

G20 Energy Efficiency Finance and Investment 2019 stocktake report

October 2019

Findings from the
G20 Global Summit
on Financing Energy
Efficiency, Innovation
and Clean Technology
and additional bilateral
engagements in 2019

About the G20 EEFTG

The G20 Energy Efficiency Finance Task Group (EEFTG) was established in 2014 to enhance capital flows for energy efficiency investments in G20 economies. It serves as a forum for G20 policy makers to share best practices in policies and financial instruments through peer-to-peer workshops and direct engagement with members of the private and public finance community, industry and international organisations.

Key milestones of the G20 EEFTG

- Released (2015) the [G20 Voluntary Energy Efficiency Investment Principles](#) for Participating Countries.
- Supported the development of the [G20 Energy Efficiency Investor Statement](#), issued (2015) by major private sector investors to fully embed energy efficiency into their investment processes.
- Conducted (2016) a **finance investment survey** on implementing the G20 voluntary principles.
- Developed and launched (2017) the **G20 Energy Efficiency Investment Toolkit** containing commitments from **122 banks** from **42 countries**, long-term asset managers handling USD 4 trillion worth of assets; and a **Joint G20 Energy Efficiency Statement from leading public financial institutions**.
- Hosted the [G20 Global Summit on Financing Energy Efficiency, Innovation & Clean Technology](#) in June 2019 as an official side event of the G20 Ministerial Meeting on Energy Transitions and Global Environment for Sustainable Growth.
- Since 2015, EEFTG has organized and participated in **over 125 events** in more than **25 countries**, engaging with **over 7,000 experts** from government, financial institutions, industry and academia.

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The daily operation of EEFTG and its technical activities in 2019 were managed, on behalf of the Co-chairs, by a small technical secretariat formed of key individuals from the co-convening organizations selected for their specific technical input and relevant networks that they brought to EEFTG. The members of the EEFTG technical secretariat are: Mr. Peter Sweatman (Climate Strategy & Partners) as task group lead and rapporteur, Ms. Jurei Yada (IPEEC); Mr. Martin Schoenberg (UNEP FI); and Mr. Mauricio Yrivarren (Climate Strategy & Partners). EEFTG secretariat also wishes to highlight the excellent contribution of Dr. Lisa Fujise whose local activity support in Japan was first rate.

Special mention in 2019 is reserved for the members of the steering committee of the G20 Global Summit on Financing Energy Efficiency, Innovation and Clean Technology: Mr. Masaomi Koyama (Director, International Affairs, Energy Efficiency Ministry of Economy, Trade and Industry of Japan (METI)), Mr. Harald Neitzel (Deputy Director at German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU)), Mr. Stefan Mager (Project Manager, giz), Mr. Masahiro Kobayashi (Director-General, International Affairs, International Affairs & Research Department, Japan Housing Finance Agency (JHF)), Mr. Anthony Cox (Deputy-Director, Environment Directorate, Organisation for Economic Co-operation and Development (OECD)), Mr. Keisuke Sadamori (Director of the Office for Energy Markets and Security, International Energy Agency (IEA)), Mr. Dolf Gielen (International Director International Renewable Energy Agency (IRENA)), Mr. Eric Usher (Head, United Nations Environment Programme Finance Initiative (UNEP FI)), Mr. Benoit Lebot (Executive Director, International Partnership for Energy Efficiency Cooperation (IPEEC)), Ms. Tatiana Bosteels (Director, Responsibility, Hermes Investment Management The Institutional Investors Group on Climate Change (IIGCC)), Ms. Fiona Reynolds (CEO, Principles for Responsible Investment (PRI)), Mr. Jon Moore (Managing Director, Bloomberg NEF), Mr. Glenn Pearce-Oroz (Director of Policy and Programmes Sustainable Energy for All initiative (SEforAll)), Ms. Gabriela Elizondo Azuela (Global Lead Clean Energy, EEX GP, World Bank Group), Ms. Martina Otto (Head of Cities Unit UNEP FI & Head of Global Alliance for Buildings and Construction Secretariat (GlobalABC)), Ms. Linda-Eling Lee (Global Head, ESG Research, MSCI), Mr. Hidetoshi Nakagami (CEO and Founder, Jyukankyo Research Institute), Mr. Andrew McDowell (Vice President, European Investment Bank).

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Introduction

At present, global investments in energy efficiency are at a crossroads. Innovation in business models, financing practices, data management, digitalization and technology is enabling the optimization of transport, buildings and industry systems. Yet, comprehensive measures to unlock increased returns for investors are needed as much as ever. These measures are also necessary to accelerate the emissions reductions required to meet the targets of the Paris Agreement and to enlarge the market for energy efficient goods and services into the trillions of USD. To address this challenge, the financial system must synchronize its actions with the various innovative technologies that are emerging. This relies on the critical ability of financial operators to understand the underlying energy performance of important asset classes such as in real estate and of energy intensive corporates.

Over five years ago, the G20 Energy Efficiency Finance Task Group (EEFTG) was launched as a multi-stakeholder platform to bring together policymakers, financial institutions (FIs) and other actors to improve understanding of existing policy and technical gaps to scale up finance flows into energy efficiency investments. As part of its work, it seeks to influence the practices of FIs and provide them with the proper set of tools so that they can effectively encourage the far-reaching upgrades to the world's industrial, built and infrastructure systems that are required to deliver an energy efficient global economy.

In 2017, the EEFTG published the G20 Energy Efficiency Investment Toolkit under the German G20 Presidency, which was the first publication of its kind to gather key insights from policymakers, banks, investors, insurance companies and public finance to maximize the ability of the financial system to factor in, price and incentivize energy efficiency measures. The present report builds on the Toolkit, and collects new inputs from EEFTG's work with these stakeholder groups and its 15 G20 member countries¹ in relation to the 2019 G20 Presidency.

To connect the dots and move from individual components to a system-wide perspective, the EEFTG and its co-conveners the International Partnership for Energy Efficiency Cooperation (IPEEC) and the United Nations Environment Programme Finance Initiative (UNEP FI), took the exceptional step, in close consultation with the Japanese G20 Presidency, to arrange an official side event to the G20 Ministers Meeting on Energy Transitions and Global Environment for Sustainable Growth in June 2019. The purpose of the side event was to convene different representatives from the global economic and political system to identify ways for finance and policy to work together in order to accelerate the transition towards global emissions neutrality, while considering energy efficiency, innovation and clean technology.

¹ Argentina, Australia, Brazil, Canada, China, France, the European Commission, Germany, India, Mexico, Russia, South Africa, South Korea, the United Kingdom and the United States.

The G20 Global Summit on Financing Energy Efficiency, Innovation and Clean Technology was held on June 12th, 2019 in Tokyo, Japan. It gathered over 140 senior executives of financial institutions, G20 policymakers and technology experts to take stock of the leading practices of G20 economies in scaling up the energy efficiency investment market. It set a milestone for the implementation of the 2017 G20 Energy Efficiency Investment Toolkit and useful review point for the progress made by the task group and its member economies.

This stock-take report is based on participants' insights, contributions and discussions and supplements these with additional findings from the numerous bilateral engagements the task group conducted in the lead-up to the 2019 G20 Summit.

Summit participants took a particular interest in the real estate sector, which represents nearly half of global stored wealth. Considering the significant amount of new construction occurring in emerging and developing countries, real estate is a critical element of the global energy transition. The need for much better information and transparency of the energy efficiency performance of real estate assets, and the need to aggregate this information, is essential to move forward.

Against a 2018 backdrop of USD 240 billion in global investment in energy efficiency - a stable but flat number reported by the IEA²-, investments in new infrastructure are projected to reach USD 79 trillion in the next twenty years. Likewise, since the adoption of the Paris Agreement, the 12 largest banks in the world have provided financing of nearly USD 2 trillion for new fossil fuel investments, which - alongside USD 1.8 trillion of new fossil fuel subsidies - indicates there is plenty of room for changes and for productive and beneficial demand side investments.

2019 has seen concentrations of greenhouse gas emissions exceed 415 ppm, their highest level in 3 million years³. IEA scenarios indicate that energy efficiency investment levels need to increase to USD 580 billion by 2025 and then again to USD 1.2 trillion between 2026 and 2050 to deliver their optimal efficient world scenario. Moreover, IRENA's "Global Energy Transformation Roadmap to 2050" (2019) concludes that additional investments of USD 15 trillion compared to current plans and policies are required to deliver a climate neutral economy by then.

In response to this challenge, a quiet revolution is underway in the financial sector. Banks, investors, insurers and regulators are increasingly analyzing and adapting their financial strategies taking into account the risks and opportunities presented by the clean energy transition. Investments in renewable energy are currently a standard practice for most financial institutions. Investments in energy efficiency are also growing, yet their transaction size is small in comparison. Nevertheless, energy efficiency cuts across core asset classes and the most important components of global economic output and wealth. Modernizing the financial system to better collect and price energy efficiency data is also a key contribution to the resilience of the entire financial system.

² IEA. (2019). World Energy Investment 2019. [Website]. Retrieved from <https://www.iea.org/wei2019/end-use/>

³ Greenpeace. (2019). Nine Ways Humans have Altered Earth's Holocene Climate. Retrieved from <https://www.greenpeace.org/international/story/22792/nine-ways-humans-have-altered-earths-holocene-climate/>

Executive Summary & Key Conclusions

Energy efficiency can modernize the financial system when it becomes more visible to financial institutions and other stakeholders. Efficiency is often hidden in mainstream financial exposures of banks and investors, and while it is beginning to gain traction, is difficult to track. This is a specific challenge in the real estate sector, which represents USD 280⁴ trillion of assets and is thus larger than listed equity and bond markets combined. Even though this sector represents a large share of global stored wealth, little is known about the aggregate financial impact of energy efficiency levels on real estate values and yields during the climate transition. Shifts in value are expected due to technology and policy/regulatory advancements.

