Towards defining and measuring affordability of utilities – a discussion paper

1. Introduction

PUAF, the Public Utilities Access Forum[1], is a UK voluntary sector umbrella group that since 1989 has brought together representatives of a cross-section of agencies and individuals concerned with policy, advice and support for people with low incomes in relation to the major networked utilities – electricity, gas, water and telecoms.

During 2003 PUAF members agreed to clarify their goals in a PUAF Consumer Charter. The topic of affordability was central to the draft Charter, but was too complex to be handled in the same timescale as other topics. This paper tries to take forward the affordability debate, in particular by extending it to people outside PUAF's immediate circle but with related interests, such as safeguarding supplies of other essential goods and services, credit and debt management, and general anti-poverty initiatives.

Because readers of this paper will have widely differing backgrounds, the body of the paper is short, with supporting material in appendices. Any opinions expressed are my own, and reflect my other work in telecoms and international development. I am very grateful for points already contributed by PUAF colleagues, and would greatly welcome comments, corrections and suggestions from other readers.

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2. Why define and measure affordability?

The term "affordable" is used in various ways, some of which seem misleading. Being affordable is not the same thing as being low-cost (though that helps); nor is it the same as being cost-effective (which may help) or sustainable (more likely to hinder). The essence of affordability lies in the resources that are available for a purchase. This means that affordability only has meaning when speaking of a certain group getting particular products or services. Its use is by no

means confined to discussions of poverty – "affordable second homes" featured in a newspaper I read the other day.

Most households in this prosperous country can easily afford all the energy, water and telecoms they want. So when we speak of affordability in the context of utilities, the group we have in mind is people with low incomes, or who are vulnerable or disadvantaged for some other reason. Mentioning affordable utilities immediately raises the issue of disadvantage, and whether we should focus on working against disadvantage and for equity rather than on bringing essentials within reach of disadvantaged people. For those who say yes, affordability may be an unwelcome distraction.

We would probably all agree that it would be far preferable to abolish poverty and achieve social justice. But some of us feel that social justice is a long way off, and that meanwhile it is worth working for improvements within the existing order. These are not just differences of individual outlook - each utility is different, too. For example, it may well be that for water, the aim should be social justice rather than affordability. But there seems to be broad agreement in PUAF that:

- Social justice or equity are "higher" goals than affordability. They are also often more controversial. There are overlapping elements in the concepts of equity and affordability, but it is important to be clear about the differences too.

- Official statements on affordability (in the utilities, normally of the general tenor that everyone must be able to afford these essential services) should have some identifiable meaning, and it should be possible to say whether the affordability situation is changing (whether for better or for worse).

- As far as possible, our efforts to achieve affordability in different utilities should be mutually supportive and reinforcing, and consistent with other groups' anti-poverty work[2].

Definitions open the way to quantitative measures. These are valuable for comparison over time, between different services and geographically. Affordability measures and international affordability comparisons may be useful to many outside the UK.

3. Why focus on the utilities?

PUAF members' interest in the utilities comes from the jobs we do. Our collaboration has arisen through the utility privatisations in the 1980s and the establishment of an economic regulator for each utility. Of course, many other necessities are at least as important. But the utilities do have some special and common features which we feel justify the attention we give them. Annex 1 looks at this in more detail. Recognising the special status of the utilities, the National Consumer Council's Everyday Essentials work programme included an early report on this topic[3].

It is beyond question that continuous and adequate supplies of water, sewerage and electricity to every household are essential for healthy living in our society. Where gas is used for heating or cooking, it acquires a similar status.

Telecoms services have arrived more recently and are not a direct physical need in the same way (other than when calling for help in an emergency). But they have clearly become a social need. For example, official leaflets (for example on benefits) for some time have left out street

addresses and instead give phone numbers, and now increasingly also internet addresses, as sources of help and advice.

