

# TA 7798-REG: Promoting Energy Efficiency in the Pacific (Phase 2)

# Urban Household Appliance and Energy Use Survey: Port Vila & Luganville, Vanuatu (2013)

# Volume 2: Training Materials April 2013

Prepared for

THE GOVERNMENT OF VANUATU PORT VILA, VANUATU and

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by

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In collaboration with and with the support of:

Department of Energy, Mines and Minerals, Government of Vanuatu

UNDP Pacific Centre United Nations Development Programme, Suva, Fiji Department of Meteorology and Geohazards, Government of Vanuatu

Coping with Climate Change in the Pacific Islands Region Programme (SPC-GIZ CCCPIR), Energy Component GIZ GMbh, Suva, Fiji Volume 2 of the Vanuatu survey report consists of the following training materials, mainly in the form of PowerPoint<sup>®</sup> presentations.

These were prepared by Mr Thomas Lynge Jensen, Environment and Energy Specialist, UNDP Pacific Centre, Suva, Fiji based on questionnaires developed by Dr Herb Wade of PEEP2.

1) Training Workshop Agenda	2 pages
2) Introduction to Main Components of the Survey Cycle	24 slides
3) Background, Objectives and Key Deliverables	12 slides
4) Vanuatu Questionnaire Design & General Survey Pointers	16 slides
5) Detailed Walk-through of Vanuatu Survey Questionnaire	131 slides

Although volume 2 is a PDF file, the materials are available as PowerPoint presentations.

# Volume 2 Annex 1: Training Workshop Agenda

Promoting Energy Efficiency in the Pacific Phase 2 (PEEP2) Energy Household Survey Training Workshop Port Vila, Vanuatu, 19-20 & 22 March, 2013

Revised & final Draft - 18 March 2013

	<u>TIME</u>	TOPICS	PRESENTER / FACILITATOR
		DAY 1: Background, Survey Cycle, Genera	I Survey Pointers, Questionnaire
		Familiarization, Detailed Walk-through of Questionnaire a	nd Writing Survey ID Code on Questionnaires
	0800 – 0810	Introductory remarks	Jerry Lapi, PEEP2 National Coordinator
	0810 – 0830	PEEP2 Energy Household Survey – Background, Objectives & Key Deliverables	Thomas Lynge Jensen, Environment and Energy Specialist, UNDP Pacific Centre
	0830 – 0835	Presentation of workshop program	Jerry Lapi
_	0835 – 0840	Introduction to participants	All
919	0840 – 0910	Introduction to main components in the survey cycle	Thomas Lynge Jensen
лц	0910 – 0940	The Vanuatu questionnaire design and general survey pointers	Thomas Lynge Jensen
<u> </u>	0940 – 1000	Familiarization with Vanuatu survey questionnaire & visual guideline	Surveyors (individual work)
۲,	1000 – 1015	TEA BREAK	
DA	1015 – 1200	Detailed Walk-through of Vanuatu survey questionnaire including Q&A	Thomas Lynge Jensen
	1200 – 1300	LUNCH BREAK	
	1300 – 1500	Detailed Walk-through of Vanuatu survey questionnaire including Q&A continued	Thomas Lynge Jensen
	1500 – 1515	TEA BREAK	
	1515 – 1530	Writing survey ID Code on survey questionnaires	Surveyors
	1530 – 1545	Briefing surveyors on test of questionnaire in their own home overnight	Jerry Lapi & Thomas Lynge Jensen
	1545 – 1600	Summary of Day 1 and program for Day 2	Jerry Lapi & Thomas Lynge Jensen
		END OF DAY 1	

	TIME	TOPICS	PRESENTER / FACILITATOR		
		DAY 2: Use of GPS & Electricity Usage M	onitor Units, Survey Field Test,		
	Feed-back from Surveyors and Planning including Logistics for Main Survey				
Ved 2(	0830 – 0900	Surveyors feed-back from test of the questionnaire in their own home including on questionnaire	Surveyors		
-	0900 – 1000	Planning including logistics for field test	Jerry Lapi & Thomas Lynge Jensen		
DAY 2	1000 – 1015	TEA BREAK			
	1015 – 1200	Survey testing in the field	25 teams of 2 persons each		
	1200 – 1300	LUNCH BREAK			
	1300 – 1400	Feed-back from surveyors including on questionnaire and field issues			
	1400 – 1500	Survey sampling framework	Harry Nalau, Vanuatu National Statistical Office (VNSO)		
	1500 – 1600	Logistics for main survey	Jerry Lapi & Thomas Lynge Jensen		
	1600 – 1630	Summary of Day 2	Jerry Lapi & Thomas Lynge Jensen		
	END OF DAY 2				

	TIME	TOPICS	PRESENTER / FACILITATOR
<del>د</del>		DAY 3: Feed-back from Surveyors	& Mid-Survey Retraining
22 - AY	0800 - 0900	Feed-back from surveyors including on questionnaire and field issues	Surveyors
Δ.	0900 – 0955	Mid-survey re-training - survey pointers	Jerry Lapi & Thomas Lynge Jensen
	0955 – 1000	End of training workshop (and survey continues)	Jerry Lapi
END OF DAY 3 & END OF WORKSHOP			

# **Structure of Presentation**



- 1. Survey Cycle
- 2. Pre-survey Data Collection and Analysis
- 3. Selection of Units to be Surveyed
- 4. Design of Survey Format and Survey Questions
- 5. Surveyors

U N D P

- 6. Supervision
- 7. Training of Surveyors & Testing of Questionnaire & Survey Process
- 8. Actual Survey
- 9. Data Entry
- 10. Analyzing the Survey Results
- 11. References



Volume 2 Annex 2:

Introduction to Main

**Components in Survey Cycle** 

Thomas Lynge Jensen, Environment and Energy Specialist, UNDP Pacific Centre (PC)

Promoting Energy Efficiency in the Pacific Phase 2 (PEEP2)

Energy Household Survey Training Workshop Port Vila, Vanuatu 19-20 & 22 March, 2013

**United Nations Development Programme** 



- Important to collect as much Information as Possible Prior to Actual Survey
- Survey visit is often difficult and/or expensive. This information can also help in the survey design
- Important Pre-survey Information Includes
  - Access and infrastructure
  - Demographic information
  - Meteorological information
  - Geographical situation
  - Past, existing and planned projects (including agriculture, fisheries and tourism development prospects)
  - Economic information
  - Health and education
  - Governance and politics

# Selection of Units to be Surveyed



#### Selection of Survey Units to be Surveyed

- Survey Units
  - Although energy surveys are almost always of people the unit of survey maybe be several people, such as a household, rather than an individual
- No Selection Process Required
  - In some cases, no selection process is required: every unit is surveyed
- Selection Process Required
  - In many cases there are too many units, they are spread over too large area, etc and therefore only a proportion of total is surveyed
  - Goal of Good Selection Process
    - To select those to be surveyed in such a way as to end up with the same survey results as if the entire population where surveyed

# Selection of Units to be Surveyed (#2)



#### **Most Common Selection Method**

- Random selection
- Rule for small randomly based surveys
  - No less than 15% of the total numbers of units, or 20 units, which ever is larger, should be surveyed to obtain an acceptably accurate estimate of total need
    - E.g. in an island community with 40 households, 15% of them is only six, so the minimum number of 20 units should be surveyed, i.e. half (50%) of the households
    - E.g. in an island community with fewer than 20 households then all of them should be surveyed

# Selection of Units to be Surveyed (#3)



#### Selection of People to be Interviewed

#### Knowledge on Subject

- If the person being interviewed for the survey has no knowledge of the subject of the interview, the results are not going to be very useful
- Willingness to be Interviewed
  - The person/persons interviewed must not only have the information the surveyor is interested in, there must be a willingness to be interviewed. E.g. the time of the day maybe make a difference
- Direct Survey
  - Cons: Probably the biggest problem with a survey of this type is being able to interview the right person in the household
  - Pros: High quality if the right person in the household is interviewed

# Selection of Units to be Surveyed (#4)



- Self-Survey
  - To provide wider coverage and additional information sometimes a self-survey is undertaken
  - Cons
    - The quality of the self-survey may not be as high as that of the direct survey
  - Pros
    - All members of the household can participate in the self-survey while the direct survey is limited to surveying those persons who happen to be home at the time of the survey visit
  - Therefore a self-survey sometimes is considered a useful supplement to the direct survey both to: a) expand the survey scope; and b) as a confirmation of the direct survey

# **Design of Survey Format and Survey Questions**



- · The Survey is no Better than the Questions Asked
  - The questions should be prepared someone/a team who has extensive knowledge of
    - The aroup being surveyed
    - The processes needed for analysis of the survey and the effect the questions have on that analysis
- It Takes Many Questions to Get One Answer
  - It is unusually not appropriate to come right out and ask that is most important to the survey
  - Instead we must ask several related questions and determine the result from the combination of answers
  - Example
    - In surveys relating to the introduction of new technology in a rural environment, the survey is often related to things few people have experienced

# **Design of Survey Format and** Survey Questions (#2)

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#### Clear

- It is important that questions be clearly worded so that little or no assistance is needed from the surveyor
- Short
  - Questions should be brief and not require elaborate directions or long written responses
- Checklist and Yes/No Responses
  - Use checklist/multiple choice or yes/no responses instead of blanks to be filled in from memory
- Actual Data
  - Though general impressions are an important part of a survey, the actual data must be in a form that is either numerical or represents a very limited choice of responses
- Use Survey Questions that has Worked Elsewhere
  - Increase the likelihood that they will work
  - Survey results can be directly compared with those of other surveys
  - Refinement are included & required
  - The organizations preparing the other surveys may be able to assist in preparing and analyzing yours

#### **Design of Survey Format and** U N D P Survey Questions (#3)

- Language
  - Enalish
    - The draft survey can be prepared in English
  - Local Language
    - The questions actually used must be in the local language. This will ensure that all questions will be asked in the same manner, which will reduce surveyor bias
    - Surveyors should not do an on site translation which can be a disaster as this increases the risk of inaccuracy in the survey
      - If each surveyor on the spot have to translate each of the questions then we are open to biases and incorrect or at least inconsistent understanding of the auestions
  - Re-translation
    - Preferably it should be translated from local language back to English to ensure that the intended meaning has been preserved



