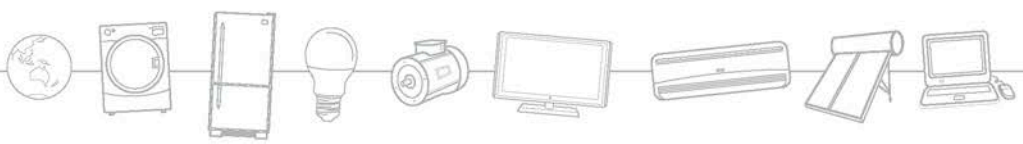
E3
Equipment Energy Efficiency

Household Lighting Consumer Survey

June 2016



A joint initiative of Australian, State and Territory and New Zealand Governments.

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Executive Summary

In March 2016 the Department of Industry, Innovation and Science (DIIS) and CHOICE jointly developed a household lighting survey to help understand what factors influence consumer purchasing decisions when buying light bulbs for their home.

The Survey was originally designed to be delivered by CHOICE through their online Voice Your Choice (VYC) research community of CHOICE members.

To broaden the demographic coverage of the sample, DIIS also commissioned I-View to deliver the same survey to the general public as VYC respondents tended to be older (more likely to be retired), more highly educated and there were far more men in the sample.

Results from the two samples are reported separately where there was a significant difference in response to a given question. The results have been combined into one sample of n=2241 responses where there was no significant difference in response.

The survey was delivered to respondents in electronic format. Images of the range of lighting technology were provided with the survey; however, the accuracy of responses relating to choices between types of lighting will in part depend upon each respondent's understanding of the differences in lighting technology.

Top results

To provide an overview, the top results are total figures from both samples, unless noted otherwise. Detail on the differences between the samples can be found in the tables noted.

The majority of homes have one or more LED or compact fluorescent lamp (CFL). CFL light bulbs were most prevalent (79%), followed by LED (59%) (See Table 1). Despite the higher upfront cost of LED light bulbs, 79 per cent of consumers said they intended to use LED lighting in the next few years (See Table 17).

Only a small number of consumers use light output in lumens as a guide to lamp brightness (15%). The majority of consumers use other methods such as equivalence claims (55%) and wattage (18%) to determine brightness (See Table 4).

50 per cent of VYC respondents and 33 per cent of I-View respondents have dimmers in their homes. Of those, 62 per cent had experienced issues with compatibility between certain types of lamps and their dimmers – 59 per cent with CFL and 42 per cent with LED (See page 9 and 10).

Most consumers dispose of their light bulbs in their household rubbish bin (65%) or recycling bin (18%). Only a small number of consumers dispose of light bulbs through

specialist waste services, e.g. council E-waste collection or CFL recycling schemes (17%) (See Table 18).

Of the 608 Voice Your Choice respondents who had halogen installed in their home, 41 per cent identified this was because they are replacing like for like based on what they have in their home, 21 per cent because they prefer their light output, 19 per cent because they work best with their dimmer and 7 per cent identified purchase price as the reason (See Table 6).

Q0 Home lighting overview

What kind of lighting technology do you currently have in your home? Please consider all lights in your home: light fittings, downlights, bathroom lighting, bedside lamps etc. and select all that apply. Multiple responses allowed.

	Total		VYC		I-View	
	#	%	#	%	#	%
Compact fluorescent (CFL)	1764	79%	1060	85%	704	70%
LED	1332	59%	852	69%	480	48%
Halogen	1063	47%	608	49%	455	45%
Incandescent (old type light bulbs)	933	42%	523	42%	410	41%
Don't know [SKIP TO Q2]	29	1%	7	1%	22	2%
n	2241	–	1240	–	1001	–

Table 1 - Home lighting overview

VYC respondents were more likely to have LED and compact fluorescent lights.

IF MORE THAN ONE TYPE IN Q0, ASK Q1:

Q1 Most common type of home lighting

And which lighting technology type is the most common in your home?