However, data technology is not only accelerating improvements of energy efficiency in the real economy by enabling improvements of whole systems of productive assets, it is also disrupting elements of the financial system. The combination of artificial intelligence and machine learning with energy efficiency data can support financial markets in properly understanding efficiency metrics.

As countries actively pursue the net zero objectives of the Paris Agreement, with many setting net zero emissions targets for 2050 or earlier, policymakers will have to strengthen the support for financial institutions and other market participants to fully leverage the multiple opportunities offered by energy efficiency. Drawing from insights from the summit and the process leading to it, we conclude the following:

- **Better sustainable finance data is required across the financial system to accelerate “real world impact” by financial institutions towards the SDGs and Paris Agreement.** Energy efficiency can be enhanced through the use of new data technologies and by embedding ‘green tagging’, as a systematic way of attaching environmental attributes to financial assets. The result would be a positive way to stimulate further transparency in the financial sector around market prices for energy efficiency, relationships to risk metrics such as default rates of mortgages, and changes in the climate risk exposures of individual financial institutions. Green tagging can provide the right aggregate information to drive energy efficiency integration across the financial system.
- **Public financial institutions should lead the market in accordance with their role as policy banks.** They can provide the right technical assistance, concessionary finance/ guarantees, and ensure development capital to foster the energy efficiency investment market. Their tagging of energy efficiency investments in all their real estate activities – both new and current exposures – is vital to mainstream green tagging into the financial system.
- **Promoting best practices, and sharing of experiences across banking, investment, public banks, and policymaking is essential to advance this market.** The UNEP FI Energy Efficiency Finance Platform offers an extremely useful forum to work with the frontrunners in the finance industry.

Finally, G20 member states and financial stakeholders at large have a unique opportunity to address the challenges and leverage the opportunities mentioned above. The EEFTG remains confident that this is possible as the capacity, skills, and the will to deliver the multiple benefits of energy efficiency are in place, as illustrated in the summit’s Tokyo Declaration.

4 GRESB. (2018). GRESB: in Review and the Road Ahead. [Website]. Retrieved from <https://gresb.com/2018-in-review-and-the-road-ahead/>

Key findings by stakeholder group

For ease of reference, EEFTG has condensed the narrative of its stakeholder Summit and bilateral meetings in Japan in the run-up to the 2019 G20 Leaders' Summit into sections which correspond to its key stakeholder groups. These findings are not exhaustive and are taken from the presentations delivered during the summit together with notes from the Summit itself as well as bilateral meetings. The findings are directed by the contributors to the EEFTG activities and therefore can be considered as the most relevant observations provided to the task group by those stakeholders as representatives of their segment.

Participants were invited to illustrate the developments of their institutions since the publication of the G20 Energy Efficiency Investment Toolkit in 2017, and touch upon the recent actions and programmes being implemented by G20 countries. The summit also focused on the use of tagging as a mechanism to better track and report on the energy and environmental performance of assets, demonstrated by buildings, to enable expanded access to new financing markets and promote greater levels of transparency and disclosure.

Participants were also requested to highlight specific best practice examples as well as to make recommendations regarding the signals and instruments needed to increase investment flows into critical sectors. All figures and facts reported in these sections have been presented by contributors and speakers during the Summit and preparatory bilateral meetings, and are sourced on those presentations. EEFTG has not independently verified any of these data points and does not warrant their accuracy.

Findings for policymakers: Emerging practices

The global rate of energy productivity improvement has been slowing down in recent years, falling to 1.7% in 2018, down from 1.9% in 2017, according to the IEA⁵. This trend highlights the urgency of addressing the energy efficiency investment gap. With the arrival of cooling services for many emerging and developing countries, global energy demand is projected to increase considerably, a challenge that must be met while enabling the expansion of cooling services to populations in need, in line with the Sustainable Development Goals. As global GDP is roughly split between 30% from the public sector and 70% from the private sector, solving these issues by focusing on public resources alone is impossible.

In this context, an enabling national policy framework is critical to mobilize and effectively channel finance to energy efficiency investments, so that policies can stimulate both demand and supply for energy efficiency investments and finance. The EEFTG has worked with its member countries to develop and track the implementation of the Voluntary Energy Efficiency Investment Principles for G20 Participating Countries (2015), which outlines key considerations for the design of effective national policy contexts to scale up energy efficiency investments.

5 IEA, IRENA, UN Statistics Division, World Bank Group, WHO (2019). 2019 Tracking SDG7: The Energy Progress Report. Retrieved from https://www.seforall.org/sites/default/files/2019-05/TrackingSDG7_report-2019.pdf

At the G20 Global Summit on Financing Energy Efficiency, Innovation and Clean Technology, several European and G20 economies presented the latest in terms of status, developments and priorities in the field of energy efficiency, clean energy and finance policies, including the need for greater collection of energy consumption data, development of classifications for sustainable activities, and promotion of building renovations, among others. G20 policymakers are also increasingly looking to leverage private sector investments and to stimulate research and innovation from the private sector.

However, while important progress has been made by policymakers in scaling up investment into efficiency and clean technology in recent years, this progress has been incremental and not transformational, according to the OECD. A joint report by UN Environment, the World Bank and the OECD on 'Financing Climate Futures: Rethinking Infrastructure'⁶ identifies six key areas governments need to focus more deeply on: planning; innovation; fiscal sustainability; re-thinking the financial system; re-doing development finance; and cities.

Policymakers must take a “whole of government” approach to tackle these emerging issues. In addressing the energy efficiency investment gap, governments must expand the role of dedicated public green finance institutions and give green mandates to existing national development banks to promote efficiency via de-risking instruments and transaction enablers.⁷ Governments must also scale up sustainable finance, particularly by improving transparency and disclosure, and by working with promotional banks to promote thematic investments into greenfield and brownfield energy efficiency projects.

In addition, it is important that G20 policymakers advance efficiency and renewable energy in parallel. According to IRENA, the combination of energy efficiency and renewable energy can provide 90% of the needed CO₂ reductions in the energy sector by 2050⁸, which would require USD 90 trillion of new investment until 2050⁹, roughly USD 3 trillion per year. Research and development also need to increase, which today stand around USD 20 billion¹⁰ per year. Summit participants noted that new markets and new types of operating systems, new business models and new financial flows are required to foster innovation.

6 OECD, UN Environment, & World Bank. (2018). Financing Climate Futures: Rethinking Infrastructure. Retrieved from <https://www.oecd.org/environment/financing-climate-futures-9789264308114-en.htm>

7 OECD. (2019). Center on Green Finance and Investment. [Website]. Retrieved from <https://www.oecd.org/cgfi/about/>

8 IRENA. (2019). Global Energy Transformation: A Roadmap to 2050. Retrieved from https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Apr/IRENA_Report_GET_2018.pdf

9 IRENA. (2019). Global Energy Transformation: The REmap Transition Pathway. Retrieved from https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Apr/IRENA_GET_REmap_pathway_2019.pdf

10 IEA. (2019). Tracking Clean Energy Progress. [Website]. Retrieved from <https://www.iea.org/tcep/>

Japan Highlights

Japan's energy policy, coordinated by the **Ministry of Economy, Trade and Industry (METI)**, is focused on realizing an energy transition that achieves 3 E + S (energy security, economic efficiency, and environmental safety) – a theme Japan has prioritized under its 2019 G20 Presidency. In terms of policy frameworks, the “Act on the Rational Use of Energy” laid the foundation of Japan's energy efficiency policy in 1979 and has been revised several times since. In order to advance the uptake of innovative technologies to further energy efficiency, METI, together with the New Energy and Industrial Technology Development Organization (NEDO), a government-funded R&D agency, jointly formulated Japan's Energy Efficiency Technology Strategy in 2016, which was updated in 2019 to include a revised list of all key energy-saving technologies¹¹. In the wake of the Fukushima Daiichi nuclear accident in 2011, environmental safety has been a major concern for the government.



Behavior-based energy efficiency programs, such as CoolBiz, have received significant focus in Japan. They have been driven by the Ministry of the Environment (MOEJ) and METI to reduce energy consumption by employees in businesses and in households. However, the challenge of reducing energy consumption in the residential sector is considerable and requires further data. Artificial intelligence and the Internet of Things hold great potential to facilitate data gathering and to feed databases that establish a baseline for energy efficiency, which helps to evaluate policy impacts and promote further efficiency, according to the **Jyukankyo Research Institute**, a

Japanese think tank.

On the finance side, green bonds issuances, often backed up by energy efficiency projects, increased by a factor of 50 in the country in recent years, according to the **Japanese Government**. ESG investments increased to JPY 2 000 trillion in 2018¹², indicating that further innovation in carbon recycling, CCUS and hydrogen could be additionally supported by this market. In 2018, the **MOEJ** conducted a series of High Level Meetings on ESG Finance which gathered key actors from the financial sector to identify how Japan could become a major player in ESG finance. The meetings concluded with a set of recommendations for financial stakeholders and government, launched in July 2018, which called, among other points, for greater cooperation between the public and private sector to develop strategies for Japan to become a big power in ESG finance, expansion of financial instruments that take ESG factors into account, and promotion of information disclosure in line with Climate-related Financial Disclosures (TCFD).

As of 2019, a record number of Japanese corporates and financial institutions have signed up to the TCFD¹³, making Japan the country with the highest number of TCFD signatories. For this reason, a newly established TCFD consortium will be issuing investment guidance and Japan will host a TCFD conference in the autumn of 2019.

11 METI (2019). Key Technologies Shown in Energy Efficiency Technology Strategy 2016 Revised. Retrieved from https://www.meti.go.jp/english/press/2019/0718_002.html.

