

## Can soft rationing of energy transform the UK non-domestic energy culture?

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### Abstract

The link between energy consumption and climate change is generally accepted by the UK politicians, the public and business communities. However, this recognition is at odds with the long standing non-domestic energy culture which views energy as a low cost resource and limitless availability as an entitlement.

Energy policies have generally relied on voluntary rational economic behavioural responses to financial initiatives established to support the UK's 2050 Pathway and carbon emissions reductions targets. However, many non-domestic users have not adopted the financially beneficial energy efficient technologies and behaviours as expected and progress towards mitigating climate change is now stalling. Since 2012 carbon emissions reductions have been largely confined to the power sector, whilst emissions from the UK's non-domestic building stock have been rising. Predictions now suggest that, without the introduction of more challenging measures to supplement existing progress, the energy transition pathways to reduce greenhouse gas emissions by at least 80% of 1990 levels will be missed.

This paper suggests that these challenging measures could include soft rationing of non-domestic energy supplies to transform the UK's current non-domestic energy culture that provokes socio-economic energy inertia by decarbonising energy sources, to one which values energy as a finite resource and promotes reduction of energy use. Soft rationing, delivered through a scheme of energy allowances to cap non-domestic energy use, may reenergise the pathway to mitigating climate change by promoting sustainable energy choices which focus on how much energy is needed rather than how much is used.

Key words: Energy culture; Non-domestic energy; Soft rationing; Energy allowances

### The current energy challenge

Current UK non-domestic energy demand and policy approaches reflect long-term historical forces that have driven continual improvements to the availability and efficiency of energy since the mid-19th Century (Unruh, 2000), and have resulted in a vastly increased per capita consumption (Warde, 2010). Whilst these developments have traditionally provided low cost energy technologies and services for non-domestic users, market forces have provoked a non-domestic energy culture that considers energy to be in limitless supply and excessive consumption acceptable (Emblen-Perry, 2016).

Politicians, business communities and the public now generally accept a strong link exists between non-domestic energy consumption and human-induced climate change, which has led to the growing use of lower carbon fuels and power generation. Whilst this decarbonisation of electricity and promotion of gas has significantly contributed to the 36% reduction in carbon emissions over 1990 levels achieved to date (Department for Business, Energy & Industrial Strategy, 2017a), progress along the Government's 2050 Pathway to meet future emissions reduction targets is now

stalling (Committee on Climate Change, 2017). Since 2012, carbon emissions reductions have largely been confined to the power sector, whilst emissions from the UK's non-domestic building stock have been rising (Committee on Climate Change, 2017); in 2016, final energy consumption increased 1.6% and industry and services accounted for 31% of energy use (Department for Business, Energy & Industrial Strategy, 2017b).

As lower carbon energy technologies can only address one side of the energy equation, i.e. sustainable generation, the need for sustainable consumption is now gaining prominence (Sorrell, 2015; Steg et al, 2015) and an economically rational opportunity to support climate change mitigation targets is emerging: using less energy.

Opportunities to contribute to mitigation of climate change through energy consumption reduction, which considers what energy is needed rather than what is used, have to date been eclipsed by overreliance on renewable energy (Committee on Climate Change, 2017). Using less energy has played a less significant role in UK energy policy to protect the long-standing, politically attractive energy culture in which energy is considered a low cost resource and limitless availability as an entitlement (Dowlatabadi and Razaei, 2013). However, with the threat of human-induced climate change increasingly being felt we no longer have the privilege of putting politics before the needs of people and the planet, or considering climate change a distant prospect (Roos, 2017). To highlight the potential impact of current trends, the International Energy Agency (2016) suggest the continuation of 'business as usual' could set the world on a course for a temperature increase of 6 degrees by 2100, which would make the majority of the planet uninhabitable for humans.

There will always be a demand for energy; the problem is not just the type of energy used, it is the way it is used, the amount used and what individuals and companies are doing with it (Hinkel, 2016; Committee on Climate Change, 2018). Even with 100% of energy from renewable sources the current energy culture and economic systems would ensure non-domestic users display socio-economic energy inertia (van Vuuren et al., 2016) and continue to act in the same way as they have for 150 years; using energy to promote economic growth which in turn provokes climate change.