	Total		VYC		I-View	
	#	%	#	%	#	%
Compact fluorescent (CFL)	896	47%	602	49%	294	44%
LED	539	28%	384	31%	155	23%
Halogen	291	15%	149	12%	142	21%
Incandescent (old type light bulbs)	149	8%	83	7%	66	10%
Don't know	22	1%	15	2%	7	1%
n	1897	–	1233	–	664	–

Table 2 - Most common type of home lighting

I-View respondents were more likely to have halogen or incandescent lights.

Q2 Factors influencing purchase decision

When buying light bulbs, apart from making sure you get the right type of base, shape and brightness, how important are the following?

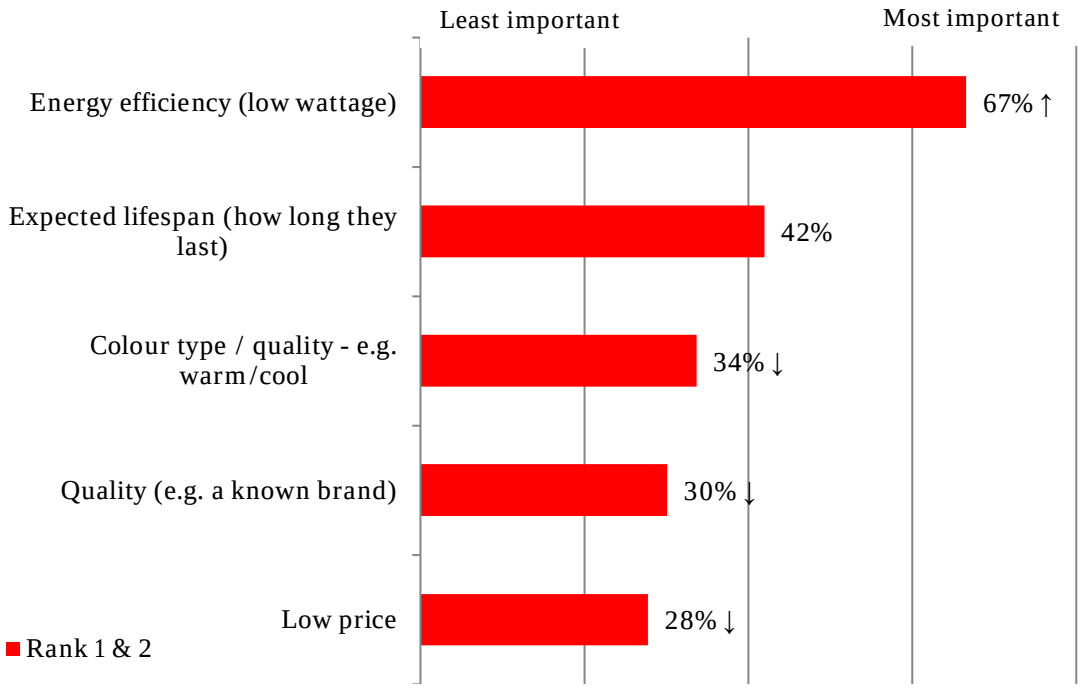

Figure 1 - Importance of factors influencing purchase decision (Rank 1 and 2 only, *n*=2241)

These results contradict sales and import data which show the less efficient halogen technology has the highest market share. It is possible that referencing wattage in relation to energy efficiency skewed the survey results, as many consumers select lamps based on similar wattage rather than overall energy efficiency (lumens per watt).

Q2A Other factors influencing purchase decision

Apart from the aspects mentioned in the previous question (i.e. price, quality, energy efficiency, colour type/quality and lifespan) what other aspects are important to you when deciding on which light bulbs to purchase?

	Total		VYC		I-View	
	#	%	#	%	#	%
No other aspects than the ones already mentioned are important to me	1456	65%	699	56%	757	76%
Other important aspects are (Please specify)*	522	23%	428	35%	94	9%
Don't know / Unsure	263	12%	113	9%	150	15%
n	2241	–	1240	–	1001	–

Table 3 - Other factor influencing purchase decision

I-View respondents were less likely to have other important aspects than those already mentioned. A third of the VYC participants nominated other factors that were important to them, compared to only 9% of the I-View participants. This may be because the VYC respondents are more highly educated in general, and from reading CHOICE articles on light bulbs.

