and upgrade cycles of our infrastructure, consistent with national development priorities and strategies.	Timing is critical for energy efficiency investments, as assets such as equipment, real estate or infrastructure have long lifespans and just few opportunities for upgrades. While some EE measures pay back quickly, others need to be tailored to coincide with the natural retirement of equipment and/or upgrade cycles of buildings or infrastructure assets. Policies should recognise the specific characteristics of EE investments and underlying asset conditions to properly integrate EE investments into replacement cycles when needed. This requires a closer engagement between financial institutions, energy service providers and consumers (industry, building owners) to ensure the timely provision of EE solutions and supporting finance packages.

105 G20 EE Investment Principles for Participating Countries

106 AR 2015

107 For full definition please refer to: UN Environment. (2015). The Three Dimension of Sustainable Development. Retrieved from <http://web.unep.org/ourplanet/march-2015/unep-work/three-dimensions-sustainable-development>

EEFTG Survey findings ¹⁰⁸	Good practice cases ¹⁰⁹	Recommendations for action
<ul style="list-style-type: none"> • Many G20 countries have qualitative EE targets and around half have a law that promotes EE. Also, most G20 countries have an EE agency¹¹⁰. • There is strong potential to improve policies that address large non-energy intensive industries, SMEs & commercial and buildings. • EEFTG's expert survey indicates above average additional potential in G20 economies to stimulate EE investments across all sectors. 	<ul style="list-style-type: none"> • France Energy Transition law • Mexico Energy Transition law • Australia's National Energy Productivity Plan • China 13th FYP 	<p>Countries can embed energy efficiency considerations in the regular development and review processes of their energy policy frameworks, as well as in their relevant broader national strategies and action plans. This can be achieved by raising the profile of energy efficiency in policy discussions, setting targets, and introducing new multi-sectoral policies to create and promote energy savings.</p>
<ul style="list-style-type: none"> • All four survey areas reveal that current government investment plans and policies are “average” at capturing the positive impacts and multiple benefits of EE. • Good opportunities to upscale EE investments exist through more systematic integration of EE investments in generation capacity planning and transmission infrastructure, energy markets and general infrastructure investment planning and scenario analysis. 	<ul style="list-style-type: none"> • EU Energy Efficiency First¹¹¹ • Canada, Ontario's 'Energy Conservation First' 	<ul style="list-style-type: none"> • Consider “energy efficiency first” as a governance principle for energy planning; • Review and improve energy planning processes and tools by systematically integrating energy efficiency considerations; • Improve the allocation of structural funds to new infrastructure projects according to the principle of “energy efficiency first”; • Improve the design of capacity markets (or introduce them where feasible).
<ul style="list-style-type: none"> • Strength of current regulatory and investment signals for the incorporation of EE in all asset upgrades were rated “below average”, with strong potential to improve; • The most widely used policies are fiscal instruments and direct regulations, such as minimum energy performance standards (MEPS); • There is a strong potential to improve upgrade demand side policies across all sectors, particularly in large intensive industries and commercial & public buildings; • Policies to drive EE in asset upgrades tend to lean towards market based instruments, such as obligation and tendering schemes, supported by capital efficient financing instruments such as guarantees or soft loans. 	<ul style="list-style-type: none"> • France White Certificates 	<ul style="list-style-type: none"> • Consider using targeted fiscal instruments to motivate owners to prioritise EE during the natural replacement or upgrade cycle of their assets; • Consider mandating EE improvements upon the sale of properties (or at least the information required and MEPS); • Consider increased use of market based instruments and supporting capital efficient finance where appropriate.

108 G20 EEFTG 2016 Survey & AR 2016

109 AR 2015

110 WEC Survey 2012

111 As contained in the «Clean Energy for all Europeans» proposal, adopted by the Commission in November 2016 European Commission. (2016). Commission proposes new rules for consumer centred clean energy transition. Retrieved from <http://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition>

	Principle ¹⁰⁵	Rationale ¹⁰⁶
3b	Appropriate national and regional incentives and mechanisms that stimulate improved energy management; support energy efficient investment choices; and improve awareness of the value of energy efficiency investments with key decision-makers.	<p>EE typically requires an upfront investment to deliver energy savings that accrue at a later stage. Stimulating demand for EE investments requires asset owners to be aware and have an understanding of energy savings potential and its strategic relevance to the business or future asset lifecycle.</p> <p>Due to the long-time horizons of EE investments -which do not necessarily coincide with asset ownership horizons- appropriate incentives can be designed and implemented to stimulate efficient energy management and investment choices. These incentives can enable asset owners and financial institutions to more frequently use energy savings as collateral.</p>
3c	Contribute to and facilitate national and, where appropriate, regional mechanisms that make the data needed for energy efficiency measures and investments easily accessible to market participants involved in the development of these investments considering in-country communication protocols and clear systems of labels and certificates.	<p>Consumers need compelling, simple and easy to execute proposals. These should include key elements that would lead to a large number of bankable and replicable transactions such as: baseline energy consumption data, reliable savings estimates, trusted project managers and installers; attractive financing (low cost with a term that matches the useful life of the measures installed).</p>
3d	Support for the appropriate development, packaging, aggregation, standardisation, bundling and provision of tailored financing for energy efficiency investments through multiple national, regional or local retail channels, to deliver a change of scale for consumer and SME energy efficiency investing.	<p>EE opportunities are often fragmented and require a large number of small interventions. This heterogeneous small scale implies higher transaction costs and greater complexity, often preventing EE investments from taking place.</p> <p>Financial and non-financial retail channels can support the dissemination of opportunities for investments in energy efficiency to the broad base of distributed asset owners (e.g. utilities and retail banks can deliver EE investments to SMEs, building owners and occupiers).</p>
3e	Review and identify policies at the national and local level that can help accelerate the replacement cycle for “worst in class” facilities and buildings regarding their relative energy performance.	<p>“Worst in class” facilities and assets can waste large amounts of energy for long periods as fully depreciated assets may just need to survive at marginal cost. In the absence of relevant policy signals, asset owners are often reluctant to close or replace redundant assets and switch to more energy efficient facilities.</p>