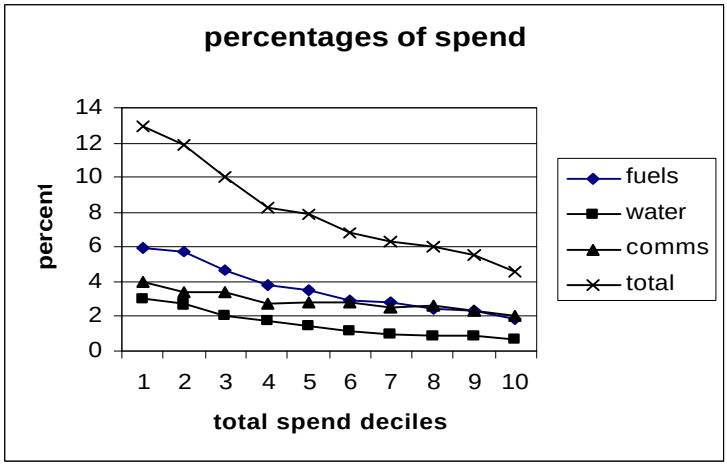

Figure 1 Percentages of spend on each utility and total, by decile[4]

Figure 1 above illustrates how significant the burden of spending on our three utilities taken together is for low-income households, and how much higher for them than for median or high income groups. Recent studies on debt have also shown the importance of household bill arrears in the debt carried by low-income households (Annex 1 summarises some relevant findings). Enlightened tariffing and collection practices by the utilities could be of considerable help to people in financial difficulties.

4. Current state of play in the UK

The NCC *life lines* report referred to above includes many recommendations for improving affordability of each utility, plus specific proposals for a more co-ordinated approach across the utilities. It does not include a full discussion of measurement issues, which this paper is exploring in more depth.

There is an accepted definition of **fuel poverty**[5] which can be read "backwards" as a definition of affordability (that is, a household being in fuel poverty means the same thing as fuel not being affordable for that household). This definition is needing to spend more than 10% of income to achieve certain levels of warmth in the home. It has been stable since the early 1990s[6] and arguably is in need of updating to reflect contemporary standards of need and comfort[7]. There are official government targets for reducing fuel poverty – currently, to abolish fuel poverty among "vulnerable households"[8] by 2010 and completely by 2018.

A definition of **water poverty** based on the fuel poverty approach – needing to spend more than 3% of income on water and sewerage charges – was put forward two years ago[9]. It has now been adopted by DEFRA as an affordability indicator, one among its large collection of sustainability indicators[10]. This means that the proportion of households for whom water is not affordable is receiving attention, but no targets have been set for reducing it[11].

In **telecoms**, affordability is an underlying principle of the universal service regime[12], but how far this is being achieved is a subjective judgement by the regulator, based on measuring take-up of

fixed and mobile phones and carrying out market research among relevant groups[13]. The official attitude has been that affordability of basic services was being taken care of by the market[14]. During 2004, a strategic review of telecoms regulation and a separate review of universal service provision offer opportunities for new approaches, and affordability of broadband is likely to attract attention.

Systematic approaches to assessing affordability outside the UK are limited, but seem to use percentage of income measures.[15].

5. Defining and measuring affordability of utilities

What we mean by affordability in the utilities is roughly:

> The ability to pay for necessary levels of consumption within normal spending patterns.

Like poverty itself, this is a complex notion which can be "unpacked" in different ways. And in spite of the common features mentioned earlier, the utilities all have different characteristics. No single measurement tells the whole story even for one utility, let alone for more than one. Probably the best that we can do is to put together a set of affordability indicators[16]. There are several categories of indicator, and some of possible interest are listed in Annex 3. If overall these are moving in the right direction, then we can say that affordability is improving (or vice versa). Some of the indicators may enable us to say that affordability has been achieved for certain groups.

The "percentage of spending" indicators are the most widely used and supported by statistical research, and can be obtained on a similar basis for each utility. Although they never tell the full story, it seems sensible to adopt them across the utilities. More background information on this approach is provided in Annex 4. But they always raise the question of what spending levels are adequate or acceptable, and of how and when targets should be set.

The figures are only meaningful when compared with the equivalents for other groups; and when they reflect necessary spending as well as (or rather than) actual spending. Basing targets on actual spending by low income groups may seem to give approval to an unsatisfactory situation. It is worth considering whether instead the expenditure patterns of a higher group, such as the median, should be the model. Whatever targets are set, a reasonable balance must be found between stability and continuing relevance. Given the pace of change in all the utility industries as well as social change, a review every five years or so does not sound excessive.

It is well known that billing and payment methods make a lot of difference to people on low incomes. Control over outgoings and avoidance of large bills are so important that people pay more for prepayment. But this is invisible in total spending figures.

Debt and disconnection statistics (examples are supplied in Annex 1) are harder both to get on a similar basis and to interpret. More lenient collection policies should improve affordability, but could lead to an increase in outstanding debt.