***Other important aspects (responses)**

- *Compatible with existing light fitting*
- *Brightness*
- *Aesthetics*
- *Environmentally sound*
- *Availability*
- *Size of bulb*
- *Works with dimmer*
- *Direction/angle of light beam*
- *Other*
- *Country of origin*
- *Shape of bulb*
- *Cost efficiency/affordability*
- *Fire safety*
- *Ease of installation*
- *Time to full illumination*
- *Warranty*

Q3 Determining brightness

When buying light bulbs, what do you mainly use as a guide to their brightness?

	Total		VYC		I-View	
	#	%	#	%	#	%
Their claimed incandescent equivalence (e.g. 'equivalent to a 60W bulb')	1235	55%	759	61%	476	48%
The wattage of the lamp	408	18%	168	14%	240	24%
Their light output in lumens	345	15%	250	20%	95	9%
I just search for something that looks the same as the old bulb	164	7%	38	3%	126	13%
I don't use anything as a guide to brightness	72	3%	11	1%	61	6%
Other (Please specify)*	17	1%	14	1%	3	0%
n	2241	–	1240	–	1001	–

Table 4 - Determining brightness

VYC participants were more likely to use incandescent equivalence and light output in lumens. I-View respondents were more likely to use the wattage of the lamp.

***Other responses (I-View)**

- *Advice from retailer or electrician*
- *The intended purpose of the light bulb*
- *Haven't needed to purchase a light since moved into new home*

***Other responses (VYC)**

- *Advice from retailer or electrician*
- *Colour*
- *Angle (of light)*
- *Volts*
- *Quantity of light is the important factor, not brightness*
- *Don't buy light bulbs. LEDs should last a very long time without replacement*

Other responses were a combination of the factors above

Q4 Reasons for prevalence of halogen bulbs

Note: due to a clerical error, the I-View and CHOICE versions of this question differed slightly. The results could not be aggregated and are presented separately below.

I-View:

IF HALOGEN SELECTED IN Q1, ASK Q4

You selected halogen light bulbs or downlights as most common in your home. What are the reasons? Multiple responses allowed.

	#	%
Replacing like for like based on what I have in my home	73	51%
I prefer their light output (brightness and colour)	52	37%
Purchase Price – cheaper upfront cost than other options	25	18%
They work best with my dimmer	11	8%
Other:_____*	10	7%
n	142	–

Table 5 - Reasons for prevalence of halogen bulbs (I-View)

CHOICE:

IF HALOGEN SELECTED IN Q0, ASK Q4

You selected halogen light bulbs or downlights as currently installed in your home. What are the reasons? Multiple responses allowed.

	#	%
Replacing like for like based on what I have in my home	252	41%
Other:_____*	244	40%
I prefer their light output (brightness and colour)	127	21%
They work best with my dimmer	113	19%
Purchase Price – cheaper upfront cost than other options	42	7%
n	608	–

Table 6 - Reasons for prevalence of halogen bulbs (VYC)

*Other (responses)

- *Already installed when house purchased*
- *Renting*
- *Will replace them with LED when they fail*
- *High cost of converting to LED*
- *Design choice*
- *Can't find suitable alternatives*
- *Used only in a specific situation, e.g. security sensor lighting or kitchen exhaust unit*
- *Already had spare halogen globes*
- *No reliable alternative and nothing close to affordable that is compatible*

- *Filament is buried inside reflector whereas LEDs are usually on the surface and cause glare*
- *Installed by builder/architect*
- *Health reasons*

Q5 Dimmers

Dimmers are devices (usually dials) that allow you to lower the brightness of a light. Do you have dimmers on any of the lights on your house?

