

Phillip Riley Research Series

The Future Is Renewable: Targets and Policies By Country

Taiwan | April 2017



PHILLIP RILEY

Introduction

This Phillip Riley research series is an investigation into the renewable energy policies of Australia, the United States and various Asia Pacific nations. The reports look into the countries' renewable energy potential, climate change targets and the success of their policy to date. Each report focuses on the current and future use of renewable energy and takes into account the political, geographical and economic challenges unique to each nation.

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The Future Is Renewable: Targets and Policies By Country

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Author:

Sophie Matera

Targets and Policies By Country: Taiwan

Taiwan has limited fossil fuel reserves and as a result imports almost all of their energy supply. This imported energy supply makes up 98% Taiwan's total energy and is highly dependent on fossil fuels¹. As a result, there have been a number of challenges when attempting to increase the proportion of renewable energy within their energy mix. Taiwan's energy supply, including imports, consists mainly of oil (48%), coal (29%) and natural gas (13%). Of the energy that is produced domestically, biomass contributes the largest amount, accounting for 1.38% of the total energy supply¹. In an attempt to reduce this dependency on imports and increase domestic renewable energy generation, a number of policies and plans have been developed. Included within this is Taiwan's renewable energy target. Currently, the 2025 target aims for renewable energy to account for 8% of electricity generation². Hopefully, through new technology, such as offshore wind farms, Taiwan is able to diversify their energy sector and reduce their dependency on imported fossil fuels. This, in turn, will help generate more renewable energy, helping them to achieve their 2025 target.

The large number of imports within Taiwan's energy sector has delayed the implementation of renewable energy. Taiwan has previously been limited in its generation options and as a result chose to import from neighbouring countries. Taiwan is currently the fifth largest liquefied natural gas importer in the world³, with the majority of the imports coming from Qatar, Malaysia and Indonesia. A number of liquefied natural gas plants exist in Taiwan. However, it is not economically sustainable to rely on these plants to produce large amounts of energy. This largely is due to the high costs associated with the plants. Despite this, the global shift to renewable energy

¹ Bureau of Energy, Ministry of Economic Affairs, Energy Statistics Handbook, 2015, http://web3.moeaboe.gov.tw/ECW/main/content/wHandMenuFile.ashx?file_id=1587

² Bureau of Energy, Ministry of Economic Affairs, Framework of Taiwan's Sustainable Energy Policy, 2008, http://web3.moeaboe.gov.tw/ECW/english/content/Content.aspx?menu_id=1524

³ International Gas Union, World LNG Report - 2014 Edition, http://www.igu.org/sites/default/files/node-page-field_file/IGU%20-%20World%20LNG%20Report%20-%202014%20Edition.pdf

has meant that more viable and economical energy options are becoming available. This will provide Taiwan with the opportunity to broaden their energy sector and increase renewable energy production.

Biomass is the main source of energy produced in Taiwan. Of the 2% of domestically produced energy, just over half of this comes from biomass¹. Biomass has likely been successfully implemented due to Taiwan's large agriculture sector. However, Taiwan may face difficulties when attempting to further increase the amount of renewable energy within the system. Pairing intermittent renewable energy with imported fossil fuels (mainly oil and coal) will reduce the energy security within the system. This will place Taiwan at a higher risk of blackouts. In order for Taiwan to continue to increase their renewable energy production, a restructuring of the energy system must occur. The plans for this restructuring and renewable energy development are outlined in the Framework of Taiwan's Sustainable Energy Policy and the Guideline on Energy Development.

In 2009, the Renewable Development Act⁴ was enacted. The aim of the act is to reduce carbon dioxide emissions, improve energy diversification and to promote green-energy industries within Taiwan. Included under this act is the 2025 renewable energy target, as previously stated. Currently, renewable energy makes up just under 2% of Taiwan's energy supply¹. A few months following the bill's enactment, the Taiwanese Government released the Framework of Taiwan's Sustainable Energy Policy⁵. The framework aims to coordinate and find a balance between energy security, economic development and environmental protection, whilst taking into account the needs of future generations. To help achieve these goals, the framework outlines a number of targets and strategies, separated into the different Taiwanese sectors. An example of a