Value of Surveys

Goal

Biases

- Greatly affected by the quality of the surveyors
- Thus getting good, reliable and honest surveyors is critical
- Basic Skills Required in Surveyors
  - Language, decent ability to communicate, patience and attention to detail
  - Require little in the way of special technical skills

# **Supervision**



- A Need for Close Supervision
  - The value of a survey is also greatly affected by the guality of the supervision of the surveyors
    - The survey supervisor will make or break a survey and should be chosen carefully
  - The supervisor preferably should have already worked on a survey team, understand survey methodology and especially be honest and trustworthy
- **Onsite Survey Supervisor** 
  - **Overall Purpose** 
    - To be in charge of the survey teams
    - Main Tasks
    - Tour the survey area to ensure the surveyors are in fact working in the right area and that there are no particular problems to be solved
    - Check (e.g. each evening) every questionnaire for
    - Wildly varying responses between respondents who are obviously • similar
    - Notable differences in the number of people questioned by the • different surveyors
    - Very consistent responses to questions asked by particular surveyors compared to the consistency of responses found by other surveyors

# Supervision (#2)



- Questions that are consistently left unanswered or answered by the equivalent of "I don't know' indicate a problem with that questions
- Ensure that the surveyors correct any obvious errors and that all answer boxes have an entry
- External Survey Backup
  - If required an external person/team can oversee the survey through e-mail interaction with the local Survey Supervisor to assist in problem solving and to help keep the survey process on track
  - This "external/off-site survey supervision" process has been used successfully for other Pacific Island energy surveys (though its success obviously is dependent on the experience and communication skills of on-site supervisory personnel)

#### **Training of Surveyors & Testing of Questionnaire & Survey Process** UN DP

- A Problem We Want to Avoid
- If the surveyors start off doing things incorrectly and are allowed to continue, that will be the pattern for the whole survey and the results will be tainted
- Main Purposes
- To give the surveyors: a) knowledge about the survey in guestion including specific questionnaire; and b) some survey experience
- **Training Process Should Include**
- Train to Minimize Surveyor Bias
  - Train surveyors to consistently ask the listed questions and to avoid the provision of "hints" or explanations of the questions other than those agreed upon in advance
- Small Scale Trial Surveys
  - Purpose
    - To double check that: a) the questionnaire is understandable by the respondents and the surveyors; and b) that the surveyors understand exactly what they are to do
  - Trial Surveys are Critical
    - As they will form the basis for any modification of the questionnaires and will help the surveyors more clearly understand the requirements of the survey

#### Training of Surveyors & Testing of **Questionnaire & Survey Process (#2)**



- Realistic trial surveys including debriefing from surveyors and thoroughly going over each question and the answers they are getting can be the key to a successful survey
- How Many Trial Surveys
  - As a minimum one
  - Ideally it is recommended that there be a second pair of trial surveys to further train the surveyors and test both of the questionnaires before proceeding with the full scale survey
- Timina
  - Training should be done before the questionnaire is printed in final form since after the trial survey we probably will want to make minor changes in some questions to make them clearer
- Experience for the Survey Supervisor
  - In the logistics of the survey and in the daily checking of all survey forms provided by the surveyors

# Actual Survey



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#### • Teams of Two Persons

- It is recommended that each household be visited by a team of two (2) persons, preferably a male/female team if possible
- One person asks the questions and the other write down the answers
- Although this is more expensive that a single person visit, the quality of the results is highly likely to be substantially improved
- Use Same Survey Team and Supervisor for all Interviews
- From the point of view of survey quality it is always better to use the same team and supervisor for all interviews so there is consistency and surveyor biases (where they exist) can be more easily identified and adjusted for
- The only real disadvantage of using a single team is calendar time for the survey
- Break-up Survey
  - The survey does not have to be done as a continuous exercise, in fact it
    may be more efficient if broken up into geographic regions with some
    rest time between trips to the field. If the survey is too long, surveyors
    get tired (and maybe start filling in the blanks on their own just to get it
    over with!)

# Actual Survey (#2)



#### Delays

- Based on past experience under similar conditions, it is likely that unforeseen delays in the survey process or in other tasks will extend the total time needed
- Projects like this are often extended since it is very difficult to predict their time needs

#### Logistics

- Usually surveys are not difficult technically, more often they are problems in logistics more than anything else
  - Somehow the surveyors have to get to the survey site, the houses that each will survey have to be identified, arrangements have to be made for lunches (and sometimes sleeping), etc.

# **Data Entry**

#### Timing

- If the data entry can be done as the survey is proceeding this would ideal since by doing that the data will be all entered almost as soon as the field work is over. However many times this is not possible (manpower, logistically, etc)
- Whom
  - Often clerical or office staff will do a better job of data entry than the surveyors (unless the individuals happen to be good with computers and typing). However the surveyors may be the best choice for checking data entry
- Data Entry Template
- Format
  - Both questionnaires and data entry form should be designed for ease of data entry and accuracy of entry. That means that:
    - Each question needs to have the answers all in the same location on the page,
    - Few questions require more than one character for the data entry (multiple choice type questions)
    - Have an alphabetical entry every 5-10 questions as this can make data entry easier and more accurate;
    - Data entry forms follow exactly the sequence of the questionnaire;
    - Data entry forms do not allow an entry that is not one of the accepted characters
- Software
  - Often done in Excel

# Data Entry (#2)



#### - Language

- No critical need to translate an of the data entry sheets from English into local language. The questions are numbered and that is sufficient to be sure the data is being entered in the right place
- Data Entry Validation
  - Data has to be checked for every questionnaire entered
  - Much preferably all entries should be checked by a second person against the original form
    - It does not work well if the person who does the data entry also does the checking
  - Ideally the data should be entered twice then have a computer compare the two, but many times that is not reasonable/feasible to do
  - Besides doing a second data entry, the fastest accurate way to do that seems to be through one person reading off the entries in the computer and the other checking the questionnaire (though one person certainly can perform the whole process if the forms are well laid out and the person familiar with computer data entry)
- Time
  - For data entry and checking it is reasonable to assume about 15 minutes per household
  - But this requires that the questionnaires and data entry form are laid out for ease of data entry and accuracy of entry

# Analyzing the Survey Results



- As Much as Possible Analysis Should be Done when in the Field
  - So that if there are problems with specific parts of the survey they can be redone or at least the reasons for the problems can be determined

#### Key Components

- Checking for Questionable Data
  - Locate questionable data and set aside for special study why is the data so unusual?
  - Data should not be discarded, but noted
  - In a good survey should not be more than 10% of the total collected
- Correlating Responses
- Determining Survey Quality
  - The quality of a survey determine what level of importance its results should have (e.g. in project decisions)

# Analyzing the Survey Results (#2)

- Indicator of high quality data
  - Clustering of data: quality data tends to be clustered

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- Results should not vary among surveyors
- Selection of survey sample
- Experience with the survey format: quality of surveys increases with the number of surveys carried out using that format
  - » A new survey format usually results in lower quality data
- Presenting the Data in usable Form
  - The two most common formats are tubular and graphical

# References

# O N D P

orect

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  - Energy User Needs Assessment through Energy Site Surveys, Experiences from a Recent Energy Survey in Samoa and Introduction to the RMI Questionnaires, 18 July 2008
  - Energy User Needs Assessment through Energy Site Surveys, Energy Survey Training Workshop, Majuro, Marshall Islands, 24-25 June 2008
- UNESCO, Solar Photovoltaic Project Development, 2003
- Wade, Herbert A.
  - Personal communication
  - Inception Note Preparatory Phase for the Samoa Photovoltaic (PV) Electrification Programme, 20 January 2008
  - De-briefing Note Preparatory Phase for the Samoa Photovoltaic (PV) Electrification Programme, 6 February 2008



Volume 2 Annex 3: DP PEEP2 Energy Household Survey – Background, Objectives & Key Deliverables

Thomas Lynge Jensen, Environment and Energy Specialist, UNDP Pacific Centre (PC)

Promoting Energy Efficiency in the Pacific Phase 2 (PEEP2) Energy Household Survey Training Workshop Port Vila, Vanuatu 19-20 & 22 March, 2013

**United Nations Development Programme** 

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# **Structure of Presentation**

- UN DP
- 1. Promoting Energy Efficiency in the Pacific (PEEP) Phase 2
- 2. PEEP2 Surveys
- 3. PEEP2 Residential Survey in Vanuatu
- 4. Acknowledgement
- 5. References

# Promoting Energy Efficiency in the Pacific Phase 2

- Expected Impact
  - Reduction in fossil fuel use by the power sector without a corresponding reduction in energy services in the participating countries
- Expected Outcome
  - End consumers use power efficiently in the participating countries
- Implementation Period
  - Three-years (2012-2014)
- Participating Countries
- Cook Islands, PNG, Samoa, Tonga, and Vanuatu
- Technical Assistance Consultants
  - International Institute for Energy Conservation (IIEC), Thailand
- Budget
  - US\$12,421,545
- Funding
  - Asian Development Bank (ADB), Global Environment Facility (GEF) and the Government of Australia

# Promoting Energy Efficiency in the Pacific Phase 2 (#2)

- Project Components
- Develop Energy Use Databases
- Develop EE Policies & Procedures
- Implement EE Programs
- Information Dissemination and Public Awareness
- Expected Outputs
  - Stakeholder access to comprehensive information on energy use
  - Energy efficiency practices mainstreamed into government policies and procedures
  - Energy efficiency programs implemented effectively and sustainably
  - Information dissemination and improved public awareness

# Promoting Energy Efficiency in the Pacific Phase 2 (#3)



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- Energy Database Key Activities
  - Review data collected in PEEP Phase 1
  - Conduct in-country surveys
  - Design & develop energy end-use database
  - Populate, update and maintain database
  - Train stakeholders

