



Partner for a Sustainable Energy Future in the Philippines

GIZ's Work in the Energy Sector on behalf of the
Federal Republic of Germany and the European Union

IMPRINT

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Sustainable Energy: Cornerstone of Development

Developing countries and emerging economies are frequently hit the hardest by the impacts of climate change. The Philippines ranks 5th in the Global Climate Risk Index (CRI) which analyzes to what extent countries have been affected by extreme weather events during the past two decades (1995-2015)¹. A continuing increase in the incidence of extreme weather events and other environmental changes will significantly stifle the development of the impacted countries and the global community as a whole.

In response to the apparent changes in our environment and the increasing certainty in climate research, some countries embarked upon a transition process towards more sustainable energy systems. This process is distinguished by a shift from large and central, mainly fossil-fuel-based power systems towards more decentralized, mainly renewables-based power systems with smarter grids and more sophisticated energy markets. Over the past years, this shift has been gaining momentum on a global scale. It is driven by the increasing availability of decentralized electricity generation units based on renewable energy, investment patterns that are rapidly shifting from the public to the private sector, new business models that are enabled through modern energy and information technologies, and dynamic changes in investment costs and fuel price relations (i.e., the continued decline in the costs of renewable energy technologies vis-à-vis the rebound of international coal prices to their 2012-2014 levels after the slump in 2015-2016).



While countries such as Germany, Denmark, and the US have been supporting the development of renewable energy for more than two decades, other countries such as Brazil, China, India, and South Africa have considered the opportunities of clean energy sources only more recently. What unites all of these countries is their desire for gaining long-term economic, environmental, and social benefits from making this transition. They all strive to strike a balance between the three fundamental goals of power systems: security, affordability, and sustainability. In the Philippines, these goals are manifested as the three pillars of the Energy Reform Agenda. To achieve the goals, a development pathway is needed that not only contributes to climate change mitigation but also ensures secure energy supply at reasonable prices to the end consumer.

While the energy transition process has often been merely associated with the goal of sustainability, it now becomes clear that it is also vital to the long-term achievement of the other two goals. A recent study by the International Renewable Energy Agency (IRENA) on the economic benefits of renewable energy concludes that “accelerating the deployment of renewable energy will fuel economic growth, create new employment opportunities, enhance human welfare, and contribute to a climate-safe future”. The study provides empirical evidence that economic growth and sustainability are fully compatible and that the “conventional consideration of trade-offs between the two is outdated and erroneous”.² Boxes 1-3 show exemplary contributions of renewable energy to each of the three sector goals in the Philippine context.

Box 1: Energy Security

Renewable energy makes use of locally available resources. Their increased use can increase the independence of the Philippines’ energy supply from price fluctuations on international fuel markets and reduce political risks in international relations with coal and oil exporting countries. Recent coal price developments highlight the risks of being dependent on foreign resources. From April to November 2016 alone, the price of Newcastle coal almost doubled. Recent import tax increases by the Indonesian government as well as the moratorium on coal shipments to the Philippines following the kidnapping of two Indonesian sailors by the Abu Sayyaf further highlight the fragility of foreign relations.

Box 2: Affordability

Due to continuous cost declines, renewable energy technologies can be a key contributor to lowering electricity rates for the Philippine consumers in the long run. Over the past 10 years, costs of solar PV systems have decreased by 90%. The IRENA expects further decreases of almost 60% by 2025. For onshore and offshore wind, levelized costs of electricity (LCOE) reductions of 26% and 35% are anticipated, respectively³. Furthermore, Bloomberg’s New Energy Outlook 2016 sees solar energy emerge as the least-cost electricity generation technology in most countries by 2030⁴. This constitutes a radical and disruptive shift in energy economics, which needs to be taken into account in energy planning scenarios for the coming years. Even at today’s prices, renewable energy technologies can increase affordability of electricity in the Philippines. A study by the Philippine Electricity Market Corporation (PEMC) concluded that the price reducing effect of renewable energy at the Wholesale Electricity Spot Market (WESM) was greater than the additional financial burden to consumers for supporting renewables through the Feed-in-Tariff (FiT)⁵.