⁴ <http://cat.inist.fr/?aModele=afficheN&cpsidt=22396562>

⁵ Bureau of Energy, Ministry of Economic Affairs, Framework of Taiwan's Sustainable Energy Policy, 2008, http://web3.moeaboe.gov.tw/ECW/english/content/Content.aspx?menu_id=1524

strategy included within the policy is, assisting small and medium-sized enterprises to improve their emission reduction capacity. The policy also outlines a number of targets, many of which the target year has already passed. For example, Raising the fuel efficiency standard for private vehicles by 25% in 2015. There has been no update to the framework and it is unclear whether these specific targets have been achieved. The policy is, therefore, due to be updated. This update is likely currently in the works as the Greenhouse Gas Reduction and Management Act was introduced in 2015.

The Guideline on Energy Development was released in 2013 and discusses the importance of Taiwan obtaining its energy from multiple and varied sources. A diversification of the Taiwanese energy sector will allow for the successful integration domestic renewable energy. The document states that it is Taiwan's priority to ensure energy security whilst taking into account environmental protection. The guideline differs from the framework as it does not outline specific renewable targets, but rather looks at the energy system as a whole. The document outlines a number of focus areas in order to help disperse the sources of energy. An example of this includes promoting and developing alternatives to oil-based products, through using methods such as looking into and adjusting the policies and rules of the petrochemical industry. This will assist in lessening the current dependence on the fuel type.

It is hard to determine the success of the Guideline on Energy Development as it does not outline specific targets. From 2013-2015 the supply of all fossil fuels increased, except for coal (and nuclear power). Despite this, the supply of all renewable energy technologies had also increased (excluding conventional hydropower which fell by 0.07%). However, it is difficult to determine trends, and therefore success, over a limited number of years. Hopefully, in future years Taiwan is able to reduce their dependency on imported fossil fuels and a diversification of the sector is able to occur.

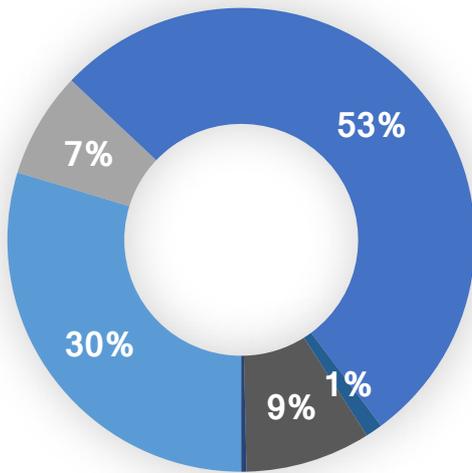
⁶ Bureau of Energy, Ministry of Economic Affairs, The Guideline on Energy Development, 2013, http://web3.moeaboe.gov.tw/ECW/english/content/wHandMenuFile.ashx?menu_id=2042&file_id=559

This will allow for more sustainable energy types to be implemented, helping them to achieve their 2025 target.

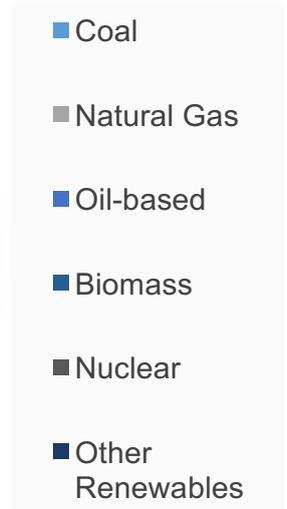
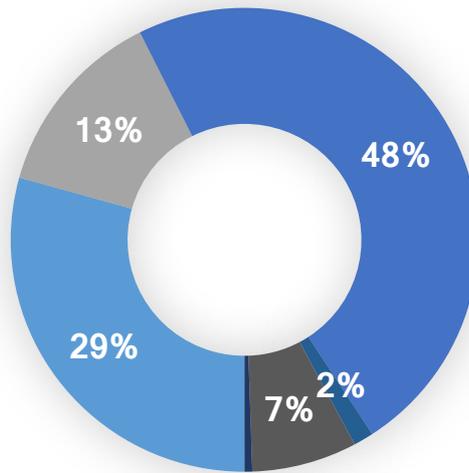
Taiwan's approach to increasing their renewable energy supply differs from other countries looked at within this research series. Due to the majority of their energy supply coming from imports, it is not a straightforward transition towards increasing domestic renewable energy. Despite this, Taiwan has a number of plans in place, to not only help in the diversification of the energy sector, but also techniques to increase clean energy production. This will likely include the development of a number of offshore wind farms. In 2015, Taiwan saw the introduction of the Greenhouse Gas Reduction and Management Act⁷. This act provides the government with a legal basis for taking action on climate change. It looks to achieve action on climate change through a phased process involving inventory, inspection and management, efficiency standards and control targets set every five years. This Greenhouse House Gas Act demonstrates Taiwan's commitment to actively reducing their greenhouse gas emissions. Hopefully, with technological advances on their side, Taiwan is able to greatly decrease their greenhouse gas emissions and increase their sustainable energy production.

