

**Recommendations  
of the  
EU-Japan Business Round Table  
to the Leaders of the European Union and Japan**

Brussels, 11 July 2017

**Working Party 4  
Energy, Environment, Sustainable Growth  
(Final Version)**

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## Introduction

Japan and the EU would like to support the final statement of the Paris Agreement, a fair and effective framework adopted by consensus of all countries participating in the 2015 United Nations Climate Change Conference (COP21), and its follow up at COP 22 in Marrakech from November 7 to November 18, 2016.

We therefore regret the recent announcement of the United States to withdraw from the Paris Agreement, which marks a severe setback for the global efforts to protect our climate. Despite the US decision, moving backwards on climate protection is not an alternative. The EU and Japan should stay fully committed to implementing the Paris Agreement. We hope that the US decision will not have spill-over effects on the commitment from other countries especially major economies. The EU and Japan cannot shoulder what other major economies have committed to deliver. We therefore call on decision-makers to engage as soon as possible in a dialogue with the EU and Japanese business community to assess the implications of the US decision.

Also, EU – Japan BRT support G7 Taormina Leaders' Communique on May 26-27, 2017, which Japan and EU reaffirmed their commitment to swiftly implement the Paris Agreement, as previously stated at the 2016 Ise-Shima Summit.

The issue of climate change is one that must be addressed through the cooperation of all countries and people. Amidst the recent inability of international conferences to come to conclusions on other important issues requiring international-level discussions, the fact that the Paris Agreement was agreed upon by countries around the world in such a short period of time makes it particularly noteworthy. To ensure that all major emitting countries ratify this agreement, as well as to enhance its fairness and effectiveness, it will be imperative to establish a system with which the promises made by each ratifying country and the fulfilment of these promises can be reviewed internationally.

Meanwhile, Japan and the EU will not only need to steadily implement the domestic measures that served as the basis for the formulation of their intended nationally determined contributions (INDC) but also undertake the tasks of developing low-carbon technologies and transferring technology to developing countries with significant potential for making reductions. In regard to energy issues, fossil fuels continue to be a mainstream energy source even today. Going forward, it will be necessary to act in accordance with the Paris Agreement in order to achieve greenhouse gas reductions, as outlined by the B20 in 2017.

For Japan and the EU, it will be crucial to carry on with efforts to secure safe, stable, economical, and sustainable energy. The governments, enterprises, industries, and citizens of Japan and the EU must not only prepare for natural disasters that could potentially occur in each region as a result of global warming and implement crisis management measures but also address energy system reform, the reduction of energy demand and greenhouse gases, and the resolution of environmental conservation and other problems.

## Recommendations from both European and Japanese industries

### WP-4/#01/EJ to EJ **Change and harmony in the areas of energy and the environment**

#### Diversification and destabilization of resource- and energy-supplying regions:

While the diversification of energy and resource supply sources through the full-scale export of shale gas by the U.S., the lifting of sanctions on Iran, and other circumstances is contributing to stable energy supplies and the stabilization of abrupt and erratic price fluctuations, the Middle East still plays a major role in the supply of energy to the world, and breeding grounds for civil war and terrorist activities exist within the region due to the continued fragility of some governments there.

We have also begun to see signs of sectarian violence and terrorism even in Middle Eastern regions that have been comparatively stable up until now. Moreover, in light of piracy issues off the coast of Somalia, it remains important for us to ensure the safety of sea lanes, including the Suez Canal and the Strait of Hormuz. The governments of Japan and EU countries will continue their efforts to strengthen cooperation among members of the international community to improve energy security.

#### The significant impact of the destabilization of energy prices on Japan and EU countries that import energy:

There are both positive and negative aspects to the fall in oil prices for consuming countries.

Growing dependence on oil from the Middle East, the world's low-cost resource superpower, means that the risk of a sharp rebound in price in the event of shrinking oil investment would offset the economic benefits. And if the price drops to such a level that it does not bring investment to the supply sector, there will also be growing concern over the stable supply of natural gas. Furthermore, incentives for the use of bio fuels do not seem to be working, and there has been a major impact on investment in energy efficient technologies and energy conservation measures. Also, in the unlikely event that a resource-rich country was to fall into a national financial crisis, it could lead to growing geopolitical risks and the preservation of terrorist organizations.

