

WORLD SMALL HYDROPOWER DEVELOPMENT

REPORT 2019

Case Studies

INCENTIVE POLICIES FOR SMALL HYDROPOWER DEVELOPMENT



UNITED NATIONS
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1. INCENTIVE POLICIES FOR SMALL HYDROPOWER DEVELOPMENT IN PANAMA



Source: Wikimedia Commons

José Fábrega, Universidad Tecnológica de Panamá and National Research System of Panama (SNI)

Increasing demand for electricity and accessibility through new renewable energy technologies has led to a strong push towards renewable energy in Panama in recent years. Moreover, incentive policies and pro-renewable energy legislation also seem to have encouraged this development – including, in particular, in the small hydropower (SHP) sector, which has seen proliferation in the projects since 2005.

Panama is a country with abundant water resources, represented by a yearly average precipitation of 2,924 mm, which feeds around 500 rivers and 52 watersheds.^{1,2} Furthermore, Panama has a growing demand for electricity and given its climatic conditions, there has been a push towards renewable energy in recent years. Renewable energy accounts for a significant proportion of overall power generation in the country. More specifically, in 2017, 10,936 GWh of electricity was generated in the country, with renewable energy sources accounting for over 70 per cent.³

In recent years, the Government of Panama has developed legislation to encourage the use of renewable energy, starting with the laws that focused on promoting mini-hydroelectric projects – though now other types of renewable energy, such as solar and wind power, are included. In this case study, the impact that the incentive policies are having on SHP in Panama will be reviewed and the number of projects and concessions will be employed as indicators. Moreover, it will also consider the existing organizational structure in the energy sector, as well as the legislation that promotes SHP and the use of renewable energy in Panama in general.

Organizational structure of the energy sector in Panama

Up until 1998, the energy sector in Panama was administrated by a public company. However, this was changed by Law 6 in 1997 (and its later amendments) as well as Decree Law 22 in 1998. These pieces of legislation introduced a new private business scheme for the sector.^{4,5,6,7} Essentially this new legislation partially privatized the electrical service with the power generation being fully opened to competition. Transmission was managed by the Empresa de Transmisión Eléctrica S.A (ETESA), a mixed (public-

private) company, and power distribution was given to three regional companies in Panama.

For this new business model to work efficiently, it is necessary for the Government to dictate policies for the sector that ensure the supply and access to energy in the country, and also to promote the rational, sustainable and efficient use of energy. This task is performed by the National Secretariat of Energy (SNE), created by No. Law 43 of 2011.⁴

In addition, the National Authority for Public Services (ASEP), is responsible for guaranteeing the provision of services and is also in charge of monitoring tariff aspects, regulating revenues of the monopolistic sectors.⁸

Finally, for rural areas that are not served, as being unprofitable and, therefore, not appropriate for concession to the private sector, the Office for Rural Electrification (OER) was renewed by Law No. 6 of 1997. This office was attached to the Ministry of the Presidency, in order to promote rural electrification projects.⁵

Overview of the legislation

In terms of incentives for SHP generation, Panama established a legal framework in 2004 by passing Law No. 45, which creates incentives for hydropower generation and other renewable energy sources.⁹ The law was regulated by the Executive Decree No. 45 of 2009, which specified the following incentives for small and mini-hydropower plants:

- Hydropower plants up to 10 MW are not charged for selling electricity directly or indirectly.
- Hydropower projects between 10 MW and 20 MW receive exemptions for the first 10 MW delivered for 10 years.
- Fiscal exemptions for importation of equipment, machinery, materials, etc.
- Fiscal incentives for projects up to 10 MW and with up to 25 per cent incentive of the original investment calculated in terms of reduction of equivalent tons of CO₂ emissions per year.^{9,10}

Since SHPs are very likely to be employed by small towns or rural communities, it is important to mention Law No. 58 of 2011, which creates a rural electrification fund based on 1 per cent of generators' net gains.¹¹ Finally, Law No. 67 of 2016 modified Law No. 58 by exempting this 1 per cent tax to generators of 10 MW or less.¹² It is also worth noting that additional legislation exists to promote specific types of renewable energy for the provision of public electricity services. More specifically:

- Law No. 44 of 2011 (modified by Law No. 18 of 2013) establishes incentives for the promotion of the construction and exploitation of wind power stations.¹³

- Law No. 41 of 2012 establishes the incentive regime for the promotion of the construction and exploitation of generation plants based on natural gas.¹⁴
- Law No. 37 of 2013 (modified by SNE Resolution No. 1647 of 2013, Law No. 38 of 2016 and SNE Resolution No. 3498 of 2017) establishes the incentive regime for the promotion of the construction, operation and maintenance of power plants and/or solar installations.¹⁵
- Law No. 42 of 2011 (modified by Law No. 21 of 2013, Executive Decree No. 345 of 2013 and Law No. 47 of 2015) establishes guidelines for the national policy on biofuels and electricity from biomass in the national territory.¹⁶

Impact of policies

As previously indicated, the promotion of SHP development was formally implemented in 2004 by Law No. 45, even though this law was not regulated until 2009. Since then, there have been other laws approved to promote specific types of renewable energy other than hydropower, mainly due to the technological advances seen in the efficiency and application of those energy sources (wind, solar and biomass).