6. An initial proposal

It is proposed that similar core affordability indicators be used for all utilities, supplemented by such other indicators as are appropriate to that utility. Specific suggestions include:

- As a core indicator, the amounts and percentages of their total expenditure or income[17] that low-income households devote to each utility, and how these compare with the corresponding amounts and percentages for median households of similar composition. Where possible and relevant, the figures should be broken down to show the situation for different income groups, household types and region.
- The unit prices that low-income households are paying for their supplies of energy and telecoms (and water, where metered), as they stand and also compared with the equivalent for median households of similar composition.
- Availability and use of pre-payment and alternative payment schemes; incidence of disconnection for debt and "self-disconnection" (avoidance of use).
- Type of utility supply used (eg which fuel(s); fixed/mobile phone or payphones).

Changes in these indicators should give a good idea of how affordability is changing. They should be monitored at least annually. The chosen indicators for each utility should be reviewed every five years for continuing relevance.

New research, including discussions with low-income households, should throw light on necessary consumption levels and be taken into account when setting targets for the indicators.

7. Working with others

The question "How much is enough?" (referring to consumption of or expenditure on some necessary item) is common to many anti-poverty groups. Ways that PUAF members might usefully work with others include:

- Studying the utility usage levels in budget standards work.
- Analysing lists of socially defined necessities for their utilities implications. For example, the more electrical appliances move on to a list, the more electricity will be needed to run them.
- Being involved in future poverty survey design, so that the results can be interpreted in ways that help to monitor affordability in the utilities

Annex 1 Features of essential goods and services

The table below analyses some features of a range of essential goods and services.

	Water	Energy	Comms	Housing	Food	Clothing	Transport	Education	Health
Physical need	Y	Y		Y	Y	Y			Y
Social need			Y			Y	Y	Y	
Industry of SGI[18]	Y	Y	Y				Y		
Can be cut off	Y	Y	Y						
(Former) public provision	(Y)	(Y)	(Y)	Y			(Y)	Y	Y
Periodic credit normal	Y	Y	Y	Y					
Economic regulator	Y	Y	Y						
Public good element	Y		Y	Y			Y	Y	Y
Durable element[19]				Y		Y	Y		
Uniform quality[20]	Y	Y	Y						
% spending[21] (all, decile1)	1%, 3%	3%, 6%	3%, 4%	N/a	10%, 17%	6%, 6%	15%, 8%	1%, 0%	1%, 1%

For comparison, the following table is reproduced from DTI's July 2004 report on consumer representation in regulated industries[22] (where it is part of a discussion of the need for sector-specific consumer representation).

	Water	Energy	Post	Comms	Financial services	Air
Degree of monopoly power	High	Medium	High	Medium	Low	Low
Degree to which it is an essential service	High	High	Medium	Medium	Low	Low
Degree of information problems in the market	Low	Medium	Low	Medium	High	Low
Market size (annual household spend £m)	£5,493	£15,038	£884	£14,629	N/a	£10,590

It's also worth mentioning that debt Administration Orders can include gas, electricity, phone and water bills. This may be related to the fact that creditors in these industries have the physical ability[23] to cut off supply as an added payment incentive.

Annex 2 Household bill arrears and disconnections

The DTI/DWP 2004 Action Plan *Tackling Over-indebtedness*[24] shows that household bill arrears are the main form of debt for low-income households – and that 20% of those with income under £7,500 (and 26% in the £7,500 to £15,000 bracket) have household bill arrears.

The DCA 2003 report *Can't Pay Won't Pay*[25] singles out some phone companies for criticism as having a "one size fits all" approach to debt collection – while acknowledging that the research predated Oftel's guidance on debt and disconnection. The report recommends a "holistic approach" to debt recovery.

The IFS 2003 report *Use of credit and arrears among low-income families in the UK*[26] shows pattern of tenants and singles being more likely to have household bill arrears than home owners and couples. Incidence patterns are similar across all bill types. Overall 13% of the households in the survey had phone arrears, compared with 12% gas, 7% electricity and 15% water; and 20% of tenant singles, 17% of tenant couples, 9% home owning singles, 6% home owning couples has phone arrears.

Average amount owed: £116 for phone, £177 for electricity, £174 for gas, £218 for water.

The PFRC/DWP 2004 report *Characteristics of families in debt and the nature of indebtedness*[27] shows a clear pattern of younger households being more likely to have household bill arrears than older. It gives median phone bill arrears among families with children as £100, electricity and gas the same, with water at £150.

