

Open Letter to the Editors
Energy Policy < www.elsevier.com/locate/enpol >

Dear Sirs,

Re: Sovacool, B. K., Kivimaa, P., Hielscher, S., & Jenkins, K. (2017). 'Vulnerability and resistance in the United Kingdom's smart meter transition'. *Energy Policy*, 109(May), 767–781.
<https://doi.org/10.1016/j.enpol.2017.07.037>

We write to draw your attention to a range of issues in this paper that, in our opinion, contradict Energy Policy's stated Aims and Scope that "...Policy prescriptions are required to be supported by rigorous analysis and balanced appraisal." We also note Elsevier's publishing and ethics guidelines that state under the Duties of Authors - Reporting Standards that: "Authors of reports of original research should present ...an objective discussion of its significance." That "A paper should contain sufficient detail and references to permit others to replicate the work..." and that "Review and professional publication articles should also be accurate and objective, and editorial 'opinion' works should be clearly identified as such." We feel this paper contains factual errors that materially change the conclusions of the paper, is sufficiently methodologically unclear as to make replication of findings impossible, and does not display issues of academic impartiality and balance expected of peer reviewed research papers.

We strongly believe in the importance of rigorous, independent, objective and balanced scrutiny of major public policy programmes such as the Smart Meter Implementation Programme (SMIP). We believe that academics have a responsibility to conduct such research – particularly on issues concerning the wider social good. In this context, we feel that issues of critical infrastructure system scrutiny, environmental impact, protection of vulnerable consumers, and consumer engagement with the SMIP are important, and that this article brings together a number of issues which it will be important for those leading the SMIP to continue to consider. We feel that the peer review process confers on academic research an authority that gives it considerable weight in the public debate. Because of this, we feel that it is beholden on academics engaging in such public debate to take reasonable steps to ensure that such contributions are factually correct, methodologically sound, and balanced. We believe that the value of this article's contribution to this debate is unfortunately weakened by a range of issues highlighted here under factual errors, methodological issues, and issues of academic impartiality and balance.

Factual Errors

The paper repeatedly cites incorrect estimates of the savings that may arise from the UK Smart Metering Implementation Programme (SMIP). These include: "...Intended to reduce household energy consumption by 5–15%..." (p.767); and "...the previously proclaimed and projected 5–15%." (p.780). This figure is not the basis of the UK SMIP Impact Assessment. In fact, the cost benefit analysis in the Impact Assessment uses a figure within the range this paper cites as being appropriate. The Impact Assessment states: "In light of our current analysis of the available evidence and given the underlying uncertainty, we retain a conservative approach and continue to assume that the gross annual reductions in demand will be as follows: 2.8% for electricity (credit and PPM); 2% for gas credit and 0.5% for gas PPM." ([Smart Meter Impact Assessment 2014](#)) The conclusion this paper reaches that "...BEIS, Ofgem, and others such as the Committee on Climate Change should revisit and update projections of SMIP costs and benefits, given advances in technology as well as new data suggesting that households will reduce their energy consumption far less than anticipated – by an average of 1–3% rather than the previously proclaimed and projected 5–15%." (p.779-780) is therefore unnecessary. It should be noted that the 2014 Impact Assessment was updated in August 2016 with revised costs for the smart meter roll-out. However the [2016 Impact Assessment](#) after extensive review, retained the assumptions for energy reduction of the 2014 assessment, i.e. in the range of 1-3%. While the 2014 Impact Assessment is cited in the article, the correct estimates of energy savings are not reported. The 2016 Impact Assessment is not cited in this article.

The article states that “*For example, in Scotland, access to fixed broadband services—a prerequisite of a functioning Smart Meter system—is 69% in rural areas, and 80% in urban areas*” (p776). This is factually incorrect. The smart meter system does not use a fixed broadband network and instead uses a blend of Cellular, Mesh and Long Range Radio communication channels to support effective coverage in dense, urban as well as remote, rural areas. [The DCC SM-WAN Assurance Strategy](#) states “connectivity will reach over 99% of UK premises by the end of 2020”.

Table 4 cites as a ‘Technical Barrier’ to the uptake of smart metering the “Incompatibility between suppliers”, and offers as an explanation that “*Requirements that consumers purchase a new meter if they switched suppliers or even altered their tariffs on existing suppliers.*” This is incorrect, consumers do not have to purchase smart meters. The SMIP requires that smart meters are offered at no additional cost to the consumer. In addition to being factually incorrect, this statement is also importantly incomplete. A balanced assessment would also note that incompatibility between suppliers does not apply to any SMETS2 compliant meters, nor will it apply to any SMETS1 compliant meters migrated to SMETS2 compliance by firmware upgrade for enrolment into the Data and Communications Company (DCC) infrastructure. From 13 July 2018, suppliers will only be able to install SMETS2 meters, and all SMETS1-capable meters already installed must comply with the obligations for enrolment into the DCC infrastructure. Once a SMETS1/SMETS2 meter has been enrolled in the DCC infrastructure, consumers may switch with no loss of smart functionality. Thus, the issue of smart meter functionality ceasing on switching will apply to a minority of early issue smart meters, in which case they will retain all the functionality of a conventional meter.

