Submission to the Senate Select Committee on Electricity Prices

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Summary

The Brotherhood of St Laurence welcomes the opportunity to submit our views to the Senate Select Committee on Electricity Prices. Across Australia, rising energy prices have focused people's anxieties about the cost of living. As energy prices have risen since 2007, so have the rates of financial hardship and energy disconnections. For many struggling households, the result is that they are forced to go without. Those on low and fixed income have been hit particularly hard because more of their weekly budget goes on energy bills. However, recent evidence suggests the impact of rising prices is being felt well beyond those on the lowest incomes, and notably by larger families.

The BSL's core function is to work for an Australia that is free of poverty. The BSL provides a national voice on matters of poverty and disadvantage, focusing on those people at greatest risk. The BSL has seen first-hand the adverse impact of rising electricity prices on vulnerable members of our society, particularly low-income households.

Addressing rising energy prices should therefore be a priority for governments. We trust the determination by the Commonwealth and state governments to address this issue will lead to meaningful changes in our energy system, with the result that consumers can benefit from reduced prices, improved consumer protections and a shift to a cleaner economy.

This brief submission:

- highlights evidence of rising prices
- explains the significance of rising prices to low-income households
- responds to the relevant terms of reference and makes five recommendations.

The submission includes an attachment from Dr Gill Owen, who has led major research projects on electricity demand response, smart meters and energy efficiency in the United Kingdom.

Recommendations

1 The Commonwealth Government should provide increased resources for the AER, in order to enhance its capability to regulate the energy market, including by pursuing rule changes in the interests of consumers.

2 Opportunities to reduce peak demand should be pursued.

Measures which have minimal direct impact on consumers, such as enabling the participation of demand aggregators in the National Electricity Market, should be pursued first.

Measures for residential consumers such as time of use pricing and direct load control should only be introduced after any adverse impacts on vulnerable residential consumers are identified and measures put in place to mitigate the impacts. This can, in part, be dealt with by strengthening the existing consumer protections to take account of the new tariffs or technologies. Consultation with consumer representatives, and programs to improve consumer energy literacy, will be an essential part of this process.

3 The Commonwealth Government, in conjunction with the states, should introduce a national energy savings initiative (NESI) with explicit measures to ensure low-income households are able to receive benefits from the scheme. These should include measures to assist access to higher value measures such as hot water systems and heating.

4 The Commonwealth Government should work with state governments to develop larger scale audit and retrofit programs which complement a NESI.

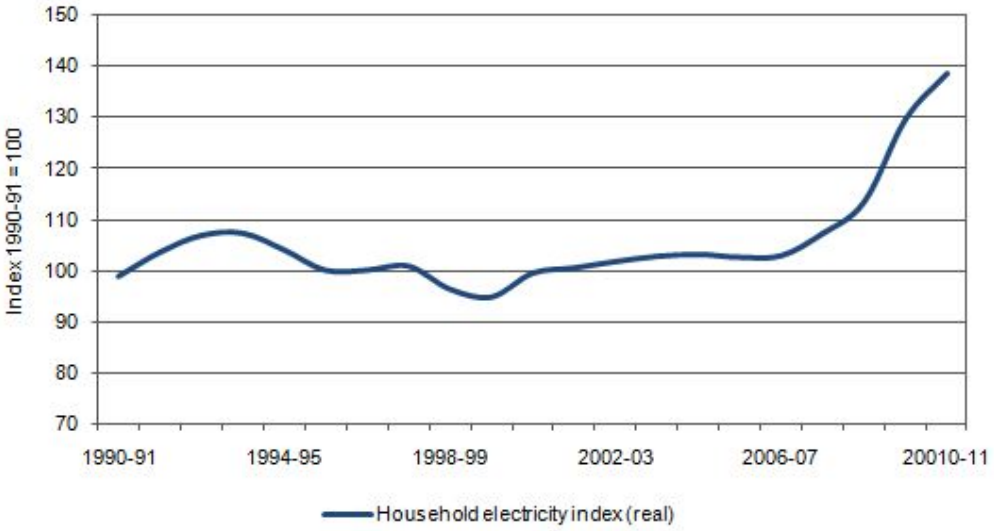
5 The National Energy Customer Framework (NECF) should be enhanced to ensure it incorporates the developments in the Victorian consumer protection framework, including those related to smart meters.

1 Rising electricity prices (TOR 1a)

What's driving up energy prices?

A number of recent reports have provided estimates of residential energy price increases over time (AEMC 2011; Garnaut 2011; Simshauser & Laochumnanvanit 2011). The price increases since 2007 have been significantly above consumer price index (CPI) increases (Garnaut 2011; Plumb & Davis 2010) as shown in Figure 1.1.

