Household Energy Consumption Survey: The Philippine Experience

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- Scope & Coverage
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- 2011 HECS Survey Questionnaire

Introduction Background

2011 Household Energy Consumption Survey

A nationwide survey that gathers information on households' utilization of fuels, supply systems and the pattern of energy use and other variables that may be useful to assess the current energy profiles of different households and communities in the Philippines.

The data collected from this survey shall provide the DOE with updated and reliable bases for an effective household energy strategy for the Philippines.



Introduction

Institutional Data Arrangements

Department of Energy

thru

- Repository of energy data and statistics, such as production, foreign trade, power generation and consumption
- Covers energy sources, such as fossil fuels (oil, coal and natural gas), renewables
 (geothermal, hydro, wind, solar, biomass)

http://www.doe.gov.ph/





• Repository of general purpose data and statistics

 Covers a wide range of sectoral data – establishment, household, employment and other socio-economic variables

http://www.census.gov.ph/

Introduction

Institutional Data Arrangements

AUTHORITY OF THE SURVEY

Information gathered by NSO are protected by law

Commonwealth Act No.591 (Section 2d) authorizes the NSO to conduct by enumeration, sampling or other methods, for statistical purposes, studies of social and economic problems in the country.

Executive Order No. 121, the Reorganization Act of the PSS, passed on January 30, 1987, declared that the NSO shall be the major statistical agency responsible for generating general purpose statistics.

National Statistics Office



- Repository of general purpose data and statistics
- Covers a wide range of sectoral data – establishment, household, employment and other socio-economic variables

http://www.census.gov.ph/

Introduction HECS Timeline



1989 – Initiative of the Office of Energy Affairs (OEA) in collaboration with the National Statistics Office (NSO); foreignassisted project sponsored by the UNDP-World Bank Energy Sector Management Program (ESMAP)

2004 – DOE project in collaboration with the NSO; as rider to the Labor Force Survey (LFS) conducted in October 2004 -first accounting of fuel consumption for transport uses in the household sector

Household Energy Consumption Survey

Objective 2011 Household Energy Consumption Survey

GENERAL OBJECTIVE

Generate comprehensive and reliable data/information and analysis on end-use energy consumption in the residential sector that is vital in the effective formulation and implementation of energy policies and programs

Objectives

2011 Household Energy Consumption Survey

PRIMARY OBJECTIVES

- To generate comprehensive and reliable data and analyze end-use energy consumption and preferences in the residential sector;
- 2. To use for formulating and implementing policies and programs that aim to improve the quality of life of the Filipinos; and
- To update the results of the HECS conducted in 2004.

Objectives

2011 Household Energy Consumption Survey

SPECIFIC OBJECTIVES

- Provide detailed information about the changing energy consumption patterns in Filipino households, as well as socio-economic conditions affecting energy use;
- 2. Establish the fuel/energy mix of the residential sector based on its energy consumption;
- 3. Determine the most energy consuming appliances, devices and equipment used for household activities;

Objectives

2011 Household Energy Consumption Survey

SPECIFIC OBJECTIVES

- Assess the current energy efficiency and conservation techniques in the residential sector vis-àvis government programs for implementation of energy consumption regulation for household appliances and equipment;
- 5. Measure and analyze the incidence of inter-fuel substitution in the households; and
- 6. Determine awareness and/or perception of the household on major energy issues (i.e. nuclear energy) and developments (energy labeling program, renewable energy, natural gas) in the energy sector.



- Sampling Frame: NSO's 2003 Master Sample (MS) for **Household Survey**
 - considers the country's 17 administrative regions, covering 79 provinces and the four (4) congressional districts of the National **Capital Region (Metro** Manila)

Multi-stage sampling design

25,500 households, or half of the nationwide Master Sample, were identified as respondents of the survey

What is a Master Sample (MS)?

- A sample from which sub-samples can be selected to serve the needs of more than one survey or survey rounds (UN-NHSCP)
- A common sample of units down to a certain stage of sample selection, from which further sampling can be done to serve individual surveys (Verma, 1991)

Sampling Frame

As in most household surveys, the 2003 MS made use of an area sample design. For this purpose, the Enumeration Area Reference File (EARF) of the 2000 Census of Population and Housing (CPH) was utilized as sampling frame. The EARF contains the number of households by enumeration area (EA) in each barangay.

This frame was used to form the primary sampling units (PSUs). With consideration of the period for which the 2003 MS will be in use, the PSUs were formed/defined as a barangay or a combination of barangays with at least 500 households.

Stratification Scheme

Stratification involves the division of the entire population into non-overlapping subgroups called strata. Prior to sample selection, the PSUs in each domain were stratified as follows:

- 1. All large PSUs were treated as separate strata and were referred to as certainty selections (Self-representing PSUs). A PSU was considered large if it has a large probability of selection.
- 2. All other PSUs were then stratified by province, highly urbanized city (HUC) and independent component city (ICC).
- 3. Within each province/HUC/ICC, the PSUs were further stratified or grouped with respect to some socio-economic variables that were related to poverty incidence. These variables were: (a) the proportion of strongly built houses (PSTRONG); (b) an indication of the proportion of households engaged in agriculture (AGRI); and (c) the per-capita income (PERCAPITA).