12 GPIF. (2019). ESG REPORT 2018. Retrieved from https://www.gpif.go.jp/en/investment/190905_Esg_Report.pdf

13 Financial Times. (September 15th 2019). Japanese companies lead world in disclosing climate risks. Retrieved from <https://www.ft.com/content/727862e4-d760-11e9-8f9b-77216ebe1f17>

France Highlights

The building stock is a central component of **France's** policy to deliver a carbon neutral economy by 2050¹⁴. In France, buildings represent 45% of final energy demand and 25% of direct GHG emissions. Housing is considered a priority area for environmental reasons, but also for social reasons. While seven million out of the 28 million dwellings in the country are energy intensive, about four million households experience difficulties in paying their energy bills.

The country aims to reduce its emissions by 40% by 2030¹⁵. EUR 40 billion of public support is being provided in addition to the requirement for EUR 5 billion in energy efficiency certificates. Local authorities have a key role to play, which is why EUR 30 million will be allocated for training 65 000 professionals to provide appropriate skills and expertise and EUR 40 million will be invested in new efficiency technologies¹⁶. Furthermore, an additional EUR 70 million will be allocated to provide training for property managers.

France aims to increase transparency in the energy efficiency investment market by providing third party verification of energy and green labels for buildings, their energy benchmarking, and to build a green lease framework. The entire carbon footprint of buildings throughout their life cycle has been considered in the Energy Plus and Carbon Minus certifications since 2017. A national observatory for construction has been launched, combining technical and economic data, and France is now considered one of the most transparent markets for sustainable buildings. Transparency is also key for fund and corporate management and the Ministry of Ecological and Inclusive Transition has launched an eco-label initiative to accelerate the transition of buildings within its overall energy transition.

France considers the massive additions of new buildings in the emerging economies of Asia and Africa as critical, and promotes international cooperation to increase the efficiency of that real estate. As a response, France along with UN Environment, supported by Germany, Switzerland and Canada, launched the Global Alliance for Buildings and Construction (GlobalABC) at COP21 in 2015. The purpose of GlobalABC is to facilitate the transition to zero emission, energy efficient and resilient buildings. It issues global status reports on the real estate sector, progress and solutions, and produces a global roadmap for the decarbonization of the buildings sector. It includes over 25 countries (including nine G20 members), representing 1.4 billion inhabitants and 70 building and construction sector organizations, as well as FIs such as the World Bank and UNEP FI.

¹⁴ Government of France. (May 3rd 2019). France wants to be the first country in Europe to put the carbon neutrality goal on a statutory footing. Retrieved from <https://www.gouvernement.fr/en/france-wants-to-be-the-first-country-in-europe-to-put-the-carbon-neutrality-goal-on-a-statutory>

¹⁵ Government of France. (November 28th 2019). Multiannual Energy Programme: what are its aims? Retrieved from <https://www.gouvernement.fr/en/multiannual-energy-programme-what-are-its-aims>

¹⁶ Ministry for the Ecological and Solidary Transition of France. (2019). French Strategy for Energy and Climate: Multiannual Energy Plan 2019-2023, 2014-2028. Retrieved from https://www.ecologique-solidaire.gouv.fr/sites/default/files/0-PPE%20English%20Version%20With%20Annex_0.pdf



Initiated by Germany and France in February 2016¹⁷, the Program on Energy Efficiency in Buildings (PEEB) provides institutional assistance to projects with a countrywide impact accelerating the transformation of the buildings sector. Between 2017 and 2022, PEEB aims to leverage investments of EUR 1.42 billion.¹⁸ Six countries have signed a declaration launched in 2018, committing governments to support energy efficiency in buildings and calling for a global movement for the transition of real estate. The first round of projects is being conducted in Tunisia, Morocco, Senegal, Vietnam and Mexico (see 'Germany Highlights', page 13).

China Highlights

China has been a leader in promoting international cooperation efforts in energy efficiency over the past several years, a role that reflects the high priority China has placed on improving energy efficiency across all sectors in its national policy, most recently under the 13th Five Year Plan (2016-20). Under its G20 Presidency in 2016, China launched the G20 Energy Efficiency Leading Program (EELP) – the first long-term framework for G20 energy efficiency collaboration up to 2030, which was adopted by consensus by G20 members. The EELP provides the basis for cooperative activities across key sectors including buildings, industry, appliances, transport, and power generation, and on cross-sectoral issues including finance, data and best practices (BPs) and best available technologies (BATs¹⁹).



The Top Ten Energy Efficiency Best Practices and Best Available Technologies task group (TOP TENS²⁰) under the G20 EELP is a work stream that promotes the deployment and adoption of energy saving solutions that are practical, cost effective and scalable, thereby fostering investment opportunities. Led by the governments of Australia and China, it counts France, Japan, Korea, Canada and the US as members. A key output of TOP TENS are lists of national BPs and BATs in the buildings and industry sectors, which are produced based on a common methodology agreed by member countries. The development of such lists, which have culminated in international lists derived from the national lists, has facilitated bilateral energy efficiency cooperation, for example between China and Japan, and China and Russia²¹. Energy efficiency technology lists further have the potential of facilitating investment if they are 'pre-approved' by banks – a practice followed by the European Bank for Reconstruction and Development (EBRD) through its List of Eligible Materials and Equipment (LEME)²².

China officially launched the second round of international TOP TENS lists at the G20 Global Summit on Financing Energy Efficiency, Innovation and Clean Technology in June 2019.

17 PEEB. (2019). [Website]. Retrieved from <https://www.peeb.build/about-peeb>

18 MEDENER (2019). [Website]. Retrieved from <https://www.medener.org/en/a-program-for-energy-efficiency-in-buildings-peeb/>

19 G20. (2016). G20 Energy Efficiency Leading Programme (Final Version). Retrieved from https://ipeec.org/upload/publication_related_language/pdf/481.pdf

20 IPEEC. (2018). TOP TEN 2018: Energy Efficiency Practices for the China Buildings Sector. Retrieved from https://ipeec.org/upload/publication_related_language/pdf/711.pdf

21 IPEEC. (2019). Top Ten Energy Efficiency Best Available Technologies and Best Practices Task Group. Retrieved from https://ipeec.org/upload/publication_related_language/pdf/1226.pdf

22 POLSEFF. LEME – List of Eligible Materials and Equipment. Retrieved from <http://www.polseff2.org/en/leme>

Germany Highlights

Germany is committed to accelerating its transition to renewable energy and energy efficiency in order to achieve the goals of the Paris Agreement. While Germany is well on track to meet its renewable energy objective of 65% by 2030, it places a high priority on achieving its energy efficiency target.

On 20 September, the German Government presented its climate package containing a range of measures aimed at reducing carbon emissions by 55% by 2030 (compared to 1990). Measures include the expansion of federal support programmes for energy efficiency in buildings as well as in municipalities and cities along with their heating, cooling and water systems. In addition, the Federal Government will continue to promote energy efficiency in the agricultural sector and plans to create a one-stop-shop streamlining its various programmes to facilitate investments by industry and private sector in energy efficiency of heat processes and production systems. The package further recognizes the particular role SMEs play in stimulating innovation and employment in the area of climate action and energy efficiency.

Through the National Climate Initiative (NKI in German), the Government has successfully supported the development and implementation of local climate projects, including on energy efficiency, together with citizens, municipalities, the private sector, and scientific community since 2008. For example, the NKI has provided more than EUR 175 million for energy-efficient cooling and air conditioning systems in industrial, commercial and residential buildings to date.

Germany has led in SME engagement through its Energy Efficiency Networks²³ (EENs) initiative which brings together 10-15 similar companies in each network. Each member company sets up individual goals and efficiency targets while sharing insights and helping one other implement cost effective energy reduction solutions. Technology is at the center of these networks, particularly with regard to heating and cooling, as standards increasingly need to be improved and enforced in line with technology developments and legislative requirements. EENs are also being implemented in China and Latin America as a way to support industry action on energy efficiency and help integrate it into companies' operational strategy.²⁴

Germany has an "Environmental Innovation Program" and "Living Labs for the Energy Transition" which seek to accelerate the application of large-scale technologies and innovation to implementation.

²³ Fraunhofer. (2018). Energy efficiency networks: Lessons learned from Germany. Retrieved from <http://publica.fraunhofer.de/starweb/servlet.starweb?path=epub0.web&search=N-503271>

²⁴ IPEEC. (2016). Energy Efficiency Networks – An effective policy to stimulate energy efficiency. Retrieved from https://ipeec.org/upload/publication_related_language/pdf/155.pdf



Internationally, Germany actively cooperates with other countries to promote a renewables-based energy transition coupled with energy efficiency. To this end, Germany maintains special energy partnerships and dialogues with 20 countries and further provides financial and technical assistance to countries through its International Climate Initiative (IKI in German). One IKI-example is the French-German cooperation in supporting the Program for Energy Efficiency in Buildings (PEEB) that is currently being implemented together with partners in Mexico, Morocco, Senegal, Tunisia and Vietnam. PEEB aims to improve the conditions for financing large-scale energy efficiency projects in the building sector. Finally, at the UNSG Climate Action Summit 2019, Germany announced that it will increase its contribution to international climate finance to EUR 4 billion by next year.

Germany also emphasizes the importance of better transparency in financial markets in an effort to shift capital towards energy efficiency.

European Union Highlights

The **European Union** requires EUR 177 billion²⁵ of new annual investments to achieve its energy targets for 2020 and 2030, with 75% of these investments needed in the buildings sector. The European Union's Smart Finance for Smart Buildings initiative aims to support its member states overcome barriers for clean energy investments, taking into account that these investments need to stem mainly from the private sector.

To leverage private sector capital, the cooperation of policymakers, public authorities, financial institutions, project promoters, and all other efficiency related stakeholders is required. The Energy Efficiency Financial Institutions Group (EEFIG), jointly convened by the European Commission Directorate-General for Energy (DG Energy) and UNEP FI, is instrumental in this regard and its landmark 2015 report²⁶ has influenced important EU policies, such as the accounting treatment of energy performance contracts on the balance sheets of local authorities.