Figure 1.1 Real household electricity price movements



Source: (Garnaut 2011, based on Australian Bureau of Statistics, Consumer price index for electricity (Cat. no. 6401.0) Note: constant 100 would mean electricity prices rising at same rate as other prices

The trend of rising energy prices is expected to continue in all Australian states and territories (AEMC 2011). Factors influencing ongoing rises identified in multiple recent reports and forums (AER 2010; DCCEE & DRET 2011; DRET 2012) include:

- shifting Australia's energy supply from cheaply available and carbon intensive coal power production, to lower-carbon forms of energy, which will result in higher wholesale prices at least in the short to medium term.
- the increasing internationalisation of gas markets, which is projected to lead to higher domestic gas prices.
- ageing network infrastructure in key states, which needs to be replaced and will lead to higher network costs.

The AEMC (2011) indicates that the most significant factors in most states are increasing transmission and distribution costs – the poles and wires. In Victoria, the AEMC suggests increasing retail costs (which may include some element of increased wholesale costs) and smart meters are driving up prices. While many of the drivers of rising energy prices are unlikely to be reduced in the medium to long term, action can be taken to address some of the others, including:

- the incentives for investment and return on capital (see TOR 1b below)
- rising peak demand (see TOR 1c below).

In addressing these areas it is essential the needs of low-income and vulnerable households are fully considered. This will require detailed consideration of the impact of any changes on different household types, and consultation with community services and energy retailers.

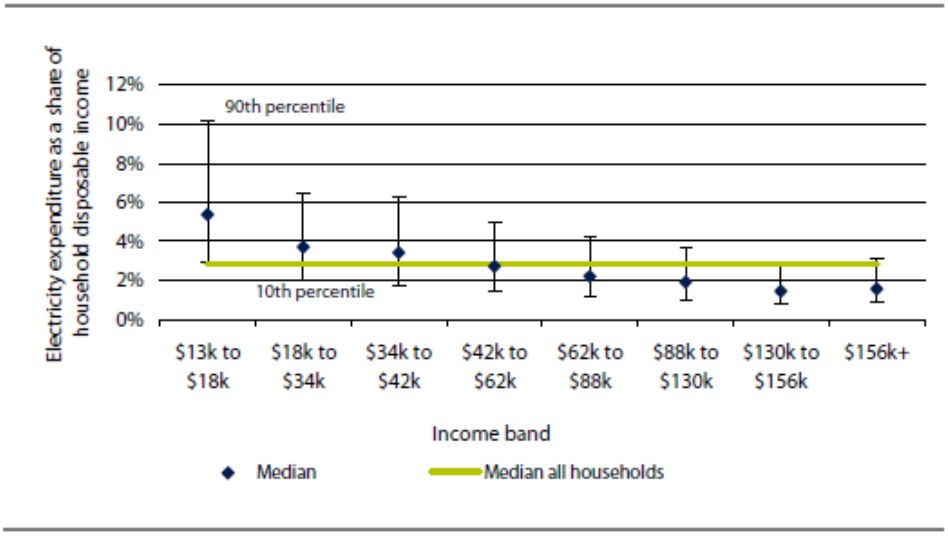
2 Energy, low-income and vulnerable households

Rising energy prices are particularly significant for low-income households because they spend a higher proportion of their income on domestic energy than do wealthier households (See Treasury 2008). Victorian households in the second and third lowest quintiles of income, for example, spend around 4.5 per cent of their income on energy; the proportion spent on energy decreases by quintile down to 2.1 per cent for the highest income quintile (ABS 2011). Australian households follow a similar pattern. Importantly, large quarterly bills have a much greater impact on household budgets when the bill is due than the averaged out figures imply. It is also worth noting that recent analysis by IPART (2012) suggests the ABS data on energy prices may underestimate the proportion of income spent by low-income households on energy.

Variation in energy expenditure between low-income households

The aggregated data conceals important variations in energy usage and expenditure between low-income households. While low-income households on average consume less energy than wealthier households there is a small but significant proportion of high energy consuming low-income households. Analysis of data from Victoria's Utility Consumption Expenditure survey (McNicol unpublished) indicates some 30 per cent of concession card holders have above average energy consumption. Research from IPART (2011) in NSW shows a greater variation in energy expenditure in lower income groups than other groups, as shown in Figure 2.1.

