

**SURVEY
OF WATER, ELECTRICITY,
GAS AND PUBLIC TRANSPORT
USAGE**

**INDEPENDENT PRICING AND REGULATORY TRIBUNAL
OF NEW SOUTH WALES**

**Survey of
Water, Electricity, Gas and
Public Transport
Usage**

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PART A. INTRODUCTION AND SUMMARY

1 Background

In 1993, Reark Research¹, on behalf of the Tribunal, undertook a sample household survey of Sydney, Newcastle, Illawarra, Gosford and Wyong areas to obtain information on household characteristics and usage of electricity, water and public transport.

In an effort to update the information collected from that survey, a new survey was commissioned by the Tribunal. This was conducted by AGB McNair, and was completed in early 1996².

The survey is intended to assist the Tribunal in assessing the potential impact of changes in prices for utilities and public transport on households. It is unique in that:

- it directly links bills and consumption levels to the households economic and demographic characteristics
- it enable the Tribunal to assess the cumulative impacts of changes in pricing structures across the sectors it regulates.

2 Scope and coverage of survey

The target population for the survey was the greater metropolitan areas serviced by Integral Energy and Energy Australia³, which resulted in the household survey comprising of interviews with respondents from the greater metropolitan areas of Sydney, Newcastle and Wollongong. This area includes the bulk of AGL Gas Company (NSW) Ltd's customers within NSW. It also includes the areas serviced by Sydney Water and Hunter Water Corporation.

To address concerns by the Tribunal regarding coverage of low income and low usage customers, two different sampling methodologies were adopted:

- a random area-based sample was used to obtain a representative view of the population overall
- a list based sample was used to obtain information that related specifically to low electricity usage customers.

The random area-based sample consisted of 1000 households. Two hundred local areas (Census Collector Districts) were randomly selected. Five households were then selected from each of these local areas. In total, a further 300 households were

¹ Reark Research. 1993, *Customer Viewpoint Household Survey of Water, Electricity and Public Transport Usage*, April.

² AGB McNair. 1996, *Survey of Water, Electricity, Gas and Public Transport Usage*, March.

³ Prospect Electricity and Illawarra Electricity were amalgamated to form Integral Energy. Sydney Electricity and Orion Electricity were amalgamated to form Energy Australia.

selected for the low usage customer sample. This sample was also clustered in local areas to avoid significant costs from extended travel times.

Further details of the sample methodology are provided in Attachment 2.

The survey questionnaire, which was identical for each sample, collected data on:

- *household demographics*; including information on household income, dwelling type, family structure, and property value
- *usage of transport*; information was collected on mode of transport for both work and non-work travel
- *views on utilities*; for example, electricity and gas suppliers and a range of price related issues.

Importantly, the questionnaire sought the customer's approval to match billing data collected during the survey to data provided by electricity and gas suppliers.⁴ Of the 1300 households selected, 85% provided approval for release of electricity billing data. Of those households being supplied gas by their local gas supplier, 82% provided approval for release of gas billing data.

3 Summary of survey findings

Although the survey indicated areas where the random based and low usage samples had similar characteristics (eg transport mode for work), the survey was able to highlight some important differences between the samples, and also discover particular characteristics of the low usage sample. These are perhaps the more interesting and useful results to come from the survey and should be kept in mind when reading through the remainder of this document.

The survey indicated that those households who are relatively small users do tend to have lower incomes. This runs counter to the common perception within the industry which has been put to the Tribunal in the past. Interpretation of the results must have regard to possible sample biases. A proportion of low usage 'customers' will not be adequately represented in the sample. Examples include holiday houses and lighting of common areas in units and townhouses.⁵ However, of the low usage households contacted a significantly higher proportion are in the lower income group than for electricity users as a whole.

The survey also indicated that the low usage sample tends to be concentrated with households classified as Older single/couples and/or those holding a Pensioner Health Benefit Card. These and other findings may have important implications when designing government and industry policy.

The following is a summary of the main findings, highlighting differences between the random and low usage samples where appropriate.

⁴ Collection of billing data and a similar matching with the supplier was not carried out for water due to the impact of restrictions distorting consumption patterns.

⁵ Such services are billed separately and will be recorded as a separate customer by the utilities.

Electricity

- the low usage sample is heavily concentrated in the lower income groups relative to the random based sample
- the random sample suggested higher income households tend to be concentrated in higher bill levels.

Gas

- the low (electricity) usage sample tends to be a low energy consuming sample overall. That is, households who use little electricity also tend to consume smaller amounts of gas than the average gas customer
- there may be some substitution of gas for electricity by the low usage sample, but it is not the dominant factor.

Household characteristics

- almost 60% of low usage sample households hold a Pensioner Health Benefit Card.

