ENERGY UTILIZATION MANAGEMENT BUREAU

Alternative Fuels Vehicle and Technology

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E-Power Mo! Energy Consumers and Stakeholders Conference

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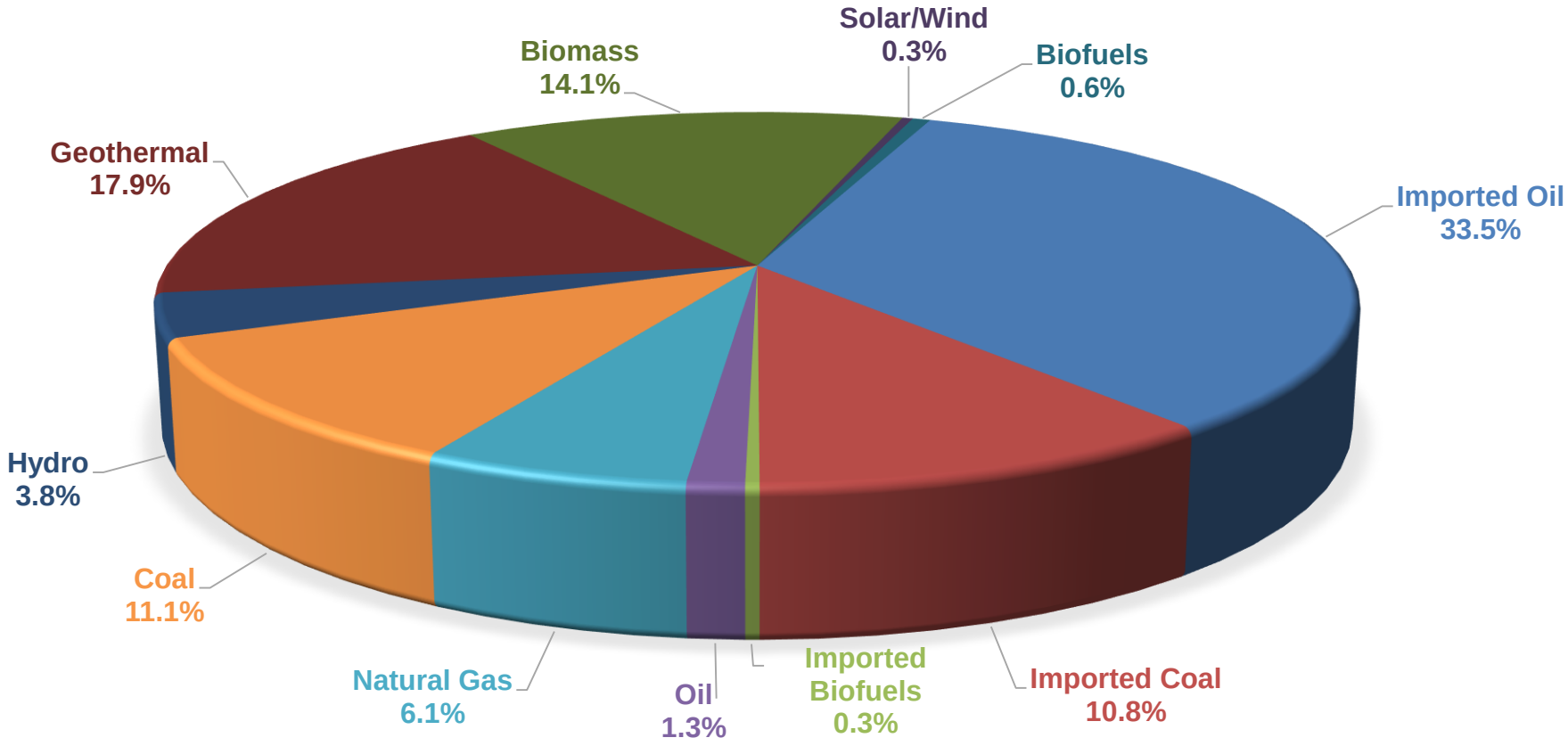
Philippine Energy Mix

