

**PIRC**

**PUBLIC  
INTEREST  
RESEARCH  
CENTRE**



**THE GREEN  
INVESTMENT  
GAP**

**AN AUDIT OF GREEN  
INVESTMENT IN THE UK**

**March 2011**

# ACKNOWLEDGMENTS

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Any errors or omissions are, of course, the responsibility of PIRC alone.

# ABOUT PIRC

Public Interest Research Centre (PIRC) is an independent charity, whose work is aimed towards building a sustainable society. Through research and advocacy, we press for the structural changes needed to effectively tackle climate change and ecological degradation.

This report has stemmed from our previous work looking at the opportunities for a major expansion of renewables in the UK. In *The Offshore Valuation* (May 2010), PIRC oversaw an investigation into the scale and value of the UK's offshore renewable resource. It is now clear that Britain possesses vastly more potential for wind, wave and tidal power than could be used by domestic demand, and indeed could in future become a net exporter of clean electricity. However, a key obstacle in attaining this goal – and our much more modest 2020 targets for renewables deployment, energy efficiency and decarbonisation – is the upfront investment needed to build low-carbon infrastructure.

Given the importance of this issue, PIRC expected to find multiple estimates of current green investment levels in the UK. In fact, we found none that were comprehensive, and so decided to conduct our own. The result is *The Green Investment Gap*. Closing the green investment gap is the key political challenge of the next decade – and one that must be met regardless of other political priorities, such as cutting the deficit.

PIRC is keen to repeat our audit of green investment again in the future, to create a regular benchmark of progress. If you are interested in being involved in this work, please get in touch by emailing [info@pirc.info](mailto:info@pirc.info).

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## 1. Summary

The Coalition Government has declared it wishes to be ‘the greenest government ever’. In a time of fiscal retrenchment and huge cuts in public spending, the surest commitment to the green economy will come through policies to stimulate green investment. We know we need to invest hundreds of billions of pounds on clean energy, clean transport and energy efficiency projects over the next decade – in order to meet our emissions targets; ensure a green economic recovery; and pass on to the next generation a ‘green inheritance’ in the form of a reinvigorated, low-carbon national infrastructure.

Yet no-one currently knows how much we invest in the green economy. The absence of any such audit of UK green investment spurred the writing of this report. It aims to provide an estimate, for the first time, of what funds the UK invests in capital infrastructure and R&D for climate change mitigation.

## Key findings

Our audit of green investment finds that:

- » **UK green investment was £12.6bn in 2009-10.** This is under 1% of UK Gross Domestic Product; half of what South Korea currently invests in green technologies annually; and less than what the UK presently spends on furniture in a year.
- » **The UK needs to at least double its annual green investment levels** if we are to meet our 2020 emissions targets.
- » There is, therefore, **a huge green investment gap in the UK.**

## Recommendations

Government, industry and the third sector need to act now to address the urgent green investment challenge, by:

- » **Producing an annual Green Investment Audit;**
- » **Committing to closing the green investment gap;**
- » **Legislating for a strong Green Investment Bank.**

These recommendations are explained in more detail in the final section.

## 2. An audit of UK green investment

How much do we currently invest in tackling climate change? PIRC has carried out a detailed audit of UK green investment. In the following sections, the scope of the audit is defined, headline figures presented, recent trends discussed and the data placed in the context of other areas of spending.

### 2.1. Defining the scope of the audit

An audit was undertaken of investment in climate change mitigation in the UK, for which a shorthand of 'green investment' is used throughout this report. Investment here is considered to be spending on fixed capital assets lasting longer than one year, and on technical knowledge (R&D), as opposed to investment in human capital or spending for immediate consumption. To be counted, investment has to have taken place within the UK's borders, rather than extraterritorially – such as UK companies investing overseas, or investing in projects through international carbon markets. The baseline of the financial year 2009-10 has been used as the year for which most data exists across sectors.

In defining what investment counts as 'climate change mitigation', the focus has been on low-carbon energy infrastructure and energy efficiency investments. Some investment in low-carbon forms of transport has been included, such as electric cars, but public transport spend has been largely excluded, as it is impossible to count this as additional for reasons of climate change mitigation alone. Awareness-raising and behaviour change campaigns, salaries and overheads for staff in dedicated organisations, have all been excluded, as these should properly be counted as day-to-day spend rather than investment.

The audit has attempted to be cross-sectoral. Public sector investment, through direct subsidies, loans, and levies or obligations on industry, has been counted; whilst for the private sector, investment raised through asset finance, public market, venture capital and private equity are included in the total. A survey of the third sector was undertaken, but it has proven impossible to isolate figures for charitable green investment (such as in community microgeneration) from other spending on campaigns, lobbying and awareness-raising. More general trends in green expenditure by all three sectors, plus a fourth, household spend, are discussed later.

## 2.2. Green investment in the UK, 2009-10

Green investment in the UK in 2009-10 totalled some **£12.6 billion**. Given that UK Gross Domestic Product in 2009 was £1,365 billion, this figure equates to **under 1% of UK GDP**.<sup>1</sup>

Investments by public and private sectors appear to have been fairly evenly matched, with private investment summing to £5.9bn, and public investment to £6.7bn.

Broken down by finance categories, the figures are as follows:

Table 1. UK green investment, 2009-2010 in £m

UK green investment 2009-10 in £m	
Public subsidy	3035
Government loans	45
Levies	3640
<b>Total public investment</b>	<b>6720</b>
Asset Finance	5617
Public Markets	60
Venture Capital / Private Equity	223
<b>Total private investment</b>	<b>5900</b>
<b>Grand total</b>	<b>£12,620m</b>

