

## Annex: Participation in Priority Areas of Energy Efficiency Work

Participation confirmed as at 27 September 2014

	IPEEC?	New Work		Accelerating Collaboration & Knowledge Sharing			Future Development	
		Vehicles	Products	Buildings	Industrial Energy Management	Electricity Generation	Finance	Network for Implementers
Argentina	N							
Australia	Y			Lead				
Brazil	Y							
Canada	Y							
China	Y	Tentative	Tentative				Tentative	
EU	Y							
France	Y							
Germany	Y							
India	Y							
Indonesia	N							
Italy	Y							
Japan	Y					Lead		Lead
Korea	Y							
Mexico	Y							
Russia	Y	Tentative						
Saudi Arabia	N							
South Africa	Y			Tentative	Tentative	Tentative		
Turkey	N							
United Kingdom	Y		Lead					
United States	Y	Lead		Lead				
<b>Total</b>	<b>16</b>	<b>8</b>	<b>7</b>	<b>11</b>	<b>5</b>	<b>5</b>	<b>8</b>	<b>4</b>
<b>G20 Guests</b>								
New Zealand								
Spain								
Singapore								
<b>Total (With G20 Guests)</b>		<b>10</b>	<b>10</b>	<b>14</b>	<b>5</b>	<b>5</b>	<b>8</b>	<b>5</b>

# **G20 Energy Efficiency Action Plan**

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*Working Together:*

*Voluntary Collaboration on Energy Efficiency*



# G20 Energy Efficiency Action Plan

## Executive Summary

- 1.1 Energy efficiency is a priority for G20 members. As the world's leading economies, and consumers of more than 80 per cent of the world's energy, G20 members agree that increased collaboration on energy efficiency can drive economic activity and productivity, strengthen energy security and improve environmental outcomes. It can also cut costs for businesses and households. By sharing approaches and working towards voluntary harmonisation where appropriate, countries can drive business efficiencies by reducing the costs of product development and standards compliance for internationally traded goods.
- 1.2 The G20 Energy Efficiency Action Plan (the Action Plan) is a practical plan to strengthen voluntary energy efficiency collaboration in a flexible way. It allows countries to share knowledge, experiences and resources by choosing, on an opt-in basis, preferred activities that best reflect their domestic priorities.
- 1.3 In developing the Action Plan, G20 members have considered the significant work being done through existing international bodies and multilateral arrangements on energy efficiency. A wide range of possible areas of work were considered. G20 members have focused on how the G20 could add value, for example by addressing emerging challenges and gaps in existing work or adding momentum to existing collaboration.
- 1.4 The Action Plan documents five priority areas of energy efficiency work for ongoing collaboration among G20 members and guests. Two of the priority areas will involve new G20 led work to address an emerging challenge or a gap in existing international collaboration. In the other three areas, the G20 will add value by expanding or enhancing existing international collaboration. Members and guests have each chosen to participate in various areas of work based on their national priorities (see [Annex 1](#)). This has resulted in the priorities and key actions set out in the table below.
- 1.5 The International Partnership for Energy Efficiency Cooperation (IPEEC) will coordinate the Action Plan, in collaboration with the International Energy Agency (IEA). It will draw on the expertise of other specialist organisations such as the International Energy Forum (IEF) and the Organisation of the Petroleum Exporting Countries (OPEC) as required. G20 members that are not members of IPEEC have been formally invited and encouraged to join IPEEC. Importantly, non-IPEEC members are welcome and encouraged to join and participate in IPEEC task groups. Non-IPEEC G20 members have also been formally invited to attend IPEEC meetings as observers.
- 1.6 By agreeing on the Action Plan, G20 members and guests acknowledge the need to provide continued resourcing to IPEEC, and relevant international organisations, to enable them to support implementation of the Action Plan. In 2015, IPEEC will report to G20 leaders on progress and recommendations on the new areas of work and will report to the G20 on progress in relation to the priorities for accelerating collaboration and knowledge sharing.

## Priorities and Key Actions

### Priorities for New Work

*IPEEC will report to G20 leaders in 2015 on progress and recommendations.*

Priorities	Key Actions
Vehicles: Improving vehicle energy efficiency and environmental performance	The United States will lead work with participating countries, through IPEEC and with support from the IEA, to establish a new Transport Task Group to improve vehicle energy efficiency, particularly for heavy duty vehicles. This work will include considering whether G20 members could commit, in 2015, to strengthen domestic standards related to clean fuels, vehicle emissions and vehicle fuel efficiency.
Products: Networked devices	The United Kingdom and the IEA will lead work with participating countries, through IPEEC, to accelerate the development of new ways to improve the energy efficiency of networked devices. This will include considering whether G20 members could commit, in 2015, to a global reduction in the standby mode energy consumption of networked devices of 50 per cent by 2025.