Electricity v's gas

- a significantly greater proportion of low usage sample households use gas for regular household usage relative to the random based sample, but they tend not to be large users of gas
- respondents in both samples regard electricity as the safer of the two energy sources
- respondents were evenly divided in their views as to which energy source is better for the environment
- respondents clearly believe electricity to offer the best value for money.

Pricing options and willingness to pay

- both samples strongly oppose the PowerCard payment⁶ method
- almost half of the respondents who indicated that they may take-up an off-peak option also expressed willingness to take-up a green pricing option for electricity
- the likelihood of taking-up a green pricing option is greater the higher is household income
- respondents are in favour of usage charges as the basis of power bills.

Public transport

- only a small proportion of households use public transport for work or recreational travel
- there is little, if any relationship, between income and use of trains or buses for work travel.

⁶ The PowerCard is a pre-paid meter system, similar to Telstra's PhoneCard, which is inserted into the household's meter (a new meter would need to be installed). It could be topped up with credit at various outlets such as shopping centres and Automatic Teller Machines.

PART B. DETAILED RESULTS

4 Electricity

All households surveyed were asked the level of their normal quarterly electricity bill. Tables 1 and 1a summarise the responses in terms of household income and household structure respectively. As electricity is billed on the basis of consumption, the size of the bill is directly related to the amount of electricity used.⁷

Table 1: Quarterly electricity bill v's Gross household income (%)

Quarterly bill	Random based sample Annual Household Income					Unstated	Total	Low usage sample*
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k			
<\$50	8	3	2	1	1	1	2	47
\$50-100	41	27	20	20	11	21	23	44
\$101-200	42	49	50	54	51	48	49	7
\$201-400	8	19	25	23	31	25	22	1
>\$400	1	2	1	1	3	1	1	0
Unstated	1	1	2	1	2	6	2	1
Total	100	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

An analysis of Table 1 indicates:

- households in the random based sample are most heavily concentrated in the \$101-200 bill range (49%), with 94% of households having bills between \$50-400
- bills for the income groups within \$0-25k tend to be concentrated in the \$50-200 range, whereas bills for higher income groups are concentrated between \$101-400 the highest income group is to a certain degree more heavily concentrated in the higher bill levels
- within the low usage sample, 47% of households have a quarterly bill of less than \$50, and 91% have a bill between \$0-100.

As the sampling technique would imply, the low usage sample is concentrated in low bill levels relative to the random based sample. Data indicates that the low usage sample is also concentrated among lower income levels (see Attachment 1).

⁷ At the time of the survey there were no fixed quarterly charges for residential customers in the area surveyed. However, there were minimum charges of \$24.60, \$24.48, \$24.53 and \$24.42 imposed by Illawarra North, Prospect, Shortland and Sydney Electricity respectively.

Table 1a: Quarterly electricity bill v's Household structure (%) - random based sample

Quarterly bill	Young single/couples	Young family	Middle family	Mature family	Older single/couples
<\$50	4	0	1	0	5
\$50-100	32	14	10	9	40
\$101-200	50	59	50	47	45
\$201-400	12	22	34	39	9
>\$400	0	0	2	4	0
Unstated	2	5	2	1	1
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 1a indicates:

Bills for smaller household structures (singles and couples) are concentrated in the lower bill levels (\$50-200), relative to the family households structures (\$101-400). Older single/couples tend to have lower bills than Young single/couples.

Consumption of electricity and bill levels will be influenced by the size of the household (which impacts on electricity consumption), the income level of the household (which may act as a constraint to consumption), or a combination of both. These factors may have influenced the preceding observation that smaller household structures have relatively lower electricity bills, and therefore electricity consumption levels. A more thorough look into household characteristics is contained in section 6 and Attachment 1.

5 Gas

All households surveyed were asked the level of their normal quarterly gas bill.

Table 2: Quarterly gas bill v's Gross household income (%)

Quarterly bill	Random based sample Annual Household Income						Total	Low usage sample*
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k	Unstated		
<\$25	17	3	9	5	7	15	10	14
\$25-50	35	40	28	29	23	17	28	38
\$51-100	32	31	34	52	40	32	39	41
\$101-200	13	11	25	11	21	28	18	5
>\$200	0	3	0	0	1	0	1	1
Unstated	3	11	3	3	8	8	6	1
Total	100	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

An analysis of Table 2 indicates:

- households in the random based sample are most heavily concentrated in the \$51-100 bill range (39%), with 67% of households having bills in the \$25-100 range
- for the lower income groups (\$0-25k), as total bill increases above \$50, the proportion of these groups in higher bill levels decreases sharply

- within the low usage (electricity) sample, bills are concentrated in the lower levels relative to the random based sample. Forty-one per cent of low usage households have a bill between \$51-100 (similar to the random sample), and 93% have a bill between \$0-100 (compared to 77% for the random sample).