Although declining resource prices have contributed to the short-term improvement of trade deficits in Japan and EU countries, it is important for these countries to fully understand the impact that the stabilization of resource prices can have on energy security, energy conservation, and energy efficiency, and to act accordingly.

#### The impact of rising energy demand in newly developing countries on national energy policy changes and resource prices:

At COP21, expectations were high for efforts toward the introduction of energy systems that are not only more low carbon but also more efficient. However, as was seen at COP 22, all participant countries must ensure that advances are materializing not only in words, but also in real progress. Indeed, as was also introduced in IEA WEO-2015, world energy consumption in the future will be driven primarily by India, China, Africa, the Middle East, and Southeast Asia. It is predicted that energy consumption will increase by one-third of present consumption by 2040,

and that the entire increase will be due to consumption in non-OECD countries. The reduction of energy consumption in OECD countries is the result of demographic changes, economic structure changes, and growing efficiency. By 2040, energy consumption [according to the International Energy Agency](#) is expected to decrease by 15% in Europe, 12% in Japan, and 3% in the U.S. With the world population expected to continue growing in the future, the majority of energy consumption is shifting from developed countries to newly developing countries. While the export of shale gas by the U.S. is expected in the long run, aggressive resource development by state-owned companies in newly developing countries is currently being witnessed and competition for resources is becoming fierce.

Japan and the EU are committed to working together to stabilize resource prices and implement energy mix policies suitable for regional needs that will enable companies to continue their business activities in a stable manner.

#### **WP-4/#02\*/EJ to EJ Basic energy policies**

Harmonization of supply stability, economic efficiency, the environment, and safety standards:

Energy forms the foundation of economic activities. Efforts to reduce energy demand while at the same time ensuring the stable supply of energy and proper electricity rates are not only critical to business operations but also have a profound impact on the creation of new business opportunities. It is also important to give due consideration to environmental load. Based on this perspective, the governments of Japan and EU countries should carefully consider the future role of nuclear power generation.

Cooperation with other countries from a global point of view:

In regard to the energy demand and supply structure of the world, changes in demand are occurring primarily in Asia, and the diversification of energy sources such as natural gas, renewable energy, and nuclear power is becoming more pronounced. Meanwhile, the impact on the global environment is being exacerbated, and energy issues are becoming even more complex.

Amid these circumstances, Japan and the EU must promote a framework for a more comprehensive collaborative alliance from the viewpoints of energy and the environment.

As such, it will be imperative to not only deepen our relationship with the IEA and IAEA but also strengthen cooperation by exchanging information with our European counterparts in various international committees.

Short-, medium-, and long-term energy strategies:

All of the countries participating in COP21 have affirmed their commitment to controlling carbon dioxide emissions as a countermeasure against global warming.

The key to this will be to balance economic growth with the reduction of CO<sub>2</sub> emissions. And while the decision to engage in global efforts to cut CO<sub>2</sub> emissions was made at COP21, it will be essential to ensure that these efforts are paired with economic growth to make it possible to move forward with them in a sustainable manner. Carbon pricing, as suggested by Policy Paper 2017 of B20 Taskforce – Energy, Climate and Resource Efficiency, might help to do so, although its pros and cons need to be carefully studied before implementation.

Going forward, it will be important for governments, industries, and citizens to develop a solid understanding of the current energy situation and consider which changes are temporary or cyclical, and which are permanent. In addition, it will be necessary to determine what kinds of risks and chances are conceivable for the future, identify what can be done to make our energy systems more secure, reliable, and sustainable, and consider short-, medium-, and long-term energy strategies.

Achieving a stable supply of energy through a multi-layered energy supply structure:

There are invariably advantages and disadvantages to the adoption of every energy source, and there is no form of energy that provides complete satisfaction from both a stability and economic standpoint. In view of this, a multi-layered energy supply structure capable of functioning not only during times of peace but also in emergencies should be established.

Maintenance and upgrading of energy infrastructure:

To ensure the stable and adequate supply of energy, Japan and the EU must share best practices for the construction of an energy value chain capable of achieving the prescribed energy mix and consider the upgrading of old equipment and facilities to improve their safety.