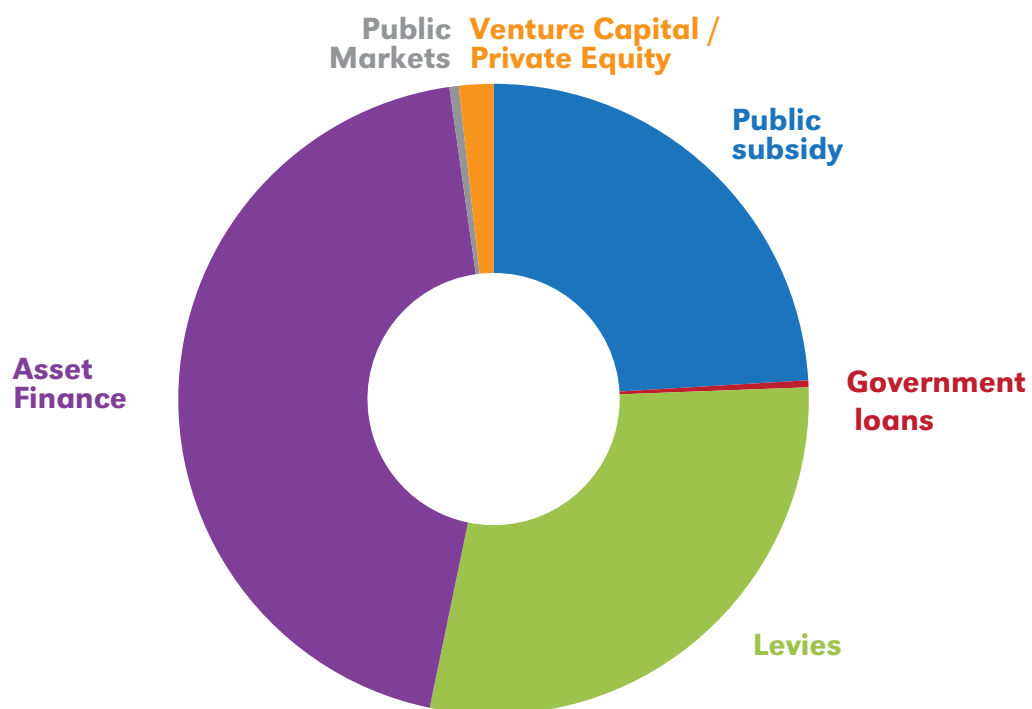


Figure 1. Breakdown of UK green investment, 2009-2010

### Categories of public sector finance

**Public subsidy** – direct grants from government to the private sector, charities and households to fund Research & Development (R&D) into, and deployment of, clean technologies.

**Government loans** – state loans to private sector firms for the purposes of financing clean technologies.

**Levies** – policies which oblige private sector companies to invest in clean energy and energy efficiency measures, thereby guaranteeing a certain level of investment. Examples include the Renewables Obligation and Carbon Emissions Reduction Target, both of which apply to utilities.

### Categories of private sector finance

**Asset Financing** – all money invested in clean energy projects, whether from international company balance sheets, debt finance or equity finance. It excludes refinancing and short-term construction loans. Asset financing typically is associated with the construction / installation of clean energy equipment and generating capacity.

**Public Markets** – all money invested in the equity of publicly traded companies developing clean power generation. Public market finance is typically associated with the scale-up phase, when companies are raising capital in public stock markets to finance product manufacturing and rollout. Investment in companies setting up generating capacity is included in the next category.

**Venture Capital / Private Equity** – all money invested by venture capital funds in the equity of companies developing clean energy technologies. In general, venture capital is invested in the innovation stage, when companies are proving the market potential of goods and services.

Private sector finance category definitions drawn from Pew Charitable Trusts / BNEF, Global Clean Power: A \$2.3tn opportunity, Dec 2010, p.12, [http://www.pewglobalwarming.org/cleanenergyeconomy/pdf/G2011\\_report.pdf](http://www.pewglobalwarming.org/cleanenergyeconomy/pdf/G2011_report.pdf)



## 2.3. Sources and problems with data

A full set of data sources are provided in the spreadsheet released alongside this report. In brief:

- » **Public sector data** – drawn mostly from past Budgets, Departmental reports, studies by government auditors such as the NAO and the Committee on Climate Change, and public statements by Ministers.
- » **Private sector data** – drawn mostly from data supplied by Bloomberg New Energy Finance.

Efforts have been made to avoid **double-counting**, such as where public subsidies assist private sector expenditure. For example, the Renewable Obligation (RO) is a levy imposed by government on electricity suppliers to source a percentage of their electricity from renewable sources, leading to approximately £1bn of investment that would not otherwise have been made. Bloomberg's data on private sector investment includes this in its totals but does not distinguish it from unsupported forms of finance. To avoid double-counting, therefore, this study has subtracted the £1bn of RO-enabled financing from private sector totals (taking the figure down from £6.9bn, as recorded by Bloomberg, to £5.9bn), and has counted it as a public Levy.

Where possible, data has been **cross-referenced** with other reports. For instance, PIRC's data was compared to figures arrived at by the Committee on Climate Change in their recent analysis, *Building a low-carbon economy*, which relied on different data sources, mostly IEA reports<sup>2</sup>. The Committee's total – that the UK Government devotes £5.5bn annually to the research, development, demonstration and deployment of climate change mitigation measures – compares favourably to PIRC's figure of £6.7bn, with the remaining discrepancy mainly due to PIRC's inclusion of investments in grid upgrades, which total £1.04bn.

Nevertheless, a major difficulty in analysing green investment in the UK is the **lack of transparency** in the data. Public sector data are particularly opaque, with no single, publicly-available record of annual monies devoted to climate change mitigation available anywhere. What figures are included in Budgets and Departmental reports invariably conflate different funding streams, obfuscate about totals, or fail to state how many years a pot of funds is spread over. As the Committee on Climate Change states, "No existing data source provides a complete picture of public spend on low-carbon innovation... Government should in future ensure data on funding for low-carbon technologies is collected and reported on a consistent and regular basis."<sup>3</sup> The National Audit Office notes: "Direct support for renewable energy technologies is not reported in a transparent way in aggregate or in relation to some individual schemes."<sup>4</sup>

This is further confused by the **number of different funding programmes** and overlapping jurisdictions between departments. As the Green Investment Bank Commission concluded last June, “The disparate collection of institutions and funds, often with similar objectives and very little accountability for the delivery of specific goals, has resulted in duplication and inefficiencies that rationalisation would reduce.”<sup>5</sup>

In addition, no attempt has been made prior to **this report to bring together public and private sector green investment data**. This is clearly crucial to current debates about a Green Investment Bank. Without a clear understanding of relative levels of public and private investment, how can conclusions be drawn about the effectiveness of public subsidy in leveraging private sector expenditure?

A further issue, and one perhaps in need of further investigation, is the **time lag between Government funding being announced and it being received by companies**.

This report records public subsidies on the basis of what has been announced by the Government – some £3bn in 2009-10. But Bloomberg figures for grants that were received by companies in 2009 are considerably lower: only £1.3bn. It is clear that there is a considerable time lag between announcements and disbursements of money<sup>6</sup>. The figure in this report is thus likely to be an *overestimate* of what public green investment funding was actually disbursed in 2009-10.

A specific example of this is the Energy Technologies Institute (ETI). Set up as a public-private partnership in 2007, the Government announced that the ETI would provide a potential fund of £1.1bn over ten years, with a maximum of £5m donated by up to eleven industry partners, and match-funded by the state. However, only six industry members have so far joined the ETI, reducing the total annual pot of money to a maximum of £60m. Yet it appears from correspondence with the ETI, and inspection of its company accounts, that its expenditure in 2009 was only £13.8m, and just £7.7m in 2008. It may be that the ETI will spend more in future years, and that more industry members will be found, thereby ‘back-loading’ the promised investment. But none of this is made clear on the ETI’s website, or any other public website<sup>7</sup>.

There are **other ways of cutting the data** than those applied here. For example, the private sector data used by PIRC does not include a separate figure for corporate R&D in clean technologies. However, other studies have attempted to measure this: a recent ONS pilot survey, for example, found private low-carbon R&D to be in the region of £240m, whilst an EU Joint Research Council study estimated the amount to be around £200m<sup>8</sup>. The ONS survey concluded that “around 40% of innovating companies do not utilise any form of Government-sponsored support.”<sup>9</sup> For the purposes of this report, it has been assumed that this is already included in Bloomberg’s private sector investment data, principally under the category of Venture Capital / Private Equity.