This suggests that the low usage sample (based on electricity consumption) actually has low total energy consumption. However, the difference between the random based and low usage samples in relation to gas bill levels is significantly smaller than that for electricity bills. The data may therefore suggest that there is some substitution of gas for electricity within the low usage sample.

Discussion in sub-section 6.1 on regular household gas use supports this conclusion.

Table 2a: Quarterly gas bill v's Household structure (%) - random based sample

Quarterly bill	Young single/couples	Young family	Middle family	Mature family	Older single/couples
<\$25	15	4	7	5	15
\$25-50	29	19	19	23	42
\$51-100	41	50	35	40	31
\$101-200	5	25	29	25	9
>\$200	2	0	0	1	0
Unstated	9	2	10	5	3
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 2a indicates:

- within a particular household structure, quarterly gas bills are concentrated between \$51-100 (as in Table 2). The exception is Older single/couples where bills are concentrated between \$25-50
- bills for smaller household structures (singles and couples) are concentrated in lower bill ranges (\$25-100) relative to larger household structures (families) which are concentrated between \$51-200. This is a similar result to that of electricity.

6 Household characteristics

It is important to understand whether the surveyed household is the normal place of residence for the respondent. It is often argued that low usage households are such because they are holiday homes, and are therefore not occupied all year round. It has been argued within the electricity industry that pensioners are not low usage customers. Sections 6.1 and 6.2 look into these issues.

6.1 Normal residence

Survey data indicates that households surveyed are the normal place of residence for almost all the survey respondents (99% for both the random based and low usage samples). Countering this is the argument that the low percentage of holiday homes in the survey is not indicative of the actual proportion (higher) in the population. Holiday homes may have been less likely to be occupied at the time of the survey.

Focussing on the random sample, 42% of all households approached (1817 out of 4307) were unable to be contacted (ie residents were out at time of call or the residence appeared empty). Unfortunately, a similar figure is not available for the low usage sample. A significantly higher figure may indicate that holiday homes do constitute a higher percentage of low usage households and the population than the survey suggests.

6.2 Pensioner status

The following section investigates the pensioner status of households. Pensioner status depends on the holding of a pensioner health benefit card.

Table 3: Pensioner health benefit card v's Gross household income (%)

	Random based sample Annual Household Income					Unstated	Total	Low usage sample*
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k			
Yes	84	48	19	9	3	29	30	59
No	13	52	78	91	96	66	68	38
Unstated	2	0	4	1	1	5	2	3
Total	100	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

An analysis of Table 3 indicates:

- 59% of households in the low usage sample hold a pensioner health benefit card
- 30% of households from the random based sample hold a pensioner health benefit card
- some households reported access to a pensioner health benefit card despite a relatively high household income
- 84% of households with an annual income of \$0-15k hold a pensioner health benefit card, compared to 3% of households with an annual income of >\$50k.

These results clearly indicate that it is more likely that low usage customers will be pensioners.

Table 3a: Pensioner health benefit card v's Household structure (%) - random based sample

	Young single/ couples	Young family	Middle family	Mature family	Older single/ couples
Yes	9	21	19	25	57
No	88	77	81	73	41
Unstated	2	2	0	2	2
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 3a indicates:

Older single/couples are most likely to hold a pensioner health benefit card (57% of the group), compared to only 9% of Young single/couples.

7 Electricity v's gas

The following section summarises survey results in relation to questions on use of gas by households, and a number of issues related to the communities relative perception of electricity and gas as energy sources.

7.1 Regular gas usage

Households were asked whether they use gas, either mains or cylinder (large not portable), for regular household usage.

Table 4: Gas for regular household usage (%)

	Random based sample Annual Household Income						Total	Low usage sample*
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k	Unstated		
Yes	35	32	31	44	45	39	39	68
No	65	68	69	56	55	61	61	32
Total	100	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

An analysis of Table 4 indicates:

- 39% of households in the random based sample use gas for regular household usage
- use of gas is relatively stable between household income groups
- a significantly greater proportion of the low electricity usage sample (68%) use gas for regular household usage.