PHILIPPINE ENERGY MIX



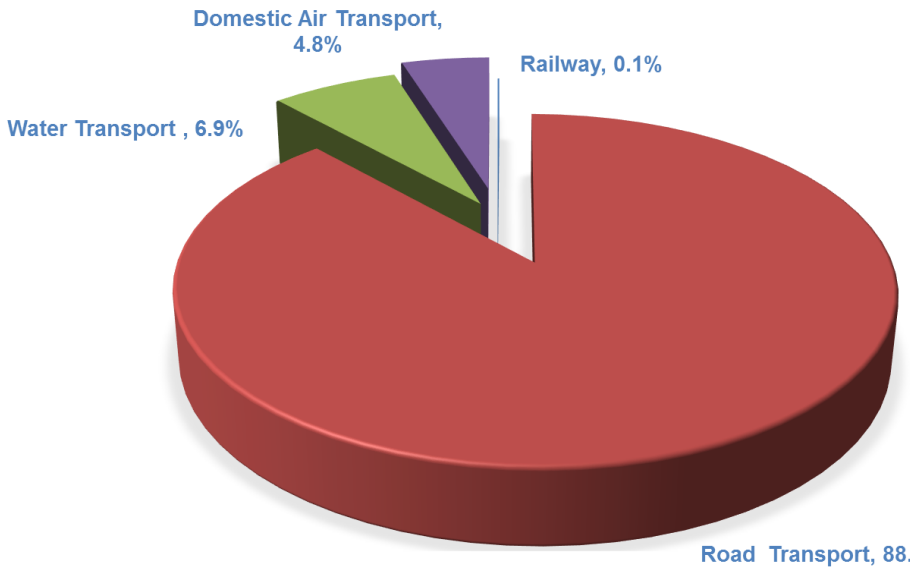
2016 TOTAL ENERGY = 53.19 MTOE

Source: DOE Planning – 2016 data

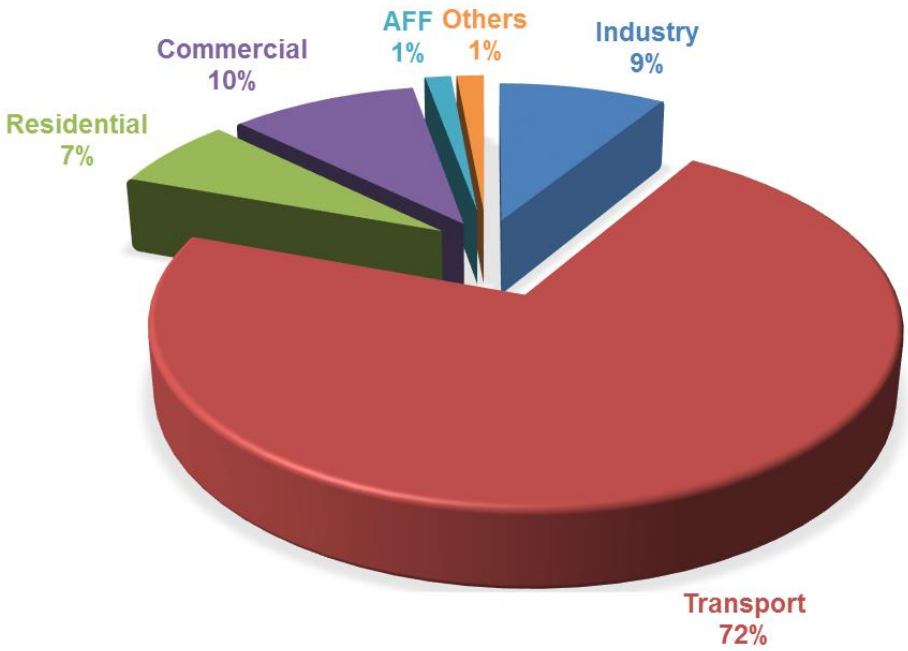
** Total Mix = Indigenous + Net imported Energy*

Petroleum Oil Mix & Transport Fuel Consumption

TRANSPORT FUEL CONSUMPTION, BY SECTOR



PETROLEUM OIL MIX, BY SECTOR



- **Total Transport Petroleum Consumption = 15,043 kTOE**
- **Total Road Transport Gasoline Consumption = 11,881 kTOE**

Source: DOE Planning – 2016 data

Registered Motor Vehicles

VEHICLE TYPE	NUMBER OF VEHICLES
MC/TC Motorcycle/Tricycle	5,329,770
Bus	29,794
Car	971,750
UV	1,969,351
SUV	493,223
Truck	407,357
Trailer	50,315
TOTAL	9,251,560