Figure 2.1 Electricity bills as share of disposable income, Sydney and surrounds, 2011/12



Source: IPART 2011, p.10

Those low-income households who use more energy are likely to be more vulnerable to price increases than others (see Sims 2010). IPART (2011) have quantified key household characteristics which result in higher energy bills for NSW households. For households with an annual income of less than $34,000, IPART identified the following contributions:

- larger households – an extra adult adds $260 a year and an extra child adds $180 per year
- larger house size – every extra bedroom adds about $50 per year
- living in a detached dwelling – adds about $280 per year
- living in the Country Energy supply area – adds about $450
- not having access to energy rebates.

The analysis suggests that measures aimed at reducing household energy bills (as distinct from system wide energy prices) will need to be tailored to assist different household types.

Implications of rising energy prices for low-income households

The impact of rising energy prices on vulnerable households can be seen in areas including increased financial hardship, disconnection rates, and spending on emergency energy relief.

Energy related financial hardship

Australian studies demonstrate rising energy costs have contributed to financial hardship, in particular for low-income households (COTA 2011; Flanagan 2009; Spoehr, Davidson & Wilson 2006). Difficulty paying electricity bills and increased demand for emergency financial relief services have been identified (Flanagan 2009; Lawrence 2002). Energy-related financial hardship is also often masked, as people prioritise the payment of utility bills above other household expenditure and may constrain their energy use, sometimes to the detriment of their home comfort and health (Green & Gilbertson 2008).

Disconnections and emergency relief grants

Electricity and gas disconnections in Victoria have risen significantly since 2006 (Table 2.1). While the increases are in line with longer term trends, they do suggest rising costs of living, including energy prices, may be contributing to the increase in disconnections (ESC 2011). Importantly the number of disconnections with a reconnection by the same customer at the same site has also risen – indicating households that are having difficulties paying their bills.

Table 2.1 Residential electricity disconnections, Victoria 2006-07 to 2010-11

	2006–07	2007–08	2008–09	2009–10	2010–11
Electricity disconnections	6,968	6,249	9,598	13,486	17,871
% of customers	0.33	0.29	0.43	0.59	0.77
Gas disconnections	8,145	6,581	10,077	15,473	13,741
% of customers	0.5	0.39	0.57	0.85	0.74

Source: Essential Services Commission 2011, p. 27, Figure 4.1

The impact of rising energy prices can also be seen in increased demand for emergency relief to meet energy bills, such as the Victorian Utility Relief Grants (URGs). URGs for electricity rose 136.4 per cent, from just over 5,000 in 2007/08 to nearly 12,000 in 2009/10 (DHS 2010).

3 Network transmission and distribution investment decision making (TOR 1b)

The Brotherhood of St Laurence is concerned that the current regulatory arrangements in relation to network transmission and distribution investment have allowed increases in investment expenditure well in excess of efficient levels. These increased capital costs are passed on to consumers, contributing to dramatic increases in residential electricity prices. To this end we made a submission to the Australian Energy Market Commission's 'Consolidated rule request – National Electricity Amendment (economic regulation of network service providers (NSPs)) Rule 2011'[1].

The action by the Australian Energy Regulator (AER) to initiate the rule change highlights the importance of empowering the AER to act in the interests of consumers, including through rule change proposals. In order to do this the Commonwealth government needs to significantly increase the resources available to the AER.

[1] For more information please refer to: Submission to the Australian Energy Market Commission on the consolidated rule request – National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2011, December 2011, < http://www.aemc.gov.au/Media/docs/Brotherhood%20of%20St%20Laurence-4bfa40d1-1b1f-4ad5-81f9-738738f53467-0.PDF>.

Our submission argued that deficiencies in the National Electricity Rules are leading to higher electricity prices, which have a significant and disproportionate impact on low-income households. Specifically we supported the proposals from the AER in relation to:

- the AER determining forecasts for capex and opex
- changing the incentives for capital expenditure
- requiring NSP submissions to be submitted with their proposals
- AER determining the weight attributed to confidential information submitted by NSPs in proposals.

In relation to increasing flexibility regarding the Weighted Average Cost of Capital (WACC), our submission identified that both the AER and the EURCC proposals would have a positive impact for consumers.

The ruling by the AEMC on this case provides a significant step in the right direction.

Recommendation: The Commonwealth Government should provide increased resources for the AER, in order to enhance its capability to regulate the energy market, including by pursuing rule changes in the interests of consumers.

4 Reducing peak demand (TOR 1c)

Peak demand is an important driver of rising energy prices that can, and should, be addressed in the short, medium and long term. In addition to our comments below, please refer to a note on the UK experience from Dr Gill Owen, who has led a number of major research projects on electricity demand response, smart meters and energy efficiency (see Appendix).