EEFTG Survey findings ¹⁰⁸	Good practice cases ¹⁰⁹	Recommendations for action
<ul style="list-style-type: none"> Above average potential was identified by EEFTG experts for further incentives and mechanisms to stimulate improved energy management and to support energy efficiency investment choices. Awareness of the value of EE investments among key decision makers can be improved in all sectors except in energy intensive industries (where EE is already a strategic priority). 	<ul style="list-style-type: none"> Australia CEFC Energy Efficiency loans Mexico Eco Credit for SMEs 	<ul style="list-style-type: none"> Review and optimise EE policy networks and mediators; Enable support to facilitate EE investment choices and awareness raising through different stakeholders, e.g. ESCOs, utilities and/or financial institutions; Create specialist EE financing facilities which target specific technologies and industrial segments can help address these points.
<ul style="list-style-type: none"> Above average/strong need for more data to make energy efficiency measures and investments more easily accessible to market participants. Above average need for more data and for clearer/improved systems of labels and certificates, especially in buildings and SMEs. 	<ul style="list-style-type: none"> Korea Building Energy Info and Management System EU DEEP AUS Industrial Energy Efficiency Policies 	<p>Ensure that the regulatory environment supports the low cost provision and transparency of relevant data which is essential for third parties to make the case for investments in energy efficiency.</p>
<ul style="list-style-type: none"> There is a strong need to deliver a change of scale for energy efficiency investments; The packaging, aggregation, standardisation, bundling and provision of tailored financing for energy efficiency investments via retail channels is relatively poorly developed in G20 countries surveyed; Utilities and banks are insufficiently involved in the packaging, aggregation, standardisation, bundling and provision of tailored financing for energy efficiency investments via their retail networks. 	<ul style="list-style-type: none"> US ESCO market US WHEEL Korea KEMCO ESCO KfW SME programmes Mexico's Green mortgage program for low income housing Specialised finance companies that provide origination 	<ul style="list-style-type: none"> Develop mechanisms that allow stakeholders to remediate risk as well as transaction costs to promote aggregation of smaller interventions (e.g. bundling assistance), project development support and the provision of secondary market liquidity for EPCs. Work with EE networks and entities that have the necessary disaggregated and heterogeneous customer relationships and communication channels.
<ul style="list-style-type: none"> Strong need identified to accelerate the replacement cycle for "worst in class" facilities and buildings for relative energy performance; Strong potential for new policies at the national and local level to help accelerate inefficient asset replacement across all sectors. 	<ul style="list-style-type: none"> China 13th FYP 	<ul style="list-style-type: none"> Send strong signals to the market through performance regulation and standards that raises awareness of waste and addresses those assets whose energy performance is "worst in class" which will increasingly become uncompetitive.

	Principle ¹⁰⁵	Rationale ¹⁰⁶
3f	Build a pipeline of bankable and replicable energy efficiency projects.	The lack of bankable and replicable energy efficiency projects has been a challenge to convince financial institutions to prioritise EE. Funding is often available, but there are challenges identifying the source of deal flow. Compared to other energy sectors, less energy efficiency projects are forthcoming and there is a perceived risk and profitability concern (due to small size and heterogeneity), hence a larger proportion of FIs energy portfolio is in other energy segments. There is a need to identify ways to properly showcase energy efficiency investment opportunities that can be replicated across different sectors and the economy as a whole.
4	Encourage collaboration to identify and explore how to unlock barriers preventing the supply of and access to finance for energy efficiency investments in local markets	
4a	Reviewing accounting and regulatory treatment for energy efficiency investments, where appropriate, to fairly reflect the net benefits and business risks of these investments.	As third party financing (where finance is provided by a party who does not own the asset) grows in importance in G20 countries, accounting standards and the treatment of energy performance contracts plays an increasingly important role. Balance sheet treatments of operating and financial leasing arrangements are key to some forms of energy efficiency investments. In some countries, accounting treatment for an energy performance contract (EPC) is a liability in public accounts (not reflecting energy savings) and this has hindered the ability of ESCOs to do more large scale interventions in the public sector (e.g. municipal street lights etc.). Similar issues apply in the private sector. Therefore it is necessary that the accounting treatment for energy efficiency investments be reviewed to fairly reflect the value of the investments (i.e. the EPC as an asset).
4b	Developing national and/or regional standards and policies that will support energy efficiency investment processes in key market segments consistent with regional and national priorities and conditions.	Standardising investment processes, such as standardised M&V, helps lower the transaction cost and increases investor confidence, and is critical for scaling up energy efficiency investments. In many countries, there is presently no registered platform with verified information on energy efficiency projects by sector or asset types available to financial institutions.
4c	Developing finance mechanisms -where relevant- that can enhance the creditworthiness of repayment streams to energy efficiency investments, such as including these repayments within existing payment collection mechanisms.	In order to unlock EE finance supply, tailored mechanisms need to be developed and implemented to address the main challenges including: specific risks, liquidity and cost of capital. Solutions include repayment securitisation mechanisms, energy saving insurance and guarantees. Securitisation can unlock EE finance supply by creating more liquidity for existing assets, lowering the cost of capital for EE and risk tranching. This provides a virtuous cycle where the regular securitisation of energy efficiency loans will enable better risk assessments as it creates and records historical performance data for successive securities and loan pools. As more investors buy energy efficiency securitisations, the increased data will provide evidence on the performance of this new asset class, this will lower the cost of capital for energy efficiency loan providers and originators, which will in turn lower the cost of loans to end-client borrowers.