EEFIG highlights three key areas for further action:

- First, to support buildings, its areas of focus are: a more effective use of public funds; appropriate technical assistance; and improving the understandings of the risks related to energy efficiency investments among financiers and investors. The "Smart Finance for Smart Buildings" initiative would provide a guarantee instrument to help member states to deploy the array of public and private financial resources that are available.
- Second, it is working on developing an Action Plan for Sustainable Finance, currently in the public consultation phase, which aims to better align the financial system with a more sustainable economy. To this end, the European Commission is developing an EU wide classification system, or 'taxonomy', of what constitutes a sustainable activity or investment. The buildings and manufacturing sectors are making a substantial contribution

²⁵ European Commission. (2019). Unlocking Investment in the Energy Transition. Retrieved from https://ec.europa.eu/commission/sites/beta-political/files/unlocking-investment-in-energy-transition_en.pdf

²⁶ European Commission. (2019). Unlocking Investment in the Energy Transition. Retrieved from https://ec.europa.eu/commission/sites/beta-political/files/unlocking-investment-in-energy-transition_en.pdf

to this action plan. A recommendation to track energy efficiency loans will be useful in this context, as will work to explore the possible development of a “green supporting factor” that may offer a lower capital requirement for green lending activities.

- Third, the European Commission is working to shape the future of energy efficiency finance in the EU by 2020. The EU budget for 2021 and 2027²⁷ will increase spending on the clean energy transition. Climate action will be mainstreamed across all EU programs and the EU has a target of having 25%²⁸ of its expenditure allocated to climate action.

Finland Highlights

Finland aims to achieve a carbon neutral economy by 2035²⁹, one of the most ambitious decarbonisation objectives in the world. The Government of Finland has recognized the importance of clear climate targets, increased policies for the penetration of clean technologies and energy efficiency, and scaled-up financing. To strengthen the use of low carbon energy sources and carbon sinks, increased action to increase investment into energy efficiency is essential.

In Finland, the market for green power is profitable. Because no new subsidies for green power are required, public funding can be oriented towards research and innovation in new climate technologies. Support needs to be channelled to all-encompassing ecosystems and platforms that can assist in the development of smart innovation, as opposed to specific individuals or companies.

The development of “energy efficiency as a service” business models are key in this regard, and Finland has seen a large number of companies emerge in this area. A CO₂ tax, in addition to financial incentives, is instrumental in stimulating efficiency in industry and buildings in Finland. The country’s energy efficiency policies are led by the Ministry of Economic Affairs and Employment (MEAE).



27 European Commission. (2019). EU budget 2021-2027. Retrieved from https://ec.europa.eu/commission/news/eu-budget-2021-2027-2019-jun-13_en

28 European Commission. (2019). EU budget for 2021-2027: Commission welcomes the provisional agreement on funding for the environment and climate action. Retrieved from https://europa.eu/rapid/press-release_IP-19-1434_en.htm

29 Finnish Government. (2019). Finland has an excellent opportunity to rebuild itself in line with the principles of sustainable development. Retrieved from <https://valtioneuvosto.fi/en/rinne/government-programme/carbon-neutral-finland-that-protects-biodiversity>

Spain Highlights

Spain's key actions to prevent climate change consist of three key legislative elements: a climate change and energy transition act, a national integrated energy and climate plan, and a just transition framework. These elements aim to deliver energy security, create employment, and facilitate innovation and technological development in Spain's economy.

By 2020, Spain seeks to achieve a 21% reduction of GHG emissions compared to 1990 levels³⁰, 42% of renewables in final energy use³¹, and an improvement of energy efficiency by almost 30%. The country also has determined to have a carbon neutral economy by 2050. An agenda to foster modernisation and innovation is necessary to transform its industrial sector, with more than EUR 200 billion³² of private investment required to take place in the next few decades.

30 MITECO. (2019). Objetivos de reducción de emisiones de gases de efecto invernadero. [Website]. Retrieved from <https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/objetivos.aspx>

31 MITECO. (2019). El Gobierno de España envía a la Comisión Europea el borrador del Plan Nacional Integrado de Energía y Clima 2021-2030 from <https://www.miteco.gob.es/en/prensa/ultimas-noticias/el-gobierno-de-espa%C3%B1a-env%C3%ADa-a-la-comisi%C3%B3n-europea-el-borrador-del-plan-nacional-integrado-de-energ%C3%ADa-y-clima-2021-2030/tcm:38-487307>

32 Gobierno de España. (2019). President of the Government presents draft of energy and climate measures for next decade. Retrieved from <https://www.lamoncloa.gob.es/lang/en/presidente/news/Paginas/2019/20190220ecological-trans.aspx>

The role of private finance

Private financial institutions are the major source of capital for the global economy, and can be the decisive actor in scaling up the energy efficiency investment market to the trillions of USD required. In addition, their lending and investment portfolios hold large parts of the real assets in need of efficiency upgrades, and hence, these institutions need to respond to the trends below:

- The efforts of policymakers to implement the Paris Agreement will result in stricter energy efficiency regulation, thus having an effect on real estate market values. In addition, increased energy efficiency levels will impact the competitiveness of energy intensive corporates.
- Energy efficiency is central to the efforts of financial institutions to align with the Paris Agreement. This is a major trend in banking, investment and insurance. Energy efficiency upgrades can help financial institutions, particularly banks, reduce indirect emissions within their lending portfolios.
- TCFD recommendations are improving the quality and availability of data pertaining to the energy efficiency performance of corporates to investors, banks and insurers. It is expected that financial institutions in line with the TCFD will be well-positioned to report on climate risks within their portfolios, take advantage of climate related opportunities, and develop dedicated financial products such as green bonds.



Leading practices by banks

Banks are crucial providers of finance to the global real estate sector and to energy intensive industrial companies, which are two primary sectors for increased energy efficiency measures. A significant share of banks' lending portfolios focus on real estate, and changes in real estate values have immediate impacts on the balance sheets of banks and their regulatory capital requirements. Banks are increasingly aware of the opportunity offered by energy efficiency as a way of potentially increasing the value of their real estate mortgage collateral, to improve the repayment capacity of borrowers and to potentially reduce default rates. Banks are also the most important actors in countries where international and domestic capital markets are not highly developed, including many developing economies.

The financial industry is experiencing a quiet revolution with the use of more advanced data technologies and the disruption of the financial system by new entrants. Moreover, the dimension of sustainable finance and responsible banking is gaining considerable ground.

- During the Climate Action Summit organized by the UN Secretary General in September 2019 in New York, over 130 major banks with trillions of USD assets under management signed the Principles for Responsible Banking. This will further align banking with the Sustainable Development Goals and the Paris Agreement. A group of these institutions is taking a collective climate pledge for the substantial enhancement of energy efficiency levels of the real estate collateral held by banks, which represents a major component of their indirect emissions.
- The TCFD provides a set of recommendations designed to enhance the availability of climate-related data provided by companies and banks. The implementation of this recommendations has led to the increased transparency of financial markets. In due course, banks will have access to accurate information about the climate performance of their clients, and in turn develop new dedicated financial products, e.g. for energy intensive corporates.
- Finally, in order to implement the Paris climate agreement, policymakers in the energy space are tightening building codes, enforcing minimum energy performance standards and other regulation, as well as increasing the availability and effectiveness of incentives such as technical assistance grants and guarantees. As countries move towards net zero emissions -in line with Paris Agreement goals-, energy efficiency levels will have an ever-increasing impact on market values for real estate. As a result, banks will need to increase their understanding of energy efficiency concepts and metrics within their lending portfolios. Since real estate finance is a long-term activity, with mortgage durations reaching up to 30 years in some markets, an improved understanding of the likely impact of regulation on real estate market prices will be an essential driver to set rates and to better manage risks in the sector.

Banking Example (EU): ING

Leading financial institutions like **ING** are committing to align their entire lending portfolio to the well below 2 degrees objective of the Paris Agreement, which also builds climate resilience into their long-term lending to commercial and residential mortgage-takers. Mortgage maturities can be 25-30 years in European markets, and emerging policy measures as well as technology changes will have a substantial impact on banks' mortgage books, which can represent over half of banks' lending portfolios, especially for retail banks.

ING has noted specific challenges in accessing accurate energy performance data in core markets, some of which make it public (like the UK and Netherlands) and many of which do not. Access to appropriate energy performance data is the precondition for ING offering to encourage significant upgrades to the energy efficiency of ING's client's homes and offices. ING has set an objective to upgrade the inefficient half of its residential real estate portfolio, which has an energy performance rating of D to G, to at least C by the end of 2022³³ - and will not grant future loans to those which do not meet threshold energy efficiency criteria.

ING plans to achieve this through an "encourage and empower" approach: First, through a partnership with the utility Vattenfall, to produce dedicated smartphone applications and valuation tools, and then as a second step to encourage the up-take of building-integrated renewables such as solar PV to further boost the energy performance of its real estate collateral. ING also intends to upgrade its entire commercial real estate portfolio to have 100% "green" buildings by 2023³⁴.

Banking Example (Japan): Mitsubishi UFJ Morgan Stanley Securities

In support of the clean energy transition and the Sustainable Development Goals, **Mitsubishi UFJ Morgan Stanley Securities** has adopted a comprehensive ESG policy³⁵ covering the seven priority areas of aging population & low birth rate; business incubation & job creation; social infrastructure & town planning; global warming & climate change; financial innovation; workstyle reforms; and cross-sectional E/S issues. Climate change is one of the biggest and most important focus areas for the business.