Sampling Design

2011 Household Energy Consumption Survey

Stratification Scheme



Sample Selection

- To have some control over the subsample size, the PSUs were selected with probability proportional to some estimated measure of size. The size measure refers to the total number of households from the 2000 CPH. Because of the wide variation in PSU sizes, PSUs with selection probabilities greater than 1 were identified and were included in the sample as certainty selections.
- At the second stage, enumeration areas (EAs) were selected within sampled PSUs, and at the third stage, housing units were selected within sampled EAs. Generally, all households in sampled housing units were enumerated, except for few cases when the number of households in a housing unit exceeds three. In which case, a sample of three households in a sampled housing unit was selected at random with equal probability.
- An EA is defined as an area with discernable boundaries within barangays, consisting of about 150 contiguous households. These EAs were identified during the 2000 CPH. A housing unit is a structurally separate and independent place of abode which, by the way it has been constructed, converted, or arranged, is intended for habitation by a household.

Sample Size

The 2003 Master Sample consists of a sample of 2,835 PSUs of which 330 were certainty PSUs and 2,505 were non-certainty PSUs. The number of households for the 2000 CPH was used as measure of size. The entire MS was divided into four sub-samples or independent replicates, such as a quarter sample contains one fourth of the PSUs found in one replicate; a half-sample contains one-half of the PSUs in two replicates.



Field Operation & Timeline

2011 Household Energy Consumption Survey



Survey Questionnaire

2011 Household Energy Consumption Survey

HECS Form 1 is a 25-page questionnaire, with 5 Major Parts:

PART I - Geographic Identification and Other Information

	HECS FORM 1 NSCB Approval No.: NSO- Expires: Reput NATIONAL STATISTICS (2011 HOUSEHOLD EN	C O N FIDE N TIALITY This survey is authorized by Commonwealth Act 591. All information obtained will be strictly held confidential. Iblic of the Philippines OFFICE and DEPARTMENT OF ENERGY ERGY CONSUMPTION SURVEY	
Geographic Identification and Other Information	PART I - A. GEOGRAPHI GEOGRAPHIC IDENTIFICATION CODES Province	Interview record Interview record	
Characteristics of the Household Head	I hereby certify that the data gathered in this of in accordance with instructions. Signature over Printed Name of D: Enumerator Accom Enumerator's Code B. CHARACTE A. Name of Household head b. Sex	Alter Male	Certification Total Number of Household members

Survey Questionnaire

2011 Household Energy Consumption Survey

- Part II. Checklist for Energy Usage
- Part III. Details of Energy Usage
 - Section A Electricity
 - Section B Petroleum Products
 - Section C Transport
 - Section D Renewable Energy Sources
 - Section E Fuel Switching
 - Section F Household Practices
 - Section G Awareness on Energy Issues
- Part IV. Family Income
- **Part V.** Housing Characteristics

Survey Questionnaire 2011 Household Energy Consumption Survey

- Reference Period: March August
 2011
- English version of the questionnaire translated into six major dialects in the country:
 - Bicolano
 - Cebuano
 - Hiligaynon
 - Ilocano
 - Tagalog
 - Waray

January	February	March		
April	May	June		
July	August	September		
October	November	December		

Survey Questionnaire 2011 Household Energy Consumption Survey

Major data items collected

- Type and quantity of energy products consumed (such as consumption of electricity, petroleum products, fuelwood, charcoal, biomass residues and other renewable energy forms)
- Average expenditure on electricity & fuel
- Energy efficiency, conservation & safety measures/practices
- Awareness on certain energy issues
- Fuel preferences
- Socio-economic conditions that may affect energy use

Household Energy Mix, by Fuel Shares Household Energy Consumption Survey (HECS)



	%Pts				
	2004	% Share	2011	% Share	Difference
Electricity	1,925	15.3%	883	11.8%	-3.5%
LPG	7,080	56.2%	3,148	42.0%	-14.2%
Kerosene	381	3.0%	84	1.1%	-1.9%
Fuelwood	2,369	18.8%	2,315	30.9%	12.1%
Charcoal	533	4.2%	730	9.7%	5.5%
Biomass Residues	299	2.4%	333	4.4%	2.1%

* For 2004, consumption is for 12 ; for 2011 consumption is for 6 months only

2019 Energy Mix, by Fuel Shares

Services Energy Mix



Household Energy Mix



Challenges and Way Forward

Challenges on the Collection of RE Data

- Availability and reliability of raw and processed data/information
- Accuracy of submitted data
- Timeliness of submission
- Monitoring of submission
- Regular conduct of sectoral surveys (HECS)
 Way Forward
- Conduct Improvement in the Methodology for RE data collection, processing and analysis
- Establishment/Development of Database for the Generation of Regional/Provincial EBT



THANK YOU!