The Citizens Advice 2003 report *In too deep*[28] shows phone debt as around 4% of total debt carried by indebted households, and fuel arrears around 2% (but 4.7% for the lowest income bracket, up to £399 a month).

Disconnections

The Water Act 1999 made it illegal to disconnect a domestic water supply for non-payment. During the previous decade, the range of disconnections for debt was between 1,000 and 14,000 a year[29].

Ofgem monitors disconnection for debt for gas and electricity[30]. Over the past decade, electricity disconnections for debt have been in the range 300 – 4,000 a year and gas disconnections for debt in the range 8,000 to 30,000 a year. In addition, around a quarter of prepayment meter users (numbering over 3.5m for electricity and 2m for gas) report self-disconnection. Energywatch is campaigning for an end to energy disconnections for non-payment.

Ofcom publishes figures for disconnection for non-payment[31]. Residential gross disconnections have been running at rather over 1m a year, and net disconnections (ie those not followed by reconnection) at around 0.6m.

Annex 3 Some possible affordability indicators

Ideally we might like to measure:

"actual amount of consumption of the service as a percentage of necessary amount of consumption of the service"

This would be 100% or more where people have no consumption constraints, and very low where they are severely constrained. Absolute poverty measures generally aim to capture situations where overall consumption of essentials is below supposed necessary levels. Of course, amounts of consumption alone aren't enough – they don't reflect poor diets or hard-to-heat houses – but they're a start.

Actual expenditure is measured in surveys. The harder part is defining and estimating necessary expenditure. The situation is different for each utility:

- Water may be easiest, especially for unmetered tariffs where necessary expenditure is simply a fixed rate. For metered tariffs, too, estimation seems possible. Average volume needs can be calculated for different kinds of household, either using a "bottom-up" approach (eg certain numbers of baths/showers, loo flushes and loads of washing per week) or by looking at actual volume consumption by non-spending-constrained households. Tariffs are known, so necessary expenditure can be calculated.

- Energy is harder because of variations in housing energy efficiency. Either of the approaches for metered water could be followed, but then have to be adjusted by an (in)efficiency factor appropriate to the group in question. This is actually done for current fuel poverty measurements.

- Because people's circumstances and needs vary so much, and service prices also vary widely, this probably isn't a practical approach for telecoms in the UK. With any "basic" service level (eg InContact), we would probably find 100%+ expenditure in just about any group. Of course, this doesn't mean that people feel they can afford to make all necessary calls. (Far too many people are on the wrong package for their usage pattern). It's a reasonable measure in developing countries, where lots of people can't afford a phone at all.

Various alternative measurements which say something about affordability are listed below.

Consumption indicators
- Per capita equivalent consumption of / expenditure on the commodity (if below some adequacy threshold, points to unaffordability).
- Percentage of total household expenditure devoted to the commodity. (Most used to date – revealing because a higher % of limited budgets goes on essentials).
- Either of the above expressed as a percentage of a "norm" (could be a supposed "necessary" level or an average, eg median). Useful as a yardstick or as a measure of equity.

Price indicators
- Unit price paid for the commodity (taking account of standing charges) – usually high for low users.
- Unit price as a percentage of a "norm" unit price – revealing for prepayment vs postpayment, and especially for telecoms
- Total bill size trend for fixed consumption (even if new, higher level is in some sense "reasonable", an unavoidable rise can upset a previously balanced budget). This one seems especially relevant for water.

Equity indicators
- Expenditure (or % of expenditure) on commodity as a % of an average level

- A “Gini coefficient” or similar measure of inequality in normalised consumption. Could be suitable for water because the bulk of domestic use is related to physical needs. Complicated for energy by hard-to-heat homes. Probably too complex to be meaningful for communications.

Payment indicators
- Available alternative payment schemes, and % of people choosing prepayment and frequent payment options.
- Arrears statistics (eg % of people with arrears, average level of arrears, current outgoings devoted to paying arrears).
- Take-up of any provisions intended to help with affordability (eg special tariff schemes)

Direct indicators
Answers to survey questions such as:
- Do you find x affordable?
- Do you buy as much of x as you feel your household needs?
- Can you keep your house adequately warm? (material deprivation question to be included in Family Resources Survey from 2004)
- In the last year, due to shortage of money, could not pay utility bills on time? (used in Australia)

Durables indicators
- Ownership of a fixed or mobile phone
- Dwelling SAP rating, fuels used (sole reliance on electricity?)

