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## Exploring public perceptions of energy security risks in the UK

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## HIGHLIGHTS

- Exploring public views on energy security using a 10 item scale.
- Concerns over energy security is relatively high but susceptible to framing.
- Patterns of concern for different energy security aspects examined.
- The term energy security is unfamiliar, only an emerging concern among UK publics.
- Further discussion on the meanings and implications of these perceptions.

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## ABSTRACT

Along with climate change and affordability, concerns about energy security are key drivers behind proposals for major energy system change in the UK and numerous other countries. Unlike climate change we know very little about how the public thinks and feels about this aspect of sustainability and energy policy. Beyond engaging critically with conceptual and theoretical discussions, empirical data from two surveys (Cardiff postal survey,  $N=520$ ; online UK survey,  $N=499$ ) using a ten item energy security scale are presented and discussed. Here we show that aspects of energy security are certainly of concern to the UK public, with particularly high concern around dependence on fossil fuels/imports and relatively lower expressed concern for actual disruption of energy supply. However public concerns around energy security are only emerging, and likely to change depending on the context in which it is discussed (e.g. in comparison to climate change). In addition, findings from public interviews are used to further contextualise the survey findings, showing unfamiliarity among the UK public with regards to the term “energy security”. We discuss implications, and further work that would be useful for understanding public perceptions in more depth.

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## 1. Introduction

## 1.1. Background

Notions of ‘energy security’, although continuously renegotiated and defined, have arguably always been present in debates around energy policy in the UK and many other countries around the world (World Economic Forum, 2006). Although the specific energy security aspects and policies differ across countries, many of the same principles apply (e.g. ensuring uninterrupted energy access; Winzer, 2011). More recently notions of ‘energy security’ (ES) have become increasingly important within UK energy policy debates, driving proposals for major energy system change, alongside climate change (CC) and affordability (DECC, 2009).

Energy security is a complex, multi-faceted concept with numerous definitions (Chester, 2010). Despite its importance, little attention has been paid to how the public thinks and feels about this aspect of

sustainability and energy policy. Interest in public perceptions of ES is however increasing internationally, particularly because of their role in understanding public engagement with (low-carbon) energy generating technologies, as well as behaviours around demand reduction and management (Knox-Hayes et al., 2013; Sovacool et al., 2012; Hobman et al., 2012; Poortinga et al., 2012).

We explore what ES means to the general public, and provide a way of measuring ES concerns quantitatively using data from two surveys. We also engage critically with conceptual discussions around public perception of ES to provide further theoretical elaboration of the topic. To begin, we will briefly discuss the conceptualisation of ES, which provides the context for the examination of public perceptions.

## 1.2. Conceptualising ‘energy security’

As Chester (2010) notes, while the term ‘energy security’ is used widely in a variety of sectors (government, industry, academia), there has been little discussion of the notions which underpin its meaning. As a result, ES is often discussed in various terms including references to causes for concern (threats to continuous supply, e.g. failing

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infrastructure, depletion of resources), consequences of these risks (price spikes, petrol shortages) and ways of enhancing energy independence (reducing demand, alternative resources). Nonetheless, Winzer (2011) notes that all of these conceptualisations encapsulate a basic idea of avoiding sudden changes in the availability of energy relative to demand, and refer to an 'idealised' resilient system with low risks of interruptions to energy supply.

Chester (2010) has further elaborated on the polysemic nature of the ES concept, where 'energy security' may be delineated through multiple dimensions (e.g. temporal, geographical) taking on different specificities in different contexts. Although ES can be narrowly discussed in terms of market-centric definitions and 'measured' with quantitative indicators, there are also broader definitions which include qualitative aspects that go beyond the basic (un)availability of energy supply, such as affordability and sustainability (IEA, 2012a).

In UK energy policy, ES is often described in terms of the risks it poses to the country, where "concerns over energy security are caused by either physical supply disruptions or spikes in energy prices" (POST, 2012, p. 1). Concerns about those aspects of ES are heightened in the UK for a number of reasons:

First, the UK faces the nearing closure of many aging power stations and hence concerns are raised over possible electricity shortages if timely investment into new generation and transmission infrastructures is not found. For example, around a fifth of UK electricity capacity available in 2011 will close by the end of the decade, while peak demand is projected to grow by around 7GW (DECC, 2012b).

