



Philippines: Market Transformation through Introduction of Energy-Efficient Electric Vehicles Project

Project Name	Market Transformation through Introduction of Energy-Efficient Electric Vehicles Project
Project Number	43207-013
Country	Philippines
Project Status	Active
Project Type / Modality of Assistance	Grant Loan
Source of Funding / Amount	Grant 0326-PHI: Market Transformation Through Introduction of Energy-Efficient Electric Vehicles Clean Technology Fund US\$ 5.00 million Loan 2964-PHI: Market Transformation through Introduction of Energy-Efficient Electric Vehicles Project Ordinary capital resources US\$ 300.00 million Loan 8261-PHI: Market Transformation Through Introduction of Energy-Efficient Electric Vehicles Clean Technology Fund US\$ 100.00 million
Strategic Agendas	Environmentally sustainable growth Inclusive economic growth
Drivers of Change	Governance and capacity development Partnerships
Sector / Subsector	Energy - Energy efficiency and conservation Transport - Transport policies and institutional development
Gender Equity and Mainstreaming	Some gender elements
Description	<p>Energy efficient electric vehicles are a new technology with the promise to transform the way energy is used by today's internal combustion engine (ICE) vehicles. For net energy importing countries, such as the Philippines, electric vehicles can dramatically reduce the country's dependence on imported energy resources, which in turn will reduce short term price volatility and improve long term energy security. This technology has also created the opportunity to transition into an environment, where vehicles no longer generate harmful air and noise pollution and can be powered by indigenous renewable energy resources such as solar, hydropower or geothermal.</p> <p>In April 2011, ADB successfully introduced, as a pilot project in the City of Mandaluyong , Philippines, a basic form of locally made electric vehicles, 20 electric tricycles (e-Trikes) with lithium ion batteries. The project will build on lessons from the pilot and scale-up for the entire Philippines and transform the sector, enabling eventual replacement of the current inefficient ICE tricycles. The proposed project will also generate local employment by establishing new associated electric vehicle support industries in the Philippines.</p>

Project Rationale and
Linkage to
Country/Regional Strategy

Energy importing countries around the world are taking policy measures to improve energy security, largely due to global concern over heightened competition for depleting energy resources, price volatility and growing demand. Many countries are planning to introduce electric vehicles as a strategy to tackle energy security, for example, in Israel, the government has committed to go 100% electric by 2020 and created generous policy incentives for it. President Obama has also set the target of putting one million electric cars on the road by 2015 and his government have provided up to \$7,500 rebate per vehicle. UK, Australia, Ireland, Japan, Singapore and many other countries have pro-active policies promoting electric vehicles. According to the International Energy Agency's Technology Roadmap, the current announced policies of the 17 countries will require seven million electric vehicles by 2020. Accounting for the total energy consumed from well to wheel, electric vehicles can reduce energy consumption by up to 50% and greenhouse gas emissions by up to 60% compared to internal combustion engine (ICE) vehicles. Electric vehicles will also reduce greenhouse gases and other harmful emissions because: (i) electric vehicles use no electricity while stranded in traffic jams (no air conditioning), (ii) electric motors have higher efficiencies than internal combustion engines, and (iii) transmission and distribution of electricity is more efficient and cost effective than transportation of liquid fuels to the end user.

In 2010, the Philippines spent approximately \$8.78 billion on imported oil, 39% more than in 2009, mainly because of higher volume and rising prices. Preliminary modeling suggests that if Philippines targets only about 7% electric vehicle penetration by 2015 and 15% by 2030, the country can reduce fuel import by about 6% in 2015, 13% in 2020 and more than 40% by 2030. This will be accompanied by greenhouse gas reduction and other economic benefits. The Government is working on an electric vehicle policy, which among others, will exempt importation of all electric and vehicle from taxes for 9 years. In addition there will be other incentives to set up electric vehicle businesses in the Philippines. Apart from introducing electric tricycles (e-Trikes) with lithium ion batteries, because of its scale, the project will also transform the tricycle industry of the Philippines from a nascent industry with less than six suppliers capable of locally manufacturing functioning electric tricycles to a mature industry with production capacity of more than 3,000 units a month.

The Philippine tricycles are unique because they run on imported gasoline, operate across the country, and although most of them may fail basic international safety standards, they remain the main form of transport in many cities. The proposed transformation will permanently change the market dynamics by increasing energy conversion efficiency and switch from imported fuel, reduce environmental impact (noise and air pollution, greenhouse gas emissions), increase driver income (reduced cost of maintenance and cost of fuel) and create new employment in manufacturing (local assembly with some imported parts). The passengers will benefit from better service (improved comfort and safety standards) with the same fare, as e-Trikes will not increase operation cost. In the longer term, however, with lower operation cost and with growing competition, prices are likely to be lower.

