

Recent Development of New Energy Policy and Legislation in Taiwan, with the Focus on Promotion of Biofuel*

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Abstract. Energy efficiency, environment protection, reducing the dependence on fossil fuels, and securing the autonomy of energy supply are becoming the major concerns in developing new energy policy of many countries. In recent years, biofuel, a much debated and controversial alternative energy, has become a solution or a strategic policy tool, to answer aforementioned concerns in the transportation sector of many countries. A number of countries or regions developed comprehensive regulations in promoting the usage of biofuel, such as mandates or direct/indirect subsidies, etc. In Taiwan, a part of the global village with deep reliance on fossil fuel, the government also carried out several programs/regulations to promote the use of biofuel in accordance with the national policy to promote the alternative energy, such as “Green Bus”, “Green County”, as well as nationwide mandate for use of B1 biodiesel (mandatory B2 nationwide in 2010). Meanwhile, a legal framework has been developed as the base to carry out those policies, in particular, adoption of the first comprehensive renewable energy law in 2009 and amendments to several energy laws from 2008 to 2009. Although the overall deployment of renewable energy, in particular biofuel, is still in initial stage compared to some leading countries, the current development in Taiwan still shows the government’s intention to achieve the sustainable development as well as to create more possibilities for the green economy in Taiwan. This article reviews recent renewable energy policies promulgated in Taiwan, in particular the promotion of biofuel including laws, administrative programs and regulations, and further investigates the effects of such legal/policy frameworks.

Аннотация. Вопросы энергоэффективности, охраны окружающей среды, понижения зависимости от ископаемых видов топлива, а также обеспечения автономии энергоснабжения выходят на первый план при разработке новой энергетической политики многих стран. В ряде стран и регионов разработаны комплексные меры по стимулированию использования биотоплива, включая прямые и косвенные субсидии и т.д. Правительство Тайваня, сильно зависящего от ископаемых видов топлива, также разработало ряд программ по внедрению биотоплива в соответствии с национальной политикой содействия использованию альтернативных источников энергии. Кроме того, разработана нормативно-правовая база для проведения такой политики, в частности в 2009 г. принят первый всеобъемлющий закон о возобновляемых источниках энергии и были внесены изменения в некоторые энергетические законы 2008–2009 гг. Несмотря на то что использование возобновляемых источников энергии, в частности биотоплива, все еще находится в начальной стадии по сравнению с некоторыми ведущими странами, нынешняя ситуация демонстрирует стремление правительства к устойчивому развитию и созданию возможностей для роста зеленой экономики на Тайване. В статье рассматривается политика Тайваня в области возобновляемых источников энергии, и в частности внедрения биотоплива,— законы, правила, административные программы, исследуются практические последствия введения правовых актов.

Key words: Taiwan new energy policy, biofuel, Taiwan renewable energy.

* Новая энергетическая политика и законодательство Тайваня, направленные на внедрение биотоплива.

1. INTRODUCTION

Energy efficiency, reducing the greenhouse gas (GHG) emissions, reducing the dependence on fossil fuels, and securing the autonomy of energy supply are becoming the major concerns in developing new energy policy of many countries. In recent years biofuel, a much debated and controversial alternative energy, has become a solution or a strategic policy tool, to answer aforementioned concerns in the transportation sector of many countries. In comparison to other renewable energies, biofuel is one of the most attractive alternative energy sources, which could be used as the traditional fossil fuel, and has long history of trust by people (Rosegrant, Msangi, 2007). Yet, the large-scale deployment of biofuel also addresses other policy considerations, such as national security, environmental concerns, foreign exchange saving, and socioeconomic issues related to the rural sector (Demirbas, 2006)¹. Therefore, a number of countries or regions developed comprehensive regulations in promoting the usage of biofuel, such as mandates or direct/indirect subsidies, etc (Nigam, Singh, 2010).

In Taiwan, a part of the global village with deep reliance on fossil fuel², the government also carried out several programs/regulations to promote the use of biofuel in accordance with the national policy to promote the alternative energy, such as “Green Bus”, “Green County”, as well as nationwide mandate use of B1 biodiesel (mandatory B2 nationwide in 2010). Meanwhile, a legal framework has been developed as the base to carry out those policies, in particular, the pass of the first comprehensive renewable energy law in 2009 and amendments to several energy laws from 2008 to 2009. Although the overall deployment of renewable energy, in particular biofuel, is still in initial stage compared to some leading countries, the current development in Taiwan shows the government’s intention to achieve the sustainable development as well as to create more possibilities for the green economy in Taiwan.

Aiming to provide a policy and legal framework background review, this article will first introduce the recent development of energy policies directed by national policy/legal framework from 1996, especially on renewable energy policies and the new

promulgated renewable energy laws. Next, this article will explore the policies, administrative programs, laws and regulations on the promotion of biofuel deployment in Taiwan.