EEFTG Survey findings ¹⁰⁸	Good practice cases ¹⁰⁹	Recommendations for action
<ul style="list-style-type: none"> Strong need to build a pipeline of bankable and replicable energy efficiency projects. In particular by helping project developers gain access to more working capital and technical assistance to increase development resources dedicated to EE. E.g. providing assistance for writing solid and standardised business cases etc. A greater focus on aggregation and transaction cost reduction was recommended along with the creation of knowledge and capacity building platforms, particularly for establishing links with insurance markets. 	<ul style="list-style-type: none"> Germany's Energy Efficiency Networks EU ELENA Denmark: pre-certified low carbon development Project pipeline development by foreign utility backed ESCO in Russia 	<ul style="list-style-type: none"> Increase capacity to facilitate ongoing project development assistance to all relevant actors and technical assistance to relevant public sector bodies; Direct public financial institutions to allocate, as part of the investment process, more development resources and technical assistance to energy efficiency.
<ul style="list-style-type: none"> Current accounting and regulatory treatments are not strongly aligned with the net benefits and business risks for energy efficiency investments. Potential to remove accounting and regulatory barriers to enhance energy efficiency investments is strongest in large energy-intensive industries. 	<ul style="list-style-type: none"> US financing programmes for energy efficiency 	<ul style="list-style-type: none"> Review public and private accounting treatment of EPCs as "fit for purpose" with input from market stakeholders; Facilitate innovation such as on-bill repayment and on-tax financing mechanisms; Ensure that accounting and regulatory treatment of EE investments are fair and supportive of third party financing.
<ul style="list-style-type: none"> The current standards that support energy efficiency investment processes are not highly developed and are below average especially in non-energy intensive industries, SMEs and residential buildings; The potential for further strengthening of national or regional standards that support energy efficiency investment processes is above average across all of the sectors; National and regional standards matter more for SMEs than for large financing (as tailored underwriting is available for large loans). 	<ul style="list-style-type: none"> US Energy Star and DoE buildings performance database US DoE guidelines for residential PACE financing programs UK LENDERS EU DEEP and EEFIG Underwriting Guidelines 	<ul style="list-style-type: none"> Improvement of information flow by developing an open-source energy and cost database; Development of a common set of procedures and standards for EE underwriting and investment processes.
<ul style="list-style-type: none"> Addressed through increasing numbers of insurance products in the market to help fill the gap around performance risk; Higher credit risks in SME sector is a barrier: The current finance mechanisms, which enhance the creditworthiness of repayment streams to energy efficiency investments, are not well developed; The strongest potential to enhance the creditworthiness of energy efficiency investments through existing payment collection mechanisms (e.g. tax or energy bill) is in SMEs and buildings. 	<ul style="list-style-type: none"> Germany's ECP US PACE US WHEEL India's EESL 	<ul style="list-style-type: none"> Improve the policy and legal frameworks for repayment securitisation mechanisms (i.e. allowing the EE investment repayments to be attached to the underlying assets); Facilitate the proliferation of insurance products in order to address performance risk barriers and those that prevent increasing creditworthiness.

	Principle ¹⁰⁵	Rationale ¹⁰⁶
4d	Simplifying public support programmes, where relevant for energy efficiency, to enable an optimal interaction with and the mobilisation of private finance streams to maximise overall funding flows and delivered benefits.	Blending of public and private financing schemes can both lever scarce public funding and resolve key barriers to unlock finance supply. Currently the investment from public financial institutions is too ‘grant-heavy’, which is not the most effective way of spending public funds (little leverage). Barriers to move away from grants to EE loans or to other support mechanisms are multiple: usually there is natural inertia for grant-giving institutions; the “clienteles” ecosystem has adapted to the grant approach and creates a moral hazard; and often there is a preference by asset owners to get grants rather than loans for EE. Public funds can be better used if they were blended, as this can leverage private finance. Also, establishing a stricter performance measurement system can generate more economic incentives through blending of grants and loans.
4e	Involving public financial institutions, where appropriate, to help formulate lending policies to prioritise and mobilise private capital towards energy efficiency investments in the respective countries.	In some countries, public financial institutions have taken an active role in the promotion of energy efficiency through programmes with private bank partners (eg. KfW and EBRD’s SEFF). However this is not widespread among G20 countries. There is a significant “organization” role for public financial institutions to support the promotion of EE investments with private financial institutions.
5	Build greater internal energy efficiency investment awareness within public and private financial institutions, expand their use of tailored approaches to structure and facilitate energy efficiency investments, and develop their capacity through the pro-active sharing of good practice.	The blending of public and private finance supports investments in energy efficiency, as regulation and the private sector do not fully value the multiple societal benefits of energy efficiency investing (such as reduced energy poverty, increased energy security and reduced emissions). In addition, public financial institutions play a critical role in crowding in private finance by providing the appropriate mix of technical assistance facilities, project development assistance, and “best in class” financial instruments such as blended grants, reduced interest rates, risk absorption facilities and standard on-lending programmes. Moreover, public financial institutions play a crucial leadership role in establishing best practices, and can use their global presence to trial and scale up supportive financial instruments to trial and measure and the delivered multiple benefits of energy efficiency.