⁷ https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=86

Energy Supply by Source, Taiwan (2005)

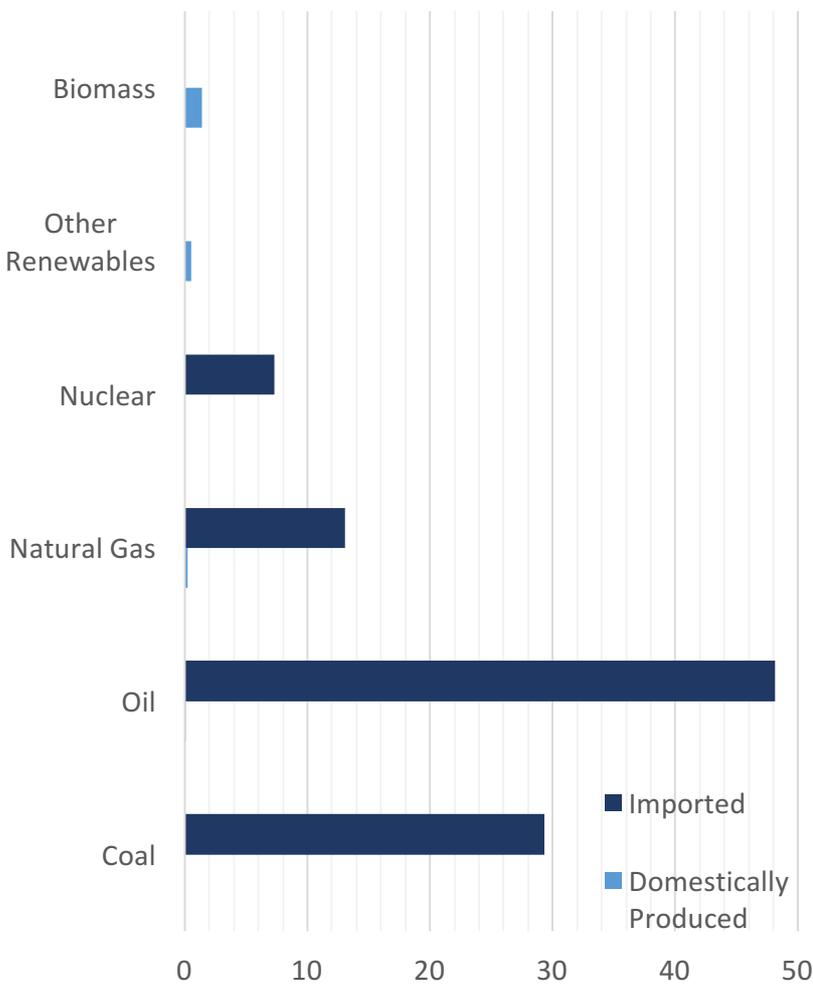


Energy Supply by Source, Taiwan (2015)



Resource: http://web3.moeaboe.gov.tw/ECW/main/content/wHandMenuFile.ashx?file_id=1587

Energy Supply, Imported vs Domestically Produced, Taiwan (2015)



CO₂ Intensity of nations in the region

CO ₂ Emissions per capita (t CO ₂ / population)*	
1. Australia	15.81
2. South Korea	11.26
3. Taiwan	10.68
4. Japan	9.35
5. Singapore	8.29
6. Malaysia	7.37
7. China	6.66
8. Thailand	3.60
9. Indonesia	1.72
10. Philippines	0.97

*From fuel combustion only

resource:

<http://www.iea.org/statistics/statisticsearch/>

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Further Resources

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