## 2.4. Trends in green investment

The audit above provides a snapshot of current green investment levels, but on its own doesn't reveal whether trends are going in right direction. The following section provides a brief overview of investment trends over the longer term. It is clear that, whilst green investment has recently increased across all sectors, levels remain low. Moreover, recent gains are still making up for underinvestment in the past. Public sector R&D into clean energy, in particular, is only now recovering from a huge decline following utility privatisation. Recent green spending cuts by the Coalition Government have created uncertainty, and there is a danger that 'green stimulus' measures introduced in 2009-10 will not continue – meaning that current investment levels will represent a spike, rather than an ongoing trend.

### Private sector

Longer-term data on private sector green investment show that whilst annual totals have fluctuated, the past decade has seen a rising trend, interrupted by the credit crunch in 2008. Bloomberg figures show that £4bn of private cleantech investments were made in the UK in 2007, dropping to £3.2bn in 2008, but rising suddenly again to reach £6.9bn in 2009. Available data on Venture Capital investments reaching back to 2003 confirm this pattern, as Figure 2 shows.

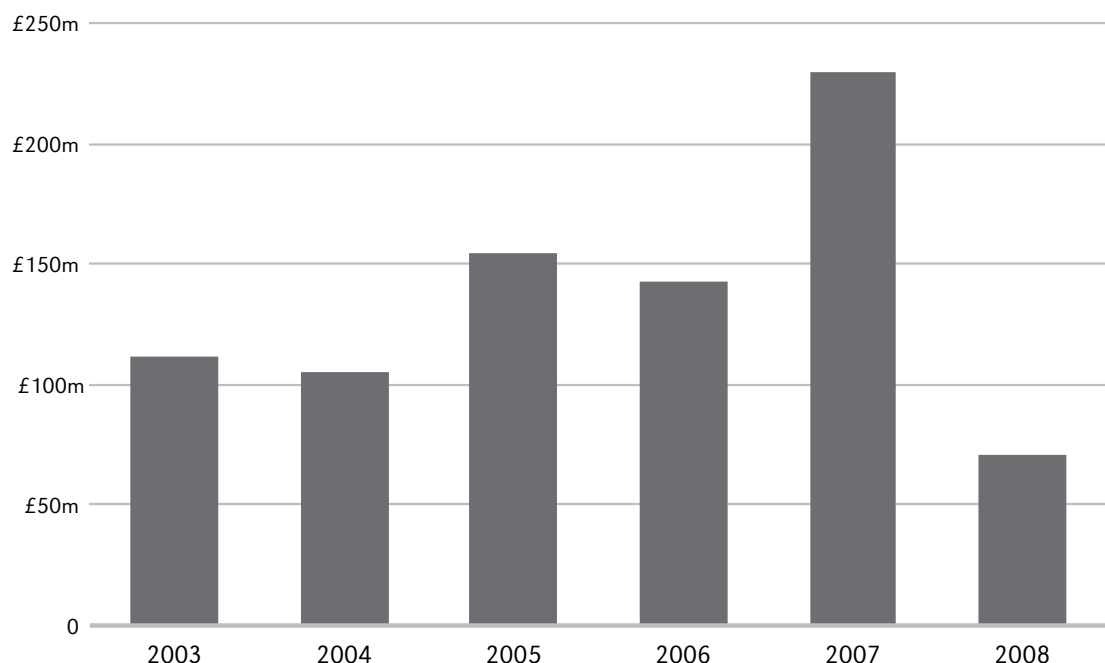


Figure 2. UK Venture Capital clean energy investment, 2003-8, £ million. Source: drawn from Carbon Trust & Bloomberg New Energy Finance, Investment trends in European and North American clean energy 2003 to 2008, July 2009, p.12.

Meanwhile, various forecasts suggest that private sector green investment trends remain set for future growth:

- » Business analysts Verdantix estimate the UK climate change and sustainability market to have been worth \$5.3bn (£3.3bn) in 2010, and for this to grow to \$8.4bn (£5.2bn) by 2013. Verdantix's analysis assesses spending on clean energy and energy efficiency measures across 457 large UK firms.<sup>10</sup>
- » A survey of business executives in 2010 by Ernst & Young found bullishness about spending on climate change; and that "despite regulatory uncertainty, climate change investment is on the rise".<sup>11</sup>
- » A Deloitte summary of Venture Capital investment in 2009 found 63% of investors expected investment in clean technologies to increase over the next three years.<sup>12</sup>

Despite the recession, therefore, private sector confidence in the opportunities for green investment remains buoyant. This needs to continue and be further incentivised.

### **Third sector**

It is very difficult to estimate levels of green investment in the third sector. Data is scarce, and it's hard to isolate instances of capital investment – such as community renewables – from day-to-day spending by charities on communications, behaviour-change campaigns, and so on. One thing is certain, however: the third sector simply does not have the money to be making large investments in clean technologies like the public and private sectors.

Data on the income of various environmental NGOs in the UK, compiled by Birmingham University, reveals a sustained and rapid rise in revenue streams (see Figure 3). By 2006, the combined incomes of the 9 NGOs included was approaching £700m. Yet clearly only a fraction of this income has gone towards work on climate change: the two largest earners, the National Trust and RSPCA, are 'environmental' NGOs only in the broadest sense. And of the remaining organisations, most have only begun devoting significant portions of their budgets to climate campaigns in the last ten years.

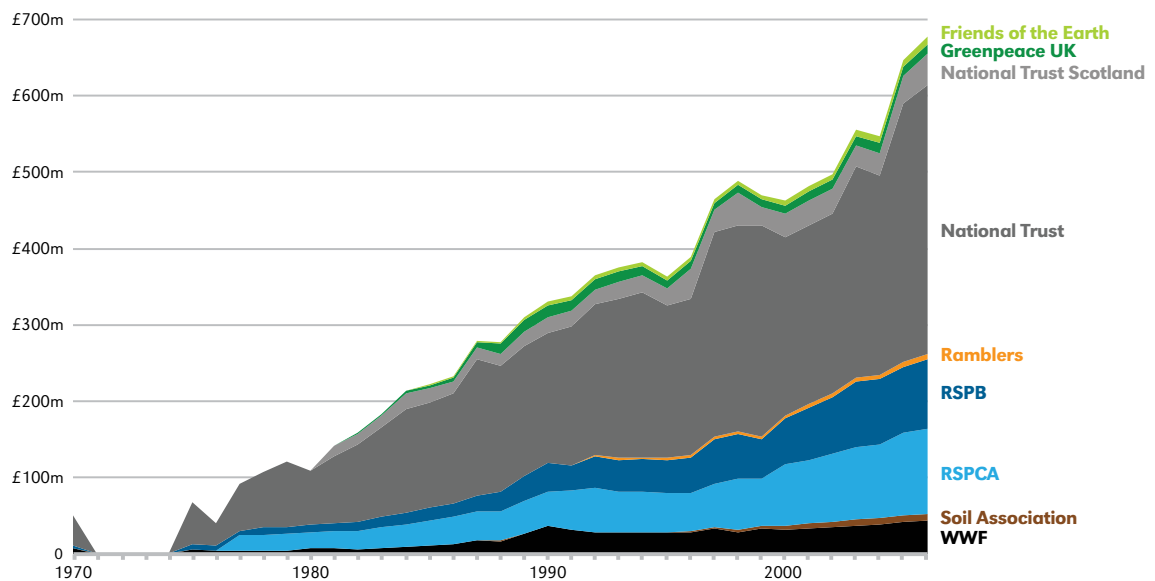


Figure 3. Incomes of environmental NGOs, 1970-2006 (expressed as 2007 money, adjusted for inflation). Source: Jean-François Mouhot, NGOs in Britain since 1945 project, University of Birmingham<sup>13</sup>.