#### **WP-4/#03/EJ to EJ Fossil fuels**

Advantages and disadvantages of coal, oil, natural gas, and LP gas:

Although fossil fuels are known to emit greenhouse gases, they do excel in terms of economic efficiency and supporting grid stability against a backdrop of increasing portion of renewable energy sources. Progress is currently being made toward the development and commercialization of highly efficient low-carbon alternatives, and governments should be providing support for these development and commercialization efforts, as well promoting the use of these alternatives in developing countries.

Still valued today as an important base-loaded power supply, coal-fired thermal power poses little geopolitical risk as many countries enjoy its own indigenous source of coal. Additionally, increased production of commercially competitive shale gas in the United States has brought down the price of natural gas which holds even lower emission profile compared to coal. It should also be noted that fossil fuels remain low in price as a form of thermal energy in developing countries. Nevertheless, these developments should not elude the necessary transition from coal-fired to gas-fired power stations. Among other technologies, gas-fired power plants can provide for security of supply and bring stronger benefits on flexibility – as compared to coal-fired generation – to the energy landscape, in particular with a growing share of intermittent renewable energy sources.

Japan and the EU should collectively contribute to countermeasures against global warming by supporting the introduction of thermal power technology characterized by high efficiency and low CO<sub>2</sub> emissions, such as ultra-supercritical coal-fired thermal power, gas-fired combined cycle thermal power, etc.

#### **WP-4/#04/EJ to EJ Nuclear power**

There is keen interest in nuclear power generation from the viewpoints of promoting measures against global warming and stably securing energy that is less susceptible to fluctuations in fossil fuel prices.

Nuclear power generation is also expected to play a major role in keeping the global temperature rise this century below two degrees Celsius, which is the long-term aim of the Paris Agreement reached at COP21. However, if we attempt to achieve this without nuclear power, the cost of doing so will increase dramatically. At the same time, it would lower the feasibility of achieving this aim, and we therefore believe it will be impossible to reach the COP21 objective without the inclusion of nuclear power generation.

A critical and competitive base-loaded power supply in regions without energy resources:

Safe nuclear power generation plays an important role in the energy mix for Japan and the EU. Moreover, it contributes to giving Japan and the EU a competitive edge, securing a low-cost base-load power source, ensuring grid stability, achieving economic growth, and creating jobs.

Rising expectations for nuclear energy and the importance of education and training on ensuring safety:

Japan and the EU must cooperate to universalize lessons learned from the Fukushima nuclear accident, as well as provide education and training in order to ensure the safety of nuclear power generation.

Promotion of the resumption of operations at nuclear power plants in Japan where safety checks have been completed:

The rising cost of coal-fired thermal power generation due to the shutdown of nuclear power plants in Japan in 2013 has not only led to the destabilization of electricity prices and increases in greenhouse gas emissions but also caused a decrease in the competitiveness of both Japanese and European companies in the Japanese market.

Taking into account economic reasons and greenhouse gas emissions, we must proceed with resuming the operation of power plants where safety has been confirmed by the Nuclear Regulatory Commission, as well as promote the stable supply of electricity in conformance with the energy mix the government aims to achieve.

Replacement of current nuclear reactors with safer ones:

The latest nuclear reactors provide a technologically high level of safety, are being explored as a possibility for inclusion in the energy mix of the future, and should be considered for use in replacing aging nuclear reactors in Japan and the EU. The construction of nuclear reactors in Japan and the EU utilizing the latest models should be used as a reference for the export of nuclear power technology by Japan and European countries to third countries.

Recycling and disposal of nuclear fuel:

In regard to spent nuclear fuel, Japan and the EU must take sweeping measures and make comprehensive decisions to solve the issue of how spent nuclear fuel should be managed, recycled, and discarded.

Japan and the EU should therefore promote an R&D program for collaboration on the development of methods for nuclear waste disposal.

Developing decommissioning technologies and methodologies:

Japan and the EU hold a large part of the worldwide inventory of the aged nuclear reactors which will be subject to decommissioning. Establishing decommissioning technologies and methodologies for safety and minimum environmental impact is an obligation of Japan and EU and precondition to promote nuclear power technology to third countries. Japan and EU should therefore promote an R&D program for collaboration on the development of methods for nuclear power plant decommissioning.

Finance & Support:

To achieve the highest possible safety standards, we would like to request that Japan and the EU not only promote investment in nuclear energy but also request that the World Bank, European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), Asian Development Bank (ADB) and JBIC provide financing to support programs dedicated to ensuring the safety of nuclear power.