Transformation will introduce lithium ion battery technology for electric vehicles and improve (in some cases establish) safety and efficiency standards. Transformation will change the way risks are being allocated in the industry: through battery leasing mechanism with minimum 3-year or more warranty on batteries, tricycle drivers, suppliers and retailers will not be exposed to the risk of a faulty battery as they are unable to manage technology risks. One of the main lessons from the 20-units Mandaluyong pilot is that battery manufacturers are best placed to manage the risk of poor performing batteries. From the environmental perspective, this project will also reduce the risk of re-introduction of lead into the transport sector: because of unleaded fuels, the transport sector is currently free from lead pollution however, the possibility of using lead acid batteries and its improper disposal poses the risk of reintroducing lead in the environment, especially in rivers and ground waters. With the Peoples Republic of China's targeted crackdown on heavy metal pollution by the lead acid battery industry, the Philippines may see large volumes of import of substandard tricycles with poor quality lead acid batteries. This may add to existing concerns on illegal smelting of lead acid batteries in the Philippines.

The Government of the Philippines has decided to capitalize on this early-adopters opportunity to attract large reputable battery manufacturers in the country and establish local manufacturing capability for e-Trikes. As the first developing country taking this initiative to develop locally designed and produced e-Trikes retailing for about \$6,000, it will also create a potential export market to the other ASEAN countries.

Without the government leading, the transformation cannot happen because reputable global electric car (and battery) manufacturers are focused on bringing in the early adopter's family car (Nissan Leaf, Chevy Volt and Toyota Prius) with prices ranging from \$40,000 to \$50,000 mainly for markets in Europe, United States, and Australia, where the governments are providing subsidies for electric vehicles. With policy support from governments around the world, electric vehicles have made significant leaps forward and are driving societal changes. Multi-donor concessional trust funds like the Clean Technology Fund (CTF) are also supporting these changes which have resources amounting to more than \$4 billion pledged by major donors such as Australia, France, Germany, Japan, Spain, Sweden, United Kingdom, and United States. In December 2009, the Trust Fund Committee for the CTF endorsed the Philippine Country Investment Plan with the goal of reducing emissions levels by about 3 million tons of CO₂e/year. CTF funds will be used to buy down the cost of this transformation.

The proposed project will be the foundation for implementing the Government's Fueling Sustainable Transport Program and the Alternative Fuel Vehicles Incentives Act of 2011. The promotion of new technology and energy efficient transportation solutions is part of the core lending strategy of the Assessment Strategy and Roadmap for the Philippine energy sector, and the program is in the Country Operations Business Plan (COBP, 2010-2012).

Impact

Sustainable energy use by transport sector

Project Outcome

Description of Outcome	Transformation of the public transportation through large-scale adoption of energy efficient electric vehicles, in particular e-Trikes
Progress Toward Outcome	Package 1 for the supply and delivery of 3,000 electric tricycle units has been awarded with delivery expected within the year 2016.

Implementation Progress

Description of Project Outputs	<ol style="list-style-type: none"> 1. E-trike units Complete e-Trike units delivered to LGUs with at least standard 3-year warrantee 2. Battery supply chain Lithium-ion battery supply chain, including support infrastructure, created 3. Solar charging stations Solar and other charging stations available in selected areas to meet the public charging needs 4. Material recovery Collection of used batteries and old ICE tricycles: (i) recycling of lithium-ion batteries and (ii) body disposal 5. Communication, Social Mobilization and Technology Transfer
Status of Implementation Progress (Outputs, Activities, and Issues)	The first procurement package for 3,000 e-trike units has been awarded, and distribution is planned for late 2016. Bidding for solar charging stations will be undertaken based on final distribution plans for the first e-trike units, based on the requirements and resource availability of the target deployment locations. An overall framework will be developed on proper handling of the old tricycles and used batteries to be adapted by the LGUs and other participating entities. Trainings will be conducted ahead of the delivery of the e-trike units to the respective areas of implementation.
Geographical Location	

Safeguard Categories

Environment	C
Involuntary Resettlement	C
Indigenous Peoples	C

Summary of Environmental and Social Aspects

Environmental Aspects	The project is categorized as C for environment. The e-trikes will have no tailpipe emissions and no engine noise. Because the project is classified as category C, no separate environmental assessment will be required, although environmental implications need to be reviewed. According to ADB's publication on electric bikes, lead pollution is an inherent problem with e-vehicles, and electric bikes with lead-acid batteries will increase overall pollution rates more than ICE motorcycles. Lithium-ion batteries, however, are not an environmental hazard, but are classified by the Government of the United States as nonhazardous waste, and are safe for disposal in the normal municipal waste stream.
Involuntary Resettlement	The project is categorized as C for involuntary resettlement.
Indigenous Peoples	The project is categorized as C for indigenous peoples.