The Environmental Funders Network monitors trends in charitable giving to environmental causes in their series of publications, *Where the Green Grants Went*. The most recent of these, from September 2009, confirms how little is currently spent by trusts and foundations on climate-related work: “less than 0.3% of the grants made by the largest grant-making trusts in the UK were directed to climate change mitigation in the period under review... Even among the core 97 environmental funders, grants directed towards tackling climate change represented less than 10% of green giving in both 2005/06 and 2006/07, even if grants relating to tropical deforestation are included.”<sup>14</sup> Clearly more needs to be done, even if the third sector can play only a limited role in overall levels of UK green investment.

## Households

Household spending on ‘green’ products and services has seen a historic growth over the last 11 years, as measured by the Co-operative’s Ethical Consumerism Reports (see Figure 4). “The ethical market in the UK was worth £36bn in 2008 compared to £13.5bn in 1999”, the Co-op notes, and during 2009 it grew still further to some £43bn, bucking the recession. Clearly ‘ethical consumerism’ is a somewhat subjective term, and far from all that it embraces can be counted as ‘green’ or aiding climate change mitigation. Breaking down the figures, it is possible to single out certain lines of household spending that are more directly related to cutting emissions: *energy efficient electrical appliances, boilers and lightbulbs, microgeneration, green energy, and green cars*. Total expenditure on these summed to £4.7bn in 2009; a substantial increase even on four years previously, when the figure was £3.2bn<sup>15</sup>.

But caveats should be applied here, too. For some of the categories, it is questionable whether the spend counted as ‘green’ is really additional to standard purchasing. The *energy efficient electrical appliances* category used by the Co-op, for instance, includes all white goods A-rated and above, which now applies to some 90% of fridge sales and 95% of dishwashers sold in the UK.<sup>16</sup> It is difficult to say, therefore, whether such purchases are contributing to additional emissions savings. More fundamentally, many of the categories overlap with areas of government subsidy and supplier obligations, making it difficult to avoid double-counting – for example, the microgeneration figures certainly include state grants. It is for these reasons that household green spending has not been included in this report’s figures for green investment.

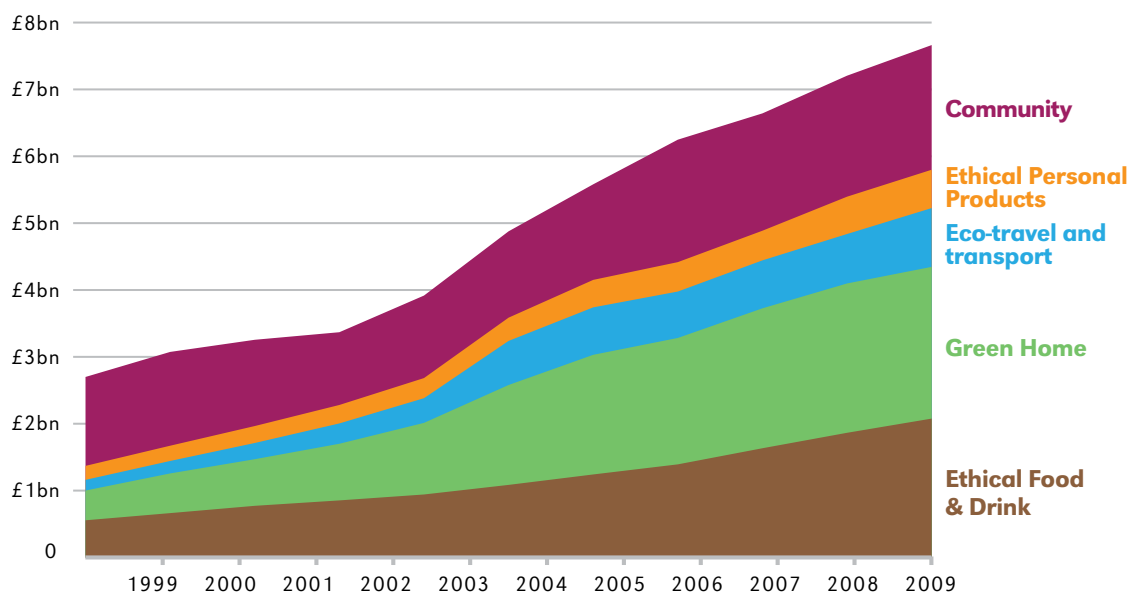


Figure 4. ‘Ethical consumerism’ in the UK, 1999-2009, £m. Source: Co-operative Ethical Consumerism Report 2010.

## Public sector

Recent increases in public sector green investment are in many ways simply making up lost ground following a prolonged period of underinvestment in the late 80s and 1990s. This is particularly true of public sector R&D budgets for clean energy, for which data sets exist going back to the 1970s – when the UK Government’s first renewable energy programmes were initiated after the 1973 oil crisis. Figure 5 shows the precipitous decline in public financing for clean energy research and development that occurred as a result of declining oil prices, spending cuts under the Thatcher and Major administrations, and privatisation of the UK utilities. Whilst nuclear fission R&D comprised a large part of this lost public investment, renewable energy and energy efficiency innovation programmes also lost out, and were not replaced by similar levels of investment by the utilities<sup>17</sup>. Only since 2004 has this trend begun to be reversed – when the then Chief Scientific Advisor, Sir David King,

persuaded the Labour government to take a more activist role in clean energy investment – but it has so far remained limited. It is hard to escape the conclusion that the UK is now having to make up for lost time after a damaging period of underinvestment, precisely when investment in green industries would have helped the country progress towards emissions targets and create new sources of jobs in the medium and long term.

