

Oil Plan 2015 – 2036

1. Background

The Ministry of Energy has set policy and National Energy Plan, call Thailand Integrated Energy Blueprint: TIEB consist of Power Development Plan: PDP, Energy Conservation Development Plan: EEDP, Alternative Energy Development Plan: AEDP, Gas Management Plan: Gas Plan and Oil plan. Oil is consumed in very high a ratio compare to a total energy consumption each year, especially in the transport sector and because the demand for fuel is consistent and has been affected by the others implementation plans. It has to be a management plan to achieve a balance of energy efficiency and can determine the direction of energy policy with concrete.

Oil Plan 2015 -2036 will be a long-term plan to support fuel management in line with the goal of energy conservation plan and alternative energy development plan and serve as a framework for the management of the future fuel mix which takes into account the environment and risks that may impact both directly and indirectly to the development of the country's energy.

2. Formulation of the Oil Plan 2015 – 2036

The formulation of oil is the integration between the EEDP2015 and AEDP2015. It is begin with the fuels demand forecasting with the same input data (Fuels demand) and same assumption of an energy conservation development plan.

In this plan "Fuel" includes oil, liquefied petroleum gas used as fuel and natural gas for motor vehicles. The plan will focus on the management of fuel in the transportation sector. This is because oil is the highest energy consumption proportion in the EEDP. EEDP has evaluated the demand for fuel in the base case scenario (Business as Usual: BAU) and it indicated that demand for fuel in the region. Transportation will be 65,459 ktoe by 2036. The plan defines the energy conservation measures in the transport sector into four groups: 1) regulate fuel prices to reflect the true cost 2) increase fuel consumption efficiency in automotive 3) Promote the truck and bus utilization management and 4) develop appropriate infrastructure for transportation.

Unit: ktoe

Economic Sector	Type of Oil	BAU		EEP100%	
		2026	2036	2026	2036
Transport	Gasoline	9,303	12,934	4,683	4,523
	Diesel	17,086	24,309	9,898	10,067
	LPG	4,601	8,001	2,785	4,264
	NG	5,731	9,269	4,020	5,447
	Jet fuel	7,206	10,036	7,206	10,036
	Fuel oil	1,010	909	1,010	909
	Total	44,937	65,459	29,602	35,246
Over all sector	Gasoline	9,381	13,012	4,760	4,600
	Diesel	23,972	32,389	16,784	18,147
	LPG	8,986	13,022	7,170	9,285
	NG	5,731	9,269	4,020	5,447
	Jet fuel	7,217	10,047	7,217	10,047
	Fuel oil	1,699	1,598	1,699	1,598
	Total	56,985	79,338	41,650	49,125

Source: Energy policy and Planning Office

Remark: BAU = Business as Usual

EEP = Energy Efficiency Plan

ktoe = kilo ton of oil equivalent

The forecast information on fuel demand in the above, The Department of Energy Business has set five management principles as follows.

1. Support measures to save fuel in the transportation sector, according to the EEP 2015
2. Manage type of fuel properly
3. Restructuring prices of fuel
4. Enhance ethanol and biodiesel consumption in accordance with AEDP2015
5. Encourage investment in the fuel infrastructure

3. Fuel management principle

Principle	Reason	Measure	Stake Holder
1. Support measures to save fuel in the transportation sector, according to the EEP 2015	<ul style="list-style-type: none"> Energy Conservation Development Plan 2558-2579 was targeted to reduce energy intensity by 30 percent by the year 2036 compared to the year 2010 by a group of 4 energy saving measures on the economy, including the transport sector, large commercial and small business building and residential. The goal was set to save energy for the transportation sector at 30,213 ktoe. 	<ol style="list-style-type: none"> Promoting high energy-efficient vehicles. Car labeling pro Transport Management for energy saving. Driving for energy savings Revolving fund to energy conservation by energy services company The subsidies for energy efficiency for the transport sector (SOP + DSM) Development of infrastructure electric trail transit Development of infrastructure, transportation, electric double-track Optimize the transport of oil by development of oil transportation via pipeline The effect of the diesel prices structure The effect of Electric Vehicle 	Ministry of Energy/Ministry of Transport/ Ministry of Finance/ Ministry of Industry
2. Manage type of fuel properly			
2.1 Management of Of fuel to suit various user groups, including liquefied petroleum gas and			