EFTG Survey findings ¹⁰⁸	Good practice cases ¹⁰⁹	Recommendations for action
<ul style="list-style-type: none"> Public support programmes are not as effective as they might be at mobilising private finance streams to supply energy efficiency investments; There is “above average” potential in all sectors to simplify and improve public support programmes, as well as optimizing the mobilisation of private finance streams and the overall funding flows and delivered benefits. 	<ul style="list-style-type: none"> Canada’s Green Municipal Fund EU Structural Funds (2014-2020) Saudi Arabia’s Vision 2030 	<ul style="list-style-type: none"> Set goals for the allocation of funds to grants (reduce) and blended finance (increase); Streamline public support programmes to enable blended finance (including instruments such as debt and equity finance as well as de-risking tools – in combination with Principle 4c); Create networks for public private partnerships that facilitate the collaboration between public and financial institutions.
<ul style="list-style-type: none"> Public financial institutions can do more with their lending policies to prioritise and mobilise private capital for energy efficiency investments; There is above average potential in all sectors for greater involvement of public financial institutions with improved lending policies to prioritise and mobilise private capital for energy efficiency. 	<ul style="list-style-type: none"> India EESL EBRD SEFFs KfW Energyhaus 	<p>Increase policy based lending and structured on-lending programmes to create attractive investment conditions for private financial institutions to promote EE.</p>
<ul style="list-style-type: none"> There is above average potential in most sectors to absorb extra financial resources for energy efficiency; There is a good opportunity for public and development banks to increase their technical assistance and project development funding; Public and private financial institutions can use more tailored approaches to structure and facilitate energy efficiency investments; There is good potential to develop the capacity of financial institutions for energy efficiency investments through the proactive sharing of good practice. 	<ul style="list-style-type: none"> EBRD SEFF UK Salix World Bank CHUEE programme in China World Bank Safeguards 	<ul style="list-style-type: none"> Allocate greater proportion of the portfolio to energy efficiency projects; Work towards standardisation of business development and pipeline aggregation; Work with donors to increase technical and project development assistance facilities; Increase the use of insurance and other products to improve the risk profiles of EE projects; engage in greater sharing of information.

EEFTG Background

In the 2014 Brisbane Summit, G20 leaders endorsed a France and Mexico co-chaired initiative, coordinated by IPEEC¹¹², to enhance capital flows to energy efficiency investments as one of the six work streams forming the G20 Energy Efficiency Action Plan: Voluntary Collaboration on Energy Efficiency.

The G20 Energy Efficiency Action Plan proposed that participating countries work with IPEEC to create an Energy Efficiency Finance Task Group (EEFTG), supported by relevant international organisations and initiatives, to facilitate a high-level dialogue with representatives of the international finance community. EEFTG's G20 members are also requested to communicate with and draw on the work of the other G20 working groups to ensure that the lessons learned on finance topics, are included in EEFTG analysis where appropriate.

At the first meeting of the EEFTG Steering Group in 2015, comprised of EEFTG member countries, it was decided that EEFTG would be a multi-annual initiative in the context of the G20 Energy Efficiency Action Plan. The long-term goals of EEFTG are to contribute to best practice and capacity building by, inter alia, collecting and analysing case studies of successful energy efficiency investment and financing initiatives from both the demand side (asset owners and policymakers) and the supply side (banks and investors).

In 2015, EEFTG connected with 180 global experts to help draft and produce the *voluntary Energy Efficiency Investment Principles* for G20 participating countries that were recognised by G20 Energy Ministers in their historic first meeting in Istanbul in 2015. Furthermore, EEFTG and its partners, delivered energy efficiency investment commitments from over 100 banks and more than USD 4 trillion of funds under management as a key input into the Paris-Lima Action Agenda of the COP21.

In 2016, with the support of collaborating organisations, EEFTG has begun to build on the platform of its energy efficiency investment policy framework and financial institutions' commitments. During the first six months of 2016, EEFTG connected with around 1,200 energy efficiency experts, policy makers and influencers around the world through a series of outreach and dissemination activities including: a global survey, technical engagement workshops, high-level engagements in the context of global conferences, educational webinars, bilateral dialogue with G20.ESWG country members and experts, coordination with IOs and one-on-one meetings with financial institutions (FIs) and policymakers in various geographies. These activities have helped EEFTG strengthen its knowledge on the relevance and implementation of the Principles across countries, as well as to disseminate its lessons learned and identify new case studies and best practices for future review and exchange.

In 2017, EEFTG has worked with the inputs from connected with 180 global experts to help draft and produce the voluntary Energy Efficiency Investment Principles for G20 participating countries that were recognised by G20 Energy Ministers in their historic first meeting in Istanbul in 2015. Furthermore, EEFTG and its partners, delivered energy efficiency investment commitments from over 100 banks and more than USD 4 trillion of funds under management as a key input into the Paris-Lima Action Agenda of the COP21.

Moving forwards, EEFTG's activities are strongly supported by the publication and G20 Leaders' endorsement of the G20 Energy Efficiency Leading Programme in their meeting in Hangzhou. This new programme highlights the cross cutting role of energy efficiency investments, and the critical need to increase them, and it reinforces the G20 Energy Efficiency Action Plan through its support for the extension of the mandate for IPEEC to continue to coordinate existing task groups (like EEFTG) as well as adding five more areas for development.