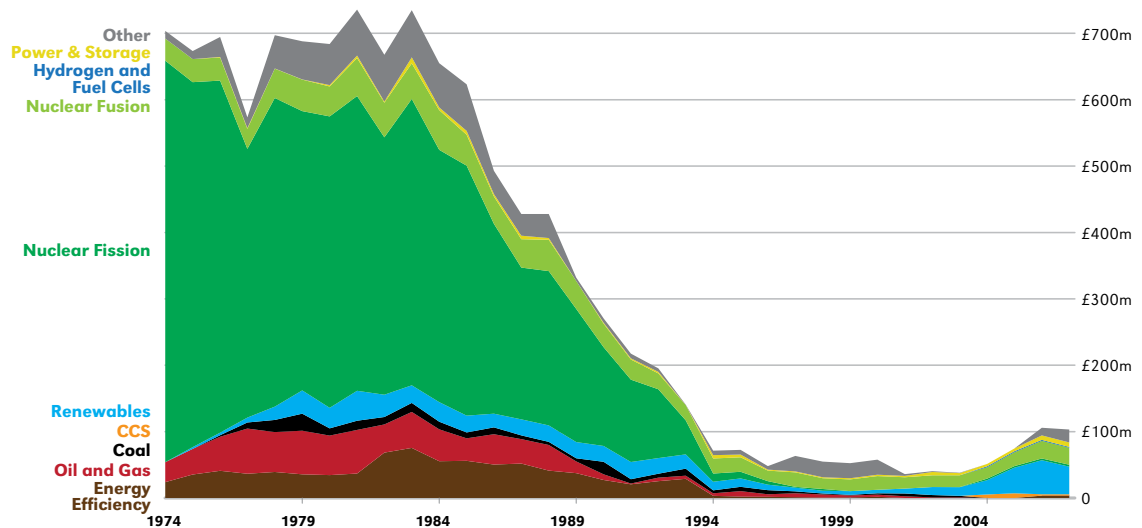


Figure 5. UK Public R&D into energy, 1974-2007. Source: UKERC 2009, based on IEA data<sup>18</sup>.

The current Coalition Government has overseen a number of significant cuts in green spending – with £85m removed from DECC’s budget during the 2010-11 financial year, including £34m specifically taken from renewables support programmes<sup>19</sup> – and slashing the 2011 budgets of the Carbon Trust and Energy Saving Trust by 40% and 50% respectively<sup>20</sup>. Combined with a reluctance to guarantee sources of green finance over the long term – including failing to guarantee grants for electric cars beyond one year<sup>21</sup>, and pledging to review the Feed-In Tariff structure in 2012<sup>22</sup> – these moves have not created an optimum environment for green investment.

The Spending Review in October 2010 appeared to spare most green investment programmes from the axe. Yet the £6.7bn of 2009-10 public sector green investment headlined in this report is almost certainly as high as it is thanks to government stimulus measures introduced during the recession<sup>23</sup>. Although the UK’s 2009 stimulus package was not particularly green by international standards – with the US, China and South Korea, in particular, far outgreening it<sup>24</sup> – it nevertheless injected additional one-off funds and set up a range of programmes to promote low-carbon innovation, under the auspices of the BIS Low Carbon Industrial Strategy. With many such programmes due to end in 2011, it seems likely that the £6.7bn may represent a peak, rather than an ongoing level of investment. Unless the Coalition moves to replace funding with new programmes, it will be presiding over a *de facto* cut in public green investment.

## 2.5. Putting green investment in context: comparisons

### Fossil fuel investments

The UK continues to invest significant amounts in fossil fuel extraction and processing. Clearly, continuing to fund dirty investment whilst trying to boost green investment makes little sense.

Data from Bloomberg New Energy Finance shows that the Royal Bank of Scotland (RBS) has provided finance worth £13 billion to the fossil fuel industry in the two years since it was initially bailed out by the UK Government in September 2008.<sup>25</sup> Government figures suggest that the Export Credit Guarantee Department in the Treasury provided £595 million of credit guarantees for fossil fuel projects between 1997 and 2010.<sup>26</sup> Because of the 'leveraging' value of credit guarantees from governments, the full value of this support will have been considerably larger.

### Costs of disposing of old energy infrastructure

Critics of investment in renewables invariably forget the legacy costs associated with fossil fuel and nuclear power infrastructure.

The cost of decommissioning the UK's ageing fleet of nuclear power stations is anticipated to be over £70bn, according to the Nuclear Decommissioning Authority.<sup>27</sup> Decommissioning end-of-life North Sea Oil and Gas infrastructure, meanwhile, is expected to cost up to £30bn, according to Decom North Sea.<sup>28</sup>

Indeed, Secretary of State for Energy and Climate Change Chris Huhne has bemoaned the fact that half of his department's budget goes into clean-up costs rather than new green investment, saying that DECC is "...not so much the Department of Energy and Climate Change, as the department of nuclear legacy and bits of other things".<sup>29</sup>

### Defence spending

UK defence spending in 2009-10 was £35.3bn (Ministry of Defence Total Departmental Expenditure Limit),<sup>30</sup> almost three times the level of green investment in that year. Other commentators have pointed out the irony of continued high levels of conventional military spending, compared to low levels of spending to guarantee climate security. As analyst Nick Mabey wrote in a RUSI report in 2008, "Despite the public attention given to climate change, the current amount of public spending and cost of climate regulation is relatively small. For example, it is far outweighed by military and security budgets... Europe... is only spending the equivalent of about 0.5 per cent of its combined defence budget on tackling climate change."<sup>31</sup>



## International comparisons of green investment

Data does not yet exist for a full international country-by-country comparison of green investment levels. Yet from the data available it is clear that in many respects the UK languishes behind other nations.

In terms of the amounts of public money devoted to energy RD&D, the UK ranks beneath Germany, Italy and the US, and far below countries like South Korea, Japan and Finland, which invest heavily in energy innovation. Japan, for example, is a world leader in developing both solar PV and electrical storage devices to help counter the variability of renewable energy.