The AEMC's (2012) Power of Choice review provides a detailed look at the opportunity for demand-side activity to reduce energy prices.

Importantly, the distributional impacts of demand-side approaches need to be examined. While the basic approach of reducing energy prices through demand-side participation is likely to benefit all energy users, some approaches will lead to increased costs for particular groups of users compared with others. Of particular concern are the proposals for time of use pricing, and other forms of cost reflective pricing. Such approaches are likely to have considerable and complex equity implications (see Johnston 2010).

We see significant issues with the introduction of time of use pricing as it requires households to know about the new offers, understand the implications and take advantage of the offers. In our experience many households either do not have sufficient information or have too much else going on in their lives to be able to take full advantage of potential offers. At the time of entering a contract, some households may not understand the risks, such as higher bills if they use energy intensive items at a specific time of day. As time of use pricing progresses it is possible that we will see a proliferation of market offers. While this may lead to benefits for some consumers, the UK experience suggests there are risks involved, as outlined in the attachment from Dr Gill Owen. Meanwhile, households who do not shift to time of use tariffs are likely to face higher prices, as more households who will benefit from time of use tariffs take them up.

Before introducing time of use pricing, it will be essential to carefully weigh up the distributional impacts of time of use pricing and ensure that existing safeguards and consumer protections are adequate to any new regimes which may be introduced. This process will require consultation with consumer and welfare organisations, along with energy retailers and other stakeholders.

Increasing the costs of electricity in order to 'force' decreased consumption is contentious, in particular for low-income households. For example Dufty (2007) claims pricing has little impact

because use is inelastic (in both the short and long run) for low-income households. In contrast, Garnaut claims there are long run impacts of pricing as people change their preferences and purchase more efficient appliances (Garnaut 2008b, p.476). However, given the barriers to energy efficiency faced by low-income households (for example higher costs of more efficient appliances, poor quality housing) it is difficult to anticipate how much which low-income households will be able to respond to pricing signals.

Alternative approaches that have been shown to successfully reduce peak demand without price shocks should also be considered. Of particular interest are the trials of opt-in direct load control for air conditioners. Recent reports have highlighted the impact of residential air conditioners on peak demand, requiring greater expenditure on electricity transmission and distribution. The Draft Energy White Paper (DRET 2012), for example, noted that while a residential air conditioner may cost a household $2000 to install it costs the entire system approximately $7000 to meet the peak demand requirements. Recent Australian trials of direct load control of air conditioners, with over 200 participants, showed that reductions in peak demand of between 17% and 27% are possible (Futura Consulting 2011). This data is summarised in Table 4.1. From a social equity perspective direct load control is worthy of consideration to address peak load from air conditioning. As with time of use pricing, potential adverse impacts on vulnerable consumers need to be considered.

Table 4.1 Australian direct load control trials

	No. of participants	% reduction	Estimated trial impact (kW or KVA)
Peakbreaker +(Glenelg)	≈ 2000	19%	30
Blacktown Solar City air con DLC	529	27%	600
CoolSaver	11	32%	15
Perth Solar City air con DLC	203 (year 1) 375 (year 2)	20%	122
Cool Change	1480	17%	1300

Source: Adapted from Futura Consulting 2011

Recommendation: Opportunities to reduce peak demand should be pursued.

Measures which have minimal direct impact on consumers, such as enabling the participation of demand aggregators in the National Electricity Market, should be pursued first.

Measures for residential consumers such as time of use pricing and direct load control should only be introduced after any adverse impacts on vulnerable residential consumers are identified and measures put in place to mitigate the impacts. This can, in part, be dealt with by strengthening the existing consumer protections to take account of the new tariffs or technologies. Consultation with consumer representatives, and programs to improve consumer energy literacy, will be an essential part of this process.

5 Mechanisms to assist households and businesses to reduce their energy costs (TOR 1d)

Practical low cost energy efficiency opportunities for low-income (TOR Idi)

Various practical measures can assist low-income households to improve their energy efficiency at low cost. Many measures are not exclusive to low-income and vulnerable households. There is, however, a strong case for government providing additional assistance to low-income households (see Garnaut 2008a; Wilkins 2008).

Low-income households spend more of their weekly income on energy than wealthier households, even though they generally use less energy in total. Many low-income households do not have up-front capital to invest in energy efficiency improvements to their homes. Further, those that do are

likely to place a greater emphasis on a dollar in their hand today than on the future savings from energy efficiency. This discounting of benefits may reduce the impetus to make energy efficiency improvements. Tenants in both private and public housing face difficulty getting landlords to make, or agree to, energy efficiency improvements. Low-income households, like other groups, also face information barriers and potential trust issues with service providers.