112 The International Partnership for Energy Efficiency Cooperation (IPEEC) is an autonomous international forum that provides global leadership on energy efficiency by facilitating government implementation of policies and programs to yield energy efficient gains. IPEEC has 16 country members and brings its collective, multi-annual experience from leading nine similar initiatives that assist its member countries to identify and share proven, innovative practices and data on energy efficiency and better inform decision makers.

Snapshot of G20 EEFTG's Achievements 2015-2017

- 1 **Embed energy efficiency** considerations into the way in which we consider investment and finance opportunities and interact with our clients
- 2 Increase our **activities** in support of **Policy Frameworks** which require and promote energy efficiency and drive a **life-cycle cost optimal approach** to the procurement of new infrastructure and buildings;
- 3 Work with our stakeholders to increase the amount, availability and accessibility of **Technical and Project Development Assistance facilities** to lever our and our partners' investments;
- 4 Work to ensure energy efficiency maintains a **high, cross-cutting internal profile** and, where possible, is **better monitored, measured and reported** throughout our activities;
- 5 Look to increase our work with **retail distribution channels** through partner banks and other innovative retail mechanisms, to support scaling up and aggregation of individual energy efficiency investments;
- 6 Work to ensure energy efficiency's central role in the **future of mobility, smart cities, energy grids, industry and infrastructure.**
- 7 Engage in a more **structured exchange of knowledge** and the **sharing of best practices** with one-another, with attention to innovative **financing mechanisms, definitions and eligibility criteria** to safeguard our energy efficiency performance standards in specific countries and subsectors.

Endorsed by:



Accronyms and Abbreviations

ACEEE	American Council for an Energy-Efficient Economy
ADB	Asian Development Bank
ADEME	French Environmental and Energy Management Agency (Agence de l'Environnement et de la Maîtrise de l'Énergie)
AFD	Agence Française de Développement
AfDB	African Development Bank Group
AIIB	Asian Infrastructure Investment Bank
AUM	Assets under Management
Bn	Billion
BNDES	Brazilian Development Bank
CAGR	Compound Annual Growth Rate
CIB	China Industrial Bank
CDP	Carbon Disclosure Project
CEFC	(Australian) Clean Energy Finance Corporation
CEM	Clean Energy Ministerial
CHUEE	China Utility-based Energy Efficiency Finance Programme
CO2	Carbon Dioxide
COP21	21st Conference of the Parties
CPI	Climate Policy Initiative
CSR	Corporate Social Responsibility
DEEP	De-risking Energy Efficiency Platform
DoE	United States Department of Energy
E&S	Environmental and Social themed investments
EBIT	Earnings before Interest and Taxes
EBITDA	Earnings before Interest, Taxes, Depreciation and Amortization
EBRD	European Bank for Reconstruction and Development
ECBC	European Covered Bond Council
EE	Energy Efficiency
EEP	Energy Einspar Protect
EEFIG	Energy Efficiency Financial Institutions Group
EEFTG	G20 Energy Efficiency Finance Task Group
EELP	G20 Energy Efficiency Leading programme
EER	Energy Efficiency Retrofit
EIB	European Investment Bank
EMF	European Mortgage Federation
EOS	Hermes Equity Ownership Services
EPC	Energy Performance Certificate
ESCO	Energy Service Company
ESG	Environmental, Social and Corporate Governance
ESI	Energy Savings Insurance
EESL	Energy Efficiency Services Limited
ESWG	G20 Energy Sustainability Working Group
EU	European Union

EVs	Electric Vehicles
FI	Financial Institution
FSB	Financial Stability Board
GAV	Gross Asset Value
GEF	Global Environment Facility
GHG	Greenhouse gas
GRESB	Global Real Estate Sustainability Benchmark
GWh	Gigawatt Hour
IDB	Inter-American Investment Bank
IEA	International Energy Agency
IEP	Integrated Energy Productivity
IFC	International Financial Corporation
IFIs	International Financial Institutions
IIGCC	Institutional Investor Group on Climate Change
IIWG	G20 Investment and Infrastructure Working Group
INCR	Investor twork on Climate Risk
IPEEC	International Partnership for Energy Efficiency Cooperation
IRENA	International Renewable Energy Agency
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
KEMCO	Korea Energy Management Corporation
KfW	German Development Bank (Kreditanstalt für Wiederaufbau)
kWh	Kilowatt Hour
LED	Light Emitting Diode
LDVs	Light Duty Vehicles
M&V	Measurement and Verification
MDBs	Multilateral Development Banks
MEPS	Minimum Energy Performance Standards
OECD	Organisation for Economic Co-operation and Development
OLADE	Latin American Energy Association (Organización Latinoamericana de Energía)
OPEX	Operating Expense
OPIC	Overseas Private Investment Corporation
PACE	Property-Assessed Clean Energy
PAMS	Policies and Measures Database
PBoC	Peoples’s Bank of China
PDC	Portfolio Decarbonization Coalition
PBOC	People’s Bank of China
PRI	Principles for Responsible Investments
PRONUREE	Argentina’s National Program for the Rational and Efficient Use of Energy (Programa Nacional de Uso Racional y Eficiente de la Energía)
PSI	Principles for Sustainable Insurance
PV	Photovoltaic
RUSEFF	Russian Sustainable Energy Financing Facility
SDG	Sustainable Development Goal
SE4All	Sustainable Energy for All
SEFFs	Sustainable Energy Financing Facilities