2. BACKGROUND REVIEW ON THE DEVELOPMENT OF NATIONAL ENERGY POLICY FRAMEWORK IN TAIWAN

2.1. “ENERGY POLICY AND IMPLEMENTATION IN TAIWAN AREA” IN 1996 AND “THE FIRST NATIONAL ENERGY CONFERENCE” IN 1998

The renewable energy concerns in Taiwan’s national policy could be dated back to “Energy Policy and Implementation in Taiwan Area” of July, 1996³. One of the policy’s guidelines listed the goal “to reinforce energy research and development (R&D) — encourage R&D and promote incentives on renewable energies and new energy technologies” and was expected to apply “review and proceed the research on various renewables, such as solar, wind, biomass, ocean, and water to promote them economically” to be the implementing measures. For reference, Figure 1 depicts the outline of Taiwan’s Energy Policy Framework with the guidelines, contents, and master goal of “energy policy and implementation in Taiwan area”.

In response to the Kyoto Protocol, the supplementary provision of United Nations Framework Convention on Climate Change of 1997 (UNFCCC)⁴, Taiwan’s government convened “The First National Energy Conference” in May, 1998⁵. This conference reached consensus to set out the goal to increase the share of new energies, including solar, wind, biomass, geothermal, ocean, and water, etc., up to 3% in Taiwan’s total energy supply by 2020; the first time that the deployment of renewable energy was introduced into the energy policy in Taiwan.

To carry out the consensus reached in this conference, the Executive Yuan (the executive branch of the Taiwan’s government) approved several administrative programs and plans after the conference. For instance, the “Renewable Energy Development Plan” announced in January, 2002⁶ proposed

¹ See also, Ayhan Demirbas, *Progress and recent trends in biodiesel fuels*, Energy Conversion and Management 50, 2009, pp.14–34, p. 30.

² There is about 98% energy supplied by imported energy. Bureau of Energy, Ministry of Economic Affairs (MOEABOE), *The White Paper on Energy Industry and Technology of 2010*, available at: <http://www.moeaboe.gov.tw>

³ MOEABOE, *Energy Policy and Implementation in Taiwan Area*, available at: <http://www.moeaboe.gov.tw/Policy/PoMain.aspx?PageId=executepolicy> (last visited: 2013/12/5)

⁴ United Nations Framework Convention on Climate Change (UNFCCC), *Kyoto Protocol*, available at: http://unfccc.int/kyoto_protocol/items/2830.php (last visited: 2011/12/5).

⁵ Ministry of Economic Affairs, *Executive effects and review on the conclusion of “The First National Energy Conference” in 1999*, March 12, 2009, available at: <http://www.moeaboe.gov.tw>