Considering its potential contribution to the achievement of the three energy policy goals, renewable energy is well suited to provide the cornerstone for the future development of the Philippine energy sector. To support the transition from fossil fuels to renewable forms of energy, the Philippines can initiate a wide array of measures such as developing a long-term energy vision with clear goals on renewable energy development, streamlining administrative processes for project development, optimizing existing renewable energy support schemes, and increasing power system flexibility to allow for a smooth grid integration of variable solar and wind power.

Germany can share its experiences from more than 20 years of renewable energy development. It has spearheaded the wide spread deployment of renewable energy and has become a role model for many countries in setting up a supportive legal framework for renewable energies, ensuring grid stability and security, achieving effective competition in the electricity sector, and optimizing electricity network planning. At the moment, around 84 GW of wind and solar electricity generation capacities are operating in Germany. In 2016, renewable energies accounted for around 30% of total electricity consumed. More than half of that electricity stems from fluctuating wind and solar resources.

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) has been a partner of the Philippines in the development of renewable energy for more than 35 years. Starting in the early 1980s with the Philippine-German Solar Energy Project, GIZ is now supporting the Philippine government in enhancing the framework conditions for sustainable energy supply.

Box 3: Sustainability

Comprehensive life cycle analyses show that clean energy sources contribute to climate change mitigation by reducing CO₂ emissions⁶. Renewable energy can therefore play a key role in achieving the government's international commitments in terms of its nationally determined contribution (NDC). Furthermore, an energy system with increasing shares of renewable energy sources can furthermore provide the Philippines with clean air and a healthy environment. Costs and losses of wellbeing and productivity through emission-related diseases and environmental degradation can thereby be avoided. Finally, renewable energy can increase sustainability from a social perspective. Studies have shown that renewable energy technologies have significantly higher labor intensity than fossil fuel technologies⁷. Due to its decentralized character, renewable energy can additionally provide electricity to marginalized households in rural areas and thereby work as a catalyst OF local socio-economic development.

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Trends and Policies in the Philippine Energy Sector

Electricity generation in the Philippines is currently dominated by coal, with a share of 45%. Natural gas and oil contribute 23% and 7%, respectively. The remaining share of 25% is made up of renewable resources. Renewables therefore already contribute a major portion to the Philippine electricity mix. Due to the advanced development of the geothermal and hydro sectors, their share is significantly higher than in the neighboring Asian countries. Other renewable energy sources such as wind, solar, and biomass are still underrepresented. To date, they only account for 1% of electricity generation.

In total, 20 GW of installed capacity is providing energy to the Philippines. In 2012, the Department of Energy (DOE) projected an increase in demand by an average of around 4% annually, with peak demand rising from around 15 GW today to 21 GW in 2030, for which installed capacity was expected to rise to 25 GW. Most recent projections by the DOE identify an even higher need for additional capacity of 44 GW by 2040. To satisfy this demand, the Philippines has to triple the level of its installed capacity within the next 23 years. This trend is unlikely to change, as the annual economic growth rate is expected to stay at around 7% over the next years and the population is estimated to grow from about 101 million in 2015 to about 171 million by 2050.

Meanwhile, capacity additions will also have to be directed to off-grid areas. The Government aims to increase the household electrification level from 88% to 90% by 2017. To reach that level, a total of 800,000 households are targeted for energization. It is estimated that 300,000 households can be connected to the grid. The remaining 500,000 will be served by off-grid systems such as stand-alone systems and micro-grids which are at this moment mainly powered by diesel generators.



Most of the unenergized households are located in far-flung off-grid areas and in conflict-affected areas in Mindanao. These households are currently relying on traditional energy sources such as kerosene, dry cell batteries, and portable generators. They spend a considerable amount of money for the very limited output provided by these devices. Making affordable, reliable, and sustainable energy services accessible for these households will be crucial for reducing poverty, improving health, increasing productivity, and promoting economic growth.

