Executive Summary

Securing the future – The role of resource efficiency

This report quantifies how resource efficiency actions, as well as reducing greenhouse gas emissions, can reduce abstracted water, ecological footprint and the use of specific resources.

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Front cover photography: Globe from space

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In 2009 WRAP (Waste & Resources Action Programme) published ‘Meeting the UK Climate Challenge: The Contribution of Resource Efficiency’, the UK’s first research into how resource efficiency can help the UK meet its climate change targets. The report showed that implementing 13 quick win resource efficiency strategies – see Table 1 below – could contribute as much as 10% of the target reduction in UK domestic greenhouse gas (GHG) emissions by 2020 as required by the Low Carbon Transition Plan. There would also be additional reductions in GHG emissions outside the UK associated with changes in UK consumption of products manufactured abroad.

### Table 1 Production and consumption strategies

<table>
<thead>
<tr>
<th>Production strategies</th>
<th>Consumption strategies</th>
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<tbody>
<tr>
<td>Lean production (e.g. light weighting)</td>
<td>Lifetime optimisation (e.g. using goods for their technical lifetime)</td>
</tr>
<tr>
<td>Material substitution</td>
<td>Goods to services (e.g. renting instead of buying some products)</td>
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<td>Waste reduction</td>
<td>Reducing food waste</td>
</tr>
<tr>
<td>Waste recycling</td>
<td>Dietary changes</td>
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<tr>
<td>Dematerialisation of the service sector (e.g. implementing resource efficiency measures)</td>
<td>Restorative economy (e.g. reuse and refurbishment)</td>
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<tr>
<td>Sustainable building (e.g. new build)</td>
<td>Public sector procurement</td>
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<tr>
<td>Efficient use of existing infrastructure</td>
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Climate change, whilst important, is not the only environmental issue of concern. Resource availability, water use and our ecological footprint (how many planets we require to support our lifestyles) have been raised at a UK and international level. These global environmental issues translate to UK economic security issues. For example, the Strategy for Sustainable Growth (BIS, 2010) highlights a need to maximise our effective use of scarce natural resources, whilst the recent National Security Strategy (HM Government, 2010) has identified a tier 3 risk of short to medium term disruption in international supplies of resources essential to the UK (e.g. food and minerals).

This new report assesses the ways in which the same 13 quick win resource efficiency strategies identified in the 2009 report could address these wider environmental and economic security concerns. It examines the extent to which these resource efficiency strategies that reduce UK GHG emissions could also reduce UK’s water use, UK’s reliance on specific materials and UK’s ecological footprint.

The specific materials chosen for this study were: iron ore and steel, wood and pulp products, plastics, fertilizers, aggregates, aluminium, gypsum and plaster products, copper, cobalt, lithium and rare earths (rare earths are a group of 17 metals that are used in specialist applications such as magnets, as catalysts in petrol, IT equipment, TVs, glass and ceramics, and are only mined and produced in a few parts of the world).

It should be noted that this research has attempted a novel way of modelling the resource inputs, flows across industrial sectors and the final outputs. In this report, environmental issues have been modelled consistently at the macro-economic level, and represent the first known attempt to incorporate physical data into a model which tracks the movement of materials through the UK economy. This innovation and some of the data quality on materials has made this approach challenging; however, all limitations and future recommendations are outlined in the report.

The keys conclusions are that:

- as well as reducing GHG emissions, implementing the 13 quick win resource efficiency strategies can significantly reduce our use of non fossil fuel resources, water and our ecological footprint. No conflicts were identified in the research;
the UK currently uses around 260 million tonnes per year of the selected materials in this study. By 2020, our use of these could be reduced by over 38 million tonnes per year (15%) against baseline projections. This is in addition to avoidable food waste identified in previous WRAP research;

- our reliance on some of the specific materials, such as rare earths, cobalt and lithium, could be reduced by 10-25% by 2020 through implementing these strategies;

- water abstraction associated with UK consumption could be reduced by almost 6% by 2020 against baseline projections; and

- the ecological footprint (the number of planets we require to support our lifestyles) can be reduced by 5-7% by 2020.

Clearly, improving resource efficiency can make a significant and positive impact on a range of environmental issues. However, implementing certain strategies or working on certain sectors can allow a focus on a particular environmental issue.

For example, for most of the materials selected, the biggest impacts can be attributed to four resource efficiency strategies; lean production (i.e. making goods with a lower material requirement); waste reduction (i.e. reducing waste in manufacture and commerce); lifetime optimisation (i.e. reducing the amount of working products thrown away) and goods to services (i.e. increasing the proportion of some products which are leased). Within these four resource efficiency strategies, those which influence the throughput of electrical goods affect many of the materials selected.

The greatest savings on material use comes from aggregate use. This is because the overall quantity of aggregates used in the UK economy is so much greater than all other materials assessed.

In a similar way, consumption strategies such as reducing food waste dominate the water use.

It is important to note that the 13 resource efficiency strategies were identified to consider the relationship between climate change and resource efficiency. They were not chosen to consider how best to reduce the use of water or the specific materials chosen. This means that the strategies used in this research have not covered particular sectors and products, where there may be additional resource savings.

It should also be noted that these results are based on quick win strategies and do not include consideration of changing technology e.g. an increase in hybrid electric vehicles would actually lead to an increased demand for lithium. A more detailed analysis of individual indicators would be required to take such technology developments into account.

Conclusion

The report confirms that quick win actions taken to improve our resource efficiency have complementary benefits of reduced GHG emissions, resource use, water use and ecological footprint. It also confirms the findings of the previous study that both production and consumption strategies are important for addressing these environmental issues.

It also shows that resource efficiency could have an important role to play in addressing resource security issues that are increasingly under debate.