Note on S-curve analysis

Jonathan Bradshaw reports exploration of a technique called S-curve analysis for estimating necessary levels of consumption of a good or service[32]. This entails plotting the “equivalised” (per head) amount consumed against increasing income. In principle, where consumption stops rising and starts to plateau, one may say that basic needs are being met. Expenditure may well continue to rise, especially where better quality is available (eg food). To date this approach has not been found particularly useful, partly because of lack of suitable consumption data. Because of relatively uniform quality in utilities, this approach might be interesting for analysing utility usage.

Annex 4 The percentage of income approach

The concept of affordability gets most attention in the context of housing. Affordability indices for housing[33] use a "multiple of income" approach. This is based on mortgage lenders' usual practice of limiting loans to a multiple of income, which in turn is based on an assumption of a maximum percentage of income that can reasonably be devoted to mortgage interest and repayments.

The basis for the percentage of income approach is the Engel curve. Ernst Engel was a statistician working in Saxony who first observed (in 1857) that poorer households spent a higher proportion of their budget on food than richer ones. This observation has since been replicated many times in different countries and for different essential goods and services. It is well illustrated in Figure 2.

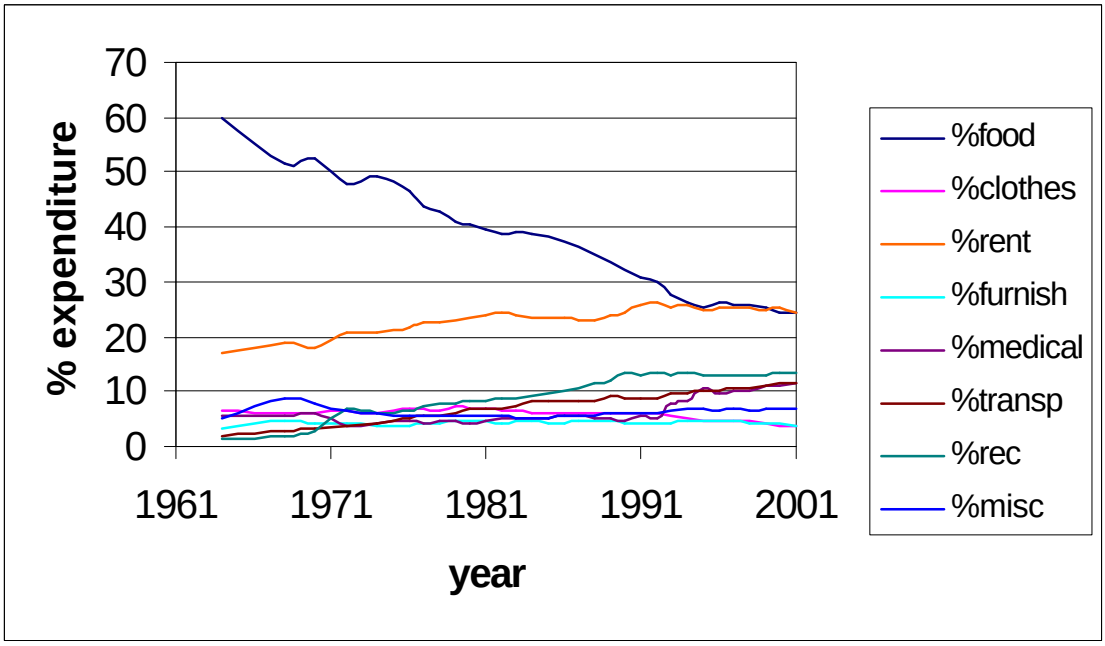

Figure 2 Changing proportions of expenditure with growing prosperity over 40 years in Taiwan[34]

Expenditure patterns are remarkably similar across different countries given similar levels of prosperity and urbanisation[35], but change long-term. Continuing growth in communications spending in rich countries is especially notable (see Figure 3). Water, electricity and gas spending have been stable for a few years but for environmental reasons are likely to rise.