In off-grid areas with existing electricity supply, affordability is the main area of concern. Electricity generation in these areas is currently characterized by high generation costs, which are largely caused by the high costs of diesel fuel. The consumers in these areas are therefore unable to pay the full cost of electricity and are heavily reliant on subsidy. The required funds come from the Universal Charge for Missionary Electrification (UCME) which, is collected from all electricity consumers nationwide. In 2015, the UCME requirement totaled PHP 7.21 billion. It is estimated to grow to PHP 11.81 billion in 2016 and to about PHP 19.35 billion in 2020.

To keep up with a rapidly growing demand for electricity, resolve the prevailing challenges in off-grid areas, and ensure sustainable and affordable electricity supply for the Filipino people in the long run, the consequent and continuous development of renewable energy is crucial. Due to the long lifetime of energy assets such as transmission lines and power plants, policy makers need to plan a long way ahead into the future. Decisions that are taken today will shape the energy system and the success of the energy transition for the decades to come. Neglecting current and future energy sector trends can lead to significant economic losses for the Philippines. To avoid a costly technology lock-in and stranded fossil fuel technology investments, steps need to be taken to steer the Philippine energy sector towards sustainability and diversity.

Feed-in Tariffs (FiTs)

The FiT offers fixed payments per kilowatt-hour of produced electricity for renewable energy technologies. In the Philippines, the mechanism applies to solar, wind, run of river hydro, and biomass. The FIT Rates are technology-specific and guaranteed for a period of 20 years. Installation targets were introduced per technology to soften the potential impact of the FiT on electricity prices. In retrospect, a study by the PEMC on the impact of the FiT on the WESM showed that the dispatch of renewable energy technologies under the FiT mechanism actually resulted in cost savings for electricity consumers of distribution utilities (DUs) that purchased at least 10% of their electricity from the spot market. The cost savings due to the decreased spot market prices proved to be greater than the additional costs for the FiT support payments. Solar and wind energy projects have already gone through two rounds of FiTs due to the oversubscription of their installation targets. The installation targets for hydro and biomass, on the other hand, are yet to be met as of January 2017.

Net Metering

The Net Metering scheme is a support mechanism for distributed generation with a maximum capacity of 100 kW. Qualified distribution utility customers with renewable energy systems on their property and a two-way connection to the grid can avail themselves of the mechanism and thereby be charged (or credited) only the difference between their electricity import and export. Exported electricity is compensated based on the so-called blended generation costs, which are calculated as the average cost of supply of the respective DUs' pool of power suppliers. As of January 2017, the registered Net Metering customers in the country totalled 732 (93% of which are MERALCO customers), with an aggregated capacity of over 4 MW⁹.



The Philippines has already embarked upon its unique energy transition process. It has initiated efforts to address the challenges of climate change and formulated mitigation strategies to limit greenhouse gas emissions. Mandated by the Climate Change Act of 2009 and guided by the National Climate Change Action Plan (NCCAP), the government has announced sustainable energy as one of the seven strategic priorities identified in the NCCAP to combat climate change.

At the conclusion of COP21 in Paris in 2015, 196 Parties, including the Philippines, adopted a new climate agreement, which is meant to guide global climate action post-2020. The Philippines signed the Paris Agreement on 22 April 2016, the first day it was opened for signature. In October 2015, the Philippines submitted its Intended Nationally Determined Contribution (INDC). The present Philippine government recognizes its responsibility to contribute its fair share to global climate action and has ratified the Paris Agreement, but it is still in the process of reviewing the impact of the submitted INDC on its development goals before concurring or submitting a revised NDC.

With the Philippine Renewable Energy Act (RA 9513) of 2008, a policy framework has been created to facilitate the implementation of renewable energy projects. The law enacted various incentives to stimulate investments in renewable energy technologies. The key policy mechanisms under the Renewable Energy Act are the FiT, the Renewable Portfolio Standard (RPS), the Green Energy Option, and Net Metering. While the FiT and Net Metering schemes have been successfully implemented, the Green Energy Option and the RPS have not yet been introduced.