### Priorities for Accelerating Collaboration and Knowledge-Sharing

*IPEEC will report to the G20 in 2015 on progress*

Priorities	Key Actions
Buildings: Improving metrics and performance	The United States and Australia will lead work with participating countries, through IPEEC, to take forward recent Building Energy Efficiency Task Group (BEET) recommendations, including in relation to building codes, metrics, rating, labelling, and disclosure.
Industrial energy management: Making industrial processes more energy efficient	Participating countries will accelerate the work of the existing IPEEC Global Superior Energy Performance Partnership (GSEP) Energy Management Working Group (chaired by the United States) and the Energy Management Action Network (EMAK) Task Group (chaired by Japan).
Electricity generation: Sharing high-efficiency, low-emissions technology	Japan will lead work with participating countries, through the IPEEC GSEP Power Working Group, to develop a detailed implementation plan for sharing knowledge of high-efficiency, low-emissions electricity generation technologies.



## 2. Priorities for New Work

- 2.1 Vehicles and networked devices are two areas where the G20 can add value by addressing an emerging challenge or a gap in existing international collaboration on energy efficiency.

### Vehicles

#### *Improving vehicle energy efficiency and environmental performance*

##### Key Actions

The United States will lead work with participating countries, through IPEEC and with support from the IEA, to establish a new Transport Task Group to improve vehicle energy efficiency, particularly for heavy duty vehicles. This work will include considering whether G20 members could commit, in 2015, to strengthen domestic standards related to clean fuels, vehicle emissions and vehicle fuel efficiency.

IPEEC will report back to G20 leaders in 2015 on progress and recommendations.

- 2.2 **The problem:** The transport sector is a major consumer of energy and source of related emissions in all G20 economies. Globally, the transport sector is estimated to account for around 20 per cent of total energy use. The IEA estimates that transport energy use could increase by as much as 70 per cent globally by 2050 unless energy efficiency and other policies are significantly strengthened. The IEA also suggests that ambitious policy and technology development, and implementation, could mitigate much of this growth. New collaborative work in this area could help participating countries to develop techniques for effectively measuring and comparing the fuel efficiency of heavy duty vehicles, which would in turn facilitate the development and implementation of harmonised national heavy duty vehicle fuel efficiency standards.
- 2.3 **G20's approach:** This work, which will be led by the United States and supported by the IEA, will evaluate and promote opportunities for faster development and implementation of more stringent vehicle fuel efficiency requirements, air pollution emissions standards and related fuel quality standards. While these standards are applied domestically, on a voluntary basis in accordance with differing national circumstances and priorities, international work can accelerate technical development of standards and testing regimes, and improve harmonisation to support lower costs for development of new vehicles, increased trade and reduced regulatory burden.
- 2.4 This work will include collaboration and exchange of experiences and best practices on relevant standards. It will also consider recommendations for further commitments by G20 members to strengthen domestic standards related to clean fuels, vehicle emissions and vehicle fuel efficiency, as well as support voluntary collaborative measures with industry (for example, green freight programs). The work will draw on the expertise of the IEA, including its transport modelling system, Mobility Model (MoMo).

- 2.5 While such performance improvements are relevant to both light and heavy duty vehicles, there will be an initial focus on heavy duty vehicles (trucks and buses), as freight transportation accounts for a large and rapidly growing proportion of energy demand in G20 countries. Other ways to improve the energy efficiency of heavy duty vehicle efficiency may also be considered, such as alternative fuels, efficiency improvements for trailers and innovative trailer combinations. Alternative fuels such as biofuels and natural gas can reduce reliance on conventional oil based fuels and may also offer environmental benefits. In this respect, participating countries could consider ways to improve the availability of these fuels in their markets, as an alternative to conventional fuels for heavy duty vehicles.
- 2.6 With respect to light vehicles, participating countries may consider strengthening support for and participation in the Global Fuel Economy Initiative (GFEI). This collaborative activity is currently supported by the IEA, United Nations Environment Programme (UNEP), the Fédération Internationale de l'Automobile (FIA) Foundation, the International Transport Forum (ITF) and the International Council on Clean Transportation (ICCT). The G20 could support the GFEI to increase collaborative activity and research, better share knowledge and experiences with light vehicle fuel efficiency standards and programs (and on related air pollution and fuel quality issues), and achieve more rapid improvements in the fuel efficiency of light vehicles internationally. The G20 may also consider further action in support of GFEI's overall aim of improving fuel efficiency by 50 per cent by 2050 (the "50 by 50" campaign) or a related relevant target (noting a number of regional targets already exist).