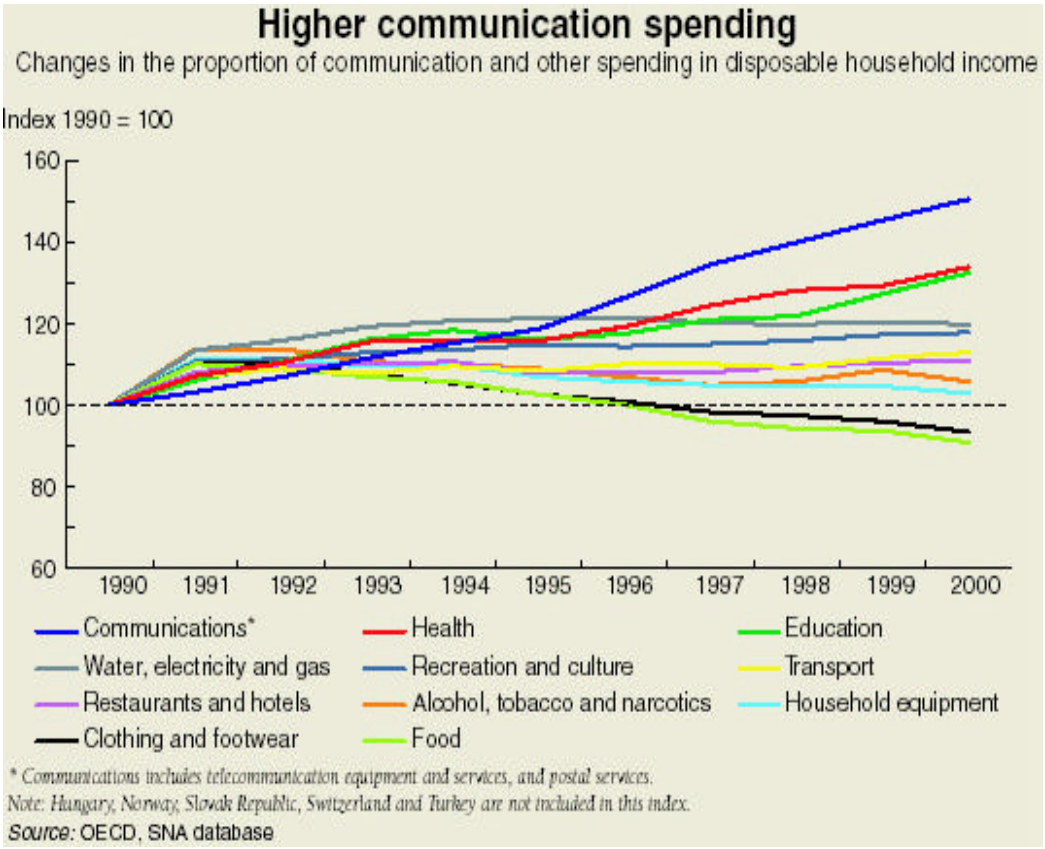

Figure 3 Changing spending patterns in OECD countries since 1990

Endnotes

[1] See our website at http://www.puaf.org.uk for more information, including a list of members.
[2] As documented in, for example, the February 2004 *Memorandum to the Prime Minister on Minimum Income Standards* from the Zacchaeus 2000 Trust.
[3] *life lines - the NCC's agenda for affordable energy, water and telephone services*, September 2003 - see http://www.ncc.org.uk/policy/everyday%20essentials.htm
[4] Source: Expenditure and Food Survey 2001-2 Tables 1.2, 1.3
[5] There is a huge literature on fuel poverty – see for example *Initial review of main fuel poverty research and publications* by Professor John Chesshire (April 2002) at
http://www.dti.gov.uk/energy/consumers/fuel_poverty/jhcresearch.pdf
and also an impressive array of fuel poverty indicators at
http://www.dti.gov.uk/energy/consumers/fuel_poverty/monitoringindicators2004.pdf
[6] The definition was based on the actual spending on fuel in 1988 survey data by the bottom three spending deciles. This group was chosen because their incomes are dominated by benefits. For details see the chapter "Profile of the fuel poor" in the book *Fuel poverty: from cold homes to affordable warmth* by Brenda Boardman (a founding member of PUAF) (Belhaven Press, London, 1991).
[7] This argument has been rejected in favour of continued stability and achievable targets. See Annex D *The English definition of a fuel poor household* of the UK Fuel Poverty Strategy (published in November 2001, available at http://www.defra.gov.uk/environment/energy/fuelpov/), where other definitional issues are discussed, including whether income should be assessed with or without housing benefit.
[8] Those including young children, elderly or disabled people. For details of the government's Fuel Poverty Strategy see http://www.dti.gov.uk/energy/consumers/fuel_poverty/index.shtml
[9] In *Water Poverty in England and Wales*, Martin Fitch and Howard Price (both PUAF members), CUCL/CIEH July 2002 http://www.cieh.net/dload/policy/ep/waterpoverty.pdf
[10] Water affordability is indicator Q3 (one of 6 freshwater indicators) in section 4 (Managing the environment and resources) of the sustainability indicator set at http://www.sustainable-development.gov.uk/indicators/national/index.htm
[11] Water affordability is however a live topic. DEFRA has set up a steering group to address it.
[12]The current statutory framework is given by the Electronic Communications (Universal Service) Order 2003 http://www.legislation.hmso.gov.uk/si/si2003/20031904.htm, which lists services include as part of universal service and requires them to be offered "at prices that are affordable for all end-users".
[13]See reports *Homes without a fixed line phone*, published November 1999 and April 2000, at
http://www.ofcom.org.uk/static/archive/oftel/consumer/about/research/con_fix_tel.htm
[14] Oftel's November 1998 statement on the principles of affordability is at
http://www.ofcom.org.uk/static/archive/oftel/publications/1995_98/pricing/rvtd1198.htm