Second, dependency on fossil fuels and energy imports has increasingly been a concern because demand for fossil fuels will rise globally, and resources are becoming scarcer and are located in fewer parts of the world; in parallel with a decline in North Sea oil and gas production (DECC, 2012a). Thus, UK import dependency has steadily risen in the last decade and is expected to continue to increase (DECC, 2012a). It is argued that this high import dependency leads to greater exposure to global energy price fluctuations. In addition, many of the remaining fossil fuel reserves in 2020 and beyond will be located in politically unstable parts of the world which leads to worries about market manipulations and increased vulnerabilities through longer supply chains. Although, at the moment, the UK receives most of its imported gas through Norway and the Netherlands, and is therefore less exposed to possible supply disruptions in Eastern Europe, this risk will increase over time (DTI, 2007). Concerns have also been raised over the limited natural gas storage facilities in the UK, especially compared to other European countries such as France or Germany (IEA, 2010). Similarly, it is uncertain whether domestic production of unconventional gas will deliver a degree of energy independence in the future (IEA, 2012b).

Third, large investment in domestic, diverse and low-carbon sources is seen as necessary to achieve CC targets and simultaneously reduce dependence on foreign energy imports. It has been estimated that if 15% of the UK's electricity comes from renewable sources in 2020, this could lead to a 20–30% decrease in gas imports (DECC, 2009). However, the likely diversification of supply sources and increased use of wind energy leads to concerns about producing reliable supply. As an example, the UK electricity sector currently enjoys reliability close to excellent with "the average consumer in the UK spending less than an hour and a half without power a year" (DECC, 2009, p. 72). It is therefore desirable to maintain this stable balance between demand and supply as the system undergoes major transformation.<sup>1</sup>

Finally, conceptualisations of ES differ depending on the perspective taken, ranging from the international through to regional, national, and local, and also differ across stakeholders such as industry, communities and individuals (Chester, 2010). From the perspective of the individual, it could be argued that diminished 'energy security' is primarily experienced through fuel shortages or power cuts, as well as through the price of energy, i.e. energy bills (Burgess and Nye, 2008). In addition, it has been suggested that most people think about 'energy' in terms of the services it provides, for example heating and feeling comfortable in our homes (e.g. Sovacool, 2011). Traditionally these perspectives have been underrepresented in energy policy, where energy is typically conceptualised as a strategic resource or commodity (Stern and Aronson, 1984). Nonetheless the above mentioned ES risks, although quite abstract in nature, all have potentially significant impacts on both the price and availability of energy as experienced by the individual.

ES issues are therefore becoming ever more important in the UK and internationally, with various occurrences highlighting different aspects of ES. The "Arabian Spring" has highlighted the issue of Western (especially European) dependence on this part of the world for much of its oil, while the Fukushima Daiichi nuclear emergency in Japan has refocused attention on the viability of the so-called 'nuclear renaissance' (Hindmarsh, 2013). In the UK the energy regulator Ofgem has reported an increased likelihood of power shortages by 2015, highlighting ES risks other than price spikes for the first time in such a public manner (BBC News, October 2012b). These events make different aspects of energy salient for periods at a time, which may or may not have lasting effects on people's views. It therefore becomes important to develop methodologies to understand public perspectives on ES, and to effectively incorporate these into decision-making in energy policy.

### 1.3. Public perception of energy security

Public perceptions of ES have not been studied extensively, especially when compared with other issues affecting energy policy, such as attitudes to CC (Pidgeon, 2012) or specific supply technologies (e.g. Devine-Wright, 2011). A large part of existing research comes from opinion polls (many commissioned by the media or interest groups). These polls have typically asked a multitude of questions quite unsystematically, and public views on ES are generally inferred from a wide variety of questions on energy policies, without further discussion in terms of their meaning (e.g. Eurobarometer, 2006; IpsosMori, 2010).

Previous research has found that the importance of energy issues is low when compared to other social issues. In 2006, energy related issues were seen to be of secondary importance compared to concerns over unemployment, crime, the economy, and environmental protection in many European countries (Eurobarometer, 2006). In a UK poll, price and affordability was rated more important than environmental considerations in relation to gas and electricity (IpsosMori, 2010), and in a similar poll, respondents prioritised clean air and affordability before reliability and energy independence (Bisconti Research, 2007). However in a more recent poll (Populus, 2011), respondents were asked to rank three key energy policy goals. Although cost was still ranked highest by most people, this was followed by "enough energy to keep the lights on" before environmental concerns. Findings from these types of questions are difficult to compare, however, and can vary substantially due to subtle aspects of question framing (Oppenheim, 1992).

One aspect of ES that has been focused on quite extensively is that of dependence on fossil fuels and foreign supplies of energy. For example, 61% are extremely or very concerned over the UK's dependence on energy produced in other countries (Ipsos Public Affairs, 2010). A slightly different question shows that 74% are concerned that Britain might run out of gas in the next 10–15

<sup>1</sup> Although this is a particular focus on the electricity sector, transport and heating are also vulnerable because they are almost entirely dependent on gas and oil in the UK currently.

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