In addressing energy efficiency improvements it is important to recognise the heterogeneity of households in terms of household size, dwelling type, and location which may affect consumption.

Existing residential energy efficiency policies and programs

A series of existing policies and programs are having an important positive impact on residential energy consumption, including that of low-income households. A selection is highlighted below.

Regulations

Regulations that provide cost effective improvements in residential energy efficiency and should be strengthened include:

- regulations for new buildings
- minimum energy performance standards and energy labelling (in the E3 program)
- phase-out of electric hot water systems (not fully implemented)
- phase out of incandescent light-globes.

The Minimum Energy Performance Standards (MEPS) have proved particularly successful in addressing residential energy usage (see George Wilkenfeld and Associates 2009). However the benefits are often slower to flow through to low-income households, who tend to own fewer, but older, less efficient appliances (see Johnson & Sullivan 2011). Incentives should be put in place to help low-income households shift to more efficient appliances, particularly large home fixtures.

Energy savings initiatives[2]

Obligations on energy retailers to reduce the emissions or energy usage of residential and sometimes commercial customers exist in Victoria, New South Wales and South Australia. The schemes differ and there is currently a process to consider a national energy efficiency program, which may include harmonisation of state schemes (see DCCEE & DRET 2011).

Each of the schemes supports the uptake of energy efficiency measures by customers of the energy retailer. Under the Victorian Energy Savings Initiative (VESI), approved providers can install approved energy efficiency measures in residential or business premises. Our equity analysis of the VESI scheme highlights the benefits and drawbacks of this approach (Sullivan & Johnson forthcoming). Households in areas that are more disadvantaged received a higher proportion of the greenhouse gas savings under the VESI scheme. This occurred as a result of the higher incidence of lower cost, high incidence measures, particularly light globes (which make up approximately 90 per cent of the savings in the first phase of the VESI) and showerheads. However, households in more disadvantaged areas received significantly less of the benefits from installing higher cost items, which have a higher energy efficiency return per household, such as hot water service upgrades or heating upgrades.

Recommendation: The Commonwealth Government, in conjunction with the states, should introduce a national energy savings initiative with explicit measures to ensure low-income households are able to receive benefits from the scheme. This should include measures to assist access to higher value measures such as hot water systems and heating.

[2] For more information please refer to: National Energy Savings Initiative Submission to Department of Climate Change and Energy Efficiency (DCCEE) Department of Resources, Energy and Tourism (DRET), Brotherhood of St Laurence, February 2012, < http://www.bsl.org.au/pdfs/BSL_subm_National_Energy_Savings_Initiative_2012.pdf>.

Targeted energy efficiency programs

Selected programs and rebates offered by the Commonwealth, states and territories and community sector organisations are identified in the table below.

Table 5.1 Encouraging action - selected programs

Program	Approach	Significance
NSW Home Power Savings Program	Home visit and basic retrofit for 220,000 households over 4 years (NSW Government 2012)	Illustrates the ability to deliver at scale, with a rigorous monitoring and evaluation framework
Sustainability Victoria appliance rebates	Graduated rebates for high value appliances/fixtures (SV 2012)	Additional incentive for low-income households, which is likely to increase uptake and reduce dead weight loss
Greentown	Peers working within their CALD communities to provide audits and sustainability information (Bailey forthcoming)	Illustrates the value of targeted approaches to specific population groups

Recommendation: The Commonwealth should work with state and territory governments to develop larger scale audit and retrofit programs which complement a NESI

Improved customer advocacy and representation arrangements (TOR 1dii)

The Brotherhood recognises limited resources of consumer groups compared with electricity industry and other significant market players. We support the consumer and welfare organisations moves to form a national consumer advocacy body, including the process led by ACOSS, CUAC, CALC, ATA and PIAC.

Such a national body will need to allow for ongoing participation of existing sector and region specific voices.

National Energy Customer Framework (TOR 1d iv)

The Brotherhood recognises and welcomes the extensive work on the National Energy Customer Framework (NECF). We also submit that no consumer should be worse off as a result of the implementation of the NECF.

We are concerned that the NECF was developed without significant reference to the introduction and use of smart meters. We are also concerned that the NECF does not meet all the existing protections in Victoria, which has the strongest consumer protections measures in the country. In part this reflects the presence of smart meters in Victoria and associated measures taken to protect consumers.

We recognise a variety of Victorian consumer organisations (including CALC, CUAC, VCOSS, and St Vincent de Paul) have played a significant role in developing these consumer protections and their input should be considered.