# **PEEP2 Surveys**



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- Sectors Covered
- Residential
- Commercial
- Public/Government
- Overall Survey Objectives
  - Complement national and regional statistical data
    - Such as energy consumption by sector and types of electrical equipment used in each PDMC
  - Help establish an energy baseline
  - Determine potential energy savings and energy efficiency targets for each PDMC
    - These targets could then be monitored and assessed against the baseline
  - Assists in gathering stakeholder interest and determining potential energy efficiency projects for PEEP2

# PEEP2 Residential Survey in Vanuatu

- Objectives
  - Determinate which electrical appliances are major users of energy and have the most potential for efficiency improvements
  - Fill-in some of the key data gaps in an accurate and statistically relevant manner
- Key Information Needed
  - The use pattern of electrical appliances and their characteristics (age, size, manufacturer, etc.)
- Key Actions that will Result from the Survey
  - At residential level develop and implement programs improving energy efficiency
    - Likewise determining which electrical appliances use so little energy that the cost of doing projects to improve their energy efficiency would not be very cost effective
- Focus
  - Residences in urban areas, i.e. Port Vila and Luganville
  - Efficiency of electrical use, i.e. not looking at general energy issues
  - It is relatively quick and easy to survey for hard data (appliance type, age, model, usage, etc.). Allows the maximum number of respondents in the time available

# PEEP2 Residential Survey in Vanuatu (#2)

- Sample Size
  - Port Vila = at least 1,000 households
  - Luganville = 300 households or more
- Key Deliverables
  - Questionnaire
  - Training Workshop program
  - Training materials
  - Survey questionnaire manual
  - Data entry template
  - Survey report including survey analysis, results & recommendations

# PEEP2 Residential Survey in Vanuatu (#3)



- Budget
  - US\$30,149
- Funding
  - PEEP2 = US\$24,149
  - Deutsche Gesellschaft f
    ür Internationale Zusammenarbeit (GIZ) = US\$6,000
  - In-kind contributions
    - UNDP (technical assistance)
    - Vanuatu Department of Meteorology & Geohazards, Ministry of Infrastructure and Public Utilities (MIPU)

# References

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- ADB, Technical Assistance Report Promoting Energy Efficiency in the Pacific (Phase 2), Project Number: 44099 Regional—Capacity Development Technical Assistance (R-CDTA), March 2011
- Johnston, Peter, Promoting Energy Efficiency in the Pacific Phase 2 (PEEP2), Renewable Energy and Energy Efficiency Trade & Investment Forum for Papua New Guinea, the Solomon Islands and Vanuatu, SPC/EU BizClim 8-9 August 2012 Westin Denarau, Nadi, Fiji
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U N D P

# **Structure of Presentation**



- 1. Questionnaire Design
  - Introduction
  - Format
  - Questions
- 2. General Survey Pointers
- 3. References

# Questionnaire Design: Introduction

**United Nations Development Programme** 

U N D P

 The Vanuatu PEEP2 Questionnaire is based on the PEEP2 Questionnaire Developed in Tonga

Volume 2 Annex 4:

Vanuatu Questionnaire Design

and General Survey Pointers

Thomas Lynge Jensen, Environment and Energy Specialist, UNDP Pacific Centre (PC)

Promoting Energy Efficiency in the Pacific Phase 2 (PEEP2) Energy Household Survey Training Workshop Port Vila, Vanuatu 19-20 & 22 March. 2013

- Very recently a questionnaire has been prepared as part of the PEEP2 component in Tonga
- The PEEP2 questionnaire for Vanuatu are based on this, but with minor revisions
- The Tonga survey form & questionnaire again have been developed based on experiences including lessons learned from household energy surveys undertaken in other Pacific Island Countries including a UNDP supported survey undertaken in Samoa in 2007/2008 covering a total of 317 households

# Questionnaire Design: Format



- Overall Design Philosophy
  - Minimize surveyor bias and formatted to facilitate rapid and accurate data entry
- Annotated Version available in the Survey Manual
  - To assist with surveyor training as well as to provide guidance to the surveyors doing the actual survey work the survey manual include a detailed annotated version
- · Required Written in Answers is Kept to a Minimum
  - Either the question is multiple choice or a specific single number is needed for the answer

# Questionnaire Design: Format (#2)



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- The Surveyor will be Less Likely to skip a Question
  - Since all boxes have to be filled
- Frequently there is Change from a Numerical Answer to an Alphabetic Answer
  - If the data entry person gets out of sync it will be obvious within a few questions. Having an alphabetical entry every 5-10 questions can make data entry easier and more accurate
- All the Responses are Lined up Clearly in a Single Column at the right Margin
  - If answers instead were to be written all over the page this would make it difficult to follow sequentially
    - With such format it is possible that the data entry person(s) will get out of sync between the questionnaire and the entry form

# Questionnaire Design: Format (#3)



- Unique Identifiers of the Household Visited
  - In the questionnaire such things as city/urban settlement, surveyor's name, name of person interviewed, date, time, GPS location, etc. can be entered, which is very important
  - In addition on each page a unique identifier should be written so that
    - If pages get separated (and some invariably do) they can be put back in order
    - After the data entry is complete if something looks strange in the data you can locate the exact questionnaire easily to see if the problem is data entry or the questionnaire entries
  - This ID encoding will eliminate errors due to misspellings of city, urban settlement, village, island, etc. names and will allow the person doing the analysis to quickly request information from the original questionnaire should there be an apparent problem with the data

# Questionnaire Design: Questions (#2)

- The surveyor is not expected to Explain what is meant by Different Questions
  - This is much preferable since the main source of surveyor bias is that a surveyor through his/her explanations consciously or unconsciously leads the respondent to give a particular answer
- Questions are Factual
  - No questions asking for opinions or much consideration by the respondent
- Questions aim to be Unambiguous with regard to Time & Quantities
  - If a reader finds these ambiguous then it is likely that respondents will also not be sure what is wanted

# Questionnaire Design: Questions (#3)

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- Survey Questions Designed to Assist Determining the following Key Aspects
  - Household
    - Size, age composition, main source of income, etc.
  - Residence
    - Type, building materials, colors, etc.
  - Lighting
    - Types, number, wattage, location and time of use
  - Refrigeration and freezers
    - Location, size, brand, type, origin, type, condition, energy label, etc.
  - Air conditioners
    - Location, size, type, origin, condition, time of use, etc.
  - Computers
    - Location, type, origin, purpose, time of use, etc.

# Questionnaire Design: Questions (#4)



- Video/TV
  - Location, origin, time of use, etc.
- Fans
  - Location, number, wattage, location and time of use
- Microwave Ovens
  - Type of controls, time of use, wattage, etc
- Mobile phones
- Number and if charger is plugged in all the time
- Small electrical appliances
  - Types, number, wattage, and time of use
- Cooking
  - Type of fuel and time of use
- Solar water heaters
  - Type, electricl back-up heater, etc.

# **General Survey Pointers**



#### • Pointers

- Below mention a few key general pointers
- Specific pointers related to each question is available in the survey questionnaire manual (each surveyor should have a copy) as well as included in the presentation Detailed Walkthrough of Vanuatu Survey Questionnaire
- Unique Questionnaire Number/Identifier
  - Every page of each questionnaire should have the unique questionnaire number/identifier entered before the start of filling in the forms at the time of the interview
  - This includes extra pages inserted when there are multiple refrigerators, freezers, videos, computers or air-conditioners
- Clear Printed Block Letters
  - All lines on the form should be printed in clear printed block letters (i.e. no longhand!)

# **General Survey Pointers (#2)**



#### • When and Why to Enter "#"

- Name for the symbol #
- Number sign
- When?
  - If the respondent does not know the answer
  - If the respondent does not answer for some reason
  - If the question does not apply to that household
- Why?
  - The main reason for the "#" is to know that the surveyor did not skip over the question
  - It also helps in the data entry to avoid getting out of sync with the questions as often happens when there are several blank entries a row
- "Don't know" Issue
  - If the answer "Don't know" seems to be given with little thought then re-ask clearly the question. If they still answer is "don't know", then give it an "#"
  - Don't force answers but be sure the people do understand the guestion so a "don't know" is not really "don't understand"

# General Survey Pointers (#3)



#### • When to Enter "0"

- If the correct answer is "none" or "nothing", enter zero (0)
- "0" means the corresponding figure is of relevance but having magnitude of 0 level (whereas "#" indicates that they don't know, etc. which means another level of response)
- No Blank Boxes
  - When the questionnaire is complete there should be no blank boxes
- Additional Information
  - If there is additional information that needs to be recorded, write in the margin or on the back of the page that includes the question that is to be commented on
    - This additional information may be anything that the surveyor needs to be appended to the questionnaire in explanation
  - Also if additional space is needed to fill in the text type questions, that may be in the margins or on the back of the same page as the question

# **General Survey Pointers (#4)**



#### Basic Mathematical Calculations

- Based on responses some places the surveyors likely will have to undertake basic mathematical calculations (e.g. from hours of use per day to hours to use per week)
- Some Questions are to be Skipped
  - Depending on responses some questions are to be skipped as they maybe does apply to that household
  - Which questions are specified in the questionnaire
  - However remember to put an "#" in boxes that do not apply again no boxes are to be left blank!
- Consistency
  - It is critical for the survey that the questions are asked identically to each respondent and leave as little as possible in the way of ambiguity or probability of misunderstanding
  - We do not want the surveyor to have to explain the question to the respondent in his/her own words since that always introduces biases

# **General Survey Pointers (#5)**



#### No Coaching

- Do not coach or instruct beyond the basic need to tell people what is wanted
- Avoid the provision of "hints" or explanations of the questions. The answer must come entirely from the respondent
- The more the surveyor is involved in assisting, the more the answers become biased towards the surveyor's opinion instead of those of the person being interviewed
- The questionnaire has been developed in a way (by using 'yes/no', multiple-choice, etc.) that it does not require dialogue between the surveyor and the surveyed
- Accurately Record Residents' Answers to Interview Questions

# References

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#### 000 U N D P

# Volume 2 Annex 5: Detailed Walk-through of Vanuatu Survey Questionnaire

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Promoting Energy Efficiency in the Pacific Phase 2 (PEEP2) Energy Household Survey Training Workshop Port Vila, Vanuatu 19-20 & 22 March, 2013

**United Nations Development Programme** 

# **Structure of Presentation**

- Background
- Introductory Part of Questionnaire
   Q1-5
- 3. Q1-5 4. Q6-8

1.