SENER	(Mexican) Ministry of Energy (Secretaría de Energía)
SICS	Ceres' Shareholder Initiative on Climate & Sustainability
SMEs	Small and Medium Enterprises
SUVs	Sport Utility Vehicles
TEW	Technical Engagement Workshop
UNEP FI	United Nations Environment Finance Initiative
UNIDO	United Nations Industrial Development Organization
UK	United Kingdom
US	United States
USD	United States Dollar
VEEIP	Voluntary Energy Efficiency Investment Principles
WB	World Bank
WHEEL	Warehouse for Energy Efficiency Loans

Bibliography

- ACEEE. (2016). Energy efficiency lowers costs in recent PJM capacity auction. Retrieved from <http://aceee.org/blog/2016/06/energy-efficiency-lowers-costs-recent>
- ACEEE. (2017). State and Local Policy Database. Retrieved from <http://database.aceee.org/>
- ASBEC. (2016). Low Carbon, High Performance – How Buildings can make a major contribution to Australia’s emission and productivity goals. Retrieved from <http://www.asbec.asn.au/wordpress/wp-content/uploads/2016/05/160509-ASBEC-Low-Carbon-High-Performance-Full-Report.pdf>
- ASE. (2016). Energy Productivity Playbook: Roadmaps for an Energy Productive Future. Retrieved from https://www.ase.org/sites/ase.org/files/gaep_playbook-energy-productivity_alliance-to-save-energy.pdf
- The Banker Magazine. (2017). 2016 Top 1000 World Banks Ranking.
- BASE. (2017). Financing energy efficiency in the agribusiness sector. Retrieved from <http://energy-base.org/project/energy-efficiency-in-the-agribusiness-sector/>
- BASE. (2017). Saving Energy in Hotels and Hospitals. Retrieved from <http://energy-base.org/project/energy-efficiency-in-colombia/>
- BASE. (2017). Scaling up energy efficiency financing for local banks in Latin America and beyond. Retrieved from <http://energy-base.org/project/scaling-up-energy-efficiency/>
- BEPAnews. (2011). Energy Savings Insurance and the New ASTM BEPA Standard. Retrieved from http://paceworx.com/wp-content/uploads/srm/Whitepaper_ESI_BEPA_11-15-11.pdf
- CDP. (2015). Energy Efficiency Bears Fruits for India Inc. Retrieved from <https://www.gita.org.in/Attachments/Reports/CDP-India-Energy-Efficiency-Report-2015.pdf>
- CDP. (2016). CDP South Africa Climate Change 2016 Executive Summary. Retrieved from <http://www.nbi.org.za/wp-content/uploads/2016/10/CDP-Climate-Change-2016-Executive-Summary.pdf>
- CDP. (2017). Carbon Action. [Brochure]. Retrieved from <https://b8f65cb373b1b7b15feb-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/001/384/original/carbon-action-infographic-2016.pdf?1481208408>
- CDP. (2017). Carbon Action. Retrieved from <https://www.cdp.net/en/investor/carbon-action>
- CDP. (2017). CDP announces new sector-focused investor strategy. [Press Release]. <https://www.cdp.net/en/articles/media/press-release-cdp-announces-new-sector-focused-investor-strategy>
- CDP. (2017). CDP ramps up plans for Task Force adoption to bring climate change into the boardroom. Retrieved from <https://www.cdp.net/en/articles/media/CDP-response-to-the-TCFD-public-consultation>
- CDP. (2017). Companies. [Website]. Retrieved from <https://www.cdp.net/en/companies>
- CDP. (2017). Cities. [Website]. Retrieved from <https://www.cdp.net/en/cities>
- CDP. (2017). Climate. [Website]. Retrieved from <https://www.cdp.net/en/climate>
- CDP. (2017). Climate Change Program. [Website]. Retrieved from <https://www.cdp.net/en/climate#d53aa2946499cb9b8af5b7d5cf29233b>
- CDP. (2017). Guidance. [Website]. Retrieved from <https://www.cdp.net/en/guidance>
- CDP. (2017). Missing link: Harnessing the power of purchasing for a sustainable future. Retrieved from <https://www.bsr.org/reports/Report-Supply-Chain-Climate-Change-2017.pdf>
- CDP. (2017). States and Regions. [Website]. Retrieved from <https://www.cdp.net/en/cities/states-and-regions>

ClimateWorks Australia. (2016). Could Boosting Energy Productivity Improve your Investment Performance? a Guide for Investors. Retrieved from http://www.energyproductivity.net.au/sites/default/files/2016-05/Climateworks_Australia_Energy_productivity_index_companies_Guide_for_investors_Final_May2016.pdf

ClimateWorks Australia. (2016). Energy Productivity Index for Companies. [Database]. Retrieved from <http://www.energyproductivity.net.au>

CPI & South Pole Group. (2017). The Productivity of International Financial Institutions' Energy Interventions. Retrieved <https://climatepolicyinitiative.org/wp-content/uploads/2017/03/The-Productivity-of-International-Financial-Institutions%E2%80%99-Energy-Interventions.pdf>

DEEP. (2017). De-Risking Energy Efficiency Platform (DEEP). [Website]. Retrieved from <https://deep.eefig.eu/>

EBRD. (2017). SEFF. [Website]. <http://seff.ebrd.com/index.html>

Energy Efficiency Financial Institutions Group. (2015). Energy Efficiency-the first fuel for the EU economy: how to drive new finance for Energy efficiency investments. Retrieved from <http://www.eefig.eu/index.php/the-eefig-report>