⁶ MOEABOE, *Meeting No. 09100000755 of Executive Yuan*, January

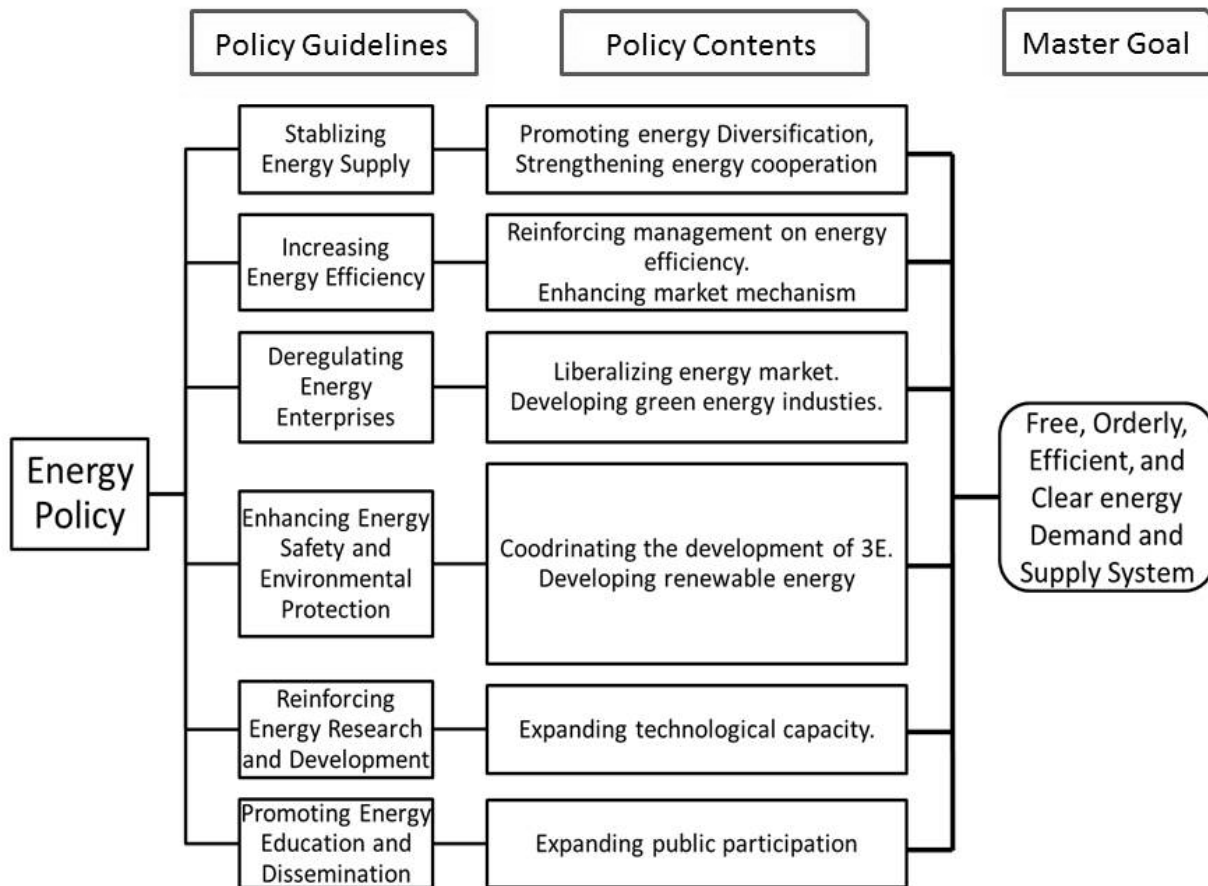


Figure 1. Energy Policy Framework of 1996- Energy Policy and Implementation in Taiwan Area.

(Source: MOEABOE, Taiwan's Energy Policy and Supply-Demand Situation-Implementation Measures, available at: http://www.moeaboe.gov.tw/About/webpage/book_en3/page3.htm (last visited: 2011/12/5))

to appropriate a budget of NT\$266.7 billion to support the development of renewable energies in 2003–2022 period. Further, “Challenge of Year 2008, National Development Plan – Water and Green Building”⁷ of May 2002 and “Nuclear-free homeland Guideline – Development Policy of Energy Saving and Clean Energy Industry”⁸ of September 2003 are also directed at the promotion on green technologies with clean, high efficiency, and sufficient alternative energies to encourage the energy diversification, decrease the dependence on the imported energies and draw up the budget of 3 billion as the

17, 2002.

⁷ Council for Economic Planning and Development, *Challenge 2008 National Development Plan*, available at: <http://www.cepd.gov.tw/m1.aspx?sNo=0001539&ex=1&ic=0000015> (last visited: 2011/12/5)

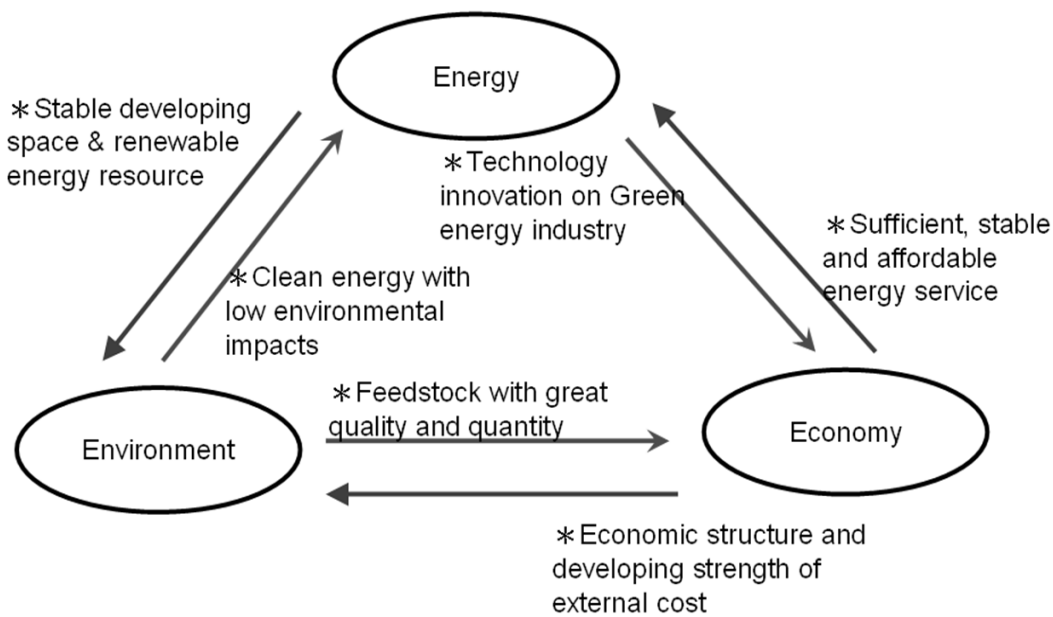
⁸ Government Information Office, Republic of China (Taiwan), *News Release-The Announcement on the 5th council of Nuclear-free homeland Promotion Committee*, July 22, 2003, available at: <http://info.gio.gov.tw/ct.asp?xItem=23287&ctNode=919> (last visited: 2013/12/5)

incentives for energy saving and renewable energies promotion.