	Total		VYC		I-View	
	#	%	#	%	#	%
No	1254	56%	616	50%	638	64%
Yes	956	43%	622	50%	334	33%
Don't know [SKIP TO Q6]	31	1%	2	0%	29	3%
n	2241	–	1240	–	1001	–

Table 7 - Dimmers

VYC participants were more likely to have dimmers on their lights.

IF YES IN Q5, ASK Q5A & Q5B

Q5A How dimmers are used

How often do you use dimmers in the following areas of your home?

	In living areas (communal spaces like the kitchen, dining and living rooms etc.)		In non-living areas (non-communal spaces like the bathroom, bedroom, study, hall, storage etc.)	
	#	%	#	%
Regularly (Every time I use the light)	265	28%	138	14%
Sometimes (About every 3rd time I use the light)	287	30%	195	20%
Rarely/Never	283	30%	208	22%
Don't have a dimmer for those lights	121	13%	415	43%
n	956	–	956	–

Table 8 - How dimmers are used

Q5B Dimmer issues I

Have you found that certain lamp types are unable to work with the dimmer?

	Total		VYC		I-View	
	#	%	#	%	#	%
Yes	597	62%	424	68%	173	52%
No	359	38%	198	32%	161	48%
n	956	–	622	–	334	–

Table 9 - Dimmer issues I

VYC respondents were more likely to find lamp types that don't work with a dimmer.

IF YES IN Q5B ASK Q5C

Q5C Dimmer issues II

Which lamp types did you have issues with in regards to the dimmer? Multiple responses allowed.

	#	%
Compact fluorescent (CFL)	354	59%
LED	250	42%
Don't know / Can't remember	83	14%
Other (please specify)*	22	4%
n	597	–

Table 10 - Dimmer issues II

Q6 Lamp specific issues

Generally, have you had any issues with any particular types (i.e. incandescent, halogen, CFL, LED) of lamps? Please describe the issues below. Multiple responses allowed.

	Total		VYC		I-View		Main issues (responses)
	#	%	#	%	#	%	
No, I haven't had any issues with lamps	1272	57%	574	46%	698	70%	
Compact fluorescent (CFL)	535	24%	400	32%	135	13%	• Brightness – *take a long time to reach full brightness*; *fade over lifetime* • Flickering • Colour temperature – *white/blue light* • Shape - *too large for some fittings* • Environment – *mercury content and disposal options* • Compatibility – *don't always work with dimmers*
LED	324	14%	233	19%	91	9%	• Lifetime – *don't last as long as claimed* • Expensive • Brightness - *not bright enough; brightness fades over lifetime* • Glare - *irritating shine* • Flickering • Unpleasant colour • Compatibility – *not working on two-way circuit; problems with dimmers* • Directional – *lighting is more of a spot light than a dispersed light that fills a room*
Halogen	310	14%	204	16%	106	11%	• Heat • High power consumption • Hard to replace • Short lifespan
Incandescent (old type light bulbs)	294	13%	159	13%	135	13%	• Lifetime - *do not last very long, fail frequently* • Breakage - *occasionally shatter when switched on or break when you try to take them out* • Heat - *they overheat* • Availability - *no longer available* • Energy efficiency - *high energy use, low energy efficiency*

	Total		VYC		I-View		Main issues (responses)
	#	%	#	%	#	%	
Can't recall the lamp type, but experienced the following issues	82	4%	61	5%	21	2%	• Lifetime • Not bright enough
n	2241	–	1240	–	1001	–	

Table 11 - Lamp specific issues

Voice Your Choice respondents were more likely to report issues with halogen, CFL and LED light bulbs.

Q7 Energy efficiency

Which type of lightbulb do you think is the most energy efficient (and therefore has the lowest running cost)?