While promoting investments in renewable technologies is one way to achieve the stipulated energy policy goals, there are other measures that are equally important. Increasing energy efficiency can help lower electricity demand and thereby avoid some of the costs and emissions associated with electricity generation. The DOE's National Energy Efficiency and Conservation Program (NEECP) 2011-2030 initiated three main activities: the Energy Efficiency Standards and Labeling Program, the Government Energy Management Program (GEMP), and the Energy Management Service/Energy Audit. There were also two foreign assisted projects that were implemented under the NEECP – the Philippine Energy Efficiency Project (PEEP), which has been completed, and the ongoing Philippine Industrial Energy Efficiency Project (PIEEP).

Despite these programs and their visible success, total energy consumption continues to grow significantly due to an increasing population and economic growth. Impacts of national energy efficiency programs remain relatively small, as they are largely voluntary or restricted to the public sector.

In 2013, the 2004 National Energy Efficiency and Conservation Program (NEECP) was reviewed and subsequently revised under the auspices of a project funded by the European Union (EU). The new Energy Efficiency Roadmap for the Philippines 2014-2030 aims to achieve a 40% reduction in energy intensity compared to 2010 baselines, decreased energy consumption of 1.6% per year against baseline forecasts, and savings of approximately one-third of the current demand. The rapid and consequent legislative enforcement of these goals will be crucial for the success of the roadmap.



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GIZ's Work on Energy in the Philippines

GIZ assists its partner organizations with targeted advisory services and capacity development to support the planning of sustainable development paths in the energy sector as well as the design and implementation of policies and programs in the areas of renewable energy, energy efficiency, and energy access. GIZ's technical assistance builds on Germany's know-how and experience from decades of technology and policy development in the energy sector.

Since 2009, GIZ has been providing technical assistance for the implementation of the Renewable Energy Act of 2008, including targeted advisory support to the DOE and the National Renewable Energy Board (NREB) on the development of the FiT. On behalf of the German Government as well as the EU, GIZ is currently implementing two technical assistance programs in the energy sector.



The **Support to the Philippines in Shaping and Implementing the International Climate Change Regime (SupportCCC II)** project, commissioned within the framework of the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), supports the Climate Change Commission (CCC), the DOE, and other key stakeholders in ensuring coherent implementation of climate change policy at the national and subnational levels and contributing to the further development of the international climate change regime. Component 4 of the SupportCCC II project supports the review and enhancement of existing renewable energy policy mechanisms such as the FiT and the Net Metering scheme, and also focuses on the larger context of mainstreaming renewable energy into energy planning processes and integrating renewable energy into the power grid and electricity market. Thus, the project is closely working with key stakeholders of the Philippine energy sector.

Furthermore, under the **Access to Sustainable Energy Program (ASEP)**¹⁰ of the EU¹¹, GIZ furthermore provides technical assistance to the DOE on a) energy access in rural areas, b) energy efficiency, and c) cross-cutting activities such as human and institutional capacity development, awareness raising and management support to the DOE. The technical assistance includes advice on policy and strategy, as well as on the development of planning tools and business models. Specifically, ASEP assists the DOE and concerned energy sector stakeholders in resolving regulatory and administrative issues that hinder the government from attaining its electrification targets and achieving a sustainable electricity market. The capacity building measures aim to strengthen the DOE's Electric Power Industry Management Bureau in its implementation of total electrification, enhanced power sector management, and support for energy efficiency programs. Furthermore, the provision of tools for evidence-based decision-making furthermore enables marginalized communities to choose the best electrification option for their needs. Disaster resiliency plays a key role in all activities implemented under ASEP.

In the context of these projects, GIZ's main areas of support are:

Policy Advice

Through studies, targeted advisory services, and the facilitation of stakeholder consultations, GIZ is supporting the DOE and other agencies in the energy sector in the design and implementation of energy policies and support schemes. Inputs are provided based on international experiences to enrich the discussions among policy makers in the energy sectors. The topics range from integrating wind and solar energy into on-grid and off-grid systems, reviewing existing policy mechanisms under the Renewable Energy Act, and designing an auctioning system for the FiT, to improving existing rural electrification programs.