Security measures:

Japan and the EU should cooperate in facilitating the effective implementation of international nuclear safety standards and security measures at bilateral meetings and multilateral meetings on nuclear power.

In addition, discussions between specialists from both Japan and the EU on information and technology related to nuclear power plant decommissioning projects, decontamination, and waste disposal should continue to be promoted.

(Meanwhile, interest in nuclear power development is on the rise in Asia and the Middle East. Viewing nuclear power as a great opportunity for the future of international business, there are also countries emerging with plans to attempt to maximize the impact on share expansion first. Since there are fragile states and areas where terrorism runs rampant in conflict zones within the region for which construction is planned, it will be crucial for the international community to proceed with caution and carefully consider how to reduce risks through nuclear non-proliferation and other measures.)

#### **WP-4/#05\*/EJ to EJ Renewable Energy**

Renewable energy is expected to play a major role in countermeasures against global warming, and there have been recent signs of improvement in the cost aspect, which had been considered an issue against the use of renewable energy. At the same time, thorough discussions regarding the economic, environmental, efficiency, safety and stability aspects must also be continued.

Advantages of renewable energy:

Although the role of renewable energy in the reduction of CO<sub>2</sub> emissions and achievement of energy security cannot be denied, integration into the grid and stability of supply remain major issues to address. Despite its potential to complement traditional energy, it will require a smart and integrated power distribution network.

Currently there are various options for renewable energy, including wind, solar, hydro, geothermal, tidal, and biomass. However, other than hydroelectric power,

which can provide a certain level of base power, these power sources are affected by regional appropriations. Thus, there are remaining economic, efficiency, environmental, safety and stability issues that need to be addressed, pointing to the need for further discussions while their uptake is being realized.

To overcome these instability factors, it is imperative to:

- Comprehensively develop the adoption of highly distributed renewable energy sources.
- Evaluate the total costs for renewable energy in comparison with other traditional energy sources, including all indirect costs of CO<sub>2</sub> emission.
- Keep the existing level of subsidies or incentive schemes for renewable energy technologies while phasing out subsidies for fossil fuels.
- Promote research on immature renewable energy technologies towards their commercialization.

### Standards in Photovoltaics

The G8 countries, in particular from the EU and the USA experience a large growth of micro photovoltaic installations with a simple connection via conventional home electric plugs. Japan is a trendsetter in residential photovoltaic installations.

Both the EU and Japan industries and consumers would benefit immensely from harmonised technical requirements, standards and solutions for Plug and Play Photovoltaic Micro-inverter Systems.

### Feed-in tariff system in Japan

There have been many cases wherein permits have been secured under the renewable energy feed-in tariff system (FIT) in Japan but the project did not actually become operational for some application programs, leading to concerns regarding the high burden on citizens and the prevention of entry of latecomer energy producers that offer lower costs and higher performance. In particular, in regard to the FIT for solar power systems, which are being introduced at a rapidly increasing rate, there is a need to formulate schemes to encourage producers to find ways to lower costs from the perspective of lowering the burden on citizens. And also, hydro, geothermal, and wind power, which are cheaper to generate but have longer lead times for commercialization, and biomass power, which contributes to “local production for local consumption” initiatives should be more encouraged to be adopted.

Furthermore, governments should evaluate examples of good practice of feed-in tariff systems in Japan and EU states to stimulate green energy.

### **WP-4/#06\*/EJ to EJ Smart Grid and convergence of Electric distribution networks with ICT**

The growth of Renewable Energy Systems on the grids in the future will to a substantial degree occur in dispersed energy production. This will in turn favour local balancing of energy flows on the grid as opposed to centralized transmission system operators (TSOs) controlled balancing.

The trends to achieve this are through automatic trading of energy flexibility by prosumers, dynamic pricing of energy based on local conditions, and maximisation of adaptability potential by harnessing virtual energy reservoirs in processes.



Local sustainability and uninterrupted energy supply to remote areas in case of natural disasters drives grid planning towards possibilities for island operation of electric micro grids.

The growing role of prosumers, smart grids, micro grids, energy storage and e-mobility requires a different distribution of roles and responsibilities in the value chain of electricity production, transmission, distribution and retail.

All these trends will have to ultimately result in a multitude of load balanced smart micro grids, which are in turn connected to the main grid, supported by state-of-the-art ICT such as internet of things, big data, etc.