The article notes with respect to In Home Displays (IHDs) that: “*Viitanen et al. (2015) concurred and emphasized in their study of customers in Sheffield and Leeds how smartphone apps were much easier to use, and more compatible with lifestyles, than an IHD.*” (p.773) This is incorrect. Viitanen et al (2016) compares smartphone energy feedback to TV-based feedback – not that of a UK SMIP IHD.

The article highlights the life-cycle impacts of smart metering concluding that: “*More refined lifecycle assessments should be conducted to determine the range and sensitivities of energy payback ratios and energy return on investment for different smart meter configurations in the UK.*” (p.780) They base this on the work of Louis et al. 2015 noting: “*For instance, Louis et al. (2015) conducted a lifecycle assessment of an entire home energy management system, including a smart meter, home automation, and IHD. They concluded it had a negative energy payback ratio of 1.6 years—the system as a whole was a net consumer, rather than saver, of energy.*” In fact Louis et al. 2015 state: “*This indicates that the environmental “investment” in terms of home automation does not pay itself back. Nevertheless, the smart meter itself can be paid back within 3.5 months meaning that the remaining months of the year are beneficial in terms of energy consumption. In terms of CO₂ payback, the smart meter would pay itself back after the 11th month.*” (p.885) The conclusions regarding the lifecycle impacts of smart metering are therefore misleading and directly contradict the findings of the citation provided.

In a section focusing on delays to the roll-out, the article notes that British Gas was fined £4.5m ‘for their slow rollout’ (p774). As the [Ofgem source](#) cited makes clear, this relates to energy companies’ responsibilities to roll out advanced metering to larger business customers – not the SMIP, which is the subject of the article. This may also apply to the £7m fine which the article mentions was issued to E.On, but the source cited (Computer World magazine) does not give enough detail to check. It is misleading to conflate these separate roll-outs.

Methodological issues

The article states that its findings are based on “...a systematic review of the academic literature” (p.767). As a systematic review, the study is not replicable, as it does not provide sufficient details of elements of the search strategy. The article states “*In order to maximize the size of our sample of literature and develop a thorough review, we conducted a broad search of articles discussing any aspect of the SMIP or smart meters, from engineering and technology concerns as well as social, political, economic, and cultural dimensions. We searched five different academic databases, looking for several sets of keywords within full-length, English language research articles. We searched article titles, abstracts, or keywords for the terms “smart meter” and “United Kingdom,” “England,” “Britain,” “Scotland,” “Wales,” and “Northern Ireland”. Table 1 summarizes the total number of articles collected from each database—with none excluded—including: Science Direct (15), SpringerLink (2), Taylor & Francis’s Informaworld (19), Wiley Online Library (1), and Sage (10).*” (p.768)

We replicated the stated search strategy using the same key-word combinations, search fields, and date ranges on the ScienceDirect database and returned similar numbers of results “*Search results: 14 results found for pub-date > 2008 and pub-date < 2017 and title-abstr-key ("smart meter" AND "United Kingdom" OR "England" OR "Britain" OR "Scotland" OR "Wales" OR "Northern Ireland").*” (ScienceDirect_ExpertSearch:http://www.sciencedirect.com/science?_ob=ArticleListURL&method=list&ArticleListID=-1242640162&sort=r&st=1&md5=62fb7396bd8252368e9f886cdb289b9e&searchtype=a) However, analysis of the results returned showed that only half of these references, 7 of 14, appeared in the list of references in the article. No explanation is given as to how the subset reviewed for this article were selected. This lack of transparency makes replication of the findings difficult.

In addition, and importantly, no search or selection strategy is provided for the non-academic sources that are referenced throughout the article. There are 79 citations in the list of references. Of these 12 are from main-stream on-line media sources targeting a wide readership - and all carry negative connotations about smart metering and the smart metering rollout. It is not possible to determine the representativeness of these articles, or eliminate any selection bias, without clear specification of the search strategy used in the review.

Systematic reviews also require that the process of data extraction, and data synthesis from the selected sources be described. This includes controlling for inter-coder bias by blind double-coding of sources to avoid conscious or unconscious bias in coding the textual data for analysis. There is no evidence that this has been done in this case.