The NECF should be enhanced to ensure it incorporates the developments in the Victorian consumer protection framework, including those related to smart meters.

Support and assist vulnerable consumers with electricity pricing (TOR 1dv)

The Brotherhood recognises the value of existing support mechanisms to assist low-income and vulnerable consumers. We also recognise that some states have increased the level of concessions: Victoria, for example, extended the concession to a full year 17.5% on the electricity bill. We are however concerned that there are substantive variations in the eligibility for and amount of state-

based concessions. To rectify this situation, consideration should be given to a national energy concessions framework, which would provide for legitimate variations based on climatic factors and energy costs. In particular the framework needs to ensure cover for Newstart Allowance recipients, who are not covered in some jurisdictions.

We also recognise the growing vulnerability of large households, who do not necessarily qualify for a concession. Support for this group needs to be considered as a matter of urgency.

Networks assisting customers to save energy and reduce peak demand (TOR 1dvi)

See section above: Energy savings initiatives.

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Response to Senate Inquiry – UK experience

Note prepared by Dr Gill Owen

This note covers three separate issues of relevance: enabling consumers to make effective energy market choices; social tariffs; the impact of demand side response measures on low income households.

1. Enabling consumers to make effective energy market choices

Background

Concerns about the effectiveness of retail competition in delivering benefits to household customers in the UK began to surface around 2006 (price control was removed in 2002). Ofgem (the GB energy market regulator) launched an Energy Supply Probe in 2008, following which it introduced a number of measures to improve competition. In 2010-11 Ofgem reviewed how well the measures they had put in place following the Probe were working. The review found competition was being stifled by a combination of tariff complexity, poor supplier behaviour, lack of transparency and the degree of influence the big six energy suppliers had on the energy market.

Ofgem found that pricing structures make comparison difficult. Some retailers offer a standing charge and then a flat rate for the energy used. Others do not have a standing charge but operate a two tier structure - one price for the first block of consumption and then a different, typically lower rate, for additional consumption. The prices at which the two tiers are charged differs between companies as does the level at which consumers switch from the first to the second tier. This makes it hard for consumers to work out the unit price they are paying and compare it with the unit price offered by another supplier.

The number of tariffs on offer grew from just under 200 in January 2008 to more than 300 at the beginning of 2011. Ofgem's research found that 70 per cent of consumers were confused by the number of tariffs available.[1] Ofgem concluded that less than 20% of customers are "active customers" who regularly shop around. 40-60% of customers are categorsied as "sticky" (never switched and reluctant or unable to do so for various reasons).

Almost all consumers say that they switch supplier in order to save money. Ofgem's analysis however found that on average around one third of switchers may not achieve a price reduction. This proportion was even higher for consumers who switch as

[1] Ofgem. Retail markets : review and remedies. Factsheet 98. 25.03.11 http://www.ofgem.gov.uk/Media/FactSheets/Documents1/RMRfactsheet_energy%20prices%20update%20FS.pdf

a result of a direct sales approach (48 per cent for gas, 42 per cent electricity). Consumers therefore often switch on the basis of poor or partial information and fail to achieve a better deal.[2]

Ofgem's 2012 proposals for tariff reform

As noted above, Ofgem has concluded that many consumers see the energy market as complex and hard to navigate. Only a small number actively seek out better deals. Ofgem and most consumer groups believe that tariffs need to be simpler to help consumers to compare and switch. Ofgem now plans to :

- reduce the number of standard tariffs,
- introduce a single unit price so consumers can choose the cheapest standard tariff more easily, and
- ensure suppliers make information for consumers a lot clearer and easy to understand.

Standard tariffs are any tariff that doesn't have a fixed end date. The supplier normally has the right to alter the price – although Ofgem now requires suppliers to write to consumers at least 30 days before their prices rise. Ofgem proposes:

- Each supplier can only have one standard tariff per payment method, per fuel. The three payment methods are direct debit, pre-payment meter, and standard credit, (where customers pay on receipt of a quarterly bill).
- The standard tariff will consist of a fixed standing charge set by Ofgem (this will vary by region but will be the same for all retailers in a region) and a single unit price set by the retailer (i.e. market based).

These changes are designed to enable consumers to choose the cheapest standard tariff more easily. They will enable people to tell at a glance whether they can save money by switching supplier or moving to a new deal.