Stakeholder Communication, Participation, and Consultation

During Project Design	A series of industry meetings among industry players coupled with formal meetings and workshops among various stakeholders including international electric vehicle experts, battery manufacturers, local government units and government agencies have been initiated to ensure local buy-in throughout the project preparatory process. These meetings have helped in building community awareness and addressing industry, community and driver concerns.
During Project Implementation	A local e-Trike manufacturing and supply industry will be created targeting multiple levels of the value chain: e-Trike assembly, lithium ion battery assembly, lithium ion battery leasing, charging station assembly, and overall leasing or banking operation. Communication strategies will include: <ol style="list-style-type: none"> (i) Development of an e-Trike website with information regarding the project and notification of opportunities to bid; (ii) Informal industry meetings to answer questions throughout the process; (iii) More formal meetings to engage stakeholders, introduce potential partners, and maintain an open dialogue with the industry; and (iv) Development of promotion materials on electric tricycles, lithium battery technology. Consultative workshops and other consensus building activities may be planned on an as-needed basis.

Business Opportunities

Consulting Services	The Project has recruited a project implementation consulting (PIC) firm with 9 months international and 79 months national inputs under the Quality and Cost-Based Selection (QCBS) method. The contract was awarded in February 2016.
Procurement	The procurement of assembled vehicles with associated warranty and support services has two phases: (i) Industry development phase (20,000 units) and the (ii) Scale-up phase (80,000 units) using International Competitive Bidding. The first package covering the supply and delivery of the first 3,000 e-trike units was awarded in February 2016.

Responsible Staff

Responsible ADB Officer	Cowlin, Shannon C.
Responsible ADB Department	Southeast Asia Department
Responsible ADB Division	Energy Division, SERD
Executing Agencies	<i>Department of Energy PNPC Complex Merritt Road, Fort Bonifacio Makati, Metro Manila</i>

Timetable

Concept Clearance	16 Dec 2010
Fact Finding	31 Aug 2011 to 08 Sep 2011
MRM	25 Oct 2011
Approval	11 Dec 2012
Last Review Mission	-
Last PDS Update	07 Sep 2016

Grant 0326-PHI

Milestones					
Approval	Signing Date	Effectivity Date	Closing		
			Original	Revised	Actual
11 Dec 2012	27 Sep 2013	13 Dec 2013	30 Jun 2018	-	-

Financing Plan			Grant Utilization			
	Total (Amount in US\$ million)		Date	ADB	Others	Net Percentage
Project Cost	5.00		Cumulative Contract Awards			
ADB	0.00		11 Dec 2012	0.00	0.36	7%
Counterpart	0.00		Cumulative Disbursements			
Cofinancing	5.00		11 Dec 2012	0.00	0.23	5%

Loan 2964-PHI

Milestones					
Approval	Signing Date	Effectivity Date	Closing		
			Original	Revised	Actual
11 Dec 2012	27 Sep 2013	13 Dec 2013	30 Jun 2018	-	-

Financing Plan			Loan Utilization			
	Total (Amount in US\$ million)		Date	ADB	Others	Net Percentage
Project Cost	399.00		Cumulative Contract Awards			
ADB	300.00		11 Dec 2012	23.13	0.00	8%
Counterpart	99.00		Cumulative Disbursements			

Cofinancing		0.00	11 Dec 2012	1.34	0.00	0%
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Loan 8261-PHI

Milestones					
Approval	Signing Date	Effectivity Date	Closing		
			Original	Revised	Actual
11 Dec 2012	27 Sep 2013	13 Dec 2013	30 Jun 2018	-	-

Financing Plan		Loan Utilization			
	Total (Amount in US\$ million)	Date	ADB	Others	Net Percentage
Project Cost	100.00	Cumulative Contract Awards			
ADB	0.00	11 Dec 2012	0.00	8.30	8%
Counterpart	0.00	Cumulative Disbursements			
Cofinancing	100.00	11 Dec 2012	0.00	0.00	0%

Project Page <https://www.adb.org/projects/43207-013/main>

Request for Information <http://www.adb.org/forms/request-information-form?subject=43207-013>

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