In tackling climate change, MUFJ focuses on environmental finance and supporting the renewable energy industry (and aims to provide JPY 20 trillion to renewable energy by 2030³⁶), as well as the promotion of advanced technologies designed to reduce GHG emissions. This also means the exclusion of new financing for coal fired power generation. MUFJ supports only highly efficient power generation which reduces CO₂ emissions. The Environmental

33 ING. (2019). A green, green home. Retrieved from <https://www.ing.com/Newsroom/All-news/A-green-green-home.htm>

34 ING. (2019). Terra progress report 2019. Retrieved from <https://www.ing.com/Newsroom/All-news/Terra-progress-report-2019.htm>

35 Mitsubishi UFJ Morgan Stanley Securities. (2019). Sustainability. [Website]. Retrieved from <https://www.sc.mufg.jp/english/company/sustainability/cef/outline.html>

36 MUFG. (2019). MUFG Report 2019 Integrated Report. Retrieved from https://www.mufg.jp/dam/ir/report/annual_report/pdf/ir2019_all_en.pdf

Management Support Loan³⁷ (with a 1% interest subsidy) and Green Project Support Loan (with a 1.5% interest subsidy) supported by Japan's Ministry of the Environment, and the Energy Conservation Support Loan (with a 1% interest subsidy) supported by the Ministry of the Economy, Trade and Industry, all further boost this market.

The green bond market is an important driver for the financial institution's work with energy efficiency, as MUFG topped the ranking for its share of underwriting in domestic green bond issuances and has expanded from financing renewables to energy efficiency. This also includes the institution's activities in developing countries, where it is working via Japan's joint crediting mechanism³⁸ (JCM) to promote the energy transition.

Banking Example (Japan): Sumitomo Mitsui Trust Bank

Sumitomo Mitsui Trust Bank is a very active player in the sustainable property and energy efficient real estate markets. The total value of Japanese real estate is over USD 23 trillion (according to SMTB) and this creates a huge opportunity for energy efficiency investments. Real estate markets in Japan can be segmented into those owned by corporations (nearly USD 4 trillion), other commercial real estate (USD 1.9 trillion), with securitization markets of USD 300 billion and J-REIT structures accounting for a market of USD 200 billion. SMTB is an important actor in these markets, holding USD 145 billion of real estate on its own balance sheet.

The bank is convinced that sustainable properties are more valuable than unsustainable ones. CASBEE results certainly show improvements of average rents for energy efficient properties, yet a correlation between CASBEE scores and market rent prices has been detected³⁹ making other factors also relevant. Of course, higher CASBEE scores and the application of its methodology to rate the environmental performance of buildings also results in the reduction of energy spend.

The bank sees future challenges in making the added value of sustainable properties more visible, and increasing the awareness of their benefits in the real estate markets globally.

Agency Example (Japan): Japan Housing Finance Agency

The **Japan Housing Finance Agency (JHF)** is a significant underwriter in Japan, as it is responsible for refinancing a 10-15% share of mortgages in Japan. JHF's mandate is to provide liquidity to the mortgage market and to enhance the quality of Japanese housing. Today, private lenders, like private banks, originate mortgages and JHF purchases the mortgages from lenders and packages them into asset backed security for investors. The JHF plays a major role in incentivizing energy efficiency by offering to reduce the interest rate for highly energy efficient real estate by 0.25% (under the Flat 35S product⁴⁰). Flat 35S, promotes accommodation which has higher quality in terms

37 MUFG. (2019). Sustainability. [Website]. Retrieved from https://www.mufig.jp/dam/ir/report/annual_report/pdf/ir2019_all_en.pdf

38 JMC. (2019). Overview of the Joint Crediting Mechanism (JCM). [Website]. Retrieved from <http://jec.jp/jcm/about/>

39 Hayashi, T., Ikaga, T., Ito, M., & Murakami, S. (2016). Correlation between CASBEE scores and market rent prices. *AIJ Journal of Technology and Design* 22(52):1053-1056. Retrieved from https://www.researchgate.net/publication/309295103_A_study_on_economic_impact_of_environmental_efficiency_and_intellectual_productivity_contribution_on_rents

40 JHF. (2019). JHF and its Green Initiatives. [Presentation]. Retrieved from https://ipeec.org/upload/publication_related_language/pdf/1331.pdf

of energy efficiency, earthquake resilience, elderly accessibility and durability & flexibility. JHF gives a reduction of the interest rate for Flat35S with 1.02% for the initial 10 years.⁴¹

Quality assurance under Flat35S operates according to three pillars: Technical standards, in terms of energy efficiency; inspection of construction which is conducted by a third party (agreement with over 300 certified private inspectors in Japan) to ensure the quality of housing on site; and housing construction specification, since most of the technical standards of the building are not easy to understand for small home builders.

JHF also refinances these mortgages via green bonds⁴² – the first green bond was issued by JHF in 2019 to finance residential mortgages in the country with a 20-year maturity, totaling JPY 10 billion, and with a nominal coupon interest rate of 0.548%. It is expected that this green bond will expand its investor base. In March 2019, JHF was awarded Japan's Ministry of the Environment Green Bond Award in the Green Innovation Category.



41 Ibid.

42 Ibid.

Leading practices by investors

Institutional investors are primary sources of capital for the global economy. Their highly diversified portfolios include important allocations to energy intensive industry, real estate and other sectors with a high energy efficiency investment potential. The positive impact of higher energy efficiency on the competitiveness of their corporate, asset and industrial investments (and on future energy prices) will have a significant effect on the performance of their investment theses and strategies. As long-term owners of companies in the real economy, across a wide range of countries, institutional investors are long-term and patient providers of capital. Institutional investors' investment strategies look decades ahead, which make the impacts of climate change and the effects of policy measures to address climate change a very material consideration for them.

Much of the energy efficiency investing of institutional investors is via indirect investments in real estate companies, real estate investment trusts (REITs) and through green bonds underpinned by energy efficiency projects. Direct real estate holdings are a relatively small share of the overall assets of institutional investors, nevertheless their deep pockets of capital make them a primary source of new investment capital for energy efficiency improvements in corporates and real assets alike. The energy efficiency investment challenge could be fully funded with just a fraction of their trillions of investment capital. Some key points arose from stakeholder dialogue with investors:

- Institutional investors are data hungry. Presently, investors rely on the information provided by their investee companies and managers, as well as the information provided by their direct real estate investments, in order to assess the impact of energy efficiency on their portfolio returns and risk levels. This is why efforts to improve the availability of climate-related financial disclosures (TCFD) will benefit institutional investors, who then can improve their reporting on portfolio wide climate risks and opportunities as the prerequisite data from banks, service providers, and investee companies becomes available.
- Institutional investors invest mainly in the traded international capital markets rather than in the private markets. Investment decisions by individual institutional investors therefore can only have a major impact if a critical mass of institutional investors is reached. However, at these critical levels, overall asset values and the cost of capital for investee corporations listed on global exchanges are impacted. Better disclosure of climate related risks and opportunities, jointly with the impact of climate related regulation, policy and incentives, can improve the ability of financial markets to better price energy efficiency levels. Green tagging is an essential way in which investors can obtain the necessary information about regulatory compliance and efficiency performance of the underlying real assets in managed portfolios or through corporate holdings. As many institutional investors are now committing to the objective of decarbonizing their portfolios for net zero emissions by 2050, much better data about indirect emissions resulting from institutional investor decisions is essential.

Example Investor Network: Principles for Responsible Investment

The **Principles for Responsible Investment (PRI)** are an investor network with 2,400 signatories to their six principles for responsible investment, and these represent USD 85 trillion⁴³ of assets under management. Signatories to the PRI play a key role in financing new technologies and energy sources. For example, Cbus, an Australian fund, recently set a net zero emissions target for its entire property portfolio for 2030. The green bonds market, which is often backed up by energy efficiency, is key to the PRI signatories and has seen extremely rapid growth, particularly in emerging markets, bringing climate-aligned bonds to USD 1.45 trillion⁴⁴.

The PRI has published a guide about “How to invest in the low carbon economy⁴⁵”, which covers the investment strategies available, provides practical case studies, taxonomies that can be used, and covers strategies for phasing out thermal coal power. PRI is also leading as Rapporteur on the Technical Expert Group appointed by the European Commission to develop a taxonomy for sustainable finance activities⁴⁶, which was drafted and offered for public consultation in June 2019.

The Global Investor Statement⁴⁷ signed by investors with over USD 34 trillion in assets under management calls for a G20 phase-out of fossil fuels subsidies and thermal coal and the introduction of carbon pricing and climate disclosure requirements (e.g. in line with TCFD), as well as a framework for the just transition of workers.

Climate Action 100+ is supported by over 300 investors representing USD 34 trillion⁴⁸ in asset under management and stands as the biggest ever engagement programme. They are targeting the top 100 emitting companies in the world. Climate Action 100+ is requesting the boards and senior management of companies to:

- Implement a strong governance framework which clearly articulates the board’s accountability and its oversight over risks related to climate change;
- Take action to reduce the greenhouse gas emissions across their value chain, consistent with the Paris Agreement goals;
- Provide enhanced corporate disclosure in line with the final recommendations of the TCFD.

43 PRI. (2019). Why sustainable finance is inevitable. [Presentation]. Retrieved from <https://slideplayer.com/slide/17006738/>

44 UNFCCC. (2018). Huge Potential for Green Bond Market – Report. Retrieved from <https://unfccc.int/news/huge-potential-for-green-bond-market-report>

45 PRI. (2018). How to invest in the low-carbon economy. [Website]. Retrieved from <https://www.unpri.org/climate-change/how-to-invest-in-the-low-carbon-economy/3210.article>

46 European Commission. (2019). EU taxonomy for sustainable activities. Retrieved from https://ec.europa.eu/info/publications/sustainable-finance-teg-taxonomy_en

47 The Investor Agenda. (2019). 477 investors with USD \$34 trillion in assets urge G20 leaders to keep global temperature rise to 1.5 degrees Celsius. Retrieved from <https://theinvestoragenda.org/wp-content/uploads/2019/06/G20-Global-Investor-Statement-on-Climate-Change.pdf>

48 Climate Action 100+. (2019). Investors. [Website]. Retrieved from <http://www.climateaction100.org/>

Also, better disclosure of climate-related risks and opportunities is essential. The TCFD report was published in 2017⁴⁹ with the contribution of the PRI. A consortium of 170 Japanese companies supporting TCFD has been launched recently⁵⁰. Corporate disclosure enables investors to assess material climate risks and opportunities. The 2019 TCFD Status Report highlights that more companies need to implement TCFD recommendation and provides decision-useful information to investors, which is another reason why the PRI supports better disclosure and information for investors about asset-level energy efficiency performance.