Principle	Reason	Measure	Stake Holder
Natural Gas for Vehicle: NGV			
2.1.1 Liquefied Petroleum Gas: LPG	<ul style="list-style-type: none"> ● LPG consumption growth rate has increased steadily. The capability of domestic LPG production is not sufficient to meet domestic demand so it need to be imported from abroad and it could affect energy security and the impact on the trade balance of the country. ● LPG production in the country should be allocated to the household sector first because it is a product that people need in everyday living. However, it is found that since 2013, the growth rate of consumption in households sector is declined while the transport sector had higher growth rates. ● The lower price of LPG for about 2-4 times compare to Gasoline – Ethanol (Excluding gasohol E85) is a major cause 	<p>Prices measures</p> <ul style="list-style-type: none"> • LPG prices to reflect the true cost of each source of supply. • Consider to charge the excise tax by heating value compared with gasoline - ethanol fuel to minimize market distortions 	<p>Ministry of Energy</p> <p>Ministry of Finance</p>

Principle	Reason	Measure	Stake Holder
	<p>of rising growth in the transport sector is (data of years 2009-2014).</p> <ul style="list-style-type: none"> ● The increasing of LPG consumption in transport sector compared to the consumption of gasohol, especially when compared to the consumption of gasohol E20 may not meet the target of ethanol consumption in AEDP2015. ● The forecast of LPG consumption in the transportation sector showed that the it is grow higher than gasoline – gasohol. It is indicated that the consumption of LPG and gasoline - gasohol fuel consumption will be 1 9 million liters per day and 17 million liters per day by the year 2036, respectively. 		
<p>2.1.2 Natural Gas for Vehicle: NGV</p>	<ul style="list-style-type: none"> ● Natural gas from the Gulf of Thailand and onshore at Nam Pong district, Khon Kaen Province was primarily used as fuel to produce electricity to replace the use of coal and oil, which are expensive and must be imported from 	<ol style="list-style-type: none"> 1. Prices measures <ul style="list-style-type: none"> ● Adjudge NGV retail prices to reflect the true cost ● Subsidizing the retail price of NGV for buses and trucks ● Excise taxes like other types of transport 2. Service stations Measures <ul style="list-style-type: none"> ● Encourage local gas stations along the pipeline. 	<p>Ministry of Energy</p> <p>Ministry of Energy</p> <p>Ministry of Finance</p>

Principle	Reason	Measure	Stake Holder
<p>2.2. Harmonization of ASEAN Fuel Quality Standards: HAFQS</p>			
<p>2.2.1 Reduction type of fuel</p>	<p>Currently, there are 5 types of gasoline – gasohol in Thailand as follow;</p> <ul style="list-style-type: none"> Gasohol E10 Octane 91 Gasohol E10 Octane 95 Gasohol E20 Gasohol E85 and Gasoline <ul style="list-style-type: none"> ● Currently (January - July 2015) <p>From the use of oil in the gasoline – gasohol fuel, it is found that gas Gasohol E10 Octane 91 was the highest consumption compared to other types (11.0 million liters per day) followed by Gasohol E10 octane 95 (8.6 million liters per day) while the use of gasohol E20 and E85 were only at 4.0 and 0.9 million liters per day, respectively. There are E20 car more than 2 million, E20 motorcycles more than 8 million and E85 car over 20 thousand.</p>	<ol style="list-style-type: none"> 1. Encourage the use of ethanol as the potential of the car. 2. Adjust the type of fuel in gasoline - gasohol in accordance with the technology of the automobile on the balance of the refinery basis. 3. Price measure <ul style="list-style-type: none"> • set the appropriate difference in retail prices for all types. 	<p>Ministry of Energy</p> <p>Ministry of Energy</p> <p>Ministry of Energy</p>