2.2. THE SECOND NATIONAL ENERGY CONFERENCE IN 2005⁹

In light of the fact that the Kyoto Protocol has taken effect from 2005, “The Second National Energy Conference” was held in the same year and addressed “Sustainability, Security, Efficiency, and Clean” as the core issue of this meeting. Through several proposed plans, such as “develop the harmonization of 3 E (energy, environment, economy)”, “promote non-regret strategy”, “boost independent energy”, “strengthen regional cooperation”, “intensify price function”, “increase energy efficiency”, “broaden technology capacity”, and “support clean industry”, the conclusion of this conference set out to reduce

⁹ MOEABOE, *The conclusion and executive effect of National Energy Conference of 2005*, available at: <http://www.moeaboe.gov.tw/Policy/98EnergyMeeting/MeetingMain.aspx?pageid=mainframe> (last visited: 2013/12/5)



Source: "Framework of Taiwan's Sustainable Energy Policy"

Figure 2. Win-Win-Win Solution for Energy, Environment and Economy.

imported energies for lower consumption percentage and achieve the target of renewable energy account for 10% among total energies in 2010.

In addition, concerning biofuels, this conference first introduced the promotion of biofuel as one of the important strategy to promote the use of renewable energy in the transportation sector. Through "Green Energy Development and Energy-using Efficiency Promotion" plan, this conference set out two goals for the use of biofuel: (a) Ethanol consumption should be up to 100,000–300,000 kiloliters by 2010, 200,000–600,000 kiloliters by 2015, and 300,000–900,000 kiloliters by 2020; (b) Biodiesel consumption should be up to 100,000 kiloliter by 2010, and 150,000 kiloliters by 2020¹⁰. These goals were incorporated in "Administrative Regulations on the Production and Sales of Renewable Energies Such as Ethanol, Biodiesel, or Oil from Recycled Waste"¹¹, which was authorized by "Petroleum Administrative Act" and aims to regulate

¹⁰ MOEABOE, *Issue 3 of The conclusion and executive effect of National Energy Conference of 2005*, available at: http://www.moeaboe.gov.tw/Policy/98EnergyMeeting/conclusion/conclusion_3.html (last visited: 2013/12/5)

¹¹ The administration regulation was amended the provisions with the title of "Administrative Regulations on the Production, Import, Blend, and Sales of Ethanol, Biodiesel, and Renewable Oil" on December 17, 2008. Laws & Regulations Database of The Republic of China, Administrative Regulations on the Production, Import, Blend, and Sales of Ethanol, Biodiesel, and Renewable Oil, available at: http://law.moj.gov.tw/News/news_detail.aspx?id=52660 (last visited: 2013/12/5)

the producers and distributors of biodiesel, ethanol, and renewable oil to comply with the certain regulations.

2.3. FRAMEWORK OF TAIWAN'S SUSTAINABLE ENERGY POLICY IN 2008¹²

In 2008, "Framework of Taiwan's Sustainable Energy Policy", which was approved by the Executive Yuan, proposed the policy object "Win-Win-Win Solution for Energy, Environment and Economy" and introduced the policy guidelines of "Improving energy efficiency, developing clean energy, and securing stable energy supply" to achieve such goal. Several measures were proposed including: (a) To improve energy efficiency by over 2% in 2008–2015 for decreasing the energy intensity over 20% in 2015 and over 50% in 2025, compared with 2005; (b) To reduce nationwide CO₂ emission, aiming to return it in the standard of 2008 in 2016–2020, and in the standard of 2000 in 2025. Further, the share of low carbon energy in electricity generation systems should be from 40% currently to 55% in 2025; (c) To build a security system of energy supply to meet the goal of annual economic growth rate up to 6% in 2008–2012 and US\$30,000 per capita income by 2015.

In addition, this policy established an energy consumption and supply system of "Two High and Two

¹² MOEABOE, *Framework of Taiwan's Sustainable Energy Policy*, available at: <http://www.moeaboe.gov.tw>

Low” – high efficiency, high added value, low emission, and low dependency. It stated “cleaner energy supply” and “rationalized energy demand” as the main steps. The former addressed to restructure energies mixing and improve energy efficiency, like the share of renewable energies in the electricity system could reach 8% by 2025 through developing carbon-free renewable energies, increasing the usage of low carbon natural gas to over 25% in total power generated in 2025. On the other hand, rationalized energy demand focused on promotion of energy conservation schemes in various sectors, such as industrial, transportation, residential and commercial, and public sectors.

Further, “Framework of Taiwan’s Sustainable Energy Policy” emphasized on provision of a comprehensive regulatory framework and mechanisms by facilitating or amending several laws, acts, and regulations, and applying some specific measures to support the framework, such as: to establish a fair, efficient, and free-opened energy market¹⁵, design a carbon emission trading scheme, set carbon reduction funds, increase the annual energy research budget from NT\$5 billion to NT\$10 billion, and promote energy conservation and emission reduction education. Figure 2 is the policy object, “Win-Win Solution for Energy, Environment and Economy”, proposed in “Framework of Taiwan’s Sustainable Energy Policy” as the national energy policy since 2008 in Taiwan. And Figure 3 is the basic principle to establish an energy consumption and supply system of “Two High and Two Low” – high efficiency, high added value, low emission, and low dependency.