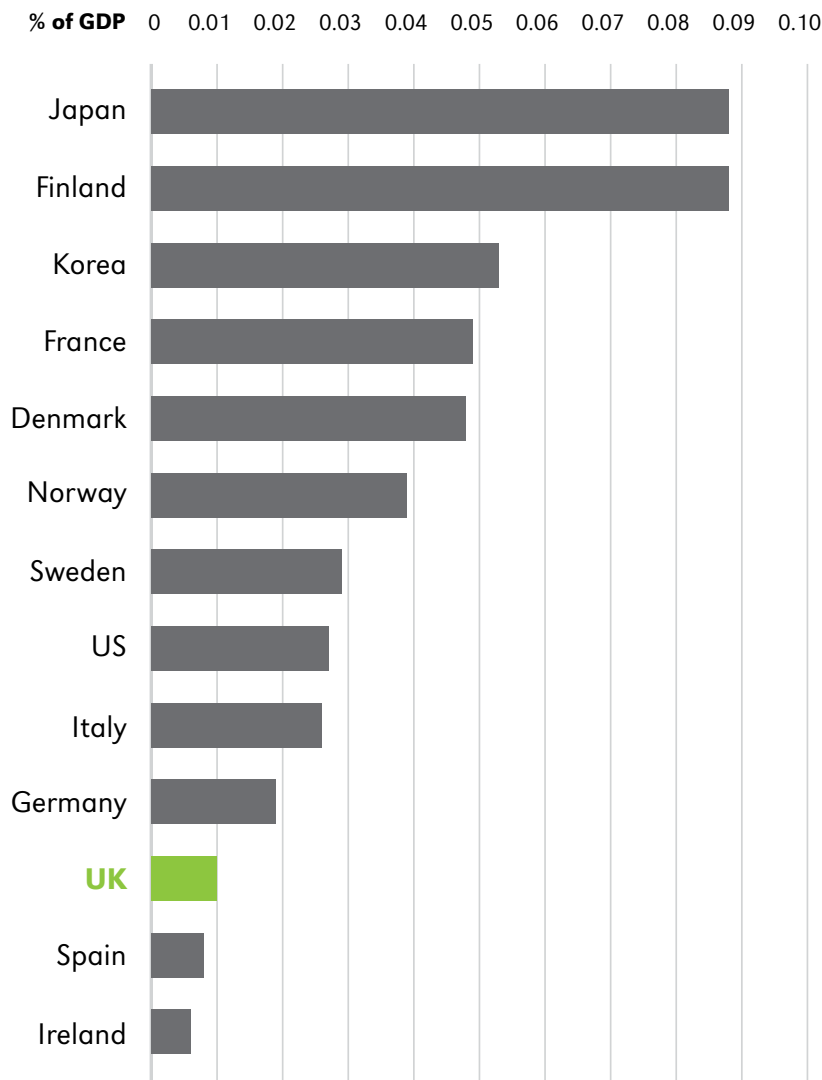


Figure 6. International comparisons of 2007 energy RD&D spend as % of GDP, including nuclear. Source: Committee on Climate Change, 2010.<sup>32</sup>

During the round of financial stimulus packages issued in the wake of the credit crunch, many governments chose to include significant injections of money for green measures. By this yardstick, too, the UK fell short. An estimated 6.9% of its stimulus programme was devoted to green investment; contrast this to the US (11.5%), China (34.3%), France (21%), or South Korea, where an astonishing 80.5% of its financial stimulus was spent on clean energy investments.<sup>33</sup> The UK's programme was also much-criticised by commentators for trying to appear more green than it actually was.<sup>34</sup>

But public sector green investment internationally has not stopped at the neo-Keynesian 'green new deals' precipitated by the financial crisis. China and the US continue to devote huge sums to clean energy innovation and energy efficiency measures, with Obama's proposed 2012 budget dedicating \$8bn for clean energy, a 12% increase on 2010 expenditure<sup>35</sup>. South Korea stands as a shining example of a country that has set itself on the path of achieving a world-beating green economy, and is investing accordingly. In July 2010, the South Korean government announced plans to more than double its financing for green research and development projects to 3.5 trillion won (£1.9bn) by 2013. The fund forms part of a huge low-carbon investment drive that will see South Korea invest a total of 107.4 trillion won (£59bn) on green projects between 2009 and 2013. This means that South Korea is currently devoting almost 2% of its GDP to green investment annually.<sup>36</sup> Against this, the UK's performance looks far from adequate.

### **Investment versus consumption**

Low investment isn't just confined to the green economy. The UK also has relatively low total investment rates compared with similar European countries. Whereas the ratio of gross fixed capital formation to GDP in the UK stood around 17 per cent over the past decade, in Germany it was 19 per cent and in France 21 per cent<sup>37</sup>. China and South Korea, meanwhile, are sinking huge percentages of their GDP into capital assets (see Figure 7, below). We need to rebalance our economy to invest more relative to how much we consume.

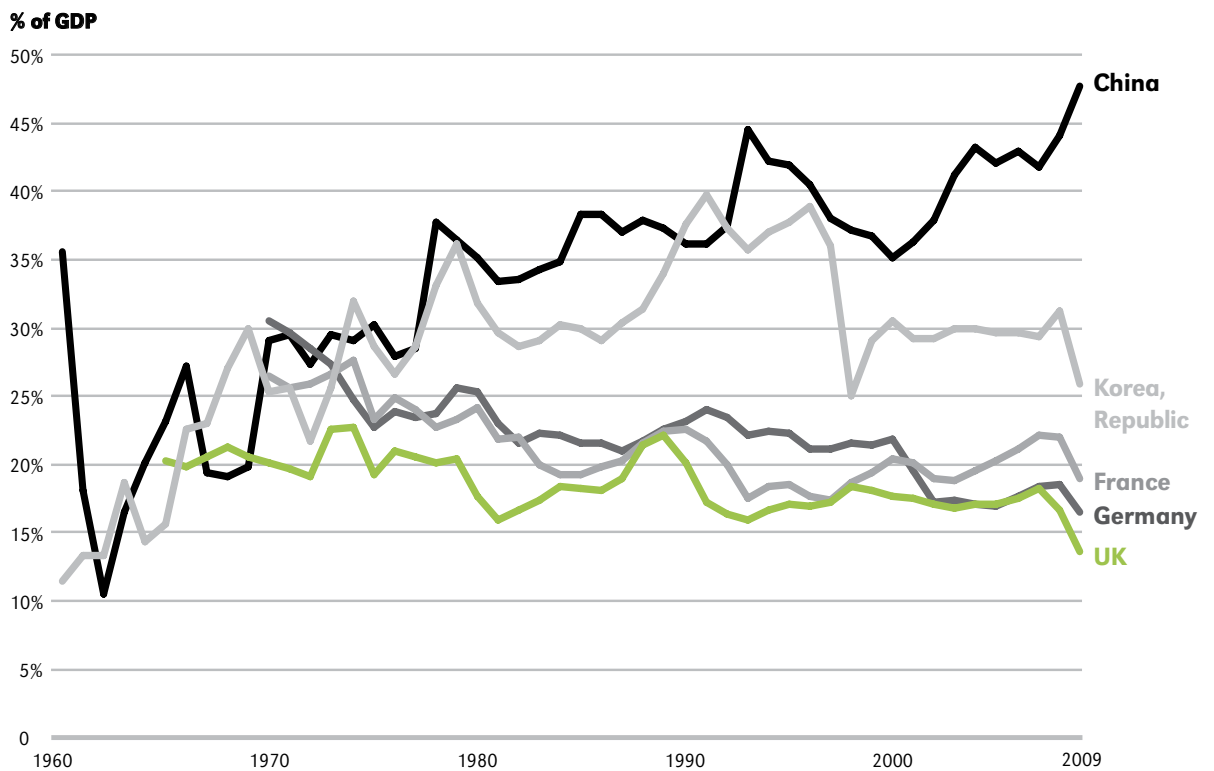


Figure 7. Gross fixed capital formation as a percentage of national GDP. Source: World Bank data<sup>38</sup>.

As a final comparison, contrast the UK's current levels of green investment - £12.6bn – with annual spending on certain consumer goods:

- » In 2008, the UK spent **£17.3bn on furniture**, according to the ONS.<sup>39</sup>
- » In 2009, UK **advertising expenditure was £14.5bn**, according to the Advertising Association.<sup>40</sup>
- » In 2008, UK spending on **cosmetics and fragrances was around £10.5bn**, within a Western European market of £67bn.<sup>41</sup>

### 3. Analysis: the green investment gap

Current levels of green investment are far below what is required if we are to meet our 2020 targets for emissions cuts, renewable energy installation and energy efficiency performance.