Environmental Finance. (2016). How green tags could boost finance for energy efficiency. Retrieved from <https://www.environmental-finance.com/content/analysis/how-green-tags-could-boost-finance-for-energy-efficiency.html>

EMF & ECBC. (2017). Energy Efficient Mortgages Initiative Energy Efficiency (EE) Financing Key Parameters Survey: Preliminary Analysis. Retrieved from <http://figbc.fi/wp-content/uploads/2017/02/2017-00008.pdf>

European Commission. (2016). Commission proposes new rules for consumer centred clean energy transition. [Website]. Retrieved from <http://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition>

European Union. (2017). ODYSSEE-MURE. [Website]. Retrieved from <http://www.odyssee-mure.eu/>

G20. (2015). Energy Ministers Communiqué. Retrieved from <http://g20.org.tr/wp-content/uploads/2015/11/Communique-G20-Energy-Ministers-Meeting-Istanbul.pdf>

G20. (2016). G20 Energy Efficiency Investor Statement. [Brochure]. Retrieved from <http://www.unepti.org/fileadmin/investment/EnergyEfficiencyStatement.pdf>

Global Investor Coalition on Climate Change. (2017). Low Carbon Investment Registry Introduction. [Website]. Retrieved from <http://globalinvestorcoalition.org/introduction/>

Global Innovation Lab for Climate Finance. (2015). Energy Savings Insurance. Retrieved from <https://climatepolicyinitiative.org/wp-content/uploads/2015/02/Energy-Savings-Insurance-Lab-Phase-2-Analyses-Summary.pdf>

GRESB. (2017). The Business Case for Sustainable Property: GRESB Event with Credit Suisse and Siemens. [PPT Presentation]. Retrieved from <https://www.slideshare.net/GRESB/the-business-case-for-sustainable-property-gresb-event-with-credit-suisse-and-siemens>

GRESB. (2017). Who we are. [Website]. Retrieved from <https://www.gresb.com/who-we-are>

Hermes. (2016). Anglo American: Managing the risks of climate change. Retrieved from <https://www.hermes-investment.com/dk/blog/eos-case-studies/anglo-american-managing-risks-climate-change/>

IDB. (2017). Energy Savings Insurance. [Website]. Retrieved from <http://www.iadb.org/en/sector/financial-markets/financial-innovation-lab/energy-savings-insurance-esi,19717.html>

IEA. (2015). KfW-Programme Energy-Efficient Rehabilitation (Energieeffizient Sanieren). [Website]. Retrieved from <https://www.iea.org/policiesandmeasures/pams/germany/name-24665-en.php>

IEA. (2016). Energy Efficiency Market Report. Retrieved from https://www.iea.org/eemr16/files/medium-term-energy-efficiency-2016_WEB.PDF

IEA. (2016). Energy Efficient Prosperity: The “first fuel” of economic development. Retrieved from <https://www.iea.org/newsroom/news/2016/october/energy-efficient-prosperity-the-first-fuel-of-economic-development.html>

IEA. (2016). World Energy Investment 2016. Retrieved from https://www.iea.org/bookshop/731-World_Energy_Investment_2016

IEA. (2016). World Energy Investments: Executive Summary. Retrieved from <https://www.iea.org/Textbase/npsum/WEI2016SUM.pdf>

IEA. (2017). Policies & Measures Databases. [Website]. Retrieved from <https://www.iea.org/policiesandmeasures/>

IEA & IRENA (2017). Perspectives for the Energy Transition: Investment Needs for a Low-Carbon Energy System. Retrieved from http://www.irena.org/DocumentDownloads/Publications/Perspectives_for_the_Energy_Transition_2017.pdf

IIGCC. (2017). About us. [Website]. Retrieved from <http://www.iigcc.org/about-us/our-members>

IIGCC. (2017). Investor Expectations on Corporate Climate Risk Management. [Website]. Retrieved <http://www.iigcc.org/corporate/programme/investor-expectations-on-corporate-climate-risk-management>

Institute for Industrial Productivity. (2017). IPP INDUSTRIAL ENERGY EFFICIENCY DATABASES. [Website]. Retrieved from <http://www.iipnetwork.org/>

Institute for Market Transformation. (2017). The SAVE Act: Making Homes Efficient and Affordable. Retrieved from <http://www.imt.org/finance-and-real-estate/save-act>

Investor Network on Climate Risk. (2017). INCR Working Groups. [Website]. Retrieved from <https://www.ceres.org/investor-network/incr/incr-working-groups>

IPEEC. (2016). The 2016 Activity Report of the G20 Energy Efficiency Finance Task Group. Retrieved from https://ipeec.org/upload/publication_related_language/pdf/541.pdf

IPEEC. (2017). Energy Efficiency Finance Task Group (EEFTG). [Website]. Retrieved from <https://ipeec.org/cms/21-energy-efficiency-finance-task-group-eeftg-.html>

Montréal Carbon Pledge. (2017). About the Montréal Carbon Pledge. [Brochure]. Retrieved from http://montrealpledge.org/wp-content/uploads/2017/03/MontrealPledge_A4-Flyer-2017.pdf

OECD. (2017). Creditor Reporting System (CRS). [Website]. Retrieved from <https://stats.oecd.org/Index.aspx?DataSetCode=CRS1>

Pensions & Investments. (2015). Data on Total Investible Assets. [Database]. Retrieved from <http://www.pionline.com/data-store>

PRI. (2017). About. [Website]. Retrieved from <https://www.unpri.org/about>

PRI. (2017). How to Report. [Website]. Retrieved from <https://www.unpri.org/report>