The article states that its findings are based on “...*observation of seven major SMIP events*” (p.767). In order to avoid the potential for confirmatory bias in the observational analysis of events, it is necessary to explicitly state both how these events were identified (presumably from a wider population of possible events) and how the analysis was conducted of the event material. While some event selection criteria are provided, it is not clear whether these were all the events which fit these criteria, or a convenience sample meeting those criteria. This could have implications for the sorts of subjects which might have been expected to be raised at the events; this should at least be highlighted as a limitation. The article states that the events were chosen for a range of reasons including that they were: “...*verifiable (most had full transcripts, background materials and a briefing booklet)*” (p.769). It is not made clear whether the analysis of these events was based on transcripts made by the authors or the publicly available transcripts, and whether they were done using standard content analysis processes using established software packages (e.g. NVivo) and controlled for inter-coder and confirmatory bias by blind double coding of sources.

Issues of academic impartiality and balance

The article states that “*Bradley et al. (2016) noted that another level of resistance relates to the devices being potentially managed by the smart meters*” (p.777). While we accept that Bradley et al. (2016) noted this, it is factually incorrect to say that smart meters can control devices in the home. Consumers can choose to install third-party Consumer Access Devices (CADs) that can be linked to smart meters via the Home Area Network (HAN). Such devices can receive data feeds from smart meters, but control rests with the user and the third-party device (CAD). A valid analogy is that BBC Radio 4 does not control devices in your home, but you can buy devices (radios) that respond to the Radio 4 signal (other radio stations are available). The decision to purchase and use such devices is entirely the customer’s.

The article states that “*Citizens Advice (2017) echoed similar concerns in a report critiquing the SMIP for its negative impacts on the elderly and low-income households, particularly those with no formal education, those who do not speak English as a native language, or those with a long-term illness. It noted that such customer classes remained confused about, distressed, or unable to use the information offered by smart meters.*” (p775)

The above quote is a reference to the DECC Early Learning Project report cited in the introduction to the Citizens Advice report. “*The government’s early learning project found that elderly and low income households, people with a disability or long term illness, and those with no formal qualifications, were the least likely to engage with the information from their smart meter*”.

The Citizens Advice report does offer recommendations to improve safeguards to vulnerable customers noting that “...*suppliers diverge greatly on how they tailor the approach and for whom*”. However, the report states (in the conclusion) that “*Every supplier at an advanced stage in their roll-out planning has a developed policy in place with respect to vulnerable consumers. All vulnerable consumers can expect an*

installer that is trained to identify and adapt their approach to specific needs. Across the board, suppliers are tailoring advice, communications and the IHD to the specific needs of vulnerable consumers.” The interpretation of the Citizens Advice (2017) report in the paper appears not to be a balanced reflection of the findings of the report.

The comparative weighting given to different references is unbalanced and does not reflect the comparative authority of the different sources. As noted above, no search or selection strategy is provided for the non-academic sources. The most frequently cited references in the paper fall disproportionately within the 12 main-stream on-line media sources targeting a wide readership - all of which carry negative connotations about the smart metering and the smart metering rollout. Of these, Lewis and Kerr 2014 is cited six times; Rose and Thed 2014 is cited five times; and both Barnett 2015, and Utility Week 2017 are cited four times. By way of comparison, the most frequently cited article by DECC occurs four times; Smart Energy GB three times; BEIS once; and Ofgem once.

The article cites out of date material which is used without acknowledgement that issues raised in that material have been addressed by the programme. Figure 4 on the Technical Challenges of the Smart Meter Implementation Programme raises a series of concerns about the efficacy of the infrastructure and the extent of its coverage. These include:

- a) *Buildings with thick walls.* The article does not state that this is being addressed through a mandatory industry change to the SMETS protocol facilitating use of 868MHz HAN signals that have better wall penetration properties.
- b) *HAN signal propagation in flats.* The article does not state that this is being addressed through development of Multiple Dwelling Unit communication systems solutions through the ALT-HAN programme.
- c) *Rural area mobile coverage.* The article does not state that this is being addressed through the Smart Meter Wide Area Network strategy which states that “connectivity will reach over 99% of UK premises by the end of 2020.”
- d) *Hacking of smart metering infrastructure.* The article does not state that cybersecurity has been a central concern of the SMIP, and that many cyber-security experts have been involved in developing robust (and auditable) processes to prevent ‘hacking’ that are mandatory requirements for any organization interacting with the smart meter system (see [written evidence to the Commons Select Committee](#)).

Citing out of date material, and failing to provide a current, and balanced assessment of issues raised, is not consistent with expected standards of academic practice in international refereed journals.

