

CIE-MAP

Centre for Industrial Energy, Materials and Products

A Summary of our research findings and impact

CIE-MAP's response to the key challenges

Recognising the key challenges for industry, CIE-MAP has considered the options to reduce industrial energy demand through further improvements in efficiency while also exploring the role of changing consumption patterns of materials and products. Material and product demand drives industrial emissions. Therefore, as well as a sector level analysis of UK Industry, CIE-MAP has undertaken a detailed assessment of resource productivity strategies from the re-design of products through to the sharing economy.

Many of these strategies could have significant consequences for the general public and UK PLC. With this in mind, CIE-MAP has conducted research on the willingness of the public to engage in resource efficiency measures (considering their response to reducing packaging and increasing product reparability and longevity, for example).

CIE-MAP identifies a clear role for UK Government in bringing about these changes. This is one of the reasons why CIE-MAP has formed a long-standing relationship with the UK Government. Our engagement with BEIS and DEFRA has involved updating their Energy and Emissions Projection model, providing analysis for the Industrial Roadmaps and Action Plans, and developing new indicators on resource and energy productivity. CIE-MAP researchers have informed the Minister of Industry and Climate Change and we are now directly shaping the UK Government's strategy for increasing energy and resource productivity; feeding into both the Industrial Strategy and the Waste and Resources Strategy.

CIE-MAP has jointly organised events with BEIS, attracting participants from numerous other Government departments and industry. It has contributed to a number of high profile reports including the CCC's evidence to parliament, Chief Scientific Advisor's report, and enquiries held by the Energy and Climate Change Select Committee. Numerous industry partners have been involved from the energy intensive sectors, construction companies and manufacturers.

We have highlighted some of the key achievements of CIE-MAP below in this introduction. This is not an exhaustive list and each highlight below has a more detailed briefing note that can be found on our website (www.ciemap.ac.uk).

Key Highlights

Sector analysis of industrial energy

Our research demonstrated that improving energy efficiency in UK industry is one of the four central strategies to reduce energy demand along with fuel switching and electricity decarbonisation, carbon capture and storage and resource efficiency gains. Efficiency gains can be made in industry, including those associated with the use of heat and with improvements in processing. The energy efficiency challenge will vary significantly across sectors requiring a detailed appreciation of the technologies, options and barriers within individual sectors.

Saving energy through resource efficiency

Our research shows that saving energy by implementing resource efficiency measures could be just as significant as the energy efficiency measures that we identified. The options available are diverse and numerous including reducing waste, material efficiency in production, product refurbishment and lifetime extension and light-weighting in vehicles and buildings. In summary, all the options involve “putting less in” and “getting more out” and significant additional energy savings are outside the scope of traditional energy and resource efficiency approaches.

Resource consumption, industrial strategy and UK carbon budgets

While the resource efficiency measures could be significant, they have been given limited attention in terms of government policy or strategy. Our analysis shows that by implementing an ambitious resource efficiency strategy, the UK would bridge the current gap in both the 4th and 5th Carbon budget. We provided two scenarios; 1) Quick win resource consumption measures, 2) Best practice resource consumption measures. By 2037, the quick win scenarios could save 62 Mt CO₂e across six key product groups with 162 Mt CO₂e saved in the best practice scenario. The six key product groups are food and drink, construction, vehicles, appliances, packaging and clothing.

Reducing carbon in construction: a whole life approach

While the emissions associated with using buildings has been declining, the emissions associated with their construction has continued to rise and now represents around 50 MtCO₂e each year. This is commonly known as “Embodied Carbon” and includes the emissions associated with all the materials and products used in construction, repair and maintenance of buildings. Our research shows a strong need to address embodied carbon through a range of policy interventions. These include requiring whole life carbon assessments for publicly funded projects, establishing a public league table of carbon reduction commitments, extending GHG reporting and requiring Environmental Product Declarations. With embodied carbon being so significant, we also recommend establishing an independent body to take ownership of the construction sector’s decarbonisation agenda.



Resource efficiency and the circular economy: What do the public think?

Many of the strategies to achieve resource efficiency will require fundamental changes in the way the public buy, use and dispose of products. Our research shows that the public is willing and able to engage with this debate and this should be fostered. People want to see a resource efficient future and many of the strategies such as reducing packaging, increasing product reparability and longevity, and extended producer responsibility are already popular. There are shared values, such as fairness, trust, convenience and affordability that will influence people's decisions.

Raising consumer demand for longer lasting products: challenges and opportunities

CIE-MAP has demonstrated that increasing the uptake of longer lasting products has the potential to reduce energy demand and carbon emissions. There is a strong need to foster for sustainable patterns of consumption as consumer expectations of product lifetimes is in decline. Measures such as mandatory lifetime labelling and longer guarantees would help ensure longer product lifetimes. In order to increase consumer uptake of longer lasting products and lengthen use times interdisciplinary research is required, informed by fields of enquiry such as behavioural economics, marketing, social psychology and social practice theory.

Resource efficiency and low carbon emissions through waste reduction

Recycling is commonly adopted by waste managers as opposed to preferred options in the waste hierarchy such as reuse. This reflects a systematic problem with the collection and handling of discarded items. Extending the product lifetime has to be one of the key resource efficiency options and this involves designing products for re-use, repair and then recycling. Material recovery can be improved at the design stage by specifying materials and enabling easy disassembly.

A big thank you!

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Finally, we would like to thank all the people who completed surveys and attended focus groups.