#### Energy storage batteries:

Along with the spread and expansion of renewable energy, grid stability, peak shift of power consumption, stable power supply need to be dealt with.

Since it is expected that the demand for storage batteries will be greatly expanded in the future, harmonization of safety standards for storage batteries, standardization and unification of test protocols, and/or introduction of mutual certification system should be promoted between Japan and EU.

Storage batteries contribute to the stabilization of the energy supply-and-demand structure through the storage of convenient power and the ability to use it anytime, anywhere. As a technology for long-term and large-scale storage of power, the hydrogen energy storage system should be more widely utilized for the efficient utilization of power.

Due to the development of the smart grid, storage battery applications are expected to expand further to include vehicles, residences, buildings, and commercial establishments. Japan and the EU must continue to work together toward lowering costs and increasing efficiency through technological development and standardization.

On the other hand, the uptake of renewable energy has led to instability of the power grid due to the increase in distributed power sources. Systems for maintaining stability, however, are prohibitively expensive. Recently, the use of cloud and ICT has made it possible to intensively gather data and carry out control at lower costs. Also, in regard to storage batteries, technologies to prevent imbalances that prevent further charging due to having one battery depleted and another fully charged are being developed. It is imperative to proactively make use of the micro-grid and ICT that enable handling efficient power sources, such as solar power generation.

Measures to be taken are:

- 1) Strengthening the positive role of highly distributed residential and small commercial photovoltaic (PV) installations for self-consumption to reduce costly investments in power distribution network and new big power generators. This will also reduce the need in harmful environmental interventions.
- 2) Promote smart functionality of PV inverters through regulatory requirements
- 3) Improvement of power quality and stability through smart grids and micro grids with battery storages.
- 4) Unify EU/JAPAN technical standards for highly distributed residential and small commercial PV installations and make them comparable to the high

standards set by the newest USA rule 21/2017 regarding power quality and fire safety (such as rapid-shutdown regulation).

- 5) Prepare concrete action plan for financial stimulation and promotion of high distributed on-site smart grid green power generation in connection with e-mobility penetration.

#### **WP-4/#07/EJ to EJ Effective use of biomass resources**

In order to make the shift from fossil to biomass resources as raw materials for a wide range of uses and therefore achieve significant reduction in greenhouse gas emissions, technologies and processes to convert biomass into fuel, such as cellulosic ethanol, bio-gasoline and biogas, or useful chemicals must be developed and become widely adopted. It is a positive example of a circular economy.

Fast-tracking the practical utilization of technologies that convert waste products, wood-based biomass, and other non-edible plant resources into fuel or useful chemicals requires strengthening of government support for collaborative R&D and technical trials between private-sector companies and academic institutions in Japan and the EU. Further, promoting the uptake of products manufactured using the above technologies requires the implementation of a sustainable, effective, and transparent framework for providing subsidies and tax incentives for biomass-derived fuels and chemicals.

International standardization of evaluation methods, classification schemes, and labelling procedures are also necessary to enable a stable and profitable uptake of biomass-derived products at the global level. In labelling for example, although there are internationally defined environmental labels (Type I, II, and III), compliance standards vary among different countries.

Standardization of the certification criteria for labels will make it possible to have universal labels that can be used worldwide. This will lead to the establishment of market reliability of biomass-derived products and pave the way for their stable and profitable uptake. Also, linking environmental labels with requirements/conditions for tax incentives and public procurement can serve as an impetus for the further spread of the use of biomass-derived products. To enable Japan and the EU to agree on and lead the way in establishing international standards for evaluation and labelling systems, both governments must pursue the harmonization and mutual recognition of their respective regulations.

#### **WP-4/#08\*/EJ to EJ Energy conservation & energy efficiency**

Energy conservation is an initiative aimed at fulfilling the need for economic efficiency, environmental compatibility, and energy security, and industries in Japan and the EU should make every possible effort to develop and promote the use of energy conservation technologies.

At the same time, it is also important to ensure that excessive investment burden is not placed on companies nor that production suppression is imposed on them for the sake of achieving excessive energy conservation effects.

The promotion of energy conservation will require the strengthening of research and development and improvement of public awareness of energy conservation.