2.4. THE THIRD NATIONAL ENERGY CONFERENCE IN 2009¹⁴

The Third National Energy Conference in 2009 emphasized four subjects: (1) sustainable development and energy security; (2) energy management and efficiency promotion; (3) energy prices and market openness; (4) energy technology and industrial development. Besides, it also combined with the “Action Program of Energy Saving and Carbon Reduction”¹⁵, enacted by the “Framework

¹³ For example, “Greenhouse Gas Emissions Reduction Act” for substantially build emission reduction capacity and enforce reduction measures, “Renewable Energy Development Act” to develop clean energy, “Regulations on Energy Tax” to reflect the external cost of energy consumption, and “Energy Management Act” to effectively promote energy saving measures.

¹⁴ MOEABOE, *The conclusion of “National Energy Conference of 2009*, available at: <http://www.moeaboe.gov.tw/Policy/98EnergyMeeting/MeetingMain.aspx?pageid=convention> (last visited: 2013/12/5)

¹⁵ Council for Economic Planning and Development, *Framework of Sustainable Energy Policy-Action Program of Energy Saving and Carbon Reduction*, September 4, 2008, available at:

Source: “Framework of Taiwan’s Sustainable Energy Policy”

Figure 3. An energy consumption and supply system of “Two High and Two Low” – high efficiency, high added value, low emission, and low dependency.

of Taiwan’s Sustainable Energy Policy of 2008”, as “Action Program of Sustainable Energy Policy” by six developing strategies of energy, industry, transportation, environment, life, and law into practice¹⁶.

2.5. 2010 NATIONAL ESTABLISHMENT PLAN OF REPUBLIC OF CHINA (TAIWAN) – POLICY AND ESTABLISHMENT¹⁷

Taiwan government stated the principle of “Populace Economy” to respond to the industrial reforms worldwide and the economic structure in the post-financial-crisis period. In 2010, the government focuses on “Promote investment, adjust framework, amuse livelihood, expand energy-saving” as the policy to execute. Especially, it emphasized “Green Energy” on several aspects, like industries, transportation, technologies, buildings, education, tax system, the public, and laws, etc.

2.6 THE “REGULATION FOR RENEWABLE ENERGY DEVELOPMENT” IN 2009

In addition to those policy or administrative actions to promote the renewable energy in Taiwan, several legislative efforts were introduced for implementing aforementioned national energy policies. The latest and most noted legislation, “Regulation for Renewable Energy Development”, was passed on June

boe.gov.tw

¹⁶ Council for Economic Planning and Development, News release- Practice Sustainable Energy Policy, *Establish low-carbon and energy-saving society*, December 4, 2009, available at: <http://www.cepd.gov.tw/>

¹⁷ 2010 National Establishment Plan of Republic of China (Taiwan) – Policy and Establishment, the meeting No.3177 of the Executive Yuan, December 31, 2009, available at: <http://www.ey.gov.tw/public/Attachment/01119451771.pdf> (last visited: 2013/12/5)

12, 2009 and promulgated by the president on July 8, 2009, after seven years long legislative process in the Legislative Yuan.¹⁸

The regulation grants the Bureau of Energy (BOE) authorities to promote the usage of renewable energies in Taiwan, increase energy diversification, reduce greenhouse gases, improve relative industries, and boost national sustainable development. The regulation contains only 23 articles but covers several aspects of renewable energies, including operation, facilities, incentives and subsidies, developments, feed-in tariff (FiT), obligations, mediation, and penalties. The categories of renewable energies identified in this bill are solar, ocean, wind, biofuels, geothermal, non-pump and storage hydropower, hydrogen, waste, fuel cell, and other renewable electricity.

The feature of "Regulation for Renewable Energy Development" is to provide the incentive for generation capacity of renewable energies by 650–1,000 MW within 20 years. Further, it is expected to achieve the goal of over 845 MW in 2025 and occupy the share of more than 15% in the total energy generation capacity in Taiwan¹⁹. The legislation of this regulation confirms that Taiwan's government has made a clear and strong commitment to develop renewable energy (Hwang, 2010).

3. THE PROMOTION OF BIOFUEL IN TAIWAN – ADMINISTRATIVE AND LEGISLATIVE EFFORTS

Pursuant to the policy and legal frameworks depicted in national energy policies, Taiwan's administrations carry out these policies by laws, regulations, and administrative rules. In the vein of promotion of the usage of biofuels in Taiwan, the implementations are mainly executed through Council of Agriculture (COA), Environmental Protection Administration (EPA), and Bureau of Energy (BOE). The followings will introduce the administrative actions and their achievements related to biofuel promotion of these agencies.