Source: Land Transportation Office (LTO) - 2016

Promotion of Alternative Fuels and Energy Technology

Initiative	On-Going Programs

Alternative Fuels and Energy Technology Program for the Transport Sector	• Auto-LPG for Public Utility Vehicles (PUV)
	• Electric Vehicles Program
	  • E-Trike Project
	  • Introduction of Next Generation Vehicles

Promotion of Emerging Energy Technologies	• Promotion of Emerging Energy Technologies for Agricultural, Household, Industrial & Commercial Applications • Partnership with State Universities, DOST & other Research Institution

Promotion of Auto LPG Program

Use of AutoLPG in Public Utility Vehicles

GOAL:

Enhance energy supply security in the transport sector through fuel diversification using LPG as a clean alternative fuel for transport

Objectives:

1. Promote the use of LPG as a clean alternative fuel for public transport
2. Harmonize and streamline government procedures in the utilization of LPG as fuel for public transport

Deliverables:

1. Monitoring of converted / retrofitted LPG vehicles in major cities
2. Harmonization of government procedures for the utilization of LPG as transport fuel
3. Conduct of tests on the use of LPG for public utility jeepneys
4. Develop and enhance inspection protocol for LPG in transport

Promotion of Auto LPG Program

Use of AutoLPG in Public Utility Vehicles

Status:

1. Total of 8,415 auto-LPG taxis and 192 dispensing stations nationwide
2. Institutionalization of AutoLPG Technical Working Group for the harmonization of AutoLPG related government policies and guidelines through a Joint Administrative Order
3. Integration of AutoLPG Technician Vocational Course in State Universities offering automotive course
4. Entered into cooperation with DILG-BFP for the formulation of emergency response protocol for alternative fuel vehicles
5. Completed the conduct of Phase 2 of on-road and laboratory performance testing for AutoLPG Jeepneys
6. Partnership with Isabela State University on the use of LPG in farm implements
7. Review and update of applicable AutoLPG standards for transport

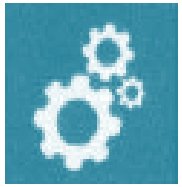
Electric Vehicles P

The E-Trike Project

Re-Branding the Philippine Tricycle

1. LGU LOCAL PUBLIC TRANSPORT ROUTE PLANNING

- Alignment of Local Transport Planning with the Local Public Transport Route Planning as required under Transport Modernization Program



2. TRICYCLE MODERNIZATION

- Introduction of high quality, energy efficient, elderly & PWD accessible and environment friendly electric tricycles with warranty and after sales support

3. FINANCING TRICYCLE MODERNIZATION

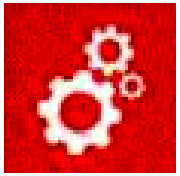
- Accessible loans which features ***no down payment, low interest rate and long payment period***

The E-Trike Project

Re-Branding the Philippine Tricycle

4. VEHICLE USEFUL LIFE PROGRAM

- Improvement in electric tricycle quality (accreditation in MAIDS) and provision for Scrappage Program for Internal Combustion Engine (ICE) tricycles



5. PILOT IMPLEMENTATION

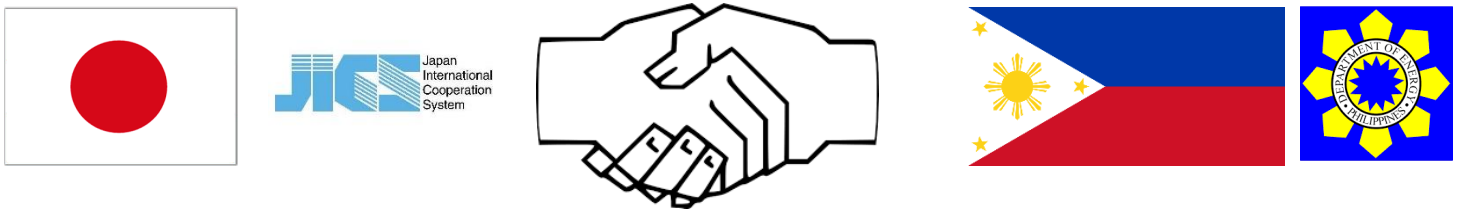
- Accelerate local adaption of next generation electric tricycle through the commercial deployment of 3,000 units for selected LGUs in NCR, Region IV-A and IV-B