#### Strengthening of energy conservation in each field:

One area in which energy conservation effects are foreseen in the residential and business fields is the use of insulation materials and high-performance windows as energy conservation measures in houses and buildings.

Energy conservation technology for electric appliances and equipment, such as refrigerators, air conditioners, servers, and LED lighting, is also evolving. In the transportation field, advancements are being made in the energy efficiency and reduced environment footprint of automobiles through the development of EV, PHEV, clean diesel, and hydrogen fuel cell vehicles (FCV). Japan and the EU should collaborate on standards to take the lead in promoting market introduction of these technologies, and alignment and simplification of related standards and regulations.

One commonality among all fields is that the introduction of energy management is also an effective means to increase energy efficiency.

To increase the efficiency of energy, Japan and the EU must revise and align laws and regulations, develop advanced technologies that boost energy efficiency through best practices, and implement stimulus measures such as investment in methodologies. At the same time, these actions should be complemented by aggressive measures that will have an impact on technologies for soundproofing of buildings and stabilization of room temperature.

Prompt implementation of regulations for building standards and insulation of houses will make it possible for the resulting highly energy efficient buildings and homes to contribute to the lowering of energy consumption and expenditures, the reduction of CO<sub>2</sub> emissions, and the maintenance of good health at both a household and national level.

Harmonization of standards and mutual accreditation of testing protocols to verify the energy saving effect of components and materials should be implemented.

#### **WP-4/#09/EJ to EJ Energy research and international cooperation**

##### The reduction of greenhouse gas emissions and energy technology development focused on the mid and long-term

Greenhouse gas emissions are impacting climate change and the environment, thereby making this an issue facing all of mankind that requires international insight. As such, the development of technologies capable of reducing greenhouse gas emissions with the use of electricity produced using fossil fuels, non-fossil-fuel renewable energy, and nuclear power deemed safe is becoming necessary on a global scale, and it is imperative that the development framework be reinforced through cooperation among industry, government, and academia.

##### Human resource development

To promote sustainable efforts aimed at achieving the goal set by all ratifying nations of the Paris Agreement to reduce CO<sub>2</sub>, both Japan and the EU—as leaders in the fields of energy and environmental technology—must forge ahead with ground-breaking innovation.

In addition to contributing to the international society, sustainable innovation activities like these are also conducive to economic growth. This is why a system for continuously training technical experts in energy-related fields through personnel exchanges should be considered.

## **WP-4/#10/EJ to EJ Efforts toward the prevention of global warming following the Paris Agreement reached at COP21**

The prevention of global warming is an issue facing all of mankind.

Since much of the world's greenhouse gas emissions have already shifted from developed countries to newly developing countries, it will be impossible to prevent global warming if only developed countries set targets for reduction.

We welcome the Paris Agreement as a framework through which all major emitting countries, including the U.S. and China, are able to participate, and view it as an extremely important and historical first step that enabled all countries participating in COP21 to set their own targets.

Going forward, it will be necessary to not only ensure that all major emitting countries ratify this agreement and demonstrate their commitment to the full implementation of the Paris agreement, as was established during COP 22 in Marrakech, but also establish a system with which the fulfilment of the promises made by each country can be reviewed internationally from the perspective of enhancing fairness and effectiveness. As was said in the introduction, we regret the US announcement to want to withdraw from the Paris Agreement. It is important that the EU, Japan and all other signatories (especially other major economies) stay committed and discuss the implications of the US decision with their business communities as soon as possible.

Japan and the EU will need to undertake the tasks of developing low-carbon technologies and transferring technology to developing countries with significant potential for making reductions.

### Visualization of emission reduction effects

A life cycle assessment (LCA) is a technology that can be used to evaluate the environmental impact made by a product at every stage of the product life cycle from the cradle to the grave. For evaluating low-carbon technologies and products by LCA, the avoided emission of CO<sub>2</sub> approach should be promoted through public-private collaboration.

### Contributions to global warming measures in Japan and the EU

The creation of a framework through which both developed and developing countries can work together to achieve low-carbon growth will play a critical role in addressing climate change issues. The outstanding technologies, products, and know-how possessed by Japan and the EU will not only lead to the strengthening of innovation and sustainable development in both countries but also contribute to global warming countermeasures on a global scale.