The higher proportion of gas users among the low usage sample relative to the random based sample is emphasised through additional information collected in the survey:

- 60% of households in the low electricity usage sample have gas hot water systems, compared with only 24% in the random based sample. Correspondingly, 36% of households in the low electricity usage sample have electric hot water systems, compared to 73% in the random based sample. There are no significant variations in the type of hot water system used within household structure or household income groupings
- 55% of households in the low electricity usage sample stated that the most often used appliance for cooking in the home was a gas stove, this compares with only 25% in the random based sample. Correspondingly, 27% of households in the low usage sample stated the most common used appliance for cooking in the house was an electric stove, compared to 52% in the ransom based sample. There are no significant variations in the appliance most often used for cooking within household structure or household income groupings
- 32% of the low usage sample stated that the kind of room heating most often used was gas. In comparison, only 19% of the random based sample stated the kind of room heating most often used was gas.

The following sub-sections (7.2 - 7.4) serve to illustrate the community’s perceptions of electricity and gas as energy sources. Questions were asked in terms of safety, environmental qualities and best value for money.

7.2 Safety

Households were asked their opinion on whether electricity or gas was the safer energy source to use in the home.

Table 5: Safety - Electricity v’s Gas (%)

	Random based sample Annual Household Income						Total	Low usage sample*
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k	Unstated		
Gas much safer	3	5	5	5	2	1	4	5
Gas safer	10	16	13	14	18	17	15	12
Same	20	22	14	22	22	22	21	30
Electricity safer	38	32	41	40	42	32	38	32
Electricity much safer	21	18	19	11	13	16	16	16
Unstated	8	7	7	6	4	12	7	5
Total	100	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

An analysis of Table 5 indicates:

- electricity is regarded as the safer of the two energy sources by both samples (whose results are similar), 54% of households from the random sample and 48% from the low usage sample believe electricity is at least ‘safer’ than gas
- the community’s perception of the relative safety between electricity and gas is generally stable between income groups (this is also the case when looking between household structure groups).

7.3 Environmental qualities

Households were asked whether they believed electricity or gas to be the better energy source for the environment.

Table 6: Better for environment - Electricity v's Gas (%)

	Random based sample Annual Household Income					Unstated	Total	Low usage sample*
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k			
Gas much better	6	15	12	13	20	11	13	9
Gas better	17	26	21	30	29	18	24	21
Same	10	8	12	11	12	11	11	18
Electricity better	35	24	21	26	20	26	25	26
Electricity much better	15	15	15	10	6	10	11	11
Unstated	17	13	19	10	14	25	16	15
Total	100	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

An analysis of Table 6 indicates:

- for the random based sample as a whole, households are essentially evenly split as to the relative environmental qualities of electricity and gas
- the higher income groups (>\$35k) appear to believe gas is the more environmentally friendly energy source. An interesting analysis would be to compare a household's perception of which energy source is better for the environment against education level. However, such analysis cannot be carried out using the survey data as presented by AGB McNair
- income groups in the \$15-35k range are essentially evenly split as to the relative environmental qualities of electricity and gas
- the lowest income group believes electricity is the environmentally friendly energy source
- households in the low usage sample appear to believe electricity is more environmentally friendly than gas, although the majority may not be significant.

The community's perception of the relative safety of electricity and gas (Table 5) was not shown in terms of Household structure because perceptions did not differ significantly between household groups. However, this is not the case for the issue of which energy source is better for the environment.

Table 6a: Better for environment - Electricity v's Gas (%) - random based sample

	Young single/couples	Young family	Middle family	Mature family	Older single/couples
Gas much better	14	15	17	10	11
Gas better	37	27	26	21	16
Same	9	10	11	11	12
Electricity better	18	21	23	32	28
Electricity much better	7	9	8	11	16
Unstated	16	18	14	15	17
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 6a indicates:

- perceptions differ significantly between some household groups
- younger household structures (upto Middle family) perceive gas to be the more environmentally friendly energy source
- older households (Mature family and Older single/couples) tend to perceive electricity as the more environmentally friendly energy source.

In practice, gas offers lower emissions of greenhouse gases and other pollutants than electricity. The difference in awareness of the relative environmental qualities of electricity and gas may reflect differences in general awareness on environmental issues.

7.4 Best value for money

Households were asked which energy source they believed represented the best value for money.

Table 7: Best value for money - Electricity v's Gas (%)

	Random based sample Annual Household Income						Total	Low usage sample*
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k	Unstated		
Electricity	39	49	51	51	62	46	51	40
Gas	10	9	10	8	8	13	10	18
Same	25	15	18	16	7	10	15	29
Unstated	26	28	21	25	23	31	26	13
Total	100	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

An analysis of Table 7 indicates:

- 51% of the random based sample believe electricity to represent the best value for money. Only 10% of the sample believed gas represented the best value for money

- all of the individual income groups perceive electricity to offer the best value for money
- as household income increases, a greater proportion of households within a particular income group believe electricity to be the best value for money, rising from 39% of households in the \$0-15k group to 62% of the highest income group
- this contrasts with gas, where the proportion believing gas to be the best value for money remains relatively stable at 8-10%
- among the low usage sample, 40% of households believe electricity to offer the best value for money.