Despite the implementation of challenging targets such as 80% carbon emission reductions over 1990 levels by 2050 (Climate Change Act, 2008) and UK Government energy initiatives to mitigate climate change, progress towards a sustainable future has fallen short of expectations. For example, within the Energy Saving Opportunity Scheme (ESOS) most participants undertook the mandatory energy audits which identified average potential energy savings of c. 20%. However, as follow up actions are voluntary, the majority of these opportunities have not been acted upon (Edie, 2018).

Many recent initiatives have proved inadequate to deliver the changes to the UK's energy culture so desperately required and have consequently been abandoned. For example, the 2014 requirement for zero carbon non-domestic buildings by 2019 was aborted in 2015, as there was no clear definition of 'zero carbon' (UK Green Building Council, 2017). The Carbon Reduction Commitment Scheme is to be scrapped following the 2018-19 compliance year and replaced by a higher Climate Change Levy charge to simplify compliance with the UK's transition to a lower carbon economy for intensive energy users (HM Treasury, 2016).

The reliance on energy policies largely based on voluntary action has created an "Energy Inconsistency", that is a marked difference between energy opportunities that have been proven technically viable, financially rational and retrofit feasible and those actually adopted (Emblen-Perry and Duckers, 2016). This gap has been recognised within research over the last 25 years (DeCanio: 1993; de Groot et al: 1999; Janda: 2008; Warde: 2010; Emblen-Perry and Duckers, 2016) although few studies have suggested potential solutions to overcome it.

Despite widespread recognition that energy initiatives have not achieved the expected rational economic responses, the 2018 Environmental Improvement Plan (HM Government, 2018) retains voluntariness at the heart of energy policy. Consequently, the Committee on Climate Change (2018)

have little optimism in the Government's ability to overcome the prevailing unsustainable energy culture.

The UK can no longer exist within this energy culture that promotes energy entitlement and over consumption. We have now moved into an economic environment in which market forces, levies on intensive energy users and voluntary engagement have made progress but are no longer sufficient to deliver the sustainable energy solutions required across all business sectors to mitigate climate change (Sorrell, 2015) and create a sustainable energy landscape that should be a balance of self-interest and altruism (Kopnina, 2017). New strategies and policy approaches are therefore urgently needed to ensure emissions continue to fall in line with the carbon budgets and energy transition pathways agreed by Parliament (Committee on Climate Change, 2017), and address unsustainable consumption across all business sectors so that small and medium (SME) businesses are as responsible and accountable for their energy consumption and carbon emissions as large intensive energy users.

In response, the author suggests that a regulatory approach of soft rationing through the application of energy allowances to cap non-domestic energy consumption could be applied to transform socio-economic energy inertia (van Vuuren et al., 2016) into a sustainable energy culture that views energy as a valuable resource and focuses on energy demand reduction rather than simply relying on decarbonising energy to achieve climate change mitigation targets.

### **Soft energy rationing as a potential solution**

Research suggests non-domestic users are more motivated to adopt energy efficiency and consumption reduction interventions through regulatory drivers than energy initiatives relying on voluntary energy behaviour change (International Energy Agency, 2015; Emblen-Perry, 2016). Therefore, adopting mandatory energy rationing through a regulatory mechanism of energy allowances, which could apply a regulatory cap and small annual reduction target for all non-domestic users, may provoke consumption reduction more successfully than previous voluntary approaches.

Energy rationing is soft for two reasons: Firstly, non-domestic users can retain control of the means and methods and financial benefits of achieving the small reduction targets set and secondly, reduction targets are small and easily achieved through well-established, proven technical and behavioural interventions.

Advocacy for a regulatory approach to energy consumption reduction through soft rationing responds to the pressing need to focus attention of non-domestic users on how much energy is needed rather than how much is used. This may stimulate the sustainable non-domestic energy culture that has so far eluded energy policy planners, embed the real cost of energy within energy decision making and promote sustainable energy consumption, in which using less becomes a social norm, to overcome the energy inertia that has contributed to the stalling of carbon emissions reductions.

A soft rationing regulatory approach could close the gaps in current energy policy and address actions that contribute to the mitigation of climate change in a way which may be more engaging and relevant for non-domestic energy users:

- As non-domestic energy users retain control over the means, methods and benefits of reducing consumption, energy allowances offer a financial incentive as a reward for compliance. This may increase the likelihood of success as rewards and incentives are key drivers of organisational behaviour (Murray, 2014).

