

Goal 7: Ensure access to affordable, reliable, sustainable, and modern energy for all.

1. Understanding of the present situation

(1) Why is it necessary to make efforts to supply energy stably and establish a low-carbon society?

Ensuring universal access to affordable energy that can be supplied stably is an extremely important development agenda for social and economic stabilization and sustainable growth in developing countries.

Although the UN has displayed leadership in promoting SE4All¹ from 2011, about 1.2 billion people have been left behind from electrification as of 2015. About 75% of them live in Africa and South Asia. The worldwide population is expected to increase from 7.35 billion in 2015 to 8.5 billion in 2030, with the growth coming mainly from these two regions. It is estimated that there will be a need for 10 trillion dollars in the energy sector by 2035, while reducing the ratio of non-electrified and coping with the increase in population.

On the other hand, it is necessary to reduce CO₂ emissions as much as possible from the development and supply of energy. To achieve the goals specified in the Paris Agreement adopted at the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) in December 2015, it is extremely important for all countries and regions, including developing countries, to prepare and submit Intended Nationally Determined Contributions (INDC) along with their emissions reduction targets, and to promote the improvement of efficiency at power generation facilities including the existing ones, the reduction of energy loss in transmission and distribution networks, the introduction of renewable energy, and the utilization of low carbon technologies such as energy conservation on the demand side. As about 90% of CO₂ emissions in Japan originate from energy and 40% of which are associated with power generation, measures that address climate change in the energy sector are essential. In this way, it is highly necessary to promote low-carbon energy while ensuring universal access.

(2) Japan's efforts

Japan's electric power industry has a history that spans more than 100 years, and provides electric power of very high quality. To keep up with the increasing demand for power due to economic growth, Japan has experience in developing technologies for the efficient use of domestic and imported primary energy, optimizing generation development plans, stabilizing power system operation, and implementing preventive and proper maintenance. In addition, the entire nation has addressed the issue of energy conservation ever since the oil crisis in 1970s. As a result, energy consumption by the industrial sector has been controlled at the level of the 1970s for the past 30 years, thus achieving the world's highest level of energy efficiency.

¹ Sustainable Energy for All

Moreover, in Japan, many world-class manufacturers have supported these efforts from a technological viewpoint and the R&D carried out jointly by academia, industry, and government after the oil crisis has been bearing fruit, such as solar and geothermal power generation and other renewable energy generation technologies and the application of highly efficient thermal power generation technology with low CO₂ emissions.

(3) JICA's strength

JICA has continued to provide support by utilizing Japan's technologies and experience described above and has made pioneering efforts to apply new technologies such as renewable energy to developing countries.

Specifically, to meet developing countries' demand for electric power, which is increasing in parallel with their economic growth, JICA has provided various approaches to cooperation through different schemes to make it possible to flexibly respond to the issues and support the needs of developing countries. These approaches to cooperation include, but are not limited to, improving the electric power infrastructure through loans (ODA Loans) and grant aid; elaborating upstream policies/plans such as drawing up a blueprint (formulating an electricity master plan) or carrying out a feasibility study (F/S) for the national power system; providing technical cooperation (human resources development) for technical issues and challenges related to Operation and Maintenance (O&M) and introducing renewable energy and energy conservation, which are faced by the power sector in developing countries; and promoting investments in developing countries through various private sector partnership projects; and supporting self-sustaining development. As a result of the accumulation of such cooperation, JICA has become the top donor² that financially supports the energy sector. In the future, JICA will continue to make efforts to formulate large scale projects and programs, cooperating with each donor.

2. Priority targets

Goal 7 consists of three targets, as well as and targets 'a' and 'b' which concern implementation means. JICA has contributed to all these targets and will continue to make efforts to achieve all of them as priority targets.

[Targets for the achievement of Goal 7]

- 7.1 By 2030, ensure universal access to affordable, reliable and modern energy services
- 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix
- 7.3 By 2030, double the global rate of improvement in energy efficiency

² According to the OECD-DAC statistics for the five years between 2009 and 2013, Japan accounted for 17.3% of the total donations in the energy field and became the top donor, surpassing the World Bank/IDA, which accounted for 15.3%.