Table 7a: Best value for money - Electricity v's Gas (%) - random based sample

	Young single/couples	Young family	Middle family	Mature family	Older single/couples
Electricity	68	64	58	47	32
Gas	6	9	10	12	10
Same	7	9	11	14	24
Unstated	19	18	22	28	34
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 7a indicates:

- perceptions differ significantly between some household structures
- within the younger household structures, over 50% believe electricity to offer better value for money than gas. The majority of households in the older groups also believe electricity to be the best value for money, however the proportion drops below 50%
- the greatest contrast is between Young single/couples and Older single/couples. Young single/couples overwhelmingly believe electricity to offer the best value for money (68%). Only 32% of households within Older single/couples believe electricity to offer the best value for money. Nonetheless, this figure of 32% still represents the majority of households within the household structure.

8 Pricing options and willingness to pay

The survey collected information on the community's willingness to pay for improvements to the environment, and their preferred payment methods for these improvements. In addition, the communities preferences in terms of energy systems and fixed and usage charges were collected.

8.1 PowerCard payment method

Tables 8 and 8a summarise the community's views on using the 'PowerCard' payment method for gas and electricity.

Table 8: Use of PowerCard payment method (%)

	Random based sample Annual Household Income					Unstated	Total	Low usage sample*
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k			
Definitely	13	18	11	11	9	8	11	4
Likely	10	16	19	14	16	7	13	6
Unlikely	7	6	12	15	18	5	11	11
Definitely not	65	55	57	57	57	72	60	74
Unstated	6	4	2	3	1	9	4	5
Total	100	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

An analysis of Table 8 indicates:

- there is no strong relationship between household income and the likelihood of using the PowerCard payment method
- the PowerCard payment option is not popular with the community. A significant proportion of households within each sample stated that they would definitely not use the PowerCard payment option (at least 60% in each case).

Table 8a: Use of PowerCard payment option (%) - random based sample

	Young single/ couples	Young family	Middle family	Mature family	Older single/ couples
Definitely	11	18	15	11	6
Likely	19	19	11	14	8
Unlikely	22	9	10	11	7
Definitely not	47	50	56	61	75
Unstated	1	4	7	4	4
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 8a indicates:

- the majority of households within each household structure are unlikely to use the PowerCard option
- Older couples/mature singles are less in favour of the PowerCard option relative to the remaining household structures.

The results indicate that PowerCard would appeal to a small minority of customers. While PowerCard may be made available on an optional basis, the strength of opposition confirms that it should not to any degree be a mandatory requirement for any group of customers.

8.2 Off-peak energy tariffs

Households were asked if they would be willing to purchase electricity under an off-peak tariff. Under this tariff, electricity would be purchased when general electricity usage is low, with the electricity tariff being lower during these off-peak periods. Savings would then be achieved by running high energy appliances during these

periods. Currently, off-peak hot water tariffs are available. Under the proposed tariff off-peak rates would be available for energy consumed in the off-peak period. Households could then manage their use of a much wider range of appliances to take advantage of the off-peak energy rates.

Table 9: Take-up for Off-peak Tariffs (%)

	Random based sample Annual Household Income						Total	Low usage sample *
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k	Unstated		
Definitely	25	34	27	27	28	21	27	9
Likely	17	16	26	19	25	19	21	13
Unlikely	13	11	12	15	19	15	15	12
Definitely not	40	37	34	37	27	42	36	59
Unstated	5	3	1	3	0	4	3	6
Total	100	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

An analysis of Table 9 indicates:

- there is no clear relationship between household income and willingness to take-up an off-peak energy tariff
- households in the random based sample are evenly divided on the likelihood of taking-up an off-peak energy tariff
- the majority of households in the low usage sample would not use an off-peak energy tariff. Fifty-nine per cent would ‘Definitely not’ take-up an off-peak tariff, compared to 36% within the random based sample.

Table 9a: Take-up for Off-peak Tariffs (%) - random based sample

	Young single/ couples	Young family	Middle family	Mature family	Older single/ couples
Definitely	30	25	36	27	19
Likely	22	23	17	25	16
Unlikely	17	17	12	16	13
Definitely not	29	31	32	31	47
Unstated	2	3	2	1	4
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 9a indicates:

- excluding Older single/couples, the results between households are similar;
- Older single/couples households are less likely to take-up an off-peak energy tariff relative to the other household groups
- for the remaining household structures, there is no strong indication either way as to the likelihood of taking-up an off-peak energy tariff.