## Products

### Networked devices

#### Key Actions

The United Kingdom and the IEA will lead work with participating countries, through IPEEC, to accelerate the development of new ways to improve the energy efficiency of networked devices. This will include considering whether G20 members could commit, in 2015, to a global reduction in the standby mode energy consumption of networked devices of 50 per cent by 2025.

IPEEC will report to G20 leaders in 2015 on progress and recommendations.

- 2.7 **The problem:** Networked devices are widely traded internationally. These devices include smart phones, computers, televisions, set top boxes, printers and other office equipment, and increasingly white goods, lighting equipment, kitchen appliances and heating and cooling products. International collaboration on product energy efficiency can reduce barriers to trade that arise from differing standards. This reduces compliance and regulatory burdens on industry and reduces product development costs. It can also facilitate pooling of resources in research and innovation. International collaboration around the energy efficiency of networked devices could be deepened, leading to more rapid realisation of benefits for all countries, including reductions in energy demand and peak load infrastructure requirements.
- 2.8 The growing energy consumption of networked devices when they are not in use - but are in standby mode – is an emerging challenge. Networks routinely “wake” such devices, leading to additional and often unnecessary power consumption. Many devices use as much energy in standby mode as they do when they are in use. With the global trend towards an “internet of things”, the IEA estimates that up to 50 billion devices may be connected to networks by 2020. Already, the annual standby power consumption of networked devices is estimated at over 600 TWh, or greater than the total annual electricity consumption of Canada. By 2025, it is projected to nearly double. However, the IEA estimates that wider uptake of today’s best practice technologies could reduce this consumption by 65 per cent.
- 2.9 **G20’s approach:** Participating countries will work with the IEA to expand relevant research and accelerate the development of international product standards, particularly on technologies that would enable devices to power down and use less energy when in standby mode.
- 2.10 G20 work on networked devices could also include development of a policy framework to constrain energy consumption of networked devices when in standby mode. This could be achieved by intensifying international cooperation through the IEA’s Energy Efficient End-use Equipment (4E) initiative and through the Super-efficient Equipment and Appliance Deployment (SEAD) initiative of the Clean Energy Ministerial and IPEEC.
- 2.11 Potential outcomes of this work could include G20 members considering in 2015 whether to commit to a global reduction in the standby mode energy consumption of networked devices of 50 per cent, relative to the business as usual scenario, by 2025.



### 3. Priorities for Accelerating Collaboration and Knowledge Sharing

- 3.1 Buildings, industrial energy management and electricity generation are **three** areas where the G20 can add value by expanding or enhancing existing international collaboration.

#### Buildings

##### *Improving metrics and performance*

###### **Key Actions**

The United States and Australia will lead work with participating countries, through IPEEC, to take forward recent Building Energy Efficiency Task Group (BEET) recommendations, including in relation to building codes, metrics, rating, labelling, and disclosure.

IPEEC will report to the G20 in 2015 on progress.

- 3.2 **The problem:** Worldwide, buildings account for over 30 per cent of total final energy consumption, much of which can be avoided through design, components (such as glazing), equipment, systems and control strategies, all of which can be cost-effective. In G20 countries experiencing rapid economic growth, energy efficiency opportunities for new buildings may be the focus. Other G20 members could retrofit a large stock of buildings to improve energy performance. While building designs and construction techniques can be localised there are opportunities to share best practice policy models and design concepts. There are also opportunities to streamline standards for building products, where international trade is significant.
- 3.3 Three examples of areas where best practice could usefully be shared are performance codes, building energy data and rating and disclosure. Performance codes remain the “workhorses” of the building energy efficiency world, and can bring about such benefits as reduced lifecycle operating costs for buildings, reduced peak electricity demand, and improved occupant health outcomes. Concerted action on building energy data can improve the availability, quality, and utility of metrics. Rating and disclosure is a market-based approach that is not prescriptive of outcomes but makes building energy performance visible; and there is growing evidence that building owners and occupants act on information provided through rating and disclosure, even where not required to do so.
- 3.4 **G20’s approach:** Participating countries will work with the existing IPEEC Building Energy Efficiency Task group (BEET), co-led by the United States and Australia, together with the IEA and the Global Superior Energy Performance (GSEP) partnership. The BEET has conducted work on building rating systems and, at the request of the Major Economies Forum on Energy and Climate (MEF), identified key areas for further international collaboration and developed options for metrics to gauge progress in building performance. Follow-on activities described below will carry this work forward.