The article concludes that consumers from vulnerable groups “...are likely to need more help if they are to obtain the full benefits of smart metering” (p.775). This statement is undoubtedly correct, but the article does not reference the research commissioned by Ofgem through the Low Carbon Network Fund specially to address this issue. The ‘[energywise](#)’ project is a £5.49 million project starting in January 2014 specifically to address issues of the impact of smart metering on vulnerable and fuel poor households. This work is not cited. The [Smart Metering Installation Code of Practice](#) also addresses these concerns, and the Citizens Advice report cited shows that 18 key safeguards to assist vulnerable customers with the smart meter rollout were offered by 90% of suppliers surveyed (11 of which were offered by all suppliers).

The article breaches standard academic conventions for research articles in several ways, quotes are unattributed and unverifiable (p.774), and emotive terms with negative connotations are used throughout: “...stuffed full of economists and engineers...” (p.780); “...hubristic agenda...” (p.780); “...thoughtless...” (p.779). In the context of editorial opinion pieces such language is more acceptable, however according to Elsevier’s own guidelines research articles drawing policy relevant conclusions are “...required to be supported by rigorous analysis and balanced appraisal”. We believe this paper falls short of generally accepted academic standards in this regard.

We wish to reiterate that we consider the areas highlighted by this article are important areas in which continued attention needs to be paid to ensure the success of the Smart Meter Implementation Programme. No government programme is, or should be, beyond scrutiny, however we believe that such scrutiny, particularly conducted by members of the academic community and given the authority of peer review, should be a fair, balanced, and evidence-led reflection on the programme.

The Authors of this letter wish to declare the following interests.

David Shipworth is a Professor in the UCL Energy Institute. He has a long-standing involvement with the Smart Metering Implementation Programme.

- He is the UK Government's Industry and Academic representative to the International Energy Agency's Demand Side Management Technology Collaboration Programme.
- He has been a consultant and advisor to the UK government and industry on smart metering over the last ten years having done work for BEIS; SEGB; ETI; ESC; EdF; E.ON; SSE; and UKPN.
- He is academic lead on the 'Vulnerable Customers and Energy Efficiency project (Energywise)' (UKPNT205). A 4-year grant from Jan 2014 to Dec 2017 funded by the Ofgem Low Carbon Network Fund and lead by UK Power Networks. Value ~£5.5M.
- He is a Co-Investigator on the RCUK 'Centre for Energy Epidemiology (CEE): the study of energy demand in a population'. 6-year grant from Apr 2013 to Mar 2018. Value: ~£6M
- He is a Co-Investigator on the RCUK 'Smart Meter Research Portal' project (EP/P032761/1). A five year ~£6M pound project from Aug 2017 to Aug 2022.
- He is a Co-Investigator on the 'Data-Driven Methods for a New National Household Energy Survey' project (EP/M008223/1). A 3-year grant from Jan 2015 to Dec 2017. Value ~£600K.

Dr Michael Fell is a Research Associate in the UCL Energy Institute. His research has focused on flexibility in consumer electricity demand, which smart meters are widely viewed as having an important role in facilitating. He has worked on projects funded by three organizations mentioned in the paper:

- Smart Energy GB (on consumer uptake of demand response, and on the use of smart meter data in health and care applications)
- Citizens Advice (on the value of time of use tariffs in GB).
- BEIS (a policy evaluation scoping exercise unrelated to smart metering).

He is currently on part-time secondment in the open science team in BEIS, where his work is not connected with smart metering. This letter is written in his capacity as a UCL researcher and makes no claim to represent the views of BEIS.

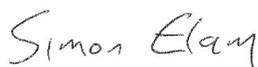
Simon Elam is a Senior Research Fellow at UCL Energy Institute with several research interests relating to smart meters.

- He is the Director of the RCUK Smart Meter Research Portal project (EP/P032761/1). The Engineering and Physical Sciences Research Council provided £6m of funding for a 5-year project (Aug. 2017-2022) to develop a [Smart Meter Research Portal](#) (SMRP) which will provide vital access to energy data for the UK research community. The SMRP consortium comprises 7 universities and the Energy Saving Trust.
- He led research streams investigating energy saving in response to smart meters (and IHDs) on the 'Vulnerable Customers and Energy Efficiency project (Energywise)' (UKPNT205), funded by the Ofgem Low Carbon Network Fund and lead by UK Power Networks. Value ~£5.5M.
- He is the author of a Teddinet-funded report 'Smart Meter Data and Public Interest Issues – The National Perspective'.

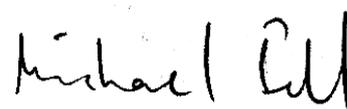
Yours truly,



[David Shipworth]



[Simon Elam]



[Michael Fell]