8.3 'Green' pricing: electricity

Tables 10 and 10a look into the issue of 'green' pricing for electricity. Households were informed that most of our electrical energy is generated by burning coal, although electricity can also be generated from more environmentally friendly options such as solar power or wind. Households were asked whether they were willing to pay more for electricity in order to have power from these sources. Only households who answered 'Definitely' or 'Likely' to the question of the likelihood of taking-up an off-peak energy tariff make up the sample.

Additional care must be taken when interpreting the survey data in Tables 10 and 10a due to the reduced sample size.

Table 10: Take-up for electricity green pricing (%)

	Random based sample Annual Household Income						Total	Low usage sample*
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k	Unstated		
Yes	32	44	50	64	54	42	49	45
No	62	47	47	28	40	45	44	45
Unstated	5	9	3	8	7	13	7	10
Total	100	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

An analysis of Table 10 indicates:

- a slight majority of households in the random based sample are willing to take-up a green pricing option. However, the difference is not significant. Nonetheless, almost 50% of households are willing to take-up the option
- there appears to be some relationship between household income and take-up of a green pricing option, as household income increases, take-up of a green pricing option tends to increase
- within the low usage sample, there is no majority either way. Nonetheless, almost 50% of households are again willing to take-up a green pricing option.

Table 10a: Take-up for electricity green pricing (%) - random based sample

	Young single/couples	Young family	Middle family	Mature family	Older single/couples
Yes	52	54	47	51	43
No	39	38	49	42	49
Unstated	10	8	4	7	9
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 10a indicates:

- the majority of households within the Young single/couples, Young family and Mature family structures are willing to take-up a green pricing option
- within Middle family and Older single/couples household structures, a minority of households were not willing to take-up a green pricing option.

While the margins are small, it is significant that broadly half the households asked expressed a willingness to take-up green pricing.

8.4 Fixed v's usage charge

Power bills are generally split so that a fixed charge is payable for access to the service, with an additional charge being payable based on the amount of power consumed. Currently, for the average person, the fixed amount for electricity is about 10% of the total bill.⁸ Households were asked how they would like their power bills to be split between fixed charges and usage charges.

Table 11: Fixed charge : Usage charge (%)

	100% fixed charge	75% fixed, 25% usage	50% fixed, 50% usage	25% fixed, 75% usage	100% usage charge	Stay as is	Unstated	Total
Random based sample	2	1	6	4	43	39	5	100
Low usage sample*	3	1	2	2	46	39	8	100

Note: rows may not add to 100 due to rounding; * based on electricity consumption.

Over 80% of households from each sample stated that either usage charges should make-up one-hundred per cent of their power bills or that the charging structure should stay unchanged. Following these options, the next most popular option in the random based sample was a 50-50 split between fixed and usage charges, with 6% of households preferring this option. In the low usage sample the next most popular option was a 100% fixed charge. Support for these alternatives was very low.

8.5 Willingness to pay to improve rivers and beaches

Households were asked if they would be prepared to pay more for water/sewerage services to help improve rivers and beaches.

Table 12: Pay more for rivers and beaches (%)

	Random based sample Annual Household Income					Unstated	Total
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k		
Yes	44	55	55	57	69	40	55
No	51	38	38	39	27	54	40
Unstated	5	7	7	4	4	5	5
Total	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 12 indicates:

- 55% of the random based sample are willing to pay more to improve rivers and beaches, compared to 40% not willing

⁸ AGB McNair. 1996, *Survey of Water, Electricity, Gas and Public Transport Usage*, March.

- there appears to be some relationship between household income and willingness to pay for improved rivers and beaches
- within the lowest income group, 44% of households are willing to pay more to improve rivers and beaches. This figure increases to 69% of households in the highest income group being willing to pay more for improved rivers and beaches.

Table 12a: Pay more for rivers and beaches (%) - random based sample

	Young single/couples	Young family	Middle family	Mature family	Older single/couples
Yes	68	61	50	54	47
No	26	33	45	42	48
Unstated	6	6	5	4	5
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 12a indicates:

- Young single/couples and ‘family’ households are willing to pay more to improve rivers and beaches, especially Young single/couples and Young family’s
- 47% of Older single/couples are willing to pay more, whereas 48% are not.

A household’s willingness to pay more for improved rivers and beaches may be influenced by a number of factors. These can include the household’s education level, their lifestyle or profession (ie whether they regularly use the rivers and beaches for recreational or business purposes) and their income level. Younger households are relatively more willing to pay increased water/sewerage charges for improved rivers and beaches compared to Older single/couples. This may reflect underlying factors such as education and income levels. Younger households may also be more likely to use rivers and beaches for recreation.