- 3.5 BEET's focus in 2015 will be work to promote uptake of best practices in the field of building energy performance codes and to develop and track building energy efficiency metrics, working through the IEA. The work on codes could highlight the continuing importance of effective energy performance requirements in building codes, including reviewing national code outcomes and capacity building and support for countries wishing to strengthen their codes. This work could also consider national mechanisms to support compliance with building codes, as compliance is acknowledged to be a concern in many countries. Further work on metrics will help gauge progress and identify opportunities for improvement in building energy performance.
- 3.6 Previous BEET work has also identified priorities to promote awareness and take-up of building rating, labelling and disclosure tools. Follow-on activities could focus on documenting best practice policy models, ratings and disclosure mechanisms, common metrics and methodologies, and capacity building.

## Industrial Energy Management

### *Making industrial processes more energy efficient*

#### Key Actions

Participating countries will accelerate the work of the existing IPEEC Global Superior Energy Performance Partnership (GSEP) Energy Management Working Group (chaired by the United States) and the Energy Management Action Network (EMAK) Task Group (chaired by Japan).

IPEEC will report to the G20 in 2015 on progress.

- 3.7 **The problem:** As many industrial processes are energy-intensive, industrial energy efficiency improvement is a cost effective strategy for all G20 members.
- 3.8 **G20's approach:** Participating countries will work to accelerate the uptake of industrial energy management systems through the existing IPEEC working groups – the GSEP Energy Management Working Group (which is a joint IPEEC-Clean Energy Ministerial (CEM) initiative) and the Energy Management Action Network (EMAK).
- 3.9 Expanded participation in the GSEP and EMAK will help to build capacity through wider sharing of tools and best practices on the use of energy management systems. Specifically, wider uptake of the ISO 50001 energy management protocol could deliver significant energy efficiency benefits in the industrial sector. The ISO 50001 energy management system respects the diversity of industrial and process systems across the G20, and is adaptable to a range of sectors and circumstances.
- 3.10 A number of G20 members are already involved in existing work of the GSEP and EMAK working groups, including Australia, Canada, China, the European Union, India, Japan, Korea, Mexico, South Africa and the United States.



## Electricity Generation

### *Sharing high-efficiency, low-emissions (HELE) technologies*

#### Key Actions

Japan will lead work with participating countries, through the IPEEC GSEP Power Working Group, to develop a detailed implementation plan for sharing knowledge of high-efficiency, low-emissions electricity generation technologies.

IPEEC will report to the G20 in 2015 on progress.

- 3.11 **The problem:** Global electricity generation expanded more than five-fold over the 20 years to 2011, with fossil fuels such as coal accounting for the largest share of this growth. Forecast rapid economic development in many countries in coming decades means electricity demand and generation growth will continue. This will require vast investments in generation and transmission/distribution capacity.
- 3.12 Improvements in energy efficiency on the demand (consumption) side are an effective strategy to reduce the burdens associated with such rapid demand growth. Electricity generators, which supply the energy will likely continue to be major consumers of primary fuels, particularly coal, due to its affordability and availability. Therefore, gains in the energy efficiency of (supply side) conventional power generation technologies, including the introduction of high-efficiency, low-emission coal-fired power plants, can lead to large reductions in total emissions. For example, the Government of Japan has estimated that if the existing coal-fired power plants in China, India and the United States were replaced with current best available technologies, CO<sub>2</sub> emissions could fall by almost 1.5 billion tonnes, nearly 5 per cent of total annual global CO<sub>2</sub> emissions.
- 3.13 **G20's approach:** Japan will work with IPEEC to help participating countries learn more about HELE technology, through the existing GSEP Power Working Group. A number of G20 members are involved in ongoing work of the GSEP Power Working Group, including Australia, Canada, China, India, Japan, Korea and the United States.