	Total		VYC		I-View	
	#	%	#	%	#	%
LED	1513	68%	959	77%	554	55%
Compact fluorescent (CFL)	280	12%	132	11%	148	15%
Don't know	195	9%	71	6%	124	12%
Fluorescent tubes	116	5%	55	4%	61	6%
Halogen	108	5%	9	1%	99	10%
Incandescent (old type light bulbs)	24	1%	9	1%	15	1%
Other	5	0%	5	0%	0	0%
n	2241	–	1240	–	1001	–

Table 12 - Energy efficiency

VYC respondents were more likely to think LEDs are the most efficient light bulb. Compared to VYC respondents, I-View respondents were more likely to say they didn't know.

Q8 Longevity

Which type of lightbulb do you think lasts the longest?

	Total		VYC		I-View	
	#	%	#	%	#	%
LED	1288	57%	784	63%	504	50%
Compact fluorescent (CFL)	282	13%	146	12%	136	14%
Don't know	272	12%	130	10%	142	14%
Fluorescent tubes	210	9%	113	9%	97	10%
Halogen	107	5%	25	2%	82	8%
Incandescent (old type light bulbs)	76	3%	37	3%	39	4%
Other	6	0%	5	0%	1	0%
n	2241	–	1240	–	1001	–

Table 13 - Longevity

VYC respondents more likely to say LEDs last longest. I-View respondents were more likely to say they don't know.

Q9 LED lighting knowledge

Which of the following claims about LED lamps were you familiar with prior to this survey? Select all that apply and please answer this question honestly – it's not a test, we just want to find out how well-known these claims are. Multiple responses allowed.

	Total		VYC		I-View	
	#	%	#	%	#	%
LEDs use less electricity than halogen lamps	1426	64%	956	77%	470	47%
LEDs last longer than halogen lamps	1256	56%	823	66%	433	43%
LEDs use approx. 80% less electricity than halogen lamps	834	37%	567	46%	267	27%
LEDs last up to 5 to 10 times longer than halogen lamps	760	34%	520	42%	240	24%
LEDs are cheaper overall than halogen lamps	689	31%	443	36%	246	25%
I wasn't aware of any of the above [EXCLUSIVE]	465	21%	162	13%	303	30%
n	2241	–	1240	–	1001	–

Table 14 - LED lighting knowledge

I-View respondents were more likely to say they weren't aware of these claims.

Q9A LED lighting claims

Based on your experience or what you believe, are the claims about LEDs correct?

(The claims being that LED lamps should last up to 5 to 10 times longer than halogen and use approximately 80% less electricity, meaning they are cheaper overall.)

	Total		VYC		I-View	
	#	%	#	%	#	%
I don't have any/sufficient experience, but would believe this to be true	1217	54%	719	58%	498	50%
Yes, in my experience I've found this to be true	449	20%	208	17%	241	24%
I'm not sure	335	15%	99	8%	236	24%
No, I didn't find this to be true (please specify how not)*	240	11%	214	17%	26	3%
n	2241	–	1240	–	1001	–

Table 15 - LED lighting claims

I-View respondents were more likely to be unsure about whether LED claims are correct.

Q10 LED lighting impact I

Knowing that LED lamps should last up to 5 to 10 times longer than halogen and use approximately 80% less electricity, meaning they are cheaper overall, does this information make you more likely to buy LEDs in the future even though they cost more upfront?

	Total		VYC		I-View	
	#	%	#	%	#	%
Yes	1782	80%	1009	81%	773	77%
Don't know	237	11%	87	7%	150	15%
No	222	10%	144	12%	78	8%
n	2241	–	1240	–	1001	–

Table 16 - LED lighting impact I

IF NO IN Q10, ASK Q10A

Q10A LED lighting impact II

Why not?

- *High upfront cost*
- *Light quality, especially colour temperature*
- *Transformer/dimmer compatibility*
- *Status quo (just replace with what was previously there/happy with the light bulbs I currently use)*
- *Renting*
- *Glare/health reasons (they cause headache/sore eyes)*

Q11 Future lighting choice

Which type of lighting do you intend to use at home in the next few years? Multiple responses allowed.