Capacity Development and Technical Trainings

GIZ supports staff of the DOE and other relevant institutions in strengthening their capacities to plan and implement sustainable energy policies and programs. Through technical trainings and delegation visits to Germany, GIZ provides the trained staff with the most recent international experience in the energy sector and helps them integrate this experience in their daily policy-related decision-making.



Services Offered by GIZ

Beyond the current technical assistance to the Philippine energy sector, GIZ is working on behalf of the German Government as well as other bilateral and multilateral donors and private stakeholders worldwide to support the transition to a sustainable energy future. The main areas of assistance in the energy sector are:

Basic Energy Supply

GIZ promotes efficient cooking energy, supports market development for small-scale power systems (solar home systems and solar lanterns), and works to expand grid-based rural electrification schemes. These require GIZ to advise governmental institutions on the design of appropriate framework conditions.

Renewable Energy

GIZ assists its partner countries to build up and expand the use of renewables, specifically wind energy, water power, bioenergy (especially biogas and biomass), and solar energy. GIZ's activities in this field are technologically state-of-the-art and include grid feed-in options.

Energy Efficiency

GIZ counsels partners on energy efficiency in thermal power plants, buildings, a wide range of different industrial applications, households, municipalities, and the transport sector.

International Energy Policy

A sustainable supply of energy is essential for all aspects of everyday life – for business, transport, education, and health care. Secure and reliable energy services are a prerequisite for the dynamic development of a society. GIZ promotes the transition to future-oriented, efficient, and sustainable energy systems that are based on renewable energies. Furthermore, GIZ works to embed national processes into international frameworks.

ENDNOTES

¹ S. Krefft, , D. Eckstein, I. Melchior, 2017: Global Climate Risk Index 2017. Germanwatch e.V., Bonn, Germany. Available at <https://germanwatch.org/en/download/16411.pdf>

² IRENA (2016). Renewable Energy Benefits: Measuring the Economics, available under: http://www.irena.org/DocumentDownloads/Publications/IRENA_Measuring-the-Economics_2016.pdf

³ International Renewable Energy Agency (IRENA): The Power to Change: Solar and Wind Cost Reduction Potential to 2025, Abu Dhabi, 2016.

⁴ Bloomberg New Energy Finance: New Energy Outlook 2016, 2016.

⁵ PEMC: Financial Impact of the Integration of FIT qualified Resources in the WESM, Forecast Vol. 1/Issue 1/2015, Manila, 2015.

⁶ NREL (2014). Life Cycle Greenhouse Gas Emissions from Electricity Generation, available under: http://www.nrel.gov/analysis/sustain_lca_results.html

⁷ International Renewable Energy Agency (IRENA): Renewable Energy and Jobs – Annual Review 2016, Abu Dhabi, 2016.

⁸ Dependable and available capacity levels are significantly lower with 16 GW and 13 GW respectively in 2015.

⁹ Resolution No. 9, Series of 2013 - A Resolution Adopting the Rules Enabling the Net-Metering Program for Renewable Energy

¹⁰ This publication has been produced with the assistance of the European Union. The contents of this publication are the sole responsibility of GIZ and can in no way be taken to reflect the views of the European Union.

¹¹ The European Union is a unique economic and political partnership between 27 European countries. In 1957, the signature of the Treaties of Rome marked the will of the six founding countries to create a common economic space. Since then, first the Community and then the European Union has continued to enlarge and welcome new countries as members. The Union has developed into a huge single market with the euro as its common currency. What began as a purely economic union has evolved into an organisation spanning all areas, from development aid to environmental policy. Thanks to the abolition of border controls between EU countries, it is now possible for people to travel freely within most of the EU. It has also become much easier to live and work in another EU country. The five main institutions of the European Union are the European Parliament, the Council of Ministers, the European Commission, the Court of Justice and the Court of Auditors. The European Union is a major player in international cooperation and development aid. It is also the world's largest humanitarian aid donor. The primary aim of the EU's own development policy is the eradication of poverty.



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