Some of these factors may also influence a household’s willingness to take-up a green pricing option on their electricity consumption (section 7.3). The patterns of willingness to take-up of a green pricing option for electricity appear similar to the patterns of household’s willingness to accept higher charges for water/sewerage services to help improve rivers and beaches.

8.5.1 Preferred payment option

Households that were willing to pay more for water/sewerage services in an effort to improve rivers and beaches were asked their preferred payment option. Tables 13 and 13a summarise the results.

Table 13: Pay more for rivers/beaches - preferred payment method (%)

	Random based sample						Total
	Annual Household Income						
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k	Unstated	
Levy	42	47	39	45	42	54	44
\$/litre	43	33	50	43	47	31	43
State tax	14	20	11	11	10	13	12
Unstated	1	0	0	1	0	2	1
Total	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 13 indicates:

- an environmental levy or usage charge are the two most popular payment options
- there is no clear preference between the two in the random based sample, with 44% of households preferring an environmental levy, and 43% preferring a usage charge.

Table 13a: Pay more for rivers/beaches - preferred payment option (%) - random based sample

	Young single/couples	Young family	Middle family	Mature family	Older single/couples
Levy	40	45	41	51	43
\$/litre	46	41	45	35	47
State tax	14	14	14	13	9
Unstated	0	0	0	1	1
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 13a indicates:

- excluding Mature family households, there are no significant differences in the preferences of household structures. These households show no clear indication as to their preferred payment option. On the other hand, Mature family's prefer a levy (51%), compared to 35% preferring a usage charge.

9 Public transport

The survey provided some data on the mode of transport for work and non-work travel. The following section summarises this information.

9.1 Work travel

Table 14: Travel mode: work (%)

	Random based sample					Unstated	Total
	Annual Household Income						
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k		
Private	64	64	66	69	77	71	71
Bus	7	12	7	5	7	13	8
Train	14	17	14	17	12	14	14
Ferry	0	0	0	1	1	0	1
Other	14	5	12	6	4	3	5
Not above	0	2	2	2	0	0	1
Total	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 14 indicates:

- the majority of households travel via private vehicle to work
- the results are broadly consistent with data in the Tribunal's transport report;

- as income increases, a greater proportion of households travel by private vehicle, however, the relationship appears relatively weak
- usage of bus or train does not appear to vary systematically with income
- trains are the most popular mode of public transport (and second most popular transport mode overall), followed by bus and ferry transport.

Table 14a: Travel mode: work (%) - random based sample

	Young single/ couples	Young family	Middle family	Mature family	Older single/ couples
Private	58	80	78	77	67
Bus	13	6	6	5	6
Train	20	11	12	12	16
Ferry	2	0	0	0	0
Other	7	1	3	6	11
Not above	1	1	2	0	0
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 14a indicates:

- unlike the analysis for income groups, the analysis across household structures does provide some variation between structures
- Young single/couples rely less on private vehicles, and hence use public transport more frequently, compared to the three family household structures. Only 58% of the group use private vehicles for transport to work, compared to at least 77% for the three family groups.

9.2 Non-work travel

The survey asked households what mode of transport was used on their last non-work trip greater than 1 kilometre. The following tables summarise the results.

Table 15: Travel mode: non-work (%)

	Random based sample					Unstated	Total
	Annual Household Income						
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k		
Private	57	66	77	85	89	70	75
Bus	13	12	7	5	1	11	8
Train	15	9	6	2	4	3	6
Ferry	0	0	0	0	1	1	0
Other	15	13	9	8	5	11	10
Not above	1	0	1	0	0	4	1
Total	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 15 indicates:

- 75% of households used private vehicles for travel (slightly higher than the figure for work travel)
- the relationship between households income and mode of transport appears to be stronger than in Table 14 (work travel). As household income increases, the

proportion of households travelling by private vehicle increases, from 57% of households within the lowest income group to 89% of households within the highest income group. Use of bus and trains declines with higher income

- for all income groups except the lowest, the proportion of households using private vehicles for travel increases compared to work travel (Table 14)
- the proportion of households travelling by train (14% for work travel) decreases to 6%
- although included within the Other category, the proportion of households who use walking as the mode of transport increases from 4% (for work) to 8%.

Table 15a: Travel mode: non-work (%) - random based sample

	Young single/ couples	Young family	Middle family	Mature family	Older single/ couples
Private	73	81	80	78	69
Bus	6	5	8	5	12
Train	9	4	3	7	7
Ferry	1	1	0	0	0
Other	10	7	8	8	12
Not above	0	2	1	1	1
Total	100	100	100	100	100

Note: columns may not add to 100 due to rounding.