The debate about what constitutes an appropriate level of green investment began properly with the Stern Review in 2006. Stern argued, famously, that the world needed to spend “somewhere in the region of 1% of gross world product” on mitigation measures in order to achieve stabilisation at 450-550ppm CO<sub>2</sub>, and forego the potential loss of 5-20% of global GDP as a result of climate change<sup>42</sup>. However, he since revised this figure upwards in light of the latest climate science, stating, “I now think the appropriate [response]... would be in the middle of that range. To get below 500ppm ... would cost around 2% of GDP.”<sup>43</sup> It is important to note that Stern’s figures are an average global cost, rather than an estimate made specifically for western countries, whose investments will clearly need to be larger to meet correspondingly tougher emissions targets.

Since Stern, a range of much more detailed estimates have been carried out looking specifically at the levels of green investment required in the UK (see table below). All these studies focus on the next 10-20 years of investment, rather than looking out to 2050 and beyond, and factor in the UK’s own targets for cutting emissions, sourcing more energy from renewables and improving energy efficiency performance. They can therefore be regarded as more accurate indications of the green investment required in the UK in the medium-term than Stern’s broad-brush, long-term estimate.

As Table 2 and Figure 8 illustrate, current analyses give a spread of estimates for how much green investment is required, ranging from 1.8% to 3.9% of current annual UK GDP. Common to all estimates, however, is the inference that current levels of green investment are far from adequate. It’s important to note, of course, that the ‘alternative’ to green investment isn’t making no investment at all – much of our energy infrastructure is in need of renewal over the next decade anyway: the question is whether we upgrade it to a greener version, or lock ourselves in to high-carbon development, with all its associated costs.

## Estimates of green investment required in the UK

Scenario	Scope	Total (£bn)	Time period	Annual (£bn)
<b>E3G 2010 (b)</b> <sup>44</sup>	All green investment	245	2010-2020	24.5
<b>E3G 2010 (a)</b> <sup>45</sup>	All green investment	525	2010-2025	35.0
<b>Ernst &amp; Young 2010</b> <sup>46</sup>	All green investment	450	2010-2025	30.0
<b>GIB Commission 2010</b> <sup>47</sup>	All green investment	550	2010-2020	55.0
<b>Carbon Trust 2010 - High Cost</b> <sup>48</sup>	All green investment	335	2010-2020	33.4
<b>Carbon Trust 2010 - Low Cost</b> <sup>49</sup>	All green investment	263	2010-2020	26.3
<b>Infrastructure UK 2010</b> <sup>50</sup>	All infrastructure, not just low-carbon	800-1000	2010-2030	45.0

Table 2. Estimates of green investment required in the UK.

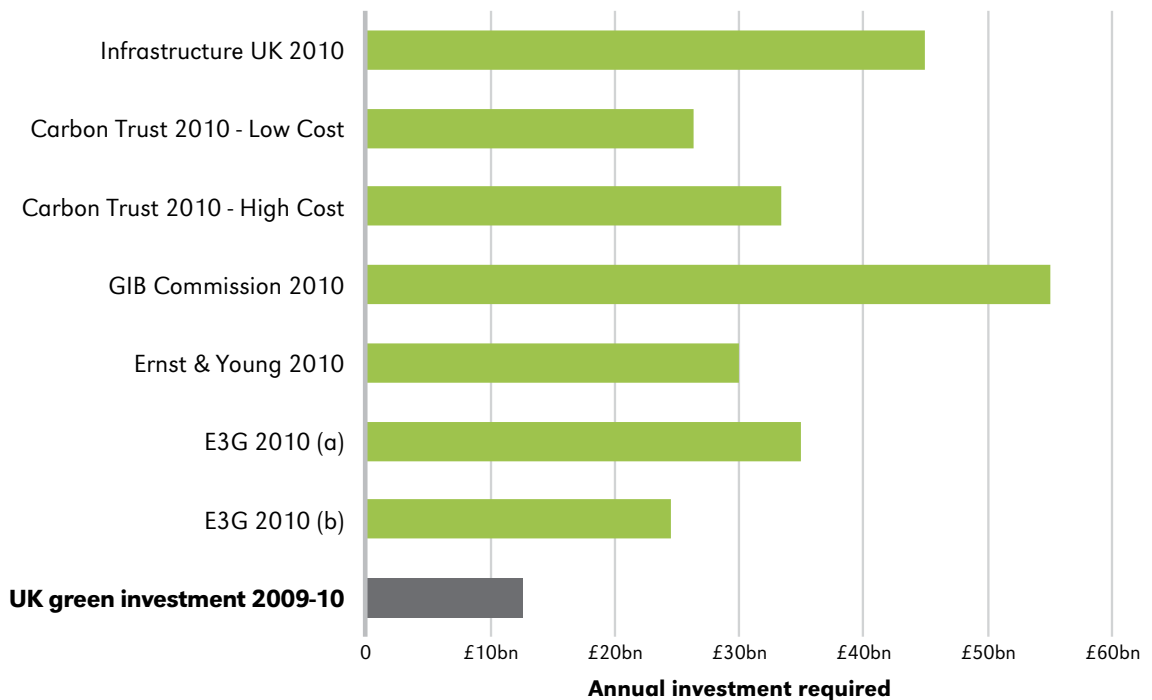


Figure 8. The Green Investment Gap.

These estimates inevitably contain a degree of uncertainty – and should be regarded as indicative numbers, rather than forecasts. Delving into the figures beneath the overarching totals, there appears to be broad agreement on the amounts of investment required in the utilities sector, on clean energy infrastructure. Ernst & Young, Ofgem, Citibank and Policy Exchange are united in pinning down the figure to lie in the range of £199bn-£234bn over the next ten years<sup>51</sup>.

But on energy efficiency investment, there is much less certainty. Dieter Helm estimates £21bn is required to finance domestic energy efficiency measures over the next decade<sup>52</sup>; E3G, aiming to reflect the total indirect costs of such measures, and also factor in the non-domestic sectors, comes up with a figure ten times that<sup>53</sup>. Climate and Energy Secretary Chris Huhne has spoken of the Green Deal pay-as-you-save scheme leading to £7bn of private sector investment in domestic energy efficiency per year<sup>54</sup>; but DECC's analysis underpinning this figure has not been made publicly available, so it is difficult to verify.