3.1. COUNCIL OF AGRICULTURE, EXECUTIVE YUAN (COA)

In 2005, COA issued "Plan for Production and Distribution of Energy Crops System Establishment" for

¹⁸ The Legislative Yuan-legal system, *Regulation for Renewable Energy Development*, available at: <http://lis.ly.gov.tw/>

¹⁹ MOEABOE, *The comparison between Erneuerbare-Energien-Gesetz (EEG) of German and Regulation for Renewable Energy Development of Taiwan*, December 4, 2009, available at: http://unfccc.epa.gov.tw/unfccc/chinese/_upload/copenhagen/01_wang_2.pdf (last visited: 2013/12/5)

promoting fallow lands to plant the energy crops with the subsidy of NT\$60,000 per hectare. Initially, the plan selected Yunlin, Chiayi, Tainan, Kaohsiung, and Pingtung in Taiwan as the demonstrative regions, where soybean, rape, and sunflower were planted. It was estimated that the area would expand from 90 hectares to 8,000 hectares in 2007 (Lin, Su, 2010).

3.2. ENVIRONMENTAL PROTECTION ADMINISTRATION, EXECUTIVE YUAN (EPA)

3.2.1. Biodiesel Road-Test Program²⁰

EPA has cooperated with BOE to engage in "Biodiesel Road-Test Program" from 2004. It encourages the garbage and recycled trucks in 13 counties and cities to fuel B20 (20% biodiesel blended into 80% diesel) for replacing the conventional diesel²¹.

3.2.2. The Recycled System for Waste Edible Oil²²

EPA has established "The Recycled System of Waste Edible Oil" from September 1, 2007. The system requires the large-scale chain stores of fast food, such as McDonalds, KFC, Mosburger, and the instant noodles producers, such as Uni-President, Vedan, Weilih, have to provide the waste edible oil for the local cleaning team or other recycling organizations and report through on-line system. Further, EPA also encouraged the residents, institutions, schools, and companies to voluntarily participate in this system to achieve the goal to recycle the waste edible oil up to 4,692 kiloliter by the end of June 2008.

3.3. BUREAU OF ENERGY, MINISTRY OF ECONOMIC AFFAIRS (MOEABOE)²³

According to "Developing Green Energy-Biofuel Executive Program" submitted by Ministry of Economic Affairs (MOEA) and approved by the cabinet meeting No. 3010 of Executive Yuan in October 11, 2006, BOE proposed "Executive Project to Promote Biodiesel" and "Executive Project on Ethanol Promotion" in 2007, with the assistance of the Industrial Technology Research Institute (ITRI) through the industry

²⁰ Environmental Protection Administration (EPA), *The Environmental Benefits and Strategy Analysis of the Biodiesel Vehicles*, executed by The Energy and Environment Research Laboratories (EERL) of the Industrial Technology Research Institute (ITRI), available at: http://epq.epa.gov.tw/project/projectcp.aspx?proj_id=HTYUJPORFC (last visited: 2013/12/5)

²¹ *Id.*

²² EPA, *The Project of Used Cooking Oil Recycling, PVC Controlling, and Estimation of General Waste Clearance and Treatment Costs (2nd year)*, executed by Sinotech Engineering Consultant, LTD., available at: http://epq.epa.gov.tw/project/projectcp.aspx?proj_id=QJHAMTKLSW (last visited: 2013/12/5)

²³ *Development & Dissemination of Bio-fuel Technologies*, Industrial Technology Research Institute, 96-D0133, 2007.

technology project “Development and Promotion Plan on Biofuel Technology.” The plan is divided into two parts, biodiesel and ethanol, and applied gradual steps to execute its individual programs and measures from 2006 till now.

3.3.1 Biodiesel

3.3.1.1. The First Step – “Subsidy Program for Energy Crop on Green Bus”²⁴

According to “Subsidy Program for Energy Crop on Green Bus”, the BOE will subsidize the cost when the public buses use the convention diesel with 1–5% domestic biodiesel blend. The detail of this program required that the qualified feedstock source for the subsidies should come from the energy crops promoted by COA and blend with the biodiesel produced from the waste edible oil. The program started from November 1, 2006 and expired on June 30, 2008.

3.3.1.2. The Second Step – “Subsidy Program for the Application on Green Country”²⁵

This pilot program designated Taoyuan County, Chiayi County and Chiayi City as the demonstrative regions to provide and sell B1 in the local petroleum station where subsidy for costs between biodiesel and conventional diesel would be covered by the administration. The qualified feedstock for the subsidy included sources from the waste edible oil, energy crops, or biodiesel procured by domestic refiners, i.e. the CPC Cooperation or Formosa Petrochemical Cooperation. The period of this program was from July 27, 2007 to July 14, 2008.