- 5. Q9-11
- 6. Q12 7. Q13-15
- 8. Q16
- 9. Q17
- 10. Q18
- 11. Q19
- 12. Q20 13. Q21
- 14. Q22
- 15. Q23
- 16. Q24
- 17. Q25
- 18. Q26
- 19. Acknowledgement
- 20. References

# Background



- PEEP2 Tonga Survey Questionnaire Manual, March 2013
  - The manual explains each question and acceptable answers and as such is the 'bible' for the surveyors
    - Therefore each surveyor needs to have a hard copy of the manual to carry with him/her during the survey
    - Preferably the surveyors should had received a copy before this workshop began so you would have read it beforehand
  - The Detailed Walk-through of Vanuatu Survey Questionnaire is based on the Tonga survey questionnaire manual. However there are differences
    - A few questions have been added to the Vanuatu questionnaire
    - A few questions will be skipped in the Vanuatu questionnaire
    - The Tonga questionnaire is only in English
  - In case there are discrepancies between this presentation and the Tonga survey questionnaire manual this presentation will supersede

# Introductory Part



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# Introductory Part (#2)



- Surveyor Name
  - The name of the person on the team who filled in the form
- Survey ID Code
- The reason that every page must have the ID is that an accident may occur that separates the pages and having the ID on each page will be required to reassemble them for data entry
- Enumerators may need to fill in extra pages for some appliances where there are more than one in use in the residence
  - These include refrigerators, freezers, televisions, computers and airconditioners
- Any time there is more than one of any of those appliances, a loose page for that appliance will need to be filled in and the first thing for the surveyor to do is to fill in the surveyor's name and ID Code so if the page becomes separated from the main questionnaire it can be included for data entry
- GPS Coordinates
- To be skipped
- City/urban settlement
  - The name of the community/area that the house being surveyed is part of

## Introductory Part (#3)



- Survey Start Time
  - The time when the survey team arrives at the household and meets the respondent
- Survey Finish Time
  - The time when leaving the household that has been surveyed
- Survey Date
  - The date of the survey in the form dd/mm/13
- Power Meter
- Meter Number
  - Every UNELCO meter has a nameplate with a different meter number. Write in the meter number seen on the meter in this space
  - If there is more than one meter, choose the meter on the main house to list in this space
- Whether more than one household share the same meter
  - Enter Y if yes and N if no
- If Y then enter the number of households that share the same meter

# Introductory Part (#4)



#### Photo of House

- To be skipped
- Full Name of Person Interviewed
  - This is the name of the person who is being interviewed or answers most of the questions when several people are present
  - It does not have to be the head of the household, just a permanent resident of that household
- Age
  - The age of the person being interviewed. The person being interviewed must be at least 18 years old
- Gender
  - Enter M for Male and F for Female
- Telephone number
  - Request telephone number of the person being interviewed



# Q1-5 (#2)



- 1. General weather on the day of the visit
  - This question is just for general information purposes
    - If it has been dry the day of the visit and also the day and night before, enter a 1 in the data box
    - If it is dry the day of the visit but rained the day or night before, put a 2 in the data box
    - If it was raining on the day of the survey even if not at the actual time of the survey visit – enter the number 3 in the data box
- 2. How many buildings in the compound have electricity
  - Only those buildings that have had electricity connected are to be counted
    - Electrified means that there is electricity available in the building, there does not have to be an electric meter on a building for it to be considered as electrified
  - If it is only the main house, then enter 1. Increase the number for each additional separate building that has electricity
  - If two buildings are separate (no wall is common to both) but are connected by a covered walkway, the buildings still count as separate buildings and are included as 2 buildings if they are both electrified
    - However any building that has its own electric meter and is not connected to the house for electricity should not be included

## Q1-5 (#3)



#### 3. Main Building Construction

- This refers only to the main house and to the largest section of the house
- If 1/3 of the house is concrete and 2/3 wood frame construction, consider it a wood frame house. If half and half, choose either on
- Question 3a refers only to the walls of the house and Question 3b only to the roof
- Wooden Frame
  - The house is constructed mainly of wood with walls and roof structure built using mostly wood framing (though he roof cover itself may be metal or tile)
    - This means that the outside wall cover will be made of wood panels, boards, or plywood sheets
  - When the building is mostly wood frame construction, enter a W in the data box
- Concrete block
  - If the house walls are made of concrete block (or poured concrete) enter C in the question 3 data box
  - Concrete blocks are also called Concrete Masonry Units (CMU). They are mostly hollow and are factory made from concrete

# Q1-5 (#4)



- Steel Frame
  - Buildings that have steel framing and walls that are covered by steel sheeting
  - If the survey includes a steel framed home, enter the letter S in the data box
- Brick/Stone
  - If the walls are mostly of brick or stone (not concrete block, only natural stone or brick though the stones may be cut to fit tightly like concrete blocks) place a B in the data box
- Fale/coconut
  - Construction using traditional materials including thatch and woven mat wall covering and coconut log/local lumber frame
  - For this type of construction, enter an F in the data box
- Other
  - Any other type of structural materials used for most of the house
  - Write the type of materials used for the construction on the line next to the word "Other" and enter an X in the data box



- 2 = White
- 3 = Light Color any color but very pale color, often referred to as a pastel color
- 4 = Medium Color a 'standard' bright color
- 5 = Dark Color a color that is quite dark such as dark red, dark blue, dark brown or dark grey

# Q1-5 (#6)



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#### • 5. Type of Residence

- When counting storeys in the residence, if parts of the house is single storey, part is two storey and part is three storey, choose the highest number present
  - In this case 3 storeys which requires the letter M to be entered
- If two storeys the letter D
- If a single storey residence, enter the letter S
- If it is a multistory apartment building, the letter A is to be entered
- If the residence is over a shop owned by the resident, enter an R
- If the residence is over a shop but not occupied by family of the shop owner, consider it an apartment and enter an A



- 6. If the residence is in an apartment building, is the residence on the top floor of the building? (Y/N)
  - Enter a Y (for Yes) if it is on the top floor and an N (for No) if it is not on the top floor
- 7. How many people are in the following age groups that belong to this household and are resident most of the year
  - List only people who are resident at least six months of the year
  - In the data boxes 7a through 7g write in the number of people in each age group that are resident in the household most of the year
- 8. On average, about how much does the household estimate it pays per month for electricity (in Vatu)





# Q9-11 (#2)



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#### 9. Method of payment of electric bill

- How is UNELCO paid for the electricity used in the residence?
  - Is it paid by cash directly to UNELCO? If so enter 1 in the data box
  - If paid through the electronic payment service, enter 2 in the data
     box
  - If paid used a pre-paid meter, enter 3 in the data box
    - With a pre-payment meter you have to pay for your electricity upfront. They work a bit like a pay as you go mobile phone you have to top-up with credit to get your electricity
    - The top-ups work in a variety of different ways. You could have a smartcard, token or key you have to take to a shop, or in some cases you put money straight into the meter itself
  - If paid another way enter 4 in the data box and write in how the payment is made on the line after Other (specify)
    - An example of 'other' might be if a relative pays the electric bill for the residents or if it is an apartment that has electricity included in the rent

## Q9-11 (#3)

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- 10. Do any residents of the household own and register a motor vehicle (car, truck, van, bus or motorcycle? (Y/N)
- Residents are those who live in the household more than 6 months out of the year
- If yes, enter Y. If no, enter N
- Note that construction machines and tractors are not considered motor vehicles for this question
- A truck may be anything from a basic pickup truck to a large container or construction machine transport truck
- 11. What type of registered vehicles are owned and the number of each
  - In the data boxes, there are enough for five different types of vehicles
  - For each type present, also enter the number of vehicles of that type on the same line
  - For example if a household has one car and three motorcycles, 11a would have a 1 (for automobile) in the Type box and a 1 (for one automobile) in the No box (No stands for Number). Then in 11b, the type box would show a 2 for motorcycle and the No box would show a 3 because there are three motorcycles owned by the household residents



#### - Automobile

A vehicle mainly for passenger service and can carry from 2-5 adults

Q9-11 (#4)

- Motorcycle
  - Any motorized two wheel or three wheel vehicle without a closed cabin for the passengers. It may be a motorized bicycle, a scooter, a full sized motorcycle or a motorized tricycle including a motorcycle with side car
- Truck
  - Any vehicle intended for carrying goods including pickup trucks with four doors and 5 passenger capacity
- Van
  - Passenger vehicle with sliding side door that carries from 6 to 14 passengers
- Bus
  - A passenger vehicle of the type seen on Vanuatu roads that carry passengers on a specific route for a price
- If there is a registered motor vehicle owned by a resident of the household that does not seem to fit any of these five categories, enter a short description of the vehicle under Other and enter a 6 in the data box under type

# Q12 (#2)



- 12. Sources of household income
  - This question is NOT concerned with the amount of income for the household only what sources the household income is based on
  - The list of the sources of income shown on the questionnaire is to be read out to the respondent and asked what the main source of income is. If required the list can be shown to the respondent
  - If a significant income source for the household is not listed, write it in under X = Other and enter an X in the appropriate data box.
    - Note however, if that Other income source is a business of some sort it can be listed in the data box as H for a business at the home or as B a business located outside the home and does not need to be specially written down
  - The code for the main source should be entered in data box 12a. Then the respondent is asked in turn to look at the list and give what is believed to be the second, third and fourth highest sources of income
  - At least one data box 12a must have an entry

## Q12 (#3)



- If there are less than four sources of income the respondent considers as significant, enter # in the remaining data boxes
- If there are more than four sources of income, list them by entering the appropriate letter codes in data boxes 12e through 12j
- If more than 10 sources of income, list only the top 10
- G = Salaried Government
  - Income to a household member that works in a Government job and receives a regular salary from that job
- S = Salaried Private
  - Income to a household member that works as a regular salaried employee of a non-government organization
  - Examples might be working in a store, working as a mechanic for a car repair business, working as a paid church employee, etc.
- A = Farming
  - Income to a household member from growing and selling farm products
  - Examples could be growing and selling crops such as kumara or animals such as chickens. The sales may be through a market or directly from the home

#### Q12 (#4) UN DP W = Skilled Work Income from a trade or personal service such as carpentry, book-keeping, house painting, auto repair etc. that is *not* done as a salaried employee of a business or government Examples would be income to a person in the household that comes from repairing furniture, sewing clothes, constructing buildings, etc The work may be for a business if the work is not done for a salary but rather is based on the amount of work done For example, an auto mechanic who is paid a salary by an automobile company whether or not there are automobiles that are in the shop for repair would come under the Private Salary category but if the household member is paid as an auto

- mechanic only for the actual time spent in working on the repair of automobiles, then that comes under the Skilled Work category
- H = Own business at home
  - Income from an established business run by a household member from the home
  - Examples include income from selling goods from the home, having a small shop at the home to repair appliances, doing book-keeping for other people from a home office, etc.

