UNIVERSITY OF TECHNOLOGY, JAMAICA
Caribbean Sustainable Energy & Innovation Institute

UNEP-GFEI: Jamaica Country Project Brief

PROJECT OVERVIEW

The objective of the UNEP-Global Fuel Economy Initiative (GFEI): Jamaica Country Project is to encourage the use of vehicle policies, to strategize and transform the transport sector in developing countries. The aim to help these transport sectors become more sustainable, with low emissions by acquiring more fuel efficient vehicles, which will improve public health, given the reduction in Green House Gas (GHG) emissions.

The three core activities of the GFEI are:
1. Data and research analysis of fuel economy potentials by country;
2. In-country capacity-building support for national and regional policy-making efforts;
3. Outreach and awareness campaigns raising to stakeholders (e.g. vehicle manufacturers)

The GFEI has set a target of 4.2 lge1/100 km for new vehicle fuel economy in the year 2030. Given that the average global fuel economy in 2013 was 7.1 (litres per gallon equivalent (lge) lge/100 km there has to be a decided improvement rate, as different countries begin at varying starting points, achieving the GFEI target can require either more or less ambitious improvement rates. The aim of this phase of the project is to establish a marker from which we can evaluate our current state and delineate actions to move forward.

From the Baseline-setting exercise we will obtain information on the weighted average fuel economy of newly registered cars that will be used to evaluate the status quo, define future average fuel economy targets and measure progress of weighted average fuel economy of newly registered light duty vehicles (LDVs). Information from the baseline will then be utilized in subsequent analysis, using the Fuel Economy Policies Implementation Tool (FEPIT). The purpose of FEPIT is to provide a simple medium for estimating the impact of some policy measures on the average fuel economy of newly registered cars.

Objectives:
1. To establish a National Auto Fuel Economy Database in Microsoft Excel, with clean data sets for 2005, and at least four subsequent years, average vehicle stock fuel economy calculated according to established GFEI methodology.
2. To create an enabling environment that will lead to the development and implementation of cleaner and more efficient national fuel economy and vehicle policies in Jamaica
3. Identifying appropriate policy measures to reach the fuel economy target
4. Quantifying the policy impact in terms of estimated fuel economy improvements

Output(s):
- Comprehensive data to measure and track vehicle population profiles over the years
- Recommendations to improve the fuel economy
- Representation of current vehicle fleet status and the level of emissions
- Scenarios for the successful implementation of policy measures

- Increased awareness about vehicle emissions

Targeted Outcomes
- Improved fuel economy
- Reduced emission from light duty vehicles
- Accepted policy recommendations to regulate and promote the use of more fuel efficient vehicles

ACHIEVEMENTS

Developing Database

- **Calculation of Average Fuel Economy and Emissions by Year**

To create the database the team ascertained the total number of new vehicle imports or first-time registration within a particular year – data retrieved from the Tax Administration of Jamaica (TAJ). Algorithms were written to get the data in a useable format. Emissions data and fuel economy data were retrieved from online sources. Guidelines for the baseline setting were provided by the United Nations Environment Programme (UNEP) consultants assigned to the project.

Minimum Required Data

The minimum required data comprised information necessary for the calculation of the average weighted fuel economy of newly registered cars for at least one historic year, categorize as follows:

- **Number of newly registered vehicles by:**
  1. Vehicle make (e.g. Toyota)
  2. Vehicle model (e.g. Corolla)
  3. Model production year – important for used imports (e.g. 2007)
  4. Engine displacement (e.g. 1,800 cm or 1.8 litres)
  5. Engine power (e.g. 80 kW)
  6. Fuel type (e.g. gasoline, diesel, LPG, CNG, electric)
  7. Rated fuel economy lge/100km) or specific carbon emissions per km (gCO_2 per km) and the respective test cycle basis (New European Driving Cycle (NEDC), Corporate Average Fuel Economy (CAFÉ) / Federal Test Procedure (FTP), JC08)

Key Activities

- **Cleaning of the Data** – the data was cleaned by the manipulation of records in excel spreadsheets to clarify and define all variables, such as:

  1. Correcting inconsistencies in CC ratings, vehicle make and models
  2. Correcting duplication and vehicle classification
  3. Grouping and counting of records
  4. Correcting Spelling Errors

- **Inputting of CO_2 Emission Values** – This included finding and populating Excel spreadsheets with CO_2 emissions for each vehicle make, based on the Corporate Average Fuel Economy (CAFE) or New European Driving Cycle (NEDC) standards for testing. The agreed testing regime for this exercise was the NEDC. The CO_2 emissions value that were found to have used the CAFÉ testing cycle, were normalized using the test cycle conversion tool provided by UNEP-GFEI consultants. Vehicles for which emission values could not be ascertained were omitted from the calculations.