- Energy allowances may provide a clear, long-term trajectory to a lower carbon future as capped energy consumption and annual reduction targets present the success criteria and targets that are lacking in the 2018 Environment Plan (Committee on Climate Change, 2018).
- Energy allowances may link fair entitlement (based on actual use) with fair expectation that all non-domestic users will contribute to climate change mitigation actions; everyone has a fair share of energy and no one has the right to exploit consumption.
- Energy Allowances focus on using less energy not paying for more. With cost penalties for over consumption, energy allowances may not be perceived as a scheme offering the right to pollute, as carbon trading schemes such as EU ETS are (McAllister, 2009; Carbon Market Watch, 2014).
- Energy decision-makers divorced from the real costs of energy are less likely to be concerned about energy efficient options (Dowlatabadi and Razaee, 2013). However, reconnecting them to the real costs of energy by applying energy allowances, energy efficiency and consumption reduction may become an instinctive reaction.
- Energy allowances may promote a sustainable non-domestic energy culture by using a regulatory approach to overcome the influence of personal traits on unsustainable energy culture and vice versa (Department of Energy and Climate Change, 2012; Steg et al., 2015).
- Unlike current energy initiatives such as the Renewable Heat Incentive and Energy Saving Opportunity Scheme, energy allowances may decouple energy consumption reduction from political popularity, which Roodhouse (2007) suggests is a key to future climate change mitigation.

To further incentivise energy culture change and consumption reduction, an over-usage penalty could be implemented. This may be paid as a fuel premium in the subsequent year if users exceed their allowance. By placing this clear financial value on over-consumption, an energy allowance scheme may promote a transformative energy culture in which energy users make sustainable energy choices, view energy as a valuable resource and develop social norms of using less.

A number of challenges may also need to be addressed for successful soft rationing of non-domestic energy. Firstly, the small annual consumption reduction targets proposed provide non-domestic users with a clear, longer term strategic horizon. However, this may conflict with more usual short-term organisational perspectives. Secondly, a programme of support and guidance may be required to ensure all non-domestic users are equipped with sufficient information to deliver the accountability and responsibility required to comply with the energy caps and reduction targets. Thirdly, the energy allowance process may need to be marketed appropriately as it may appear unacceptable to the powerful business lobby and politicians who dislike fiscal controls (Ockwell et al., 2009). Further research would be required to identify the most appropriate solutions to these challenges.

## Conclusion

Today's UK non-domestic energy culture reflects the users long-held views that energy is in limitless supply so that excessive consumption is acceptable (Emblen-Perry, 2016). The resulting energy usage patterns are now becoming a cause for concern, not only as a key contributor to carbon emissions (Lyon and Maxwell: 1999) but also as a cost burden for non-domestic users (Ambrose, 2017)

Successive Governments have relied on energy policies to reduce carbon emissions by decarbonising fuel and promoting efficiency through technological advances. The "carrots" (incentives) for smaller non-domestic users and "sticks" (levies) for intensive energy users to encourage energy efficiency have relied heavily on economically rational, voluntary behaviour change responses. However, whilst these have resulted in quick wins from decarbonising energy supply, non-domestic users have not reacted as expected and emissions reduction is now stalling (Committee on Climate Change, 2017). Effective new strategies and policies are therefore urgently needed to ensure emissions continue to

fall in line with the carbon budgets and energy transition pathways agreed by Parliament (Committee on Climate Change, 2017).

In response this research proposes an alternative approach to energy policy, one that recognises the importance of a sustainable energy culture and acts to develop it through the soft rationing of energy. Although regulatory approaches may be politically unattractive, they are a key motivator of change within the business community (Emblen-Perry, 2016; The Energyst, 2017). Consequently, an energy allowance scheme which caps energy and applies a small reduction target is advocated. This may introduce greater rationality and relevance into the policy landscape, assign energy responsibility and accountability to those who use it and promote the fair use of energy as a sustainable resource. It may provide the sustainable energy consumption that has eluded energy policy planners and promote a transformative energy culture in which sustainable energy choices are made that value energy as a finite resource and consumption reduction becomes the new social norm.

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