Investor Example (Japan): Government Pension Investment Fund of Japan

The **Government Pension Investment Fund of Japan** (GPIF) is the largest asset owner in the world, managing above USD 1.4 trillion⁵¹ with an equal allocation to bonds and equities which serves as an important reserve to support Japan's pay as you go pension system despite the country's ageing population. The fund has an investment horizon of 100 years. While GPIF holds equity stakes in over 5000 companies, 100% of GPIF's investment activities are outsourced to external asset managers. GPIF takes a passive attitude to company engagement, as it is forbidden by law to interfere in company management decisions and instead requests its external asset managers to promote the integration of ESG. GPIF also invests close to USD 28 billion into ESG and environmental indices⁵².

GPIF advocates for the largest emitting sectors⁵³ (utilities, 31%; materials, 23%; and industry) to reduce their emissions substantially and has recently joined efforts to implement the recommendations of the TCFD and Climate Action 100+.

Investor Example (Global): Allianz Investment Management

Allianz Investment Management is the investment arm of one of the world's largest insurance companies and the world's largest insurance investors. They manage own insurance assets of EUR 650 billion and in addition invest over EUR 1.4 trillion⁵⁴ in client assets. Similar to GPIF, Allianz needs to construct insurance portfolios with extremely long time horizons of 50 to 100 years, and consequently real world impact and sustainability are extremely important considerations.

Accordingly, Allianz has committed to running its own operations on 100% renewable power by 2023⁵⁵ – as the company has already been carbon neutral since 2012. Allianz also plans to make its

49 TCFD. (2019). TCFD: 2019 Status Report (June 2019). [Website]. Retrieved from <https://www.fsb-tcdf.org/publications/tcdf-2019-status-report/>

50 The Japan Times. (May 27th 2019). New consortium to accelerate climate-related corporate disclosures in Japan. Retrieved from <https://www.japantimes.co.jp/news/2019/05/27/business/new-consortium-accelerate-climate-related-corporate-disclosures-japan/>

51 Willis Towers Watson. (2019). Thinking Ahead Institute / Pensions & Investments. Retrieved from <https://www.slideshare.net/TowersWatson/the-worlds-largest-pension-funds-2019-167697788>

52 GPIF. (2019). GPIF ESG Investment. Retrieved from https://ipeec.org/upload/publication_related_language/pdf/1251.pdf

53 Ibid.

54 Allianz. (2019). Allianz Group. [Website]. Retrieved from https://www.allianzgloballife.com/en_IS/allianz-group.html

55 Allianz. (2019). Real World Impact with Insurance Investments. [Presentation]. Retrieved from https://ipeec.org/upload/publication_related_language/pdf/1296.pdf

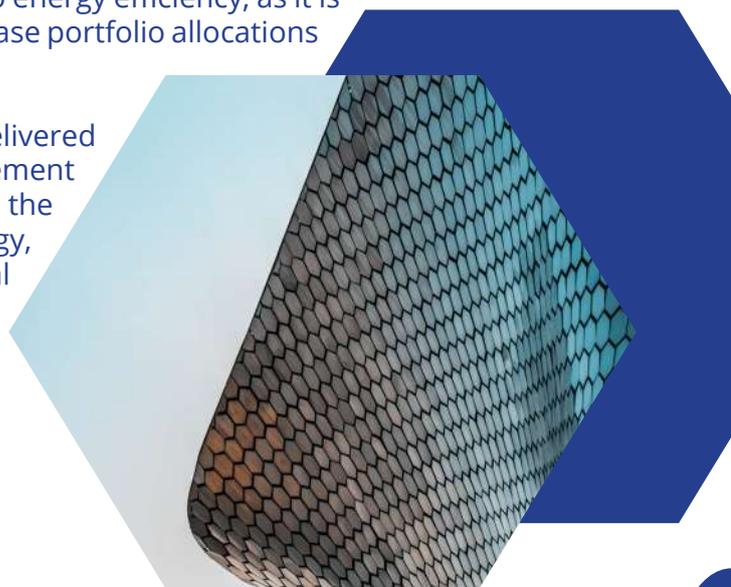
entire investment portfolio carbon neutral by 2050⁵⁶, and is actively working with its portfolio companies to encourage shifts in corporate behavior in line with this objective. ESG is embedded into every part of Allianz's investment process and it is also divesting from its unsustainable and most polluting assets. Half of Allianz's sustainable investments are in green buildings and real estate (50% of EUR 25 billion⁵⁷), and another EUR 7 billion is currently invested in wind and solar farms.

Investor Example (UK): Hermes Investment Management

Hermes Investment Management is a UK based investment management company, with a smaller asset portfolio than large asset owners (like Allianz and GPIF) but with a particular commitment to pursuing holistic returns. Hermes IM is committed to long-term investment performance and stewardship, while delivering sustainable outcomes to improve the real economy. Hermes has USD 45.8 billion of assets under management⁵⁸, with an additional USD 500 billion of assets under stewardship⁵⁹. The asset manager engages investee companies on behalf of asset owners, bringing significant assets under stewardship.

Hermes, in line with the findings of the G20 Energy Efficiency Investment Toolkit⁶⁰, has found that energy efficiency is currently mostly self-financed (by homeowners or from corporate balance sheets) and thus not easily traceable for financial institutions and the wider market. While investors are keen to increase their exposure to energy efficiency, as it is not visible to financial institutions it is difficult to increase portfolio allocations to efficiency, which is not an asset class in itself.

The scaling up of efficiency investment can also be delivered through the operational measurement and improvement of energy efficiency performance in buildings. With the increased penetration of IT and smart meter technology, this should become common practice and a potential future legal requirement.



⁵⁶ Ibid.

⁵⁷ Ibid.

⁵⁸ Hermes. (2019). About. [Website]. Retrieved from <https://www.hermes-investment.com/es/about-us/>

⁵⁹ Ibid.

⁶⁰ IEA, IPEEC & UNEP FI. (2017). G20 Energy Efficiency Investment Toolkit. Retrieved from <https://www.unepfi.org/wordpress/wp-content/uploads/2017/05/G20-EE-Toolkit.pdf>

Leading practices by public financial institutions

Energy efficiency investment needs to overcome several market-related barriers that public financial institutions are well positioned to address. These relate to the smaller transaction sizes of energy efficiency investments compared to capital market issuance and renewable energy and other climate-related infrastructure investments (which creates a need for aggregation); the need to understand the technical risks inherent in energy efficiency transactions (combining technical/project development expertise with financial expertise); and the fact that efficiency is typically embedded in other financing, such as mainstream lending to real estate or company loans.

Public financial institutions have smaller balance sheets than many private institutional investors or banks. While the lending capacity of public financial institutions is increasing in many markets and new public financial institutions have been created in response to the clean energy infrastructure investment gap, public financial institutions still need to focus their interventions where they achieve the highest amount of private sector leverage and maximize their impact as determined by their own management and policy objectives. This means:

- By combining different interventions, public financial institutions can support the creation of an investable pipeline of efficiency projects so that the necessary scale is reached through the deployment of technical assistance. By being able to deploy guarantee instruments they can achieve more leverage and consider the economic viability of efficiency projects.
- Public financial institutions stimulate a large proportion of the efficiency transactions which ultimately become bankable. They are leading actors in the drive towards greater market transparency and by deploying green tagging as a means to attach environmental information to transactions, they can promote best practices among their private financial institutional clients, both for reporting back to them and for own use.

Public Finance Example: World Bank Group

The **World Bank Group** (WBG) has two main strategic objectives: The elimination of extreme poverty, and building shared prosperity in order to achieve the UN Sustainable Development Goals (SDGs). WBG is an SDG development partner at the global, country and private sector levels. WBG operates in 89 countries, providing services in three categories: financial services, knowledge services and convening services.

WBG has been issuing Green Bonds for 10 years⁶¹ with a high degree of success. With 150 green bond issues in 20 currencies (providing USD 13 billion in funding) since 2008, it has every intention of continuing to issue more. Half of the funding from the existing WBG green bonds has been allocated to renewable energy and energy efficiency projects.

In 2018, WBG's clean energy assets amounted to around USD 30 billion (with an equal split between energy efficiency and renewable energy). While there has been a tendency to invest

⁶¹ WBG. (2019). 10 Years of Green Bonds: Creating the Blueprint for Sustainability Across Capital Markets. Retrieved from <https://www.worldbank.org/en/news/immersive-story/2019/03/18/10-years-of-green-bonds-creating-the-blueprint-for-sustainability-across-capital-markets>

more in the supply side to date, WBG is growing its sustainable building capacity and expects to increase the rate of growth of other sustainable assets, as well as energy efficiency. To achieve this, efforts are focused on the following interventions:

- Increased concessionary finance to build in emerging markets – notwithstanding the fact that concessionary finance is finite and sustainable energy markets need to start operating on commercial terms;
- Scalable products to attract new institutional investors into new markets;
- A super-ESCO which will take the well documented practices of the ESCO market to a new level.

The WBG has also produced its corporate guidance⁶² for energy, which shifts the focus from “spending more” to “spending better”, with a particular focus on a “service gap” into which energy efficiency can often deliver. This guide notes the importance of focusing more on software solutions for infrastructure, which can help deploy smart enabling infrastructure (smart grid and digital solutions) to materialize efficiency gains in those wider systems. Furthermore, WBG notes that quality standardization is crucial to facilitate the aggregation of energy efficiency assets.