6. STAKEHOLDER SUPPORT MECHANISM

- Community empowerment through gender sensitive trainings, and enhanced livelihood to stimulate local socio-economic development

Promotion of Electric Vehicles

Japan Non Project Grant Aid (NPGA)



Non-Project Grant Aid (NPGA) for the Introduction of Japanese Advanced Products and Its System (Next-Generation Vehicles Package)

- JPY 500 million (PhP225 million) grant for the promotion of next-generation vehicles and infrastructure
- Provided as part of Typhoon Yolanda assistance as well as for the promotion of environment-friendly and fuel efficient vehicles

NPGA Vehicles

Type	Description
Hybrid Vehicles	• Combination of two (2) or more distinct power sources i.e., gasoline engine and electric motor • More fuel efficient @ 30 km/liter • Less emission (86g/km) vs. average gasoline powered vehicles
Plug-in Hybrid Electric Vehicles	• Power input can either be gasoline or electric • Intelligent system maximize efficiency of gasoline and electric power drive • More fuel efficient @ 45 km/liter equivalent
Electric Vehicles	• Powered by electricity through battery packs • Energy efficient @ 51.84 km/liter equivalent Zero tail-pipe emission

NPGA Vehicles

Promotion of Emerging Energy Technologies

Initiative	On-Going Programs
Promotion of Emerging Energy Technologies	**Commercial/Industrial Sector** Transport Sector • Prototyping of Original Equipment Manufactured (OEM) and Philippine National Standards (PNS) compliant AutoLPG Jeepney • Tricycle Modernization Program Non-Biomass based waste-to-energy generation • Collaboration with international technology provider for pilot technology demonstration **Household Sector** Non-wood based fuel for domestic cooking • Collaboration with Central Mindanao University for the identification and characterization of grass-based fuel for use in domestic cook stove **Agriculture** • Collaboration with Isabela State University for the prototyping and demonstration on the use of LPG in agricultural machineries

Policies and Issuances

Existing Alternative Fuels and Energy Technologies

Existing Policies/Issuances	Description
1. Joint Administrative Order No. 1 Series 2016	• Establishment/Creation of the Technical Working Group (TWG) on the use of LPG as fuel for public transport and for other related purposes
2. Special Order No. SO2017-04-0026 Creation of an Ad hoc Technical Working Group (TWG) on the Reclassification System of Fuel Retail Outlets to Include Installation of Electric Vehicle (EV) Charging Stations	• Establishment of an Ad Hoc TWG to study technical viability of setting up EV charging stations in fuel retail
3. AutoLPG-related Philippine National Standards (PNS)	
4. DOST's Harmonized National R&D Agenda	

Policies and Issuances

Alternative Fuels and Energy Technologies		
Under Development	**Description**	**Status**
1. Joint DOE and DBM Budget Circular for the procurement of AFVs by NGAs, LGUs and GOCCs	• Mandates that 10% of total service fleet of NGAs, LGUs and GOCCs shall use more energy efficient and environment-friendly such as EVs, AutoLPG and natural gas, as applicable	• Ongoing
2. Updating of PNS 05:1983	• Code of Practice on the Use of LPG as Fuel for Internal Combustion Engines (ICE)	• For finalization of the draft update
3. Legislative Issuances for AFVs	• to provide fiscal and non-fiscal incentives for AFVs	

Policies and Issuances

Alternative Fuels and Energy Technologies		
Under Development	**Description**	**Status**
4. Development and Establishment of Charging Station to Promote the Deployment of Electric Vehicles Integration of EV Charging Station with Existing Fuel Retail Outlets	• Formulate and recommend policies on EV charging	• Ongoing
5. Protocol for Minimum Energy Performance (MEP) Certification for Charging Equipment	• Certification Guidelines on the Necessary Equipment for Charging Infrastructures	• On-going review and collaboration with DOST-PCIEERD
6. Policy/Guidelines for Certification of Charging Station	• Certification Guidelines to set-up EV Charging Stations	• On-going review

Policies and Issuances

Alternative Fuels and Energy Technologies		
For Development	**Description**	**Status**
7. Certification for Tax Exemption of AFVs under RA 10963	• Excise Tax exemption of hybrid and pure electric vehicles	Ongoing

Thank You!

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