Principle	Reason	Measure	Stake Holder
<p>2.2.2 Harmonization of ASEAN Fuel Quality Standards: HAFQS</p>	<ul style="list-style-type: none"> Fuels sold in ASEAN countries are very different in quality. The Singapore and Thailand that use fuel with a sulfur content at Euro-4 standards or higher, while Malaysia, Vietnam and the Philippines used Euro-2 standards fuel and Brunei, Cambodia, Indonesia, Laos and Myanmar still used of fuel with a high sulfur content. Different in fuel standard causes the problems of cross-border travel and fuel trade between Member States. This also affects the stability of fuel supply in the whole the region. 	<p>Establish Task Force on the Harmonization of Quality Standards for Transportation Fuel in ASEAN</p>	<p>Ministry of Energy</p>
<p>3. Restructuring prices of fuel</p>	<p>To make the fuel prices in line with costs and the appropriate tax burden for the different type of fuel and consumer to optimize the energy consumption of the country. A resolution of NEPC, On December 15, 2014 was set framework and guidelines for the restructuring of fuel prices related to the transport sector as follow;</p>		

Principle	Reason	Measure	Stake Holder
	<p>1) Energy prices have to reflect the actual cost.</p> <p>2) The price of fuel used to transport excise rates should be similar.</p> <p>3) Oil Fund will used to maintain price stability and promote renewable energy.</p> <p>4) Reduce the Cross Subsidy of fuel</p> <p>5) The market price should be in the appropriate level.</p> <p>6) The oil fund charge would be at a similar rate and consider to heating fuel to the following heat value.</p>		
<p>3.1 Restructuring Oil Prices</p>		<ul style="list-style-type: none"> ● Adjust the rate of excise tax on gasoline and diesel fuel in similar to each other in the range of 2.85 to 5.55 baht per liter to reflect the cost of pollution and road damage. ● Determine the difference between the retail prices of fuel. ● The average market value of commercial gasoline and diesel should be in the proper and fair. 	<p>Ministry of Finance</p> <p>Ministry of Energy</p> <p>Ministry of Energy</p>
<p>3.2 Restructuring LPG Price</p>		<ul style="list-style-type: none"> ● Set LPG cost to reflect the true cost of each supply source. ● Rated the excise tax by heating value and compare between gasoline – gasohol fuel to minimize market 	<p>Ministry of Energy</p> <p>Ministry of Finance</p>

Principle	Reason	Measure	Stake Holder
		mechanism distortions	
3.3 Restructuring NGVPrice		<ul style="list-style-type: none"> ● Adjust prices to reflect the true cost. ● Charging for the excise tax 	Ministry of Energy Ministry of Finance
.4 Enhance ethanol and biodiesel consumption in accordance with AEDP2015	Encourage the use of biofuels as a potential production of agricultural raw materials without impacting food and regardless of the technology		
4.1 Measure to promote Ethanol in transportation sector	The planned development of renewable and alternative energy potential of ethanol production based on sugar cane and sugar Strategy (2015-2026) target to increase sugarcane plantations area from 10 million hectares of to 16 million hectares by year 2026. It possible to produce ethanol from molasses up to 4.8 million liters per day. If based Strategic of cassava and cassava products (2015-2026) to increase the yield from 3.5 tons per hectare in 2014 to 7 tons per hectare in 2026. It is assumes that the	<ul style="list-style-type: none"> ● Encourage the use of oil-based fuel potential of the car by promoting to make more confidence and understanding of the Gasohol, Gasohol E20 and E85. ● Promoting the E85 consumption in cars and motorcycles of government agencies and enterprises. ● Determine the difference between the prices of fuel ● Promote tax for vehicles that use ethanol as a fuel in a high proportion. 	Ministry of Energy Office of Budget/Ministry of Energy Ministry of Energy Ministry of Finance