3.3.1.3. The Third Step – Mandatory B1 nationwide in 2009²⁶

Pursuant to “Rules related to the Range and Ways of Blending Percentages for the Refiner and Importer of Petroleum in Domestic Transportation” authorized by Article 38–1 of “Petroleum Administration Act”, the domestic refiners are mandated to blend B1 biodiesel in Taiwan island from July 15, 2008. This mandatory rule also provided refiners three months grace period to replace the supply and storage system, but a nationwide full force mandate started from 2010.

²⁴ MOEABOE, *Subsidy Program for Energy Crop on Green Bus*, available at: http://www.moeaboe.gov.tw/opengovinfo/laws/secondaryenergy/LSecondaryMain.aspx? PageId=l_secondary_06 (last visited: 2013/12/5)

²⁵ MOEABOE, *Subsidy Program for the Application on Green Country*, available at: http://www.moeaboe.gov.tw/opengovinfo/laws/secondaryenergy/LSecondaryMain.aspx? PageId=l_secondary_07 (last visited: 2013/12/5)

²⁶ MOEABOE, *Rules related to the Range and Ways of Blending Percentages for the Refiner and Importer of Petroleum in Domestic Transportation-Used Diesel blended with Fats*, available at: http://www.moeaboe.gov.tw/opengovinfo/Laws/secondaryenergy/LSecondaryMain.aspx? PageId=l_secondary_11 (last visited: 2013/12/5)

Nonetheless, the order did not stipulate the source of biodiesel blend nor provided subsidy.

3.3.1.4. The Forth Step – National Mandatory B2 in 2010²⁷ and Suspension in 2014

After the implementation on mandatory B1 since 2008, BOE was further ruling mandatory B2 in June 15, 2010, and BOE estimates that demand for biodiesel will achieve the goal of 80,000 kiloliters per year.

However, on May 5th, 2014, BOE officially announced the suspension on the mandatory B2 rule.²⁸ BOE explained that the suspension of current policy is a response to the protests from the gas stations operators and tourist bus associations claiming that the B2 biodiesel is the cause of sludge which clogging oil pump filters and engines. BOE took these claims seriously and decided to suspend the current mandatory B2 rule indefinitely pending science investigations and quality assurance improvements in the chain of oil supply system.²⁹

3.3.2. ETHANOL

3.3.2.1. The First Step – “Program of Green Public Fleet”³⁰

The pilot program required the public fleet of Taipei city as the demonstrative region and operated from September 29, 2007. It directed that the public fleet belonging to Legislative Yuan, Judicial Yuan, Examination Yuan, Control Yuan, Executive Yuan and its subsidiary agencies, and Taipei City Government had to apply E3 (3% ethanol blended into 97% gasoline) with the subsidy for purchasing, cost differences, maintenance, and the marketing on ethanol promotion. In addition, the general public could also purchase E3 from selected gas stations where the oil price was cheaper than regular unleaded gasoline by up to NT\$1 per liter on account of the subsidy provided by BOE.

3.3.2.2. The Second Step – “Promoting Program for Ethanol in Taipei and Kaohsiung Metropolis”³¹

To boost ethanol into usage in the market is the aim of the second step of “Executive Project on Ethanol Promotion”. From July 29, 2009, the petroleum refin-

²⁷ *Id.*

²⁸ MOEABOE, *Announcement of the suspension of mandatory B2 rule*, 05/05/2014, available in Chinese at: http://web3.moeaboe.gov.tw/ECW/populace/news/News.aspx?kind=1&menu_id=41&news_id=3563 (last visited: 2014/05/30).

²⁹ *Id.*

³⁰ MOEABOE, *Program of Green Public Fleet*, available at: http://www.moeaboe.gov.tw/opengovinfo/Laws/secondaryenergy/LSecondaryMain.aspx? PageId=l_secondary_09 (last visited: 2013/12/5)

³¹ MOEABOE, *Promoting Program for Ethanol in Taipei and Kaohsiung Metropolis*, available at: http://www.moeaboe.gov.tw/opengovinfo/Laws/secondaryenergy/LSecondaryMain.aspx? PageId=l_secondary_15 (last visited: 2013/12/5)

er offering and selling E3 in Taipei City and Kaohsiung City could apply the subsidy for cost differences, repairing, promotion, and marketing.

3.4. THE EFFECT OF BIOFUEL PROMOTION POLICY IN TAIWAN

In order to balance the requirements on energy, environment, and economy to achieve the target of national energy policies directed since 1996, Taiwan has executed and practiced biofuels since 2004 and made some initial progress through the efforts of the administrative departments. Especially, COA, EPA, and BOE under Executive Yuan have implemented various programs to promote biofuel in Taiwan.