Investment figures for energy efficiency clearly depend a lot on what level of efficiency you want to achieve: are you aiming for a broad spread of simple insulation measures, or whole-house deep retrofits? The highly variable state of the British housing stock means that costs fall within a very broad range. The UK Green Buildings Council PAYS Taskforce states that a “comprehensive package of home energy improvements... including renewable heat technologies” could cost anywhere between £5,000 and £30,000 per property<sup>55</sup>. The Sustainable Development Commission estimates that £11,000 per property could bring a million homes up to SAP81 standards<sup>56</sup>, whilst the Existing Homes Alliance warns against any estimates that fall below £10,000, proposing instead that a deep retrofit could cost around £22,300 for a ‘typical home’<sup>57</sup>. And that's just the domestic sector. It is clear that more research is needed into requisite levels of energy efficiency investment – and surprising that the Government has not commissioned more in preparation for the Green Deal.

Regardless of such uncertainties, it is plain there is a huge green investment gap. Even if the UK could rely on maintaining 2009-10 levels of investment, the country faces a shortfall of £11.9bn - £41.4bn each year over the next decade. Bridging that gap must be the highest priority for the Government.

## 4. Conclusions

Our audit of UK green investment leads us to the following conclusions:

### 4.1. Benchmarking is vital

This audit was undertaken when it was realised that no other organisation appeared to be doing one on an economy-wide basis. The absence of such a benchmarking process for green investment across public and private sectors is worrying: it suggests a lack of joined-up thinking, and a certain disregard for measuring how far public monies are leveraging private finance.

When gauging success in combating climate change, clearly the atmosphere only cares about one measure: the quantity of greenhouse gases being pumped into it. Measuring results by ultimate outcomes – in this case emissions levels – is patently the ideal metric. Yet it's not always so simple. Emissions levels fluctuate with economic output, meaning that a recessionary year like 2009 registered a large drop in emissions – without telling us very much about how robust the UK's climate policies are<sup>58</sup>. And the longer-term decline in the UK's emissions to date has been underpinned by the 'dash for gas' of the 1990s coupled with the ongoing flight of heavy manufacturing to the East. To some extent, the low hanging fruit has now been reaped, and what is required is an ambitious programme of unprecedented energy market investment and reform, in order to make the deep cuts in emissions required over the next decade and beyond.

A better approach would be to couple emissions inventories with some ancillary metrics. One might be emissions per unit of GDP<sup>59</sup>. Another, attempted in this report, is to measure green investment as a new benchmark of climate progress. Knowing that capital is flowing towards climate mitigation in sufficiently large quantities is, in many ways, a surer sign of commitment to action than anything else – far better than rhetoric from politicians and businessmen. An annual green investment audit would reveal, for all to see, whether Government and industry are putting their money where their mouth is.

An analogy here might be the widely-recognised target for committing 0.7% of a nation's Gross National Income towards international development<sup>60</sup>. The UK Government has pledged to reach this target by 2013. The 0.7% target represents a solid commitment to tackling global poverty, around which a cross-party consensus developed, and to which the Coalition Government has stuck to despite the recent recession. A similar consensus needs to develop around appropriate levels of green investment – firstly, through all parties pledging to close the green investment gap, with strong policies to encourage investment; and secondly, to ramp up green investment levels over the long term.

## 4.2. Raising the level of green investment is crucial

Green investment is crucial in order to effectively tackle climate change, deliver on our targets under national, EU and international law, and strengthen our preparedness to make deeper emissions cuts beyond 2020. It is also central to ensuring a green recovery as the UK picks itself up from recession, and to building a green economy over the long term. Making meaningful green investments now will reap major benefits for the UK in terms of cleantech export markets, new green jobs, and new revenue streams for government.

Yet it is clear from the preceding audit that current levels of green investment in the UK are sorely lacking. We spend more on furniture annually than we devote to green investment. The UK sits behind South Korea – still nominally a developing country – in the proportion of GDP it sets aside for clean technologies. We risk losing out in the global race to green our economy – and most of all, we owe it to the next generation to make the investments now that will determine their futures. The infrastructure we build over the next few decades will constitute a ‘green inheritance’ from which all future generations will benefit.

Raising investment levels in the UK isn’t a predicament solely confined to the green sector. We have historically low rates of overall investment compared to other OECD countries: the UK has averaged 17% of GDP over the past decade, compared to 19% in Germany and 21% in France<sup>61</sup>. The need to increase green investment should be seen as part of a wider rebalancing of the UK economy: away from immediate consumption and short-term profit, and towards investing for the longer term.



### **4.3. We need strong policies to bridge the investment gap**

The keystone of the Government's green investment policy must be a strong Green Investment Bank (or GIB). To be worthy of its name, a GIB must be a proper public bank<sup>62</sup>, with sufficient government equity to underpin it and capable of borrowing from the capital markets. It should be able to place equity, lend, and create risk-sharing instruments to leverage private sector capital at scale.

Whilst the majority of the capital that a strong Green Investment Bank will catalyse will be private sector money, the Government has a clear responsibility in capitalising the GIB with adequate seed funding, and ensure its ability to borrow. Ernst & Young analysis recommends the GIB receives at least £4 to 6 billion in tier 1 credit risk capitalisation over the spending review period to 2015.<sup>63</sup> Without the ability to borrow, however, this number looks small. Clearly, any borrowing capacity will have to be managed in a time of government austerity, but the public sector is clearly best placed to make this arbitrage.

To date, discussion of possible sources of government seed funding has focused on bringing together existing sources of funding<sup>64</sup>, and raising revenue by selling off public assets<sup>65</sup>. But the former does not increase the overall level of green investment, whilst the latter risks short-sighted firesales. A third option is to raise new revenue through green taxation. Hypothecating auctioned EU ETS carbon credits is the most obvious contender.<sup>66</sup>

## 5. Recommendations

Government, industry and the third sector need to commit to the following urgent actions:

### 5.1. Produce an annual Green Investment Audit

The audit should amalgamate data on current levels of green investment from across public, private and third sectors, and act as a new benchmark for climate progress. All sectors should cooperate in sharing and publishing data, improving transparency, and building understanding of how expenditure in one sector can leverage investment from another. The Audit would ideally be carried out initially by HM Treasury, before becoming the responsibility of the Green Investment Bank. It would seek to improve on the previous year's coverage (disclosure) and content (leverage data). Clearly, repeat analysis would be required year-on-year, as a snapshot won't suffice.

### 5.2. Commit to closing the green investment gap

The UK devoted £12.6bn towards green investment in 2009-10; it needs to be investing between two and three times as much every year between now and 2020 in order to meet our emissions targets. Every sector has a role to play here, but it is incumbent upon government to provide seed capital, sponsor RD&D, and set strong policy frameworks to encourage green investment. The private sector is better placed to do the 'heavy lifting' but it needs a comprehensive reform of policy, from Energy Market Reform to a Green Investment Bank.

### **5.3. Legislate for a strong Green Investment Bank**

A GIB worthy of its name – a proper bank with at least £4 to 6 billion in tier 1 credit risk capitalisation over the spending review period to 2015 and capable of issuing bonds. To function effectively it needs to be able to leverage its credit rating (cheaper money in) and work without the red tape that frustrates the credit validation processes at larger lending organizations such as the European Investment Bank (quicker money out). It should also aim to lure private sector talent into its management and governance.

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## Notes



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