Principle	Reason	Measure	Stake Holder
	<p>year 2036, ethanol from cassava up will be produced at 6.5 million liters per day. It is results that Thailand will have the total potential to produce 11.3 billion liters of ethanol per day in 2036.</p>		
<p>4.2 Measure to promote Bio-diesel in transportation sector</p>	<p>The AEDP2015 estimated the potential of biodiesel according to strategy of palm oil and palm oil (2015-2026) targeted to extend the plantation area from 4.5 million hectares to be 7.5 million hectares and increase the productivity from 3.2 tons per hectare to 3.5 tons per hectare by the year 2036. It is estimated that Thailand will have the potential to produce 14 million liters of biodiesel per day.</p>	<ul style="list-style-type: none"> ● Promote utilization of B20 in Heavy Duty Truck ● Implement tax measure to promote more H-FAME technology 	<p>Ministry of Energy Ministry of Finance</p>
<p>5. Encourage investment in the fuel infrastructure</p>			
<p>5.1 Support Fuels logistic and transport system through the development of</p>	<p>Pipeline System was used for transporting large quantities of oil supply to the oil terminal for delivery to the next user or sent to the user who has been a major oil pipeline. Pipeline transportation in the early</p>	<ul style="list-style-type: none"> ● Allow private sector to develop oil pipeline to the North. ● Service integration to facilitate and to enhancing private sector to invest oil pipeline. ● Consider the oil pipeline route, the location of depot and the 	<p>Ministry of Energy Ministry of Energy</p>

Principle	Reason	Measure	Stake Holder
<p>pipeline.</p>	<p>stages due to high transportation costs are charged to use the pipeline include the financial cost but costs are lower if transport a large amount of oil through the pipeline and the need for investment in inventory at the end of the oil pipeline. However, the pipeline transportation as a means of transportation that consumes minimal power. The transportation of oil in the same direction and can also be used as transport fuel in large quantities. Continuous It also has less impact on safety and the environment. Since it is a closed system that separately accidents and oil spills likely less.</p> <p>NEPC resolution. On August 13, 2015 approved the extension of the oil pipeline transportation system to the north and northeast by giving the same enterprises or oil traders. Other private development is an ongoing project to free competition. The various government agencies Related Support Project and to authorize the Board</p>	<p>volume of oil transported through the pipeline.</p> <ul style="list-style-type: none"> ● Order ERC to regulate oil trading via the oil pipeline. 	<p>Ministry of Energy Ministry of Energy/Office of Energy Regulatory Commission</p>

Principle	Reason	Measure	Stake Holder
	<p>of Management of the Energy Committee (CEPA.) Is responsible for overseeing the transportation of oil by pipeline to market dominance. Antitrust Provide protection to oil traders and the public to access and obtain services at the fair. Until the Energy Regulatory Commission (ERC). There will be a scheduled update or revise legislation on the supervision system in the transport pipeline.อนาคต</p>		
<p>5.2 Develop Strategic Oil Stockpile</p>	<ul style="list-style-type: none"> ● Because Thailand dependence on imported oil from abroad, up to 85 percent of the total refining crude oil each year. ● 80 percent crude oil imported from abroad were from the Middle East, which are the countries with very high geopolitical risks. ● There are also other risk factors, such as the transportation of oil from the Middle East to Thailand through the Strait of Malacca, which is overcrowded. 	<p>Conducted a study to establish strategic oil reserves by;</p> <ul style="list-style-type: none"> ● Implementing the strategic reserve is the burden of the Government. ● Trader reserve is under the burden of the private sector. ● The number of the strategic reserve time depends on of the global crisis, such as war, disaster. ● The number of commercial days reserve depends the unexpected events such as accidents, transport problems. 	<p>Ministry of Energy</p>

Principle	Reason	Measure	Stake Holder
	<p>Risk of accidents, water And plunder Pirates Including disasters such as earthquakes, tsunamis fairly impassable with more intensity.</p> <ul style="list-style-type: none"> ● Risk factors such as external factors that cannot be predicted and controlled. If this happens, any the impact caused supply disruptions of crude oil for a period of one will impact both directly and indirectly to the economy of the country, certainly. Because oil is a major factor in the economy, such as direct transportation sector manufacturing sectors. The agricultural sector and the household sector. ● If the disruption remains a period of time, it goes into the national fuel shortages which directly impact severely on the public sector and may lead to the hiring freeze as well as the economic and social stability of the country and is significantly broader. 		