#### Q12 (#5) UN DP B = Own Business outside Income from an established business owned by a household member but located away from the home Examples include owning a bakery not located in the home, owning a repair business in a building away from the home, owning a guest house that is separate from the home. etc. – F = Fishina Income by a member of the household from catching and selling fish - P = Pension Income to a person retired and receiving a pension from government or a former job in a company

• An example would be a household member who has a government retirement pension, is retired from working overseas and the overseas company provides a pension payment. etc.

# Q12 (#6)



- R = Remittance
  - Income from family members not living in the household
  - It may be regular (e.g. money sent every month) or irregular (e.g. a large amount at Christmas time and a little every now and then during the year)
  - Examples are money sent every month from a family member working overseas and money or major gifts sent by family members in Vanuatu
- X = Other
  - Income that cannot be fitted into the previous categories
    - An example might be income from a trust account or an inheritance from a family member. In this case enter it only if it is one of the top four income sources
  - Write in the income source on the blank line and put an X in the data box
  - If more explanation is needed, write it in the comments section at the bottom of the page

# Q13-15



13 1 = Flush toilet = 1 5 2 = water sealed squat toilet <sup>11</sup>	3 = Outside Pit latrine <sup>4</sup> 4 = None <sup>II</sup>	13	π
Do you do the family washing washing please skip to Question 15, Lig	with a washing machine? (Y/N) If N, hting Inventory. <sup>21</sup>	141	×.
15 <sup>II</sup> How many washing machine load	How many washing machine loads per week do you estimate you do? $\ensuremath{\mathbb{I}}$		н.
15 <sup>II</sup> How many washing machine load	How many washing machine loads per week do you estimate you do? ments on questions 9 through 15.		н.

# Q13-15 (#2)

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- 13 Type of sanitary facilities refers to toilet facilities.
  - 1 = Flush toilet
    - The common type of toilet connected to a water supply that automatically fills after being flushed.
  - 2 = Water sealed squat toilet
    - A toilet that must be flushed manually by pouring water into it from a bucket.
  - 3 = Outside pit latrine
    - Non flushing toilet in an out-house or even open ground
  - -4 = None
    - Means the household must go to another place for using toilet facilities
  - To avoid possible embarrassment, this information can be filled in based on the surveyors own observation without specifically asking the question

#### Q13-15 (#3) UN DP • 14. Do you do the family washing with a washing machine? (Y/N) If No, please skip to Question 16 (Lighting Inventory) This question is asked specifically to find out if the person being interviewed does the laundry - If Y (Yes) then question 15 is asked in order to find out how many loads a week are done - If the person being interviewed is *NOT* the person that does the laundry for the household, then enter N (No) and skip question 15 and go to the next page which is the questions about lights 15. How many washing machine loads a week do you estimate you do A load is defined as one operating cycle of the washing machine

 It does *not* matter how many clothes that may include so each time the washing machine is run through a wash cycle counts as a load even if only a few clothes are washed at that time

# Q13-15 (#4)



- Comments on questions 9 through 15
  - Is the place to write in explanations for unusual answers to questions 9 through 15
  - When making an entry, first write the question number then write the explanation
    - For example you might enter something like
      - 15 the household does 30 loads per week because they do washing for the neighbors as well as themselves
      - This comment then is known by the reader to refer to question 15 and the number of loads washed each week

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i <mark>ghting Inventory</mark> his is an important part of the survey and should b	be don	

carefully and thoroughly

• 16. L

- Room Location Code
  - There are no fixed definitions for the room types in homes so the general use pattern is what is used here
- The most important rooms to identify are
  - Cooking, dining, general living and sleeping areas
- In some houses occupied by more than one branch of a family there may be more than one living room as well as many sleeping rooms
  - There is no need to be concerned about having multiple rooms of the same use type, just use the room use code that fits the room
- S = Sleeping room
  - Rooms where there are beds and are specifically intended for sleeping





# Q16 (#4)



- W = Workroom/shop/office/ for personal use
  - This is a room mainly used by members of the family to do different kinds of work such as sewing, hobbies, personal office, etc
  - It is NOT used for a business, that should be listed under room type  ${\sf B}$
- T = Bathroom/Toilet
  - The room that includes the bathing and/or toilet facilities
  - A room with just a shower, just a tub and just a toilet or any combination of the three main facilities should be classed as a T room
- H = Hallway
  - Long narrow space that connects with several rooms
  - Also you may use this location code H for a stairway that has its own lighting
- R = Storage room or closet
  - A storage room is one used mainly for storage that is big enough to walk into
  - A closet is a shallow storage space that is not large enough to walk into

## Q16 (#5)

- Any space that has no walls but is fully open to the outside
  - » It may have a roof but no walls. A porch or veranda is an example.

U N D P

- A pole light is also an example of an exterior light
- An exterior may in a few cases be one of the large bulb types used for street lights and warehouses called a high pressure lamp. If one is found, list it under X = Other and call it a High Pressure Lamp. If the respondent does not know the watts, list it as 75 Watts. If it is on all night, show the hours as 12
- The light listed must be one owned by the household and that is connected to the household meter
  - » Community or public streetlights are not to be listed
- G = Garage

• E = Exterior

- A light in the covered or enclosed space where a car is usually parked for the night
- Only use the G for a space where a car is usually parked or stored
- If this is an open but covered space where there is NOT usually a car parked then this should be classed as E

# Q16 (#6)



- B = Room used for business purposes (specify business purpose for the room)\_\_\_\_\_
  - A room that has as its main use some activity related to business
  - The business does not need to have its main location at the house though it is fine if it is at the house
- X = Other (specify)\_\_\_
  - Use this for a room or covered exterior space not specifically listed as a type
    - » An example would be a personal gym full of exercise equipment. Write the room use under 'other' and enter X as the room type



# Q16 (#8)



- Also the fixture includes what is called a "ballast" which is a component that regulates the electricity going into the tube
  - The oldest type of fixture includes a transformer type ballast commonly called an 'iron' or a 'magnetic' ballast
  - » Newer ones usually come with an electronic ballast that is smaller, lighter and more efficient
- Three types of fluorescent tubes in common use
  - T12 (where the T = tube and the 12 = mm in diameter). Unless replaced by a new electronic ballast, will always use the iron type ballast
  - » T8 (which is 8 mm in diameter) is currently the most common type used and fixtures using T8 bulbs may have an iron ballast or an electronic ballast
  - » T5 (which is 5mm in diameter), which is the newest type. Fixtures with T5 tubes *always* include electronic type ballasts

# Q16 (#9)



- So how do you tell if a light uses an iron or an electronic ballast?
  - » They will only be in T12 or T8 tubes fixtures since T5 bulbs always use an electronic ballast
  - The sure sign of a iron/magnetic ballast is the presence of a 'starter' that controls the starting current. It is a small cylinder that has two pins that plug into a socket in the fixture, usually through a circular hole a little bigger than the starter. Usually you can see the starter easily as it has to be replaced fairly often and is therefore generally out in the open



# Q16 (#10)



- If you cannot see a starter but when you turn on the light it flickers a time or two and/or glows red at each end before it steadies to a constant light, that is a sign that the lamp uses an iron type ballast. If the lamp turns on instantly with no flashing or red glow at the end of the tubes, it probably has an electronic ballast
- Assume
  - » T12 tubes: 30 Watts for the 2 foot tubes and 50 Watts for the four foot tubes
  - » T8 tube lights with an iron ballast: assume 28 Watts for each 2 foot tube and 46 Watts for each four foot tube
- E = Standard fluorescent (T8) with electronic ballast
  - Use as an estimate for each tube of 21 Watts for a two foot tube and 39 Watts for a four foot tube
- T = Small tube fluorescent (T5) with electronic ballast
- Assume the 2 foot bulbs are 16 watts and the four foot tubes are 31 Watts



# Q16 (#12)

- B = CFL plug-in bulb with separate electronic ballast
  - Most commonly in a U tube shape around 15 cm long with two or four pins that plug into a separate electronic ballast/fixture



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- In this configuration, the bulb and electronic ballast can be replaced separately (with the integrated ballast CFL, if either the ballast or the bulb fails, you must replace the whole thing)
- The Watts is typically printed on the glass bulb
  - » If you cannot locate the watts, assume 11 Watts



- Is generally used only in applications where the light is on 24-hours a day and long life is especially important
- The light from an LED bulb is typically a group of bright spots rather than one continuous light
- If one is found in a home, assume a 7 Watt power for it



- and 100 Watts
- The watts are usually clearly written on the top of the globe
- If you cannot determine the Watts, assume the bulb is a 60 Watt bulb but try to find the actual watts rating if you can
- Note that the size of the bulb gets bigger as the watts gets bigger. So a 25 W bulb will be smaller than a 60 Watt bulb which in turn is smaller than a 100 Watt bulb