## 4. Areas for future consideration

In addition to the priorities set out above, several other areas of work received support from G20 members and guests and may be considered further by the G20 in future years. These include:

- 4.1 **Finance: enhancing private capital flows to energy efficiency investments:** Convene a high-level dialogue between representatives of the international finance community, participating countries and relevant international organisations. The dialogue would seek to enhance understanding of the policy settings that would best facilitate the flow of private capital into energy efficiency investments among G20 members. This work received wide support but G20 countries will further consider which country is best suited to lead on this issue. G20 members will also consider the work of the G20 Investment and Infrastructure Working Group (IIWG) when considering how to advance this possible new work on financing for energy efficiency.
- 4.2 **Network of implementing organisations:** This network, which Japan is establishing, would build capability and support best practice knowledge sharing on energy efficiency implementation across several sectors and technologies. An expanded network would build on the work of existing institutions. The UN Sustainable Energy for All (SE4All) work, being carried out through the Copenhagen Energy Efficiency Hub, may also have relevance for this network. The G20 may in future consider how members could further enhance this network.
- 4.3 **Energy efficiency data:** The IEA and France have proposed a Joint End Use Data Initiative (JEUDI) which could enhance data collection and indicator analysis on energy efficiency. This would provide governments with further evidence to help them realise significant energy efficiency opportunities. It would also help to develop shared techniques for measuring and projecting the benefits of energy efficiency and could also support private sector investment decision-making. Some elements of this work are being considered as part of the Buildings work through the BEET 4 work plan, which will focus on developing metrics through the IEA. G20 members may consider how to advance wider elements of this work in future years.



## 5. Implementing the G20 Energy Efficiency Action Plan

IPEEC will be the central coordinator of the Action Plan, supported by key expert international organisations, including the International Energy Agency (IEA).

The G20 acknowledges that sufficient resourcing for IPEEC, and for the work set out in this Action Plan, will be critical to success.

To support effective resourcing for the Action Plan, G20 members and guests commit to support and strengthen IPEEC through active participation in their selected areas of work, direct contributions to those areas of work (financial or in-kind) and, if they are IPEEC members, ongoing voluntary member contributions to IPEEC (financial or in-kind).

G20 members that are not members of IPEEC have been formally invited and encouraged to join IPEEC. Importantly, non-IPEEC members are welcome and encouraged to join and participate in IPEEC task groups. Non-IPEEC G20 members have also been formally invited to attend IPEEC meetings as observers.

G20 members also support and acknowledge the important role of relevant international organisations, particularly the IEA, in supporting the Action Plan through provision of expertise and specialist resources. G20 members will take this additional G20 energy efficiency work into account when considering future financial contributions to these organisations.

- 5.1 IPEEC is a partnership rather than an institution. Its work is undertaken by officials from IPEEC member countries, who exchange ideas and experiences, and collaborate on specific projects. It acts as a steering committee to coordinate activities among governments. It is funded entirely by members' voluntary contributions. The small secretariat oversees and coordinates the work of its task groups, and provides administrative services to IPEEC members. This model's advantages include significant flexibility and responsiveness to changing needs and priorities.
- 5.2 IPEEC's membership is similar to that of the G20, meaning IPEEC is well placed to coordinate this Action Plan. It can help to minimise duplication of effort and realise synergies among existing collaborative initiatives.
- 5.3 IPEEC will not undertake the *delivery* of individual areas of G20 energy efficiency work. Officials from participating countries will play the primary delivery role, using IPEEC task groups, with support from expert institutions or consultants. However, IPEEC will be requested to facilitate and co-ordinate the overall work program, and to collaborate widely with existing organisations and arrangements.
- 5.4 To fulfill this role, IPEEC will require appropriate resourcing. Additional resources will enable the IPEEC secretariat to better co-ordinate committee and task group meetings, to provide strategic oversight, to monitor progress, to document and report outcomes and to plan and co-ordinate events.

- 5.5 G20 members note the important roles of expert organisations, including the IEA, the OECD, the IEF, the World Bank and the Organisation of the Petroleum Exporting Countries (OPEC). Their expertise will be critical to its success. As such, G20 members will consider this in the context of their wider support and resources.
- 5.6 In 2015, IPEEC will report to G20 leaders on progress and recommendations in relation to the new areas of work and will report to the G20 on progress in relation to the priorities for accelerating collaboration and knowledge sharing.