3.4.1. COA – “Established Plan for Production and Distribution System on Energy Crops”

The plan estimated the energy crops could be planted on 2,000 hectares for producing 1,000 kiloliters of biodiesel in 2006, on 6,000–8,000 hectares for producing 3,000–4,000 kiloliters of biodiesel in 2007, and planted on 20,000 hectares for producing 10,000 kiloliters in 2008. And the actual achievements were 1,721 hectares in 2006 and 2,334 hectares in 2007 (Lin, Su, 2010). Further, the biodiesel produced by these energy crops like soybean, rapeseed, and sunflower, were used in the program of “Green Bus” and “Green Country” executed by BOE.

3.4.2. EPA – “Biodiesel Road-Test Program” and “The Recycled System for Waste Edible Oil”³²

EPA executed and promoted “Biodiesel Road-Test Program” with the budget of 100 million every year in accordance with “Nuclear-free homeland Guideline – Development Policy of Energy-saving and Clean Energy Industry” promulgated by Executive Yuan since 2004. 13 counties and cities have already received the subsidy for using B20 as the alternative fuel produced mainly from the waste edible oil.

“The Recycled System for Waste Edible Oil” was aimed to put the waste edible oil to reuse as the transportation fuel with the goal of recycling it up to 4,692 kiloliter by the end of June 2008. According to the government public information, there were 5,370 kiloliters of waste edible oil recycled and accounted from July 2007 to June 2008.

3.4.3. BOE – “Plan of Development and Promotion on Biofuel Technology”³³

“Subsidy Program for Energy Crop on Green Bus” was implemented from November 1, 2006 to June 30, 2008 and made the public buses’ usage of biodies-

el in Kaohsiung City and Chiayi County reach the amount about 160 kiloliters of B100. It contributed Kaohsiung and Chiayi to be the second and the third city in Asia with the public buses fueled by biodiesel entirely after Kyoto, Japan. Moreover, “Subsidy Program for the Application on Green Country”, started on July 27, 2007, selected Taoyuan County, Chiayi County and Chiayi City as the demonstrative regions to supply B1. The government public information indicated that 297 gas stations participated in this program and supplied 343,241 kiloliters of B1 accounted on July 14, 2008. Further, Taiwan has approved 9 biodiesel refineries to produce, blend, and distribute nationally, and also implemented the mandatory B2 on June 15, 2010 authorized by the amendment of Article 38 (1) of “Petroleum Administration Act”³⁴ with the target of 100,000 kiloliters. The study showed that the consumption of biodiesel reached 36,000 kiloliters and reduced 120,000 metric tons of CO₂ in 2009.

In addition, the development on promotion of ethanol sets are also in progress, for example, “Program of Green Public Fleet” had consumed 123 kiloliters of E100 from September 29, 2007 to July 28, 2009 and decreased 258 metric tons of CO₂ emission. Besides, there are 8 gas stations in Taipei City and 6 E3 gas stations in Kaohsiung; about 145 kiloliters were consumed from July 2009 to July 2010 based on “Promoting Program for Ethanol in Taipei and Kaohsiung Metropolis”.

4. CONCLUSION AND PERSPECTIVE

Through tracking and observing the international trend, we see that energy policies currently address issues related to developing environment-friendly technology with for increasing energy supplies, encouraging cleaner and more efficient energy usage, reducing air pollution and carbon dioxide emission to alleviate the global warming and climate change (Demibras, 2007). Taiwan’s energy policies has emphasized the significance of renewable energies since 1996, while the government promoted biofuel since 2004.

Based on the review of the track of recent Taiwan energy policy developments, one could find that through the proposal of several administrative actions, such as the establishment of “Framework of

³² See generally, ITRI, *Supra* note 23.

³³ *Id.*

³⁴ The Executive Yuan Gazette Online, *Amend Executive Period, Range, and Way of Esters Blended Percentage on Petroleum Refinery and Importers to Sell Domestic Transportation Diesel*, issued on June 10, 2010, effected on June 15, available at: http://gazette.nat.gov.tw/EG_FileManager/eguploadpub/eg016112/ch04/type1/gov31/num5/Eg.htm (last visited: 2011/12/5)

Taiwan's Sustainable Energy Policy", as well as latest legislative action on new renewable promotion regulations, Taiwanese government has taken the step to incorporate sustainable considerations into its energy policy. However, based on the background reviews of the formation of Taiwan's recent energy policy, we also can find the facts of lacking of comprehensive and solid legal scheme, relying heavily on administrative pilot programs, shortage of interagency cooperation, which indicate the limitations of current policy formation.

In observing the progress of introducing and promoting the usage of biofuel in Taiwan, we could conclude the initial progress is successful through the stages of pilot programs and mandates. However, lack of strategic policy goals, industry, technology or agriculture fostering measures and comprehensive developing schemes, reveals the deficiency of current policy. The suspension on the mandatory B2 rules in 2014 due to sludge issues, also reflects such deficiency in its policy implementation as well as to the lacking of quality assurance rules in current practice. In addition, currently, many countries or regions are adapting their biofuel policies to incorporate sustainable criteria in terms of biofuel production and deployment, which should also be one of the major policy considerations for Taiwan to deploy the large scale of biofuel use in the future.

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