Public Finance Example: European Investment Bank

The **European Investment Bank (EIB)** is a major financial institution with a balance sheet of EUR 600 billion. It has a commitment to deploy 25% of its annual financing to climate action (mitigation and adaptation), with 35% outside the EU. The EIB is also committed to delivering a minimum of EUR 100 billion from its balance sheet for financing climate action from 2016 to 2020⁶³.

Energy efficiency finance and investment forms a core part of the EIB’s activities to deliver its decarbonization policy goals. Strong policy and legal frameworks are needed to overcome the multiple investment barriers preventing energy efficiency measures, and especially those related to the lack of awareness of energy efficiency opportunities among homeowners and businesses. Energy efficiency projects are quite small, and there is often a lack of technical expertise from developers and asset owners during their project preparation phase. While a typical energy efficiency project financed by the EIB can be EUR 100,000, a typical renewable energy project is a hundred times bigger at EUR 100 million. To overcome these challenges, public financial institutions have to work with partners, developers and aggregators more closely in energy efficiency.

EIB provides traditional public sector lending and co-financing, and has led in the development of tools to finance retrofits of government buildings. EIB also provides assistance to finance ministries to build up ESCOs and energy efficiency markets in their countries. Additionally, EIB offers corporate finance for commercial housing, industrial and utility projects, infrastructure funds, publicly sponsored funds and energy efficiency funds and manages technical assistance facilities for project development.

62 WBG. (2019). Financing Clean Energy: Emerging Experience and Corporate Direction.[Presentation]. Retrieved from https://ipeec.org/upload/publication_related_language/pdf/1336.pdf

63 EIB. (2018).EU bank tackles investment gaps in innovation and development. Retrieved from <https://www.eib.org/en/press/all/2018-006-eu-bank-tackles-investment-gaps-in-innovation-and-development.htm>

Leading practices by industry

A large share of potential energy efficiency savings can be delivered in industry, which has the second highest untapped potential after buildings. Industry typically can access the required finance via the capital markets, or direct lending, and often has the ability to self-finance its efficiency projects through its own balance sheet. Industrial efficiency potential has the advantage that if projects are already 'aggregated' in a corporate structure, they can be financed through larger loans. In reality, efficiency projects often have to compete with other internal, and more strategic, CAPEX plans in industrial companies, and too often energy efficiency does not "win". Therefore continuous improvement, rather than radical upgrades to plants, is often the way by which efficiency potentials are realized. The construction of new plants is clearly a major opportunity for efficiency upgrades, since the most efficient choices are available where no factory exists and to those with long planning horizons.

- Energy intensive industry is sensitive to energy prices and high efficiency levels offer an attractive hedge against increasingly volatile energy prices. The energy efficiency upgrade of existing plants also responds to stronger investor demands for highly emitting industries to align with the Paris Agreement, like the Climate Action 100+ initiative and PRI.
- The same industries may also deliver the solutions necessary for increasing efficiency levels. As key drivers of innovation in efficiency sectors, such as appliances and cooling, advanced building technologies and highly efficient transport, these industries are a major source of the technological innovation necessary to achieve an energy efficient world economy.
- Energy intensive industry is increasingly reporting in line with the recommendations of the TCFD, which provides an important basis for both the companies and financial markets to better assess climate related risks and opportunities. This increased transparency from industrial players is also a key driver of improved energy efficiency, as this often appears on the "opportunity" side of that equation.

The two oil shock events of the 1970s initiated the growth of energy efficiency processes and investments in Japanese industry. For example, the Japanese steel industry delivers the lowest energy intensity among other of the world's major steel producers. The Japan Iron & Steel Federation reported that 20% of total energy consumption from the steel making processes in Japan were saved in the first 20 years after the 1970s⁶⁴ (resulting in savings of JPY 3 trillion) and new technologies were introduced from 1990s. From 1990 until today, an additional JPY 1.8 trillion and 12% of total energy consumption⁶⁵ was saved mainly through exhaust heat recovery within steel mills and waste plastics.

These efforts created new markets for Japan's steel producers, who sell their efficient technologies and solutions to other countries and to other industries. Bilateral technology cooperation is under way with China and India, and these technologies have been sold to companies in China, Korea,

64 Japanese steel industry for a Low Carbon Society. (2019). Activities. [Presentation]. Retrieved from https://ipeec.org/upload/publication_related_language/pdf/1321.pdf

65 Ibid.

India, Russia, Ukraine and Brazil. Cooperation with these countries is enabled by public-private cooperation and with particular thanks to the definition of best available technology lists (BAT-lists). While partnerships, expert discussions and the sharing of information are essential, in developing countries access to finance for these technologies is key. In addition, public sector intervention via reporting policies, benchmarking, intensity targets can provide the necessary frameworks for action.

Industry Example (JP): Tokio Marine Holdings

Tokio Marine Holdings is a Japanese multinational non-life insurance company with a deep awareness of climate change and its effects on its business and clients⁶⁶. As a member of the PRI and UNEP FI's sustainable insurance principles and as a strong advocate of the TCFD, Tokio Marine has responded to the recent climate change related weather events by offering technical risk insurance for clean energy facilities.

One product it offers is the Mega-solar project⁶⁷ composed of risk consulting (natural disaster risk assessment and soil contamination status assessment) and an arrangement of property and casualty insurance. This project has enabled Tokio Marine Holdings to build an encompassing know-how to assess with precision those potential risks that can threaten the viability of solar PV projects, and put to forward preventive investments and measures.

A second product is the geothermal package plan⁶⁸, which takes into account ground surveys to underwrite property, and construction and liability risks for geothermal developers. Its liability risk compensation is key to secure investments, as compensation for damages takes place in the event of water related changes during the development or operational phases of a geothermal power generation facility.

Industry Example (International): Toyota Motor Corporation

Toyota Motor Corporation is responding to climate imperatives with six challenges⁶⁹: three zero CO₂ challenges of achieving new vehicle zero CO₂ emissions (90% by 2050), achieving lifecycle zero CO₂ emissions, and having zero total plant emissions by 2050. In addition, Toyota has three net positive impact challenges to minimize and optimize water usage, establish a recycling based society and systems, and establish a future society in harmony with nature.

To deliver its new zero CO₂ emissions vehicle challenge, Toyota believes electric vehicles need to go mainstream and it has adopted a technology neutral approach. This approach entails: the improvement of technology, and the roll out of a large range of electric vehicles, including battery electric vehicles (EVs), fuel-cell EVs, plug-in hybrid EVs and hybrid EVs. Toyota believes that fuel cell electric vehicles still have many advantages, such as a long cruising range and a

66 https://ipeec.org/upload/publication_related_language/pdf/1301.pdf

67 Tokio Marine Holdings. (2018). Preventing Global Warming by Promoting the Development of Clean Energy. [Website]. Retrieved from https://www.tokiomarinehd.com/en/sustainability/theme2/clean_energy.html

68 Ibid.

69 Toyota. (2019). G20 Global Summit on Financing Energy Efficiency, Innovative and Clean Technologies. [Presentation]. Retrieved from https://ipeec.org/upload/publication_related_language/pdf/1311.pdf

large power supply capacity, as well as a fast refuelling time and resilience during cold weather conditions.

Even though Toyota is currently out-performing EU fuel economy standards by 25%, the company understands that the electrification of transport is becoming increasingly indispensable. In order to reduce the cost of EV batteries and fuel cells, Toyota has started to share royalty-free patents with key partners to boost the widespread use of its technologies. The company emphasizes the importance of “well to wheel” considerations and believes that each country’s energy mix should be taken into consideration when weighing the benefits of EVs against other alternatives.

Industry Example (International): Daikin Industries



Daikin Industries is the leading manufacturer of air conditioning equipment globally. Daikin has developed its “Air as a Service” business model that includes finance, maintenance and full management⁷⁰ of super-efficient air-conditioning devices. Instead of selling its equipment, Daikin thus sells customers cool and/ or warm air, and as customers do not own the air conditioner, and therefore also do not need to cover the upfront cost, it can optimize based upon satisfaction and needs, as opposed to access to finance.

The Air as a Service business model offers packaged services, so that customers do not need to buy the equipment or pay for maintenance and management; and Daikin offers an off-balance sheet financing approach to reduce the reporting burdens and financial ratio impact of the service. Daikin monitors the equipment for operational performance and habitability, and so energy efficiency improvements and needs can be easily identified and acted upon, and efficient devices are deployed.

⁷⁰ Daikin. (2019). Developing the PaaS-based Air-Conditioning (A/C) business. [Presentation]. Retrieved from https://ipeec.org/upload/publication_related_language/pdf/1351.pdf

Future areas of action

Over 150 experts and industry representatives were brought together under by the G20 EEFTG to the G20 Global Summit on Financing Energy Efficiency, Innovation and Clean Technology in the framework of the Japanese Presidency of the G20. These CEOs of major financial institutions managing trillions of USD of assets and senior G20 negotiators were able to build upon the prior G20 basis for energy efficiency investments to chart a common way forward.

The following observations were made by high-level attendees to the Summit and illustrate some of their particular take-aways for future action:



Satya Tripathi, UN Assistant Secretary General and Secretary, UN Environment Management Group: “It is heartening to see public sector policy-makers and finance joining forces to accelerate action towards the realisation of Agenda 2030 and the Paris Agreement. It is more urgent than ever before to upgrade the world’s building stock and industry to future-proof investment while accomplishing the Paris Agreement objective of global emissions neutrality by the second half of the century.”



Benoit Lebot, Executive Director, International Partnership on Energy Efficiency Cooperation: “It was particularly encouraging to see such an engaged discussion between G20 policy makers and financial institutions at [the] Summit. Increasing investments in energy efficiency, innovation and clean technology is clearly a part of the 2019’s G20 agenda where solid progress can be made.”



Peter Sweatman, rapporteur for the Summit and technical lead of the G20 EEFTG: “The tide has turned for financial institutions, and better understanding the relative energy performance of balance sheet assets is the first natural step in overall alignment with the Paris Agreement and reducing the risk of stranded real estate assets.”