PRI. (2017). Montreal Carbon Pledge. [Website]. Retrieved from <http://montrealpledge.org/>

PRI. (2017). Partnerships. [Website]. Retrieved from <https://www.unpri.org/partnerships>

PRI. (2017). PRI leads action on climate risk. [Website]. Retrieved from <https://www.unpri.org/news/pri-leads-action-on-climate-risk>

PRI. (2017). The PRI 2017/18 Work Programme: Starting the Next Decade of Responsible Investment. Retrieved from https://www.unpri.org/download_report/30063

PRI. (2017). The Six Principles. Retrieved from <https://www.unpri.org/about/the-six-principles>

Principles for Sustainable Insurance. (2012). The UNEP FI Principles for Sustainable Insurance. Retrieved from http://www.unepfi.org/psi/category/publications/core_psi-documents/

RAP. (2017). Knowledge Center. [Website]. Retrieved from <http://www.raponline.org/knowledge-center/>

REEGLE. (2017). Policy and Regulatory Overviews. [Website]. Retrieved from <http://www.reegle.info/policy-and-regulatory-overviews>

Science Based Targets. (2017). About. [Website]. Retrieved from sciencebasedtargets.org/about-the-science-based-targets-initiative/

SEforALL. (2015). Our Value Added. [Website]. Retrieved from http://www.se4all.org/our-vision_our-value-added

SEforALL. (2015). SEforALL provides “strong global framework” for energy SDG – Ban Ki-moon. [Website]. Retrieved from http://www.se4all.org/2015_09_17_se4all-provides-strong-global-framework-for-energy-sdg-ban-ki-moon

UN Environment. (2015). The Three Dimension of Sustainable Development. Retrieved from <http://web.unep.org/ourplanet/march-2015/unep-work/three-dimensions-sustainable-development>

UNC Center for Community Capital & Institute for Market Transformation. (2013). Home Energy Efficiency and Mortgage Risks. Retrieved from http://www.imt.org/uploads/resources/files/IMT_UNC_HomeEEMortgageRisksfinal.pdf

UNEP FI. (2014). Seven-step Process for Real Estate Investors to Drive Value via Energy Efficiency Retrofits. Retrieved from http://www.unepfi.org/fileadmin/documents/Commercial_Real_Estate.pdf

UNEP FI. (2014). UNEP FI Investor Briefing: Commercial Real Estate Unlocking the energy efficiency retrofit investment opportunity. Retrieved from http://www.unepfi.org/fileadmin/documents/Commercial_Real_Estate.pdf

UNEP FI. (2016). Sustainable Real Estate Investment Framework. Retrieved from http://www.unepfi.org/fileadmin/property/SustainableREI_AssetOwners.pdf

UNEP FI. (2017). About the UNEP FI Principles for Sustainable Insurance Initiative (PSI Initiative). [Website]. Retrieved from http://www.unepfi.org/fileadmin/documents/Commercial_Real_Estate.pdf

UNEP FI. (2017). Banking. [Website]. Retrieved from <http://www.unepfi.org/banking/banking/>

UNEP FI, the Global Investor Coalition, PRI, & RICS. (2016). Sustainable Real Estate Investment: Implementing the Paris Climate Agreement: an Action Framework. Retrieved from <http://www.iigcc.org/files/publication-files/Sustainable%20Real%20Estate%20Investment%20Framework%20FINAL.pdf>

UNIDO. (2017). Statistical Databases. [Website]. Retrieved from <http://www.unido.org/resources/statistics/statistical-databases.html>

University of Toronto. (2015). Communiqué G20 Finance Ministers and Central Bank Governors Washington DC, April 17, 2015. Retrieved from <http://www.g20.utoronto.ca/2015/150417-finance.html>

UNPRI. (2016). Collaboration Platform. [Website]. Retrieved <https://www.unpri.org/about/pri-teams/esg-engagements/collaboration-platform>

UNPRI. (2016). Eco-Efficiency and Climate Change Engagement. [Website]. Retrieved from <https://www.unpri.org/group/eco-efficiency-and-climate-change-engagement-2488>

Task Force on Climate-related Financial Disclosures. (2016). Recommendations of the Task Force on Climate-related Financial Disclosures. Retrieved from <https://www.fsb-tcfd.org/wp-content/uploads/2016/12/TCFD-Recommendations-Report-A4-14-Dec-2016.pdf>

World Bank. (2016). RISE: Regulatory Indicators for Sustainable Energy, a Global Scorecard for Policy Markers. Retrieved from <http://documents.worldbank.org/curated/en/538181487106403375/pdf/112828-REVISED-PUBLIC-RISE-2016-Report.pdf>

World Bank. (2017). RISE. [Website]. Retrieved from <http://rise.esmap.org/>

World Economic Forum. (2014). Direct Investing by Institutional Investors Implications for Investors and Policy-Makers. [Website]. Retrieved from http://www3.weforum.org/docs/WEFUSA_DirectInvestingInstitutionalInvestors.pdf

World Energy Council. (2017). Dynamic Data. [Website]. Retrieved from <https://www.worldenergy.org/data/>



International Energy Agency
31-35 rue de la Fédération, 75739 Paris Cedex 15, France
info@iea.org | www.iea.org

International Partnership for Energy Efficiency Cooperation
31-35 rue de la Fédération, 75739 Paris Cedex 15, France
contact@ipeec.org | www.ipeec.org

UNEP-Finance Initiative
15 chemin des Anémones CH-1219 Châtelaine Geneva, Switzerland
info@unepfi.org | www.unepfi.org