[15] The European Commission's affordability indexes for Services of General Interest measure percentages of income required to buy predefined quantities of telephone, electricity and gas service. See *Horizontal evaluation of the performance of network industries providing services of general economic interest* (2004) and earlier similar papers at http://europa.eu.int/comm/internal_market/en/update/economicreform/
Social Issues in the Provision and Pricing of Water Services (OECD 2003) includes a chapter on measuring affordability. Affordability has also been investigated for universal broadband in Western Australia and for water and electricity in Eastern Europe.
[16] As is done for general poverty measurement. See *Measuring poverty and social exclusion 2003*, New Policy Institute http://www.poverty.org.uk/intro/index.htm
[17] The specific choice of expenditure or income, and how either should be measured (in particular, whether before or after housing costs) is itself a topic attracting a lot of attention. Whatever is best should be used consistently across the utilities.
[18] Services of General Interest (EU terminology). Policy site at
http://europa.eu.int/comm/secretariat_general/services_general_interest/index_en.htm
[19] Like fresh food or transport, but unlike clothing, utilities can't be stored, and the need for them can hardly be postponed.

[20] Absence of lower quality alternatives makes it harder to economise (or dangerous, as when open flames are used instead of electricity).
[21] Figures from 2001-2 Expenditure and Food Survey
[22] http://www.dti.gov.uk/ccp/topics1/consumer_strategy.htm
[23] Though no longer always the legal ability (eg water)
[24] http://www.dti.gov.uk/ccp/topics1/overindebtedness.htm
[25]Executive summary at http://www.dca.gov.uk/research/2003/4-03es.htm
[26] Use of credit and arrears on debt among low income families in the United Kingdom, Sarah Bridges and Richard Disney, University of Nottingham, July 2003
http://www.nottingham.ac.uk/economics/staff/details/papers/Bridges-Disney-FSv2.pdf
[27] Report 211 at http://www.dwp.gov.uk/asd/asd5/rrs2004.asp
[28] http://www.citizensadvice.org.uk/polfull.ihtml?id=0000036
[29] http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/debt_disconnection_tables_02-03.xls/$FILE/debt_disconnection_tables_02-03.xls
[30] http://www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/6110_monitoringfeb2004.pdf
[31] http://www.ofcom.org.uk/research/industry_market_research/m_i_index/discon?a=87101
[32] See Saunders, P., Bradshaw, J. and Hirst, M. (2002) *Using household expenditure to develop an income poverty line, Social Policy and Administration*, 36, 3, 217-234
[33] See for example *Affordability and the intermediate market*, Glen Bramley, Heriot-Watt University for the Barker Inquiry on Housing Supply, October 2003 at
http://www.hm-treasury.gov.uk/media/BC516/Glen%20Bramley.pdf and
A home of my own – report of the government's low-cost home ownership task force, November 2003 - Executive summary at http://www.housingcorplibrary.org.uk
[34] Source: *Survey of Family Income and Expenditure 2001*, Directorate-General of Budget, Accounting and Statistics Executive Yuan, Republic of China
[35] See for example *A system-wise analysis of international consumption patterns* by Saroja Selvanathan, Kluwer, 1993