An analysis of Table 15a indicates:

- Young single/couples and Older single/couples use private vehicles to a lower degree than other groups, although the difference may not be significant
- use of private vehicles by Young single/couple households increases significantly relative to Table 14a (work travel)
- use of trains by each group is significantly lower than for work travel
- walking as a mode of transport increases for all groups relative to work travel.

ATTACHMENT 1: LOW USAGE HOUSEHOLDS

This section attempts to highlight some of the key aspects of households within the low usage sample, and to also compare these characteristics to the random based sample. The following tables show the relationship between household income and household structure. Table A1 shows how household income groups are proportioned between household structures. Table A2 shows the opposite, that is, how individual household structures are proportioned between income groups.

Table A1: Household structure v's Gross household income (%)

	Random based sample Annual Household Income					Unstated	Total	Low usage sample*
	\$0-15k	\$15-25k	\$25-35k	\$35-50k	>\$50k			
Young single/couples	8	13	12	17	25	15	16	13
Young family	9	20	19	19	16	9	15	6
Middle family	10	20	17	25	19	13	17	5
Mature family	10	16	22	21	31	30	23	6
Older single/couples	64	31	27	19	8	32	29	69
Unstated	1	0	2	0	0	1	0	0
Total	100	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

Table A1 indicates there are significant differences between the household structures of the random based and the low usage samples. The majority of households within the low usage sample are classified as Older single/couples (69%). This compares with 29% of random based sample households being classified similarly.

Table A2: Gross household income v's Household structure (%)

Household income	Young single/couples	Young family	Middle family	Mature family	Older single/couples	Random based sample	Low usage sample*
\$0-15k	9	11	10	8	41	19	50
\$15-25k	9	15	13	8	12	12	13
\$25-35k	9	15	11	11	11	11	7
\$35-50k	20	23	26	17	12	18	8
>\$50k	39	27	28	35	7	25	9
Unstated	14	9	11	20	17	15	13
Total	100	100	100	100	100	100	100

Note: columns may not add to 100 due to rounding; * based on electricity consumption.

The low usage sample is concentrated in the lower income levels. Fifty per cent of the sample have an annual income of less than \$15k. Within the random based sample Older single/couples are concentrated in the lower income levels relative to the remaining household structures. Forty-one per cent of this household structure have an annual income of less than \$15k.

ATTACHMENT 2: SURVEY METHODOLOGY

The target population for the survey was the greater metropolitan areas serviced by Integral Energy and Energy Australia⁹, which resulted in the household survey comprising of interviews with respondents from the greater metropolitan areas of Sydney, Newcastle and Wollongong. This area includes the bulk of AGL Gas Company (NSW) Ltd's customers within NSW. It also includes the areas serviced by Sydney Water and Hunter Water Corporation. The sample population consisted of Statistical Local Areas (SLAs) selected by the Tribunal that fell within these greater areas.

To address concerns by the Tribunal regarding low income and low usage customers, two different sampling methodologies were adopted:

- a random area based sample was used to obtain a representative view of the population overall
- a list based sample was used to obtain information that related specifically to low electricity usage customers.

The random area based sample consisted of 1000 households. This sample was constructed by selecting 200 Census Collector Districts (CD's) from the 47 SLAs which formed the sample. The number of CD's selected from each SLA was proportional to the number of dwellings in the SLA.¹⁰ Five households were then selected from each of the 200 CD's.

In total, 300 households were selected for the low usage customer sample. The sample was clustered to avoid significant costs from extended travel times. To undertake the clustering, each of the 47 SLA's were matched with a relevant postcode. Electricity suppliers were then asked to supply the address of customer's whose household fell within these postcode areas and whose electricity usage fell within the lowest 10% of domestic customers (matching was done with electricity authorities to avoid costs and time in matching customers across both electricity and gas). The number of households selected from each SLA was proportional to the number of low users in the SLA, rounded to the closest multiple of five.

The survey questionnaire, which was identical for each sample, collected data on:

- *household demographics*; including information on household income, dwelling type, family structure, and property value
- *usage of transport*; information was collected on mode of transport for both work and non-work travel
- *views on utilities*; for example, electricity and gas suppliers and a range of price related issues.

Importantly, the questionnaire sought the customer's approval to match billing data collected during the survey to data provided by electricity and gas suppliers.¹¹ Of the

⁹ Prospect Electricity and Illawarra Electricity were amalgamated to form Integral Energy. Sydney Electricity and Orion Electricity were amalgamated to form Energy Australia.

¹⁰ 1991 Census of Population and Housing.

¹¹ Collection of billing data and a similar matching with the supplier was not carried out for water due to the impact of restrictions distorting consumption patterns.

1300 households selected, 85% provided approval for release of electricity billing data. Of those households being supplied gas by their local gas supplier, 82% provided approval for release of gas billing data.