[Means for achievement]

- 7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology
- 7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support

3. Priority efforts to achieve the goals

JICA aims to fulfill the following three “L” policies (3L) in a well-balanced way and as the main target, contribute to the enhancement, expansion, and stabilization of developing countries’ national grids (national power systems). In addition, JICA will continue to promote cooperation with the private sector, etc. to support the use of off-grid power sources.

Basic policy: promotion of 3L Policies (* also contributing to Goal 13)

“3L Policies” means the “fulfillment of “Low-Cost,” “Low-Carbon,” and “Low-Risk” in a well-balanced way.” Details are as follows:

“**Low-Cost**”: means a reduction not in the initial investments but in the total cost. Specifically, JICA will contribute to reducing the total cost from the viewpoint of lifecycle cost, introducing low-carbon, high efficiency, and highly reliable technologies that have superior environmental performance.

“**Low-Carbon**”: This means the realization of low-carbon emissions. Specifically, JICA will contribute to further reduction in CO₂ emissions from the national power systems, the main source of CO₂ emissions, by utilizing Japan’s advanced technologies including the introduction of low-carbon energy, such as highly efficient thermal power, hydro power, geothermal power, and other renewable energy sources, reducing the loss of the power transmission and distribution networks, and promoting energy conservation.

“**Low-Risk**”: means reducing the risks that threaten the stable supply of energy. Specifically, JICA will contribute to the energy security of primary energy, promote the best energy mix, avoid or reduce climate risks, and stabilize the grid systems, etc.

Following are the three typical efforts involved in promoting this:

(1) Promotion of power access and stable supply through enhancing the national grid

To enhance the national grid, JICA will continue to support the establishment of

energy policies such as an electricity master plan and F/S, rehabilitate deteriorated facilities, strengthen the power transmission and distribution systems, and support expansion of the distribution network in rural areas, etc. In addition, JICA will provide appropriate support, such as the introduction of Japan's advanced technologies, taking into consideration the present situation of power supply and energy security in each country.

Especially, the main target areas are Africa and South Asia, where the population has been sharply increasing while access to electric power continues to have serious issues. In Africa, JICA will cooperate with the World Bank and other donors to promote support of the "Africa Power Pool", that is, the construction of interconnected power systems, the stabilization of power grid systems, the introduction of highly efficient power generation facilities, and the introduction of large-scale renewable energy including hydro power development, which will contribute to the improvement of access to electric power in the Sub-Saharan Africa region. In South Asia, JICA will also continue to make positive efforts to enhance the national grid and improve the efficiency of electric power systems.

(2) Promotion of introducing low-carbon power sources (developing geothermal power generation and promoting the Hybrid Island Program for small-island countries)

JICA will continue to support the development of geothermal power generation, a clean and stable base power source, mainly in Africa and Latin America. JICA will accelerate this development especially in the African Rift Valley (Great Rift Valley) and the part of Latin America located along the Ring of Fire as well as other potential development areas, such as Indonesia. JICA will support cooperation from the stage of trial drilling from both the financial and technical aspects, making use of the technical superiority of Japanese companies.

In addition, to improve the fluctuation risk in generation fuel prices and the low rate of energy self-sufficiency, problems which are common to Oceania, the Caribbean nations, and other island countries, JICA will promote cooperation which contributes to establishing a low-carbon society and improving energy security by developing optimum hybrid systems through improving the efficiency of diesel engines and introducing renewable energy on a proper scale.

Moreover, JICA will actively challenge the application of hydrogen energy and other new technologies which require a mid- and long-term viewpoint in developing countries through Science and Technology Research Partnership for Sustainable Development (SATREPS), etc.

(3) Enhancement of the capacity to operate and maintain electric power facilities and promotion of efficient energy use

In developing countries, it is essential to enhance their O&M capacity while enhancing their generation, transmission and distribution facilities. JICA has frequently provided technical cooperation regarding O&M-related technology and has contributed to improving energy efficiency through reducing the rate of power loss. JICA will further consider the use of remote monitoring, etc. by using IoT (Internet of Things), etc. to provide more effective and efficient support.

Moreover, on the energy demand side, in order to promote the efficient use of energy (energy conservation), JICA will support appropriate policy-making and provide technical support, loan and grant aid to realize these policies according to the situation in each country.