In particular, contributions utilizing ICT should also be considered. These include continuous observation of the global environment using artificial satellites, radars, sensors, and other equipment to monitor climate change, the use of supercomputers and other means for climate change prediction and research on the mechanisms behind climate change, and the construction of a global earth observation system.

It will also be imperative to conduct research and development of technologies for calculation and verification of greenhouse gas emissions and carbon dioxide capture and storage (CCS) in order to alleviate climate change.

Moreover, a bilateral offset mechanism will be an effective means for achieving greenhouse gas reductions in newly emerging and developing countries where a sharp rise in energy demand is becoming apparent. Japan and the EU must not only work together with industry to design such a system but also clarify support measures.

In conjunction with measures like these to alleviate climate change, the governments of Japan and EU countries must open their doors to industry, provide easy-to-understand explanations of adaptive planning, technology needs, and financial assistance, and create an environment in which industry can easily participate. Governments in Japan and the EU must also set high standard regulations, as well as share a common interest in making efforts toward market liberalization that would include third countries in addition to Japan and the EU.

#### Establishment of IPR protection

To promote commercial technology transfer, Japan and the EU must take measures to ensure the creation of appropriate regulatory frameworks in countries to which technology transfers are to be made and the protection of intellectual property rights. It will be necessary to create appropriate regulatory frameworks to establish IPR protection in newly emerging and developing countries, and governments in Japan and the EU should introduce monitoring systems for the protection of IPR, provide patenting assistance, and establish technology partnerships.

#### **WP-4/#11\*/EJ to EJ Promotion of resource efficiency and the circular economy**

Although resource prices are declining in the short term, resource constraints are likely to inhibit economic growth over the medium to long term. This is why it is imperative to improve the efficiency of resource use. In this light, Japan and the EU welcome the progress being made through international-level discussions on resource efficiency and the circular economy, including the establishment of the G7 Alliance on Resource Efficiency at the G7 Summit at Schloss Elmau held in 2015. The announcement of the EU's adoption of a Circular Economy Package and the promotion of efforts to improve resource efficiency are also welcomed.

Discussions on resource efficiency and the circular economy go beyond recycling and other aspects of the venous industry to cover a wide range of concepts impacting manufacturers, service providers, and other companies to be recognized as arterial industry, including the extension of product life, the sharing of services, and the goods and services through operational billing. The discussion holds the potential to create business opportunities that will lead to additional economic growth and the job creation in the future. The truth of the matter is that business is already doing a lot in both Europe and Japan: For example, the European Circular Economy Industry Platform ([www.circularity.eu](http://www.circularity.eu)) showcases what business is already doing on circular economy and what challenges it faces to become even more circular.

On the other hand, the pursuit of resource efficiency through exceedingly regulatory approaches could inhibit economic growth. Therefore, it is desirable to choose an approach that will lead to economic growth, such as promotion through voluntary efforts by stakeholders with associated incentives. It will also be imperative to pursue resource efficiency from the viewpoint of international circulation system based on the fact that movement of secondary raw materials across borders is now the norm.

In view of the above, Japan and the EU should not only move forward with efforts aimed at improving resource efficiency but also work together to formulate consistent rules. In addition, Japan and the EU are expected to take advantage of the advanced innovation and competitive edge in international market, which they possess in regard to the institutional and technical aspects of resource efficiency and the circular economy, deepen their cooperation and collaboration, and take the lead in international discussions on the future direction of the circular economy and resource recycling, as well as on the creation of institutions and systems. In this regard, we are looking forward to active discussions on resource efficiency and the circular economy during coming G7 Summits.

#### **WP-4/#12/EJ to EJ Promotion of global investments and nurturing of long-term relationships**

Amidst sharp fluctuations in the price of oil and other resources, continued investment and strong economic collaboration in a wide range of fields will be necessary to secure stable and inexpensive resources in response to global risks.

When it comes to long-term sustainable energy policy, it is important to make the necessary investments and ensure strong cross-border collaboration in order to achieve ambitious targets. Japan and Europe should therefore encourage direct investment from a transparent, open, and long-term perspective living up to the commitments all parties made in the Energy Charter Treaty.

To promote the spread of energy conservation technologies and the like, it will be important to promote high-efficiency, low-cost renewable energies and conduct research and development of hydrogen, energy storage, geothermal, and other new energies. In addition, research that will contribute to the highly efficient utilization of fossil fuels and both the safety and security of nuclear power should also be considered.