- **Calculation of Average Fuel Economy and Emissions by Year** – By applying standardized formulas, we were able to determine comparable averages for the following:

  1. Emissions (g CO2/km NEDC)
  2. Weighted emission average (gCO_2/km NEDC)
  3. Fuel economy (mpg NEDC)
  4. Fuel economy (lge/100km)

Once fuel economy data is available for at least 85% of the newly registered vehicles, the weighted average fuel economy was calculated.

Table 1: Key project milestones and activities

Id	Description	Who	Scheduled Start	Scheduled Finish
1	Preparation of baseline year (2005)	UTech, Ja	Aug 2015	Oct 2015
2	Preparation of subsequent years (2008, 2010, 2012, 2014)	UTech, Ja	Oct 2015	Mar 2016
3	Review of draft database after submission.	UNEP, Baseline setting team	Apr 2016	Apr 2016
4	Training – Use of FEPIT	UNEP	Apr 2016	Apr 2016
5	Correction and revision based on feedback	UTech, Ja	Apr 2016	Jun 2016

Data Management and Quality Control Issues

During the exercise the local project team has had virtual consultations and meetings with our UNEP-GFEI consultants from Chile, Costa Rica and the International Energy Agency (IEA). The consultants provided expert advice to resolve challenges experienced in developing the database and made recommendations for its improvement. Some of the issues identified in the process affected satisfying the required GFEI standards.

A major challenge was identifying credible data sources and getting plausible emissions data to populate the database. This was particularly difficult because the information had to be retrieved from different sources, some of which did not contain the full information. The consultants also assisted in guiding the team to trustworthy sources of information links and resources to support project work. As stated before similar projects were done in Chile and Costa Rica and the consultants provided information based on the databases developed from these examples.

Local Stakeholders and Partners

- Ministry of Economic Growth and Job Creation
- Ministry of Science, Energy and Technology (MSET)
- Jamaica Automobile Association (JAA)
- Tax Administration of Jamaica (TAJ)

Summary of Preliminary Findings

Table 2: Summary of Preliminary Findings

	2005	2008	2010	2012	2014
Number of records	20,134	21,213	11,317	17,868	10,303
Average fuel economy MPG (NEDC)	21.13208	27.73916	29.81446	30.22177	30.51519
Average Fuel economy (mpg CAFÉ)	24.11632	30.86699	33.00247	33.41279	33.68542
Harmonic fuel economy average (mpg CAFÉ)	15.018	12.77441	10.44051	10.99888	2.415244
Fuel economy (lge/100km)	19.64	9.95	9.80	8.90	7.988366
Emissions (g CO_2/km NEDC)	288.62	221.52	199.11	198.46	191.41

The information in Table 2 provides an overview of the existing fuel economy in Jamaica based on preliminary findings. The findings show that the indicators (Average fuel economy MPG (NEDC), Fuel economy lge//100km) has been trending down over the period 2005 to 2014. The information was reviewed by an expert from UNEP and a number of suggestions and changes made, the Microsoft Excel datasets are being refined to eliminate errors and to ensure that the integrity of the data.. The information received for the year 2014 only accounts for new vehicles, other first registration vehicles are in the process of being added, following the review and correction exercise there will be a better representation of the information. The observation was made that the Fuel Economy (lge/100km) is reducing gradually after a sharp drop in 2005. Looking at the average CO_2 emissions it underlines the fact that although the quantity of cars is increasing, they more efficient. Another indication of this is shown by the increased mileage per gallon of fuel. This can be attributed to better engineering and design and improved road infrastructure; which can also positive change environmentally and economically.

Review of Existing Policies and Regulations

A review of the national fuel and air quality standards, motor vehicle emissions standards and the national transport policy is already in train. Related policies, standards and existing legislation, as well as, policy and strategy issues influencing the fuel product quality in Jamaica, were examined.

Two reports were produced:
- Report on the average vehicle fuel economy trends and recommendations for promoting fuel economy regulations in Jamaica.
- Report On Existing Legislation and Policy Recommendations on Cleaner and More Efficient Transport Fuels and Vehicles for Jamaica.

Ruth Potopsingh, PhD
Assoc. Vice President, UTech, Ja. and
UNEP-GFEI- GEF 5 Jamaica Project, Project Manager
June 22, 2016