# Q16 (#16)



- H = halogen bulb
  - A halogen bulb is a special type of incandescent bulb that can operate at a higher temperature – and therefore a higher efficiency – than the conventional incandescent bulb
  - It is a much smaller bulb than the conventional incandescent bulb and is often used for desk lamps and lighting under counters and in cabinets



# Q16 (#18)

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- The last column is Watts per light bulb
  - » This is *NOT* watts per fixture but watts per bulb
  - » So if the first fixture to be entered in the data is in the living room, has four two foot fluorescent tubes of the old style with iron ballast, and the fixture is turned on for three hours a day, the data in the first four lines (one lane for each bulb) 16a, 16b, 16c and 16d would be entered as F (for the lamp type), 3 (for the hours per day of use), L (the location is the living room) and 26 (the watts used by a 2 foot fluorescent tube running off an iron ballast)
  - The number of lines needed for a fixture will be equal to the number of bulbs in the fixture. All the lines for that fixture will be the same since all the bulbs in a fixture go on and off at the same time
- Decorative lights, such as those used on Christmas decorations, do not need to be listed though if they are present should be described in the comments section at the bottom of the page

# Q16 (#17)



U N D P

- Data Entry Columns
  - In the left most data column enter the letter code for the light type.
    - » For example if the light is an incandescent bulb with a screw base, the letter code is S
  - The next column is for the hours of use per day
    - » This is provided by the person being interviewed in the household and will be different for each light
    - » It is important to get the respondent's answer for number of hours of daily use for each light in each room even if you cannot enter the room
    - The hours need to be matched with each specific type of light being used, for example an entry might be: Type = P (Incandescent light with pin type base), Hours of use per day = 3, Location Code = W (workshop) and Watts per light bulb = 60
  - The third data column is the location code which identifies which room it is used in
    - $\,$  \* For example a light located in a hallway would show the data code H
    - » The location code for the light needs to be entered even if you cannot enter the room yourself

# Q16 (#19)

- Important Points to Remember in Gathering the Lighting Data
   The data written down is for each individual light bulb/tube
  - So if there are two bulbs in a fixture, that is counted as two
  - So in there are two builts in a fixture, that is counted as two lights not one (though the watts and hours of use will be the same for both because they are a matched pair and are turned on and off at the same time)
  - 2. Sometimes when a fluorescent fixture has sockets for more than one tube, not all of the sockets may be actually be filled when you visit
    - It is not unusual for people who have a two tube fixture to only install one tube and leave the other socket vacant
    - Count that as two tubes operating the same number of hours as the one tube is now
    - Always enter the data as though all the fluorescent tubes are installed in all the available sockets
  - 3. That is not appropriate, however, for sockets intended for screw or bayonet based incandescent bulbs
    - If there are empty sockets of that type do not include them in the survey (unless the household says they plan to replace them)

# Q16 (#20)



- Do your best to determine which fluorescent fixtures use iron 4. ballasts and which use electronic ballasts
  - Remember if there is a starter in the fixture it has an iron ballast
  - Also if the light flickers or glows at the ends when you turn it on, it probably has an iron ballast
    - » If the light instantly comes on without glowing at the ends or flickering it probably has an electronic ballast
- 5. The most important lights in the survey are those that are on the most hours
  - So pay special attention to outdoor security lights and any lights that are expected to be on all night and lights in living spaces that may be on for several hours a day
  - Lights in closets and storage rooms that are rarely turned on are much less important though of course, they still need to be reported as accurately as is practical

# Q16 (#21)



- 6. Ask to see the lights in each room since the person interviewed may not know about the many different kinds of lights that are typically in a home
- 7. If the respondent refuses to allow you to visit any of the rooms, show the light card that has pictures of the various light type to the respondent so the respondent can see the different types of lights and ask the respondent to identify the types of lights in the rooms that you are not allowed to visit
  - Be sure to ask the questions about the size and hours of use of the lights for each type of light used in those rooms and identify the room type
- 7. If the respondent does not know the size of the lights *assume* the following sizes for each basic type
  - Incandescent bulb (both screw base and pin base) = 60 Watt
  - Halogen = 50 Watt
  - Two foot (short) Tube light = 25 Watts
  - Four foot (long) Tube light = 40 Watts
  - Six foot (very long) Tube light = 60 Watts
  - Compact Fluorescent (CFL) (both plug in with separate ballast and those with integrated ballast) = 11 Watts





# Q17 (#3)



- Also do not forget to fill out the top section that includes the name of the surveyor and the ID Code for the household being surveyed on extra pages
  - That is required so the extra sheets filled out for additional refrigerators can be combined with the rest of the survey even if the loose pages get separated somehow
- Room Location Code
  - The room code uses the same coding as was used for lighting though fewer rooms are listed since refrigerators are not likely to be in bedrooms, halls or toilets
  - If there is a refrigerator in a room not listed on the refrigerator sheet, fill it in under X = Other and specify the room
- Door Arrangement Code
  - There are five relatively common door arrangements for refrigerators







# Q17 (#7)



- U = Freezer under the refrigerator door

» This relatively uncommon door arrangement has the small freezer door at the bottom of the refrigerator and the large refrigerator door at the top





- Enter the single letter code for the room where the refrigerator that is being described on this sheet Is located
- Question 17b = Approximate year obtained
  - This entry should be a four digit year (like 2002 or 1999)
  - If the respondent gives the number of years they have had the unit, subtract that number from 2013 and enter the resulting year
  - » For example if the respondent does not give a specific year but says "we have had it about 5 years" then enter 2013 5 = 2008 as the year obtained
- Question 17c = Obtained new or used
  - If bought new enter an N and if obtained used, enter a U
- Question 17d = From local or overseas source
  - If the unit was obtained locally (purchased locally or provided by a local family member) enter L
  - If the unit was imported from overseas directly by the homeowner (whether new or used) enter O

# Q17 (#8)

- -R = Freezer in a drawer under the refrigerator door
  - » Instead of a door into a freezer compartment at the bottom of the unit, there is a drawer that can be pulled out to access the freezer compartment. The large refrigerator door is above the freezer drawer.



Q17 (#10)

# O P

UN

DP

- Question 17e = Self-defrosting (Y/N)
  - If the freezer section never accumulates ice and thick layers of frost, it is self-defrosting and enter Y
  - If the homeowner has to regularly remove layers of ice and frost from the freezer it is not self-defrosting and enter an N
- Question 17f = Door arrangement code
  - Enter the appropriate single letter code for the door arrangement seen on the refrigerators
- Question 17g = Width in mm
  - To be skipped
- Question 17h = Height in mm
  - To be skipped

# Q17 (#11)



- Question 17i = Door seal check-Good or Bad (G/B)
  - The door seal on both the freezer section (if it has a separate door) and the refrigerator section should be checked
  - Two checks are needed



Check one is visual. Look at the edge of the door and see if you can see any gaps between the seal and the surface of the refrigerator/freezer chamber. Open the door and see if the seal appears clean and there is no black mold or obvious areas where the seal is damaged and may allow warm air to enter the cold space. Look just inside the area where the door seal fits against the refrigerator body and see if you see condensate (drops of water) in some areas that indicate that warm air carrying moisture is entering the cold space near those areas

# Q17 (#12)



- The second test is to open the door and close the door so the provided piece of thin cardboard is between the seal and the refrigerator body. Slide the card up and down the seal area. If it is very easy to slide at some places and noticeably more difficult at others, then the seal is bad. If the seal is ok, the card will stay by itself in any spot on the seal when the door is closed and sliding it will feel about the same, with a little friction, all around the seal. If the seal seems good, enter a G and if bad enter a B
- Question 17j = How much do you think it costs for electricity every month (in Vatu)
- This is a question to ask the respondent. The intent is to see how accurately the people in the Vanuatu household estimate what the refrigerator costs to operate each month in Vatu
- Question 17k = Manufacturer name
  - Print clearly the name of the manufacturer of the refrigerator (like Westinghouse, Fisher and Paykel, Sanyo, etc.)

# Q17 (#13)

U	Ν		
D	Ρ		

- Question 17L = Manufacturer model
  - If available, write in the model name and/or number of the refrigerator
  - This may be on a sticker inside the refrigerator or the unit may not be clearly marked in which case enter #
- Question 17m = Is there an energy label (Y/N)



- This is a label stuck on the outside of the refrigerator door that indicates the relative energy efficiency of the refrigerator and may provide an estimate of the energy use in kWh of the refrigerator over a one year period
- The label may show a series of five stars with the best rating all five stars and an average rating being two or three stars
- If there is an energy efficiency label, enter Y. If not enter N



# Q17 (#15)



- Question 17o. What country is the label from
  - An energy efficiency label on the refrigerator from Australia = A is a label that uses the star system for rating
    - » Note that New Zealand does not have its own labels, it uses Australian labels
  - A label from Singapore = S which uses large green checks for their rating system



 Japan J, Korea K, China C, Thailand T labels also may appear



- label
   Australian labels and some other country labels include an estimate of the kWh the owner can expect the refrigerator to use each year. If that number is available, write it in the data box
- Question 17q. Plans to replace (Y/N)
- If the homeowner is planning to replace the unit, enter a Y
- If there are no current plans to replace the unit, enter an N
- Question 17r. If yes, how many months from now
  - If the answer to question 17q is yes, they do plan to replace the unit, enter the number of months remaining until they plan to replace the refrigerator
    - » If the respondent is unable to make an estimate, enter 12 months
  - If there are no plans to replace the unit (question 17q is no) enter #







- Door Arrangement Code
  - There are three relatively common door arrangements for freezers
    - C = Single top opening door
      - This type of unit has but one door that effectively covers the entire top of the freezer, is hinged in the back and opens up. This is the most common home freezer door arrangement. Sometimes it is called a 'chest freezer'.