Additionally, the rural electrification fund (managed by the OER) has been employed in rural areas primarily for expanding the electrical grid over short distances (10 km), and for promoting the use of solar photovoltaic energy. In addition to the incentives stated under Law No. 45, the exemption of 1 per cent from the rural electrification fund tax for generators of less than 10 MW can be seen as another way in which SHP is promoted.

Figure 1 and Figure 2 help to assess the impact of the four pieces of legislation in the energy sector – Law No. 45 2004, Decree No. 45 of 2009, Law No. 58 of 2011 and Law No. 67 of 2016. The primary indicators are the number of projects and energy capacity for SHP and other types of renewable energy during the period between 1999 and 2017.

Figure 1 shows that for SHP up to 10 MW, the number of projects follows roughly a similar trend to that of hydropower stations with capacities above 10 MW for the two periods, 2001–2005 and 2013–2017. It is also important to note that since 2005, SHP projects became the renewable energy option with the greatest number of projects. However, this situation is changing with solar and/or wind power projects becoming more popular options. Figure 1 also shows that there is an observable increase in the number of SHP projects once Law No. 45 of 2004 and Decree No. 45 of 2009 were developed. In Figure 1, in the case of solar and wind power stations, it is evident that there has been an impact on the use of these sources since 2015. Moreover, it is important to note that the legislation aimed specifically at these sectors was passed in 2011 (for wind power) and 2013 (for solar power).

Lessons for future SHP development

Lesson 1: Legislation encouraging use of renewable energy including SHP seems to have a positive impact on the number of SHP projects

Panama has developed legislation to encourage the use of renewable energy. The country started with the laws focused on promoting mini-hydropower projects; however, recently the same has been done for other types of renewable energy such as solar and wind power. There was an increase in the number of SHP projects after 2005, which coincides with the approval of Law No. 45 of 2004. Although this legislation might not have been the only factor behind this rise, it seems to have had a positive impact. In the case of wind and solar power, there has been a dramatic increase in recent years, most likely due to the incentives in the laws issued and a more profitable technology development in recent years.

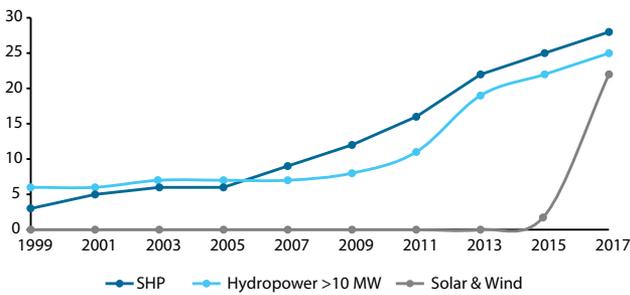


Figure 1. Total number of renewable energy projects in Panama between 1999 and 2017

Source: ETESA^{17, 18}

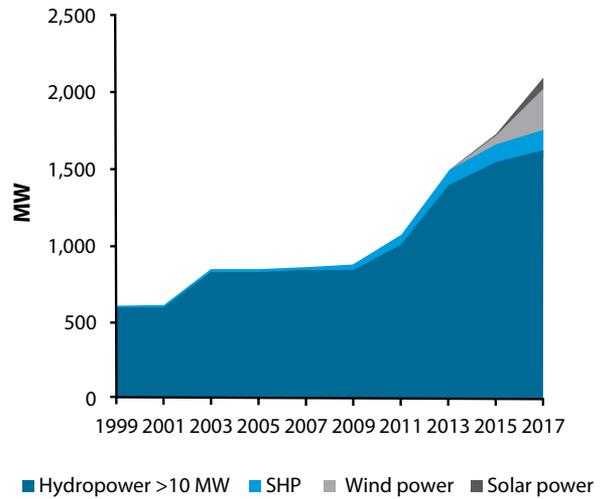


Figure 2. Total renewable energy capacity in Panama (in MW) between 1999 and 2017, including hydropower, solar and wind power stations

Source: ETESA^{17, 18}

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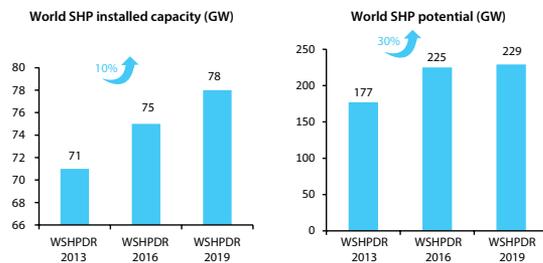
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World Small Hydropower Development Report

The *World Small Hydropower Development Report (WSHPDR) 2019* is an update of the Report's first two editions in 2013 and 2016. The *WSHPDR 2019* contains **166** national reports and **20** regional reports, with 21 new countries added since its first edition.



A special report with **Case Studies** is added to the *WSHPDR 2019*, showing the different roles small hydropower can play in achieving the SDGs.

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- SHP for social and community development
- SHP financing
- Technology, innovation and smart SHP
- Incentive policies for SHP development
- Green SHP

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 - b. Small hydropower sector;
 - c. Renewable energy policy and;
 - d. Barriers to small hydropower development.



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