More innovative tariffs – Ofgem has proposed that all other tariffs must have a specified end date and fixed terms and conditions. The proposals for these tariffs:

- No restrictions on the number, type, structure or duration of fixed term contracts, including exit penalties.
- Terms and conditions, including price, set at the start of the contract and cannot change for the duration of the fixed term. (Although price would not be fixed for tracker-type tariffs).
- Automatic roll-over at the end of the contract will be banned. So customers who do not sign up to a new deal when their fixed term ends will default to the standard tariff. They will also be free to switch.

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[2] Ofgem. Energy Supply Probe : Initial Findings Report. October 2008. http://www.ofgem.gov.uk/Markets/RetMkts/ensuppro/Documents1/Energy%20Supply%20Probe%20-%20Initial%20Findings%20Report.pdf

- Strict rules on clear information and ensuring the customer understands the terms.

The fixed term tariffs proposals are designed to enable suppliers to continue to innovate – particularly in the area of time of use and other new tariffs that may be introduced with smart meters (which are being rolled out to all customers in the UK by 2019).

Making comparisons and choices - Ofgem proposes:

- Displaying all energy prices in pounds and pence, for example *£/month* as well as *p/kWh*. Ofgem's research found that consumers relate better to information presented this way. It will be the equivalent of an 'APR' comparison for gas and electricity.
- Suppliers will have to publish the price of all their tariffs in the same way so consumers can compare between standard and fixed term tariffs.

2. Social tariffs

In response to encouragement from the Government and Ofgem (and pressure from consumer groups) energy retailers voluntarily introduced a number of social tariffs from around 2005 onwards. These were designed to deliver lower prices to vulnerable and low income households. Ofgem published an annual review of the tariffs to aid transparency. It was found however, that the tariffs on offer varied widely in terms of who was eligible, how well they were taken up, and the level of benefit. In a number of cases the social tariff was a less good deal than other tariffs that the retailers offered to some customers (notably internet only tariffs). The retailers also found that it was often difficult to identify customers in need. As a result, in 2009, the then Government decided to legislate to make some of this assistance mandatory .

The Warm Homes Discount (WHD) was introduced in 2010. This provides a £130 a year discount off electricity bills for qualifying households (retirement pensioners on low incomes). Primary legislation was passed to enable data sharing between the energy retailers and the Department of Work and Pensions (because this would otherwise have been prohibited under data protection laws), which means that eligible customers receive the discounts automatically and do not have to claim them. The electricity retailers have also agreed to give a £130 discount to some other customers in vulnerable groups (called the broader group). Each electricity retailer has different eligibility criteria they use to decide who may get this discount.

One criticism of the WHD has been that some customers getting the discount may be on a tariff that is more expensive and therefore that the benefit will be lower than it could be. There have been calls for the retailers to switch households who get the

WHD to their best tariff to ensure that the discount delivers the maximum benefit. One retailer (EDF Energy) currently does this.

3. Demand side response measures – impacts on low income and vulnerable households

Interest in demand side response (DSR) measures has been incrasing worldwide for a number of years as a means of reducing peak demand and thus avoiding or deferring some of the costs of network infrastructure and electricity generation peaking plant. Interest is also increasing because of new challenges for electricity distribution networks in accommodating distributed generation (inlcuding solar PV) and new loads such as electric vehicles, heat pumps and inreasing penetration and usage of air conditioning. DSR measures can be aimed at reducing peak demand day in day out or only at critical peak periods (e.g. the times of highest demand on very hot days).

DSR measures can include various forms of tariffs designed to provide an incentive to customers to reduce their usage at peak periods; forms of automatic control that switch off or cycle down certain appliances for short periods at peak times (typcially air conditioning units) ; or a combination of both. Some trials have also experimented with providing information only (no economic incentive or automatic control) to test consumer willingness to reduce their demand at peak times.

A recent in depth review, for the UK's Department of Energy and Climate Change, of 30 DSR trials in the household sector in Europe, the US and Australia[3], reached the following conclusions :

- Consumers do shift electricity demand in response to economic incentives (such as higher prices during peak periods) even if these incentives are accompanied by only basic information, however the size of the shift can vary significantly. Basic information may include fridge magnets displaying peak hours and/or prices, information sheets, and basic bill inserts. This finding applies to both day-in day-out reductions in peak demand and reductions at times of critical peaks
- Interventions to automate responses deliver the greatest and most sustained household shifts in demand where consumers have certain flexible loads, such as air conditioners or electric heating.
- After automation, a combination of economic incentives and enhanced information delivers the greatest demand response. Enhanced information includes billing which breaks consumption down into different tariff periods, and technologies that provide real-time interactive information (such as in-home displays - IHDs).