# Q18 (#4) UDD UDD Image: Construction of the second second

# Q18 (#5)



U N D P

- Question 18f = Skin or open condenser (S/O)
  - To be skipped
- Question 18h = Width in mm
  - To be skipped
- Question 18i = Height in mm
  - To be skipped



# Q19 (#2)

UUDP

- 19. Questions about Air Conditioners
  - Type Code
    - The window = W
      - Is cheaper and easy to install since it just sits in a window. The unit is self-contained and both evaporator (cool side) and condenser (hot side) are in the same unit
      - The window air-conditioner is typically noisier and less efficient than the other type of air-conditioner, the split type S

# Q19 (#4)

	9	
U	Ν	
D	Ρ	

- Filter
  - In both the window type and the spilt type, there is a filter that is in the indoor part of the air-conditioner (the evaporator)
  - The filter is intended to capture dirt and lint (short, fine fibers) in order to keep it from building up inside the air-conditioner and reducing its operating efficiency



# Q19 (#3)

U N D P

- The split unit = S
  - The evaporator (cool side) is completely separate from the condenser (hot side) and are connected by insulated pipes
  - The evaporator (cool side) can be designed to be very quiet and the condenser (hot side) to be efficient at getting rid of the heat that is moved from inside the house to the outdoors





- If it is a split unit, the evaporator (the cooling unit) can be anywhere as can be the condenser (though preferably not too far as the long connecting pipes will be a problem)
- For any air-conditioner, the evaporator (the cooling unit) will have to be mounted in the room where the cooling is needed, often a bedroom of the house
  - So for 19a, the data entry is the code for the room that the evaporator is located which is the room that is being cooled
- Question 19e = Is the condenser shaded most of the day (Y/N)
- Ask householder if not obvious
- The condenser (hot side) is the outside part of the air-conditioner
- If it is placed in a location where it is in the shade most of the day enter Y

# Q19 (#6)



- If it is in the sun most of the day, enter N
- Shade may come from the roof overhang, a little canopy built over the condenser or trees and bushes
  - Remember that the sun moves so even if it is in the shade when you visit, it could be in the sun another time. If you are not sure, it is best to ask the householder
- Question 19f = If a split system, is the pipe insulation intact? (Y/N)
  - There will usually be exposed pipes leading to the outside unit (the condenser)
  - If the insulation is damaged enough to see the bare pipe in places or is clearly damaged, enter N
    - An indication of insulation damage is also water dripping from the connection of the pipe to the condenser when the unit is running
  - If you see no significant damage and it looks like the insulation around the pipes is in good shape, enter Y



# Q19 (#8)

	Ð	
U	Ν	
D	Ρ	

- Question 19g = Condition: 1 to 5 with 5 the best
  - Usually if there is damage to the air conditioner due to corrosion or lack of maintenance, it will be seen mostly on the outside part of the unit
  - The most common damage to both window and split units is heavy corrosion on the outdoor unit in the area where the air blows through
    - It usually is worst along the bottom of the unit
  - 1
    - If the corrosion is so bad that as much as ¼ of the aluminum fins that the air blows through are corroded away
  - 2
    - If some of the fins are corroded away but not a lot
  - 3
    - If there is corrosion but almost all the fins are ok



• Enter Y if there is one, N if not

# Q19 (#10)



- Question 19i = EER, SEER or COP (E+, S+, C+number)
  - These are different types of energy efficiency ratings
  - They often are written on the manufacturer's label
    - If the label is visible (usually not in a window unit but usually easily found on the outdoor part of a split unit), in the data box write the number after the letter corresponding to the type of rating seen
      - » Thus if the label says EER=11, enter an E and the number 11 in the data box
      - » If the label says SEER=12, enter an S and the number 12 in the data box
      - » If the label lists the COP, type a C followed by the number
- Question 19j = Label watts rating if present
  - If you can read the label, usually it will give the watts that the unit will use when running. Enter that number in the data box

# Q19 (#11)



- Question 19k = BTU rating if listed
  - The BTU rating is related to the size of the space that the air-conditioner can properly cool and is the rated capacity of the A/C unit for cooling
  - It will be on the manufacturer's label if you can access it
- Question 19m = Use hours per day hot season
  - Enter in this data box the *hours per day* that the respondent says the unit is typically used in the hot season
  - If they say that the unit is not used, enter a 0
- Question 19n = Use hours per day cool season
  - Enter in this data box the hours per day that the respondent says the unit is typically used in the cool season
  - If they say that the unit is not used, enter a 0

# Q19 (#12)

	9	
U	Ν	
D	Ρ	

- Question 19o = Evaporator filter code
  - In the indoor part of the A/C unit, the evaporator (cool side), there will be screen near the fan that blows the air into the room
  - That is a filter to catch lint (short, fine fibers) and dirt so it does not clog up the A/C unit itself
    - The filter should be regularly cleaned because when it is dirty the amount of air the fan can deliver to the room is reduced and so is the cooling of the room
  - Ask the respondent if you can please see the filter
  - If the respondent does not know how to access the filter, enter an M since that probably means it is never cleaned
  - If there is no filter at all, enter an X
  - If the filter is between about ¼ and half clogged, enter P
  - If there is only a little clogging or is completely clean enter C





# Q20 (#3)

	9	
U	Ν	
D	Р	

- Note that most of these appliances are not used every day
  - So ask instead how many times a week the appliance is used
- If the household owns one of the appliances but rarely uses it (not even one hour per week), enter a '0' in the data location
- Usually it will be more accurate if you ask how many days a week the appliance is usually used then ask how many hours (or minutes or fractions of an hour for appliances such as hair dryers) on each day
  - Then you will need to multiply the hours per day times the number of days per week to get the hours per week
- Always use the decimal, not the fraction

# Q20 (#2)

- Most households have a number of small appliances. The list on the questionnaire includes the most common ones but others may be present
- Note that
  - Though a washing machine is not usually considered a small appliance, it is listed here since its use does not justify a separate sheet
    - » However, there are several types of washing machines so each type has a separate code (L1, L2, LF & LW)
  - Also a dishwasher is not usually considered a small appliance but as they are rare in Vanuatu households, a separate sheet is not needed
- For all small appliances, the Watts are usually listed on the label
  - Sometimes Watts are not shown but Amperes is shown. If the number is in Amperes, to get Watts, multiply the number times 240
  - For these appliances a location code is *not* needed











# Q20 (#9)

• LW = Washing machine with wringer



- C = Clothes dryer
  - The nameplate is unlikely to be visible without moving the unit so for Watts enter the number 2500
  - Note that some dryers use gas for the heating but still use electricity for the motor. If that type of dryer is found, enter the number 250 in the Watts data box



24

# T = Hair straightener



box and check the label for Watts

 B = Electric Water Cooler - Normally this will operate

Q20 (#10)

- all day every day but ask for hours per day of usage since sometimes the family unplugs or switches the unit off at night
- Don't forget we are looking for hours per week for these small appliances
  - » For a unit operating 24 hours a day that will be 168 hours a week and if it is switched off at night, it will be 84 hours a week



U N D P



- Y = Hair Drver
  - Since a hair dryer is a heavy user of electricity, getting accurate information about total time of use per week is important

Q20 (#11)

- The label on the hair dryer will show the Watts but some hair dryers have several settings with different Watts and the label may show a range of Watts
  - » Choose the highest Watts listed on the label



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# Q20 (#13)

- S = Electric Sewing Machine
  - The watts for sewing machines is typically on a label affixed to the motor
  - If more than one person in the household uses the machine be sure to add up all usage to get the hours per week
- E = Electric Dishwasher
  - Ask the respondent about how many minutes the dishwasher takes to complete its washing cycle and the number of washing cycles per week that it is used
    - » By multiplying the number of cycles per week times the number of minutes per cycle, you will get the total minutes per week for the use of the dishwasher. Convert that to hours per week and enter that in the appropriate data box



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Q20 (#14)

#### • H = Toaster

- Assume each time the toaster is used, the energy is used for 3 minutes
  - » So if the toaster is cycled five times, the total time of use would be 15 minutes. If that occurs seven days a week then that would be seven times 15 minutes or 105 minutes which is 1.75 hours per week



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 The Watts can be found on the manufacturer's label

#### • X = Other

Any other electricity using appliances that are used more than once per week (e.g. power tools) should be listed here and accounted for in the data entry boxes





# Q21 (#3)



- 21f Diagonal measure screen size (mm)
  - To be skipped
- 21g Desktop or Laptop (D/L)
  - Enter a D in the data box if the unit is a desktop unit (has a separate screen, processing unit, keyboard and mouse)
  - Enter an L if it is a laptop
- 21h Is there a laser printer (Y/N)
  - A laser printer is much like a copy machine. It uses what is called toner instead of ink. It prints fast and with high quality but uses quite a lot of energy. If there is a laser printer with the computer, enter a Y. If not, enter an N
- 21i Is there an ink-jet printer (Y/N)
  - An ink-jet printer uses small ink cartridges for printing and is relatively slow. However it uses little energy. If there is an ink-jet printer with the computer, enter a Y. If not, enter an N
- 21j Hours used per day on school days
  - When school is in session, on average how many hours per day is the computer used

# Q21 (#4)



- 21k Hours used per day on school holidays
  - When school is NOT in session, on average how many hours per day is the computer used
- 21L Hours used per day on Saturdays
  - Enter the average number of hours the computer is used on a Saturday
- 21m Hours used per day on Sundays
  - Enter the average number of hours the computer is used on Sunday

# Q21 (#5)

# O N D P

- 21p What is the computer mostly used for (Computer use code)
- Enter the letter code below for the task that the computer is mostly used for
  - F = Facebook, You Tube, Twitter and other Internet social sites. The computer use is mainly for interacting with social type sites such as Facebook, Twitter, Google +, You Tube, etc.
- R = Research, looking up information on the Internet.
- S = School work
- W = writing documents
- F = Finance and accounts
- E = Email
- G = Games
- X = Other\_\_\_\_

# Q21 (#6) 21q Is the equipment above all left connected to power all the time? (Y/N) If the computer, printer, screen and other components are left plugged in all the time and if the wall switch is turned on so power gets to the equipment all the time, enter Y If the power is turned off or the equipment unplugged when not in use, enter N 21r Is there Internet access at the home (Y/N) Can the computer be connected to the internet at the home? If yes enter Y in the data box if no, enter N 21s Is there WiFi in the home (Y/N) WiFi is a wireless connection to the Internet. Although the Internet is brought to the home through the phone lines, it can be delivered to computers wirelessive by connecting what is called an

With is a wheless connection to the internet. Autough the internet is brought to the home through the phone lines, it can be delivered to computers wirelessly by connecting what is called an access point (or router) to the phone line. It will take the data stream from the Internet and connect to a wireless received in the computer to transfer data both ways. So if the computer is not connected to the Internet with a wire, assume there is WiFi in the home and enter YIf the computer has a wire to connect to the Internet, then enter N.