Sandra Schoonhoven, Head of Sustainability, ING Bank: “As part of ING’s climate ambition to steer our lending portfolio of EUR 600 billion towards the well-below two-degree goal of the Paris Agreement, we aim to make our mortgage portfolio energy positive. Robust data on the energy efficiency of homes is key to be able to steer on greening our mortgage portfolio. The sooner we start this journey, the more gradual the transition path can be. The conversations here in Tokyo confirm that we are on the right track.”



Masahiro Kobayashi, Director General of Japan Housing Finance Agency (JHF): “It was a great pleasure and honor to share our experience in the field of energy efficient mortgages and green bond. We would be more than delighted to work with G20 members in the coming opportunities to accelerate the promotion of green housing finance in emerging Asia, among others.”



Andrew McDowell, Vice President, European Investment Bank: “The EIB was pleased to share with the Summit its insights into the challenges of investing for energy efficiency improvements, and now commits to working with our Summit partners on mobilizing the global financial system to move the needle on the level of energy efficiency investment, consistent with the Paris Climate Accords”



Ritu Arora, Chief Executive Officer & Investment Officer of Allianz Investment Management Singapore Pte Ltd: “As a leading insurer and investor, we promote the transition to a climate-friendly economy. We want to shape this change together with our clients and also strategically develop our investment opportunities in new technologies.”

The discussions among high-level actors, Summit participants and contributors resulted in the release of the ‘Tokyo Declaration’ (see p.33), which is a forward-looking statement that outlines priority action areas and recommendations to stakeholders to improve the visibility and energy performance of assets held by financial institutions. Officially launched during the concluding session of the Summit, the declaration was developed by the high-level steering committee through a consultative process.



G20 Global Summit on Financing Energy Efficiency, Innovation and Clean Technology

12 June 2019, Tokyo, Japan

Tokyo Declaration on Improving the Visibility and Energy Performance of Asset Investments by Financial Institutions

As Summit participants, financial institutions, supporting networks and experts we declare to the G20 Ministerial Meeting on Energy Transitions and Global Environment for Sustainable Growth, that to increase the innovative financing and capital sources for our Energy Transition, we recommend:

1. Increased transparency of the energy performance of banks' assets through their accelerated tagging to nationally appropriate energy performance metrics, leading with buildings.
2. An exemplary role for public financial institutions in their consideration of energy performance in all new real estate lending activities, and as a priority to review and tag existing assets, leveraging digital innovation where relevant.
3. To promote best practices, and to track the commitments made to tag assets' energy performance through networks of leading financial institutions, like the UNEP FI Energy Efficiency Finance Platform, inter alia.
4. To consider smart enabling infrastructure in cities and the built environment that can yield important systemic efficiency gains, including efficient building design to reduce heating and cooling requirements, super-efficient cooling devices, electric vehicle charging and heat pumps in combination with smart renewable energy solutions.

These recommendations build on the recognition that:

The G20 Energy Efficiency Leading Programme (art 4.3.3.3) calls for the broadening and deepening of private sector engagement, including through the establishment of a Private Sector Energy Efficiency Investment Platform, and other work with long-term investors, banks and insurers with partner support;

The G20 Hamburg Climate and Energy Action Plan for Growth (art D.1) highlights the importance of frameworks to encourage necessary additional investments in technological innovation in energy efficiency as a driver for economic growth, and acknowledges the G20 Energy Efficiency Investment Toolkit, a set of voluntary options for participating countries to upscale energy efficiency in G20 economies, as an integrated approach to enhancing capital flows towards energy efficiency. Finally, it invites international organisations to provide regular updates on the global transformation of the energy sector and further investment needs;

The G20 Energy Efficiency Investment Toolkit (p.3) concludes that 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;

The voluntary Energy Efficiency Investment Principles for G20 participating countries (p. 1) call for further collaboration to build an awareness of energy efficiency (and its associated benefits) within public and private financial institutions;

The G20 Energy Efficiency Action Plan (art 2.13) called for the identification of issues for energy efficiency investment finance from the perspectives of both demand (borrowers) and supply (banks and investors); and (art 3.5) work on metrics to help gauge progress and identify opportunities for improvement in building energy performance;

The G20 Toolkit of Voluntary Options and Action Agenda for Renewable Energy Deployment call for exchange on experiences in the use of risk mitigation instruments as an efficient means for public sector finance to mobilize private sector investments and to develop a guide to the use of risk mitigation instruments within the G20 framework.

Latest data from the International Energy Agency (IEA) shows that growth in global energy efficiency investment stalled in 2018, despite the need for significant investment in the near-term to meet global sustainability goals and reduce the overall effort required from energy supply measures. A total of USD 240 billion was invested in energy efficiency across the buildings, transport, and industry sectors, the same level as in 2017. This resulted from lower spending on energy efficient buildings, while electric car sales continued to soar and air conditioner sales grew 16% in 2018 to their highest ever level, led by Asian and Latin American G20 countries where rising demand for space cooling is putting enormous strain on electricity systems and driving up emissions.

Global real estate is worth around US\$ 280 trillion and represents around 30% of total bank assets, with buildings responsible for over 30% of global greenhouse gas emissions and at risk of climate-related losses relating to sea-level rise estimated over \$2 trillion;

Cities have the power to implement complementary renewable and energy efficiency investments as illustrated in "Solutions to integrate high shares of variable renewable energy and Climate change and renewable energy – national policies and the role of communities, cities and regions". Urban electrification can be combined with renewable power from surrounding areas to yield high overall efficiencies and deep decarbonisation enabled by innovative smart infrastructure investments.

One-hundred and thirty-six (136) parties have referenced action required by the buildings and/ or construction sector in their Nationally Determined Contributions under the Paris Agreement; The G20 Energy Efficiency Finance Task Group has developed commitment tools that have enabled 122 private banks, six leading public financial institutions and more than USD 4 trillion of institutional investors embed energy efficiency considerations more deeply in their activities, supported by the networks of UNEP FI and other partners;

The material importance of up-scaling energy efficiency investments in global real estate as a core component of energy transitions and promoting sustainable growth as outlined in the Global Alliance for Buildings and Construction (GlobalABC) 2019 Global Status Report, and the key role sustainable and efficient buildings play in improving citizens' local environments and the social and business innovations necessary to achieve them; and

UNEP FI's role as a partnership between United Nations Environment Programme and the global financial sector created to promote sustainable finance with more than 230 financial institution members, including banks, insurers, and investors ;and

The role of a whole-of-government approach to strengthen domestic enabling conditions and unlock finance for energy efficiency, innovation and clean technology; and the readiness of the OECD to provide policy advice and support for implementation.

Acronyms and Abbreviations

3 E + S	Energy security, economic efficiency, and environmental safety
BAT	Best available technology
BP	Best practice
EU	European Union
EV	Electric Vehicle
CO ₂	Carbon Dioxide
CCUS	Carbon Capture, Utilization, and Storage
EEFIG	Energy Efficiency Financial Institutions Group
EEFTG	G20 Energy Efficiency Finance Task Group
EENs	Energy Efficiency Networks
EIB	European Investment Bank
EELP	G20 Energy Efficiency Leading Program
ESCO	Energy Service Company
ESG	Environmental, Social and Corporate Governance
EUR	European Union Euro
EV	Electric vehicle
GAL	Global allocation
GHG	Greenhouse gas
GPIF	Government Pension Investment Fund of Japan
IKI	International Climate Initiative
IPEEC	International Partnership for Energy Efficiency Cooperation
IEA	International Energy Agency
IRENA	International Renewable Energy Agency
JCM	Joint crediting mechanism
JHF	Japan Housing Finance Agency
JPY	Japanese Yen
MEAE	Ministry of Economic Affairs and Employment of Finland
METI	Ministry of Economy, Trade and Industry of Japan
MOEJ	Ministry of the Environment of Japan
NEDO	New Energy and Industrial Technology Development Organization
NKI	German National Climate Initiative
OECD	Organisation for Economic Co-operation and Development
PRI	Principles for Responsible Investment
UNEP FI	United Nations Environment Programme Finance Initiative
USD	United States Dollar
PEEB	Program on Energy Efficiency in Buildings
ppm	Parts per million
REIT	Real Estate Investment Trust
SDG	Sustainable Development Goal
SMTB	Sumitomo Mitsui Trust Bank
SEforALL	Sustainable Energy for All
TCFD	Task Force on Climate-related Financial Disclosure
UK	United Kingdom
WBG	World Bank Group

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About the organizers

G20 Energy Efficiency Finance Task Group (EEFTG)

The Energy Efficiency Finance Task Group (EEFTG) aims to enhance capital flows for energy efficiency investments in G20 economies by supporting countries to build robust, investment-grade policy and investment frameworks. It also serves as a forum for G20 policy makers to share best practices in policies and financial instruments through peer-to-peer workshops and direct engagement with members of the private and public finance community, industry and international organisations. The EEFTG is co-convened by IPEEC and UNEP FI.

International Partnership for Energy Efficiency Cooperation (IPEEC)



The International Partnership for Energy Efficiency Cooperation (IPEEC) is an autonomous partnership of 17 major economies founded in 2009 by the Group of 8 (G8) to promote global cooperation on energy efficiency. Its member economies together account for over 80% of global energy use and 85% of energy-related GHG emissions. Since 2014, IPEEC has been coordinating the G20's energy efficiency activities under the group's two plans - the G20 Energy Efficiency Action Plan (2014) and the G20 Energy Efficiency Leading Programme (2016).

UN Environment Programme Finance Initiative (UNEP FI)



United Nations Environment Programme – Finance Initiative (UNEP FI) is a partnership between United Nations Environment and the global financial sector created in the wake of the 1992 Earth Summit with a mission to promote sustainable finance. More than 300 financial institutions, including banks, insurers, and investors, work with UN Environment to understand today's environmental, social and governance challenges, why they matter to finance, and how to actively participate in addressing them.

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