[3] Frontier Economics and Sustainability First. Demand side response in the domestic sector : a literature review of major trials. DECC. August 2012

- Evidence on the impact of DSR measures on large households is mixed. The *California State-Wide Pricing Pilot* and found that smaller households were more responsive to price changes than larger households. Similarly the UK EdF *EDRP trial* found that smaller households reduced peak demand more than larger households. There is no conclusive explanation for this, but it may be that households with children have less flexibility to reduce demand during peak hours. In the *Ontario Smart Price Pilot*, some families with small children said they found it difficult to reduce laundry use during peak periods. In contrast, the *Ireland Electricity Smart Metering Trials* found that households with children under the age of 15 reduced peak demand by more than the average. Focus group evidence suggested that this was due to educational initiatives, which may result in children driving behaviour change.
- Evidence on the impact on low-income consumers of DSR is also mixed.. The US *Institute for Electric Efficiency (IEE)*[4] notes that flatter initial loads for low-income consumers (that is, electricity use spread more evenly across the day) mean that, before any behaviour change, low-income consumers may see a reduction in bills in a move from a flat rate tariff to a ToU or a CPP tariff. This is because, compared to the average consumer, low-income consumers already consume a higher proportion of their electricity at off peak times, when prices are lower under ToU or CPP tariffs. Faruqui and Palmer simulated the impact on electricity bills of CPP tariffs and found that 65% of low-income consumers were better off on the CPP rate than on a flat tariff, before any behaviour change.
- Evidence on responsiveness to economic incentives by income group in the UK is limited. Studies covered in the IEE paper generally found that low-income consumers in the US do respond to incentives to shift load, but that their responses tend to be smaller than the responses for average consumers.

There are several possible reasons why low-income consumers may have different peak use reductions relative to non-low-income consumers.

- Lower overall electricity use may mean less discretionary[5] load than an average consumer, limiting the extent to which they can reduce demand at any time of day (including peaks). On average low-income households have lower electricity consumption than high income households in the UK, therefore it is plausible that they may have less discretionary load to shift, although this has not been tested.
- Flatter load shapes may reduce the scope to shift peak demand, as they are already consuming less in peak periods (assuming peak periods are late afternoon/early evening and breakfast-time). Low income consumers are more likely to be at home during the daytime (for example due to being unemployed, retired or disabled). In the *Northern Ireland Powershift trial*, consumers in the trial group, who mostly had low incomes, were found to benefit from the lower off-peak prices in the ToU tariff passively (that is, without having to change their

[4] "The Impact of Dynamic Pricing on Low Income Customers" (2010)

[5] "Discretionary" load is electricity use that consumers are likely to be willing to shift or reduce. Laundry and dishwashing tend to be discretionary whilst cooking and TV watching tend not to be. Heating and air conditioning can be discretionary depending upon the interaction of price and comfort factors.

behaviour), as a lot of their electricity use was already at off-peak times (peak period in this trial was 5–7 pm when household and commercial sector loads overlap).

- Low-income consumers may have different standards of housing and different appliance ownership to average consumers. In the US *PG&E Trial*, the difference between low-income and average consumers was fully accounted for by differences in appliances used by these groups. Appliance use varies by income in the UK. For example, use of on-peak electric heating is more prevalent amongst low-income than better off households. Of the 560,000 households in Great Britain whose primary heating source is on-peak electricity, 53% are in the bottom two income quintiles. However, the effect of different appliance use by income on DSR has not been tested in the UK.
- Response to automation and information. In the *OG&E (Oklahoma and Arkansas) Trial, t*he IHD or web portal along with a CPP tariff led to smaller percentage reductions from low-income consumers than for higher income consumers. In contrast when the CPP tariff was combined with a smart thermostat, which allows an automated response to tariff rates, peak demand reductions were higher for low-income than high-income consumers. It is noted that other factors which may be correlated with income, such as the age of participants, may also have driven this result. This suggests that automation might work better for some low income households, than tariffs that they are expected to respond to through the provision of information.

Dr Gill Owen

Dr Owen has recently moved to Australia from the United Kingdom where she has been leading a number of major research projects on electricity demand response, smart meters and energy efficiency. She is co-author of a newly published review of demand side response trials worldwide for the UK's Department of Energy and Climate Change (DECC).[6] She was also Vice Chair of the UK Government's Fuel Poverty Advisory Group and has been, a member of DECC's Smart Meters Consumer Advisory Group and a non-executive member of the boards of the UK's energy and water regulators (Ofgem and Ofwat) and is also a former Commissioner of the UK's Competition Commission.

[6] Frontier Economics and Sustainability First. Demand side response in the domestic sector : a literature review of major trials. DECC. August 2012