,			
Microwave ovens	Is there a microwave oven (Y/N)	22a	1
Electronic screen means that settings are by push buttons and such things as time to cook	If Yes, is the operating time set by turning a knob or by buttons (K/B)	22b	
are shown on a screen. The other type without a screen uses a knoh that engages a	How many minutes per day average?	22c	
mechanical timer to time the cooking.	What Watts is listed on the label	22d	
	Is it left plugged in all the time (Y/N)	22e	
Mobile phones	How many mobile phones in use by household members?	22f	
	Are chargers left plugged in and power on to the chargers all the time? (Y/N)	22g	
		1 1	

# Q22 (#2)

- 22. Questions about microwave ovens and phones
  - 22a Is there a microwave oven (Y/N)
  - If the household has a microwave oven, enter Y in the data box. If not enter N
  - 22b If Yes, is the operating time set by turning a knob or by buttons (K/B)
    - If there is a microwave oven in the household and on that oven there is a knob to turn that sets the time for the oven to turn on, enter a K in the data box
    - If there are push buttons and an electronic screen to set the time, enter a B in the data box



UN DP

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# Q22 (#3) DP

- 22c How many minutes per day average?
  - Ask the householder to estimate the number of minutes per day • that the microwave oven is typically used

UN

- If not used every day, then ask for typical use over a week and divide that number by 7 to get minutes per day to enter in the data box. If only used rarely, enter  $\mathbf{0}$
- 22d What Watts is listed on the label?
  - If the label is not visible and there is no indication of Watts on the front of the unit, assume 700 Watts for entry in the data box
- 22e Is it left plugged in all the time (Y/N)
  - If the microwave oven is always plugged in and the power is left on at the wall, enter Y
  - If the household unplugs the microwave or leaves the wall switch off except when using the oven, enter N
- 22f How many mobile phones in use by household members?
  - Enter the number of mobile phones that are used by household • members in the data box

# Q22 (#4)

- 22g Are chargers left plugged in and power on to the chargers all the time (Y/N)?
  - If most or all the people who have mobile phones leave their chargers plugged in and power on all the time, enter
  - If most unplug or turn the power off to chargers when not actually charging phones, enter N



# Q23 (#2)

- The three categories of usage would be
- L
  - For major usage, more than half the cooking is done using this energy source
  - M
    - For medium usage, not over half the time but used several times a week
  - S
    - For small usage, used only once in a while



- If there is an electric cooking unit such as a full sized electric stove or a table top electric cooking unit with one or more cooking locations, enter Y
- If there is no electric cooking unit enter N
- Note that small electric appliances such as electric fry pans and table top electric ovens are included elsewhere
  - This question only applies to units that have an electric heating element that can be used in the same way as a gas or wood fire used for heating cooking utensils like pots and pans
- 23b If Yes, estimate its usage (S/M/L)
  - If there is an electric cooking unit, ask if that is the main way food is cooked and more than half of all cooking is done with that electric cooking unit. If the answer is yes, enter L in the data box
  - If the answer is no, ask if the electric cooking unit is used most days but not as the main way to cook. If yes, enter M. If no enter S
- 23c Is there a gas cooking unit (Y/N)
  - If there is a gas cooking unit such as a full sized gas stove or a table top gas cooking unit with one or more cooking locations, enter Y. If there is no gas cooking unit enter N



# Q23 (#5)



- 23g Is cooking done with wood (Y/N)?
  - If the household does some cooking with wood (for example on the weekends) enter Y in the data box
  - If they do not cook with wood, enter an N
- 23h If Yes, estimate its usage (S/M/L)
  - If there is a cooking with wood, ask if that is the main way food is cooked and more than half of all cooking is done with wood. If the answer is yes, enter L in the data box
  - If the answer is no, ask if the wood is used most days for cooking but not as the main way to cook. If yes, enter M. If no enter S



- through the pipes of the house
- The water in the tank is kept hot using an electric or gas heating element



	Q24		U N D P
Solar: T = Tube type solar water heater = T F = flat type solar water heater = F D = Don't know = D E = Electric = E G = Gas = C Tank type water heater has a large (50 litres or bigger) insulated Instant on water heater only adds heat to water when the hot water tap or shower hot water is turned on	Is there a solar water heater (T/F/N) If Yes, is there an electric back-up heater in the solar water heater if there is no sun (Y/N/D) Is there a tank type water heater (E/G/N) Is there an 'instant on' water heater (E/G/N)	24a 24b 24c 24d	



# Q24 (#4)

- iii. A solar water heater
  - The heating unit may be a flat black surface flush with the roof or a series of glass tubes connected to the tank

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- The units with the glass tubes may be mounted on a rack on the roof instead of flat on the roof surface
- Some solar water heaters include an electric heater so that if the sun is behind clouds all day and water is not heated by the sun, the electric heater automatically turns on to do the heating
  - The respondent may not know if there is an electric back up heater or not. If not, enter a D in the data box which stands for 'Don't know'



- 24d Is there an 'instant on' water heater (E/G/N)
  - This is a small box, typically around 300 mm wide and 450 mm tall connected to the hot water delivery pipe and mounted on a wall near the place where the hot water is used, usually a shower head or bath tub
    - There is no hot water storage tank. When the water tap or shower head is turned on, the electricity or gas instantly heats the water flowing through the pipe and that is sent on to the shower head or hot water tap for use
  - If the heating is done by electricity, enter an E
  - If the heating is by gas, enter a
  - If there is no instant water heater, enter an N

# Q24 (#5)

U N D P

- 24a Is there a solar water heater (T/F/N)
  - If a flat plate type solar water heater you should enter an F in the data box
  - If it is a tube type solar water heater , enter a T in the data box
  - If there is no solar water heater enter an N in the data box
- 24b If there is a solar water heater, is there an electric back-up heater in the solar water heater to heat the water if there is no sun (Y/N/D)
  - If the respondent says there is, enter a Y in the data box
  - If there is not, enter an N
  - If the respondent does not know, enter a D
- 24c Is there a tank type water heater (E/G/N)
  - If there no tank type water heater, enter an N
  - If there is a tank type water heater and it is electric, enter an E
  - If it is a gas tank type water heater, enter a G in the data box



# Q25 (#2)

- 25. Questions about Fans
  - Fan Code
    - C = Ceiling Fan
      - This is a fan with large, often wooden, blades that hangs from the ceiling and blows down into the room
      - Usually there is a speed control on the wall or a switch on the fan controlled by a pulling a small cord hanging down from the center of the fan
      - Some ceiling fans also have one or more lights attached below the fan motor
    - T = Table fan
      - This is a small portable fan that can sit on a desk or table and is mainly used to cool a person sitting there





# DP

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# Q25 (#3)

- F = Standing fan
  - This is a larger portable fan that sits on the floor with the fan mounted at about chest height. Usually this is a relatively large fan that often has push buttons or a knob to control its speed
- U N D P SRY

- This fan cools a section of the room
- W = Window or large floor fan
  - This is a large, often high speed, fan that is mounted in a window or sits down close to the floor
  - It is intended to cool most of a room



	Q26	
Room Code:	Location of TV/Video	26a
S = Sleeping room = S	Approximate year obtained	26b
	Obtained New or used? (N/U)	26c
D = Eating room = D	From local or overseas source (L/O)	26d
I – Main living room with T) (hidon – I	Flat screen or CRT (F/C)	26e
L = Main living room with TV/video = L	Diagonal measure screen size (mm)	26f
K = Cooking area = K	Is there a satellite box (Y/N)	26g
-	Is there a remote control unit (Y/N)	26h
W = Workroom/shop/office/ = W	Watts rating on manufacturer's nameplate	26i
B = Business area (specify) = B	Hours used per day during the week during school days	26j
x = Outer (specify)	Hours used per day during the week during	
	school holidays	26k
	Hours used per day on Saturdays	26L
	Hours used per day on Sundays	26m
	Plans to replace (Y/N)	26n
Comments:	If yes, how many months from now	260
	Is there a DVD Player (Y/N)	26p
	If there is a DVD player, how many hours a week is it used (if none = 0)	26q
	Is there a Sony, Nitendo, XBox, or Wii game console normally connected? (Y/N)	26r
	If there is a game console, how many hours a week is it used (if none = 0)	26t
	Is the equipment above all left connected to power all the time?(Y/N)	U

# Q26 (#2)



UN

DP

- 26 Questions about Video/TV use
  - Many homes have one or more televisions or video players
  - Often they are connected to a DVD player or electronic game console such as a Sony Play Station, Nitendo Wii or Microsoft X-Box
  - Fill out one of these pages for each video or television that is in the home being surveyed
    - Be sure to enter the ID number for the video and the survey ID code for the house that is being surveyed



# Q26 (#4)

- 26f Diagonal measure screen size in (mm)
  - To be skipped
- 26g Is there a satellite box (Y/N)
  - Does the household have a satellite box (Usually Digicel) to watch satellite TV?
    - If yes, enter a Y. If no enter an N
- 26p Is there a DVD player (Y/N)
  - If there is a separate box connected to the TV/video that is used for playing DVDs, enter Y
  - If there is none, enter N
- 26q If there is a DVD player, how many DVDs are played each week (if none = 0)
  - If the answer to 26p is Y, ask the respondent about how many DVDs a week are played and enter the number in the data box
  - Note that this includes DVDs played through a game console such as a Sony Playstation, Nitendo Wii or Microsoft X Box)



- If it is unplugged or the wall switch is turned off, enter N

# Acknowledgement



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# References



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