	Total		VYC		I-View	
	#	%	#	%	#	%
LED	1772	79%	1038	84%	734	73%
Compact fluorescent (CFL)	794	35%	530	43%	264	26%
Fluorescent tubes	393	18%	278	22%	115	11%
Halogen	357	16%	218	18%	139	14%
Incandescent (old type light bulbs)	204	9%	118	10%	86	9%
Don't know	149	7%	42	3%	107	11%
Other	33	1%	25	2%	8	1%
n	2241	–	1240	–	1001	–

Table 17 - Future lighting choice

I-View respondents were more likely to not know what types of lighting they will use at home in the future.

Q12 Disposing of light bulbs

When it comes to disposing of dead or broken light bulbs, which of the following statements apply for you? Multiple responses allowed.

	Total		VYC		I-View	
	#	%	#	%	#	%
I put them in my household rubbish bin	1459	65%	833	67%	626	63%
I put them in my recycling bin	401	18%	187	15%	214	21%
I dispose of them through specialist waste services, e.g. council E-waste collection or CFL recycling schemes.	372	17%	252	20%	120	12%
Don't know / don't dispose of light bulbs [EXCLUSIVE]	104	5%	28	2%	76	8%
Other	42	2%	40	3%	2	0%
n	2241	–	1240	–	1001	–

Table 18 - Disposing of light bulbs

I-View respondents were more likely to dispose of light bulbs in their recycling bin.

Appendix A: Demographics Overview

I-View Survey Demographics

1001 participants were surveyed. *n=1001* for all I-View survey results, unless otherwise indicated.

D1. Region

	#	%
ACT	21	2%
New South Wales	301	30%
Northern Territory	5	0%
Queensland	194	19%
South Australia	98	10%
Tasmania	45	4%
Victoria	246	25%
Western Australia	91	9%

D2. Age groups

	#	%
18-23 years	57	6%
24-29 years	142	14%
30-39 years	209	21%
40-49 years	171	17%
50-64 years	251	25%
65 years+	171	17%

D3. Gender

	#	%
Male	489	49%
Female	512	51%

CHOICE Survey Demographics

1240 people completed the survey, though not all respondents answered all questions. See the sample size, *n*, listed for each question. Respondents who answered this survey from the Voice Your Choice research community tend to be older, with a higher proportion of retirees, and more highly educated than the general population. They are also far more likely to be men than women.

1. Age *(n=1238)*

	#	%
17 years or under	0	0%
18-19 years	0	0%
20-24 years	2	0%
25-29 years	7	1%
30-34 years	19	2%
35-39 years	30	2%
40-44 years	51	4%
45-49 years	90	7%
50-54 years	133	11%
55-59 years	168	14%
60-64 years	210	17%
65-69 years	222	18%
70-74 years	172	14%
75-79 years	87	7%
80 years or above	47	4%
Prefer not to say	-	-

2. Generation *(n=1238)*

	#	%
Gen Y	36	3%
Gen X	215	17%
Baby boomers	719	58%
Pre boomers	268	22%

3. Gender *(n=1238)*

	#	%
Male	759	61%
Female	479	39%

4. Region *(n=1238)*

	#	%
Australian Capital Territory	69	6%
New South Wales	414	33%
Northern Territory	7	1%
Queensland	217	18%
South Australia	99	8%
Tasmania	30	2%
Victoria	275	22%
Western Australia	127	10%

5. Education *(n=1236)*

	#	%
High school	153	12%
University degree/diploma	799	65%
TAFE or other technical college	264	21%
Prefer not to say	20	2%

6. Employment *(n=1236)*

Multiple responses allowed.

	#	%
Working	582	47%
Retired	577	47%
Student	20	2%
None of these	64	5%
Prefer not to say	11	1%

7. Home Ownership *(n=1238)*

	#	%
No - I rent	90	7%
Yes - I have a mortgage	357	29%
Yes- I am mortgage free	770	62%
Other	21	2%

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A joint initiative of Australian, State and Territory and New Zealand Governments