

UCL ENERGY INSTITUTE

THE KfW EXPERIENCE IN THE REDUCTION OF ENERGY USE IN AND CO₂ EMISSIONS FROM BUILDINGS: OPERATION, IMPACTS AND LESSONS FOR THE UK

Mark Schröder¹, Paul Ekins¹, Anne Power², Monika Zulauf²,
Robert Lowe¹

¹ UCL Energy Institute, University College London

² LSE Housing and Communities, London School of Economics



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The full *Cutting Carbon Costs* report may be viewed at:

http://www.brookings.edu/~media/Files/rc/papers/2011/0902_germany_energy_power_zulauf/0902_energy_power_zulauf.pdf

The summary report may be viewed at:

http://www.brookings.edu/~media/Files/rc/papers/2011/0317_germany_energy_power_zulauf/0317_germany_energy_power_zulauf.pdf

Executive Summary

The widespread devastation of the German housing stock at the end of the Second World War resulted in the creation, as part of the Marshall Plan, of a remarkable bank: the Kreditanstalt für Wiederaufbau (KfW). The bank proved a most effective vehicle for lending, recovering and re-lending Marshall Plan funds for the reconstruction of German infrastructure and buildings. In subsequent decades the bank expanded and diversified its activities. In the 1970s, in response to the oil price rises, the first German legislation on energy efficiency was passed and KfW started its first lending programmes in this area, offering reduced interest rates for investments in energy efficiency improvements. These continued through the 1980s, but in the 1990s the major emphasis in KfW building programmes was on the refurbishment of the housing stock in the former German Democratic Republic (GDR), following reunification – half the housing stock of the GDR, or 3.6 million dwellings, was refurbished over 10 years.

The 1990s also saw KfW's first programmes devised explicitly in support of climate policy, and it is these programmes that are the major focus of this paper, with a view to exploring how other countries, and particularly the UK, can learn from what KfW has achieved. The achievements are impressive. As of 2010, KfW had financed in total the rehabilitation to high energy efficiency standards of 9 million pre-1979 housing units. Between 2006 and 2009 KfW programmes retrofitted 1 million existing homes with energy-efficient products, and approximately 400,000 highly energy-efficient new homes were built, directly generating approximately a quarter of a million jobs per year, largely in the construction and supply chain. Energy efficiency in new buildings has doubled over 2002 - 2009, reducing calculated energy use from 120 kWh/(m²a) to 60 kWh/(m²a), while renovation has reduced it to approximately 80 kWh/(m²a) in existing buildings. It is estimated that every €1 of subsidy has leveraged €9 in loans and private investment, with a leverage ratio of 1:10 for the KfW programmes and 1:12.5 for the Market Incentive Programme (MAP). Moreover, KfW energy-saving programmes from 2006-2009 have saved heating costs of €1 billion per year, resulting in reduced carbon dioxide (CO₂) emissions of almost 4 MtCO₂/year. CO₂ savings through the support programmes (low-interest loans and investment subsidies through KfW and MAP) are estimated at around 1.2 MtCO₂ per year. Over the lifetime of the investments, the various measures are estimated to have led to long-term savings of around 72 MtCO₂.

The UK has a number of new policy initiatives related to the improvement of home energy efficiency, including the Green Deal, Energy Company Obligation (ECO) and, less directly, the Green Investment Bank. While the particular history and experiences of KfW mean that its approaches to home energy efficiency could not be transferred directly to the UK, nevertheless a comparison between conditions in the two countries shows that there are a number of important lessons from the activities of KfW that are relevant to what the UK is hoping to achieve.

First, the German 'three-pillar' approach of integrating energy efficiency provisions into a clear framework of regulation, information and support for renewables has served it well, creating a

strong, enforceable legal standard to underpin change and generating a clear, consistent message about the direction and required radical nature of change.

Second, KfW provides repayable loans on favourable terms, or performance-linked investment subsidies, rather than unconditional subsidies or tax concessions, as a more reliable and sustainable funding mechanism. The UK too is moving towards loans, but without subsidised interest rates and, at present, no provisions for subsidies for more expensive energy efficiency measures. This may not deliver adequate take up of these measures to achieve the large energy efficiency improvements that are required.

Third, the German schemes provide qualified expert advice and installation so that appropriate work is carried out to a high standard. As a result, the promised energy gains and a positive customer experience have been achieved, and over time the German construction industry has acquired great expertise in this area. The UK has much still to prove in this respect, through the accreditation mechanism for energy advisers and energy efficiency installers that is being set up under the Green Deal.

Fourth, German policy requires investments in energy efficiency to be made *before* subsidies for renewable energy are paid. This increases the proportionate contribution renewable energy can make to meeting overall demand, saves money, makes a bigger contribution to the wider goal of climate protection, and provides a more coherent overall message to the public about the need to reduce CO₂ emissions. The UK has yet to adopt this integrated approach.

Fifth, German policy assumes it is better to adopt a 'whole house approach' to energy saving, even if measures are adopted piecemeal, and high energy efficiency measures only implemented bit by bit as people work on different parts of their houses. This enables the overall ambition for energy efficiency improvement to become clear for energy suppliers and builders, while giving some assurance to government that the required emission reductions will be achieved.

Sixth, policy aims to support experimentation and innovation, to build awareness and familiarity for new approaches to energy efficiency, and to identify successful approaches that can be taken to scale.

Seventh, public buildings have an important role to play, to provide conspicuous examples to the public of what can be achieved by ambitious retrofit measures. This is particularly the case in schools, nurseries and children's centres, where such measures can have important educational benefits as well.

Ultimately, conserving attitudes and behaviour towards energy use, and awareness of the need to reduce greenhouse gas emissions, are going to be required if the necessary step changes in home energy efficiency are to be achieved. In this respect the German public is significantly ahead of the UK. There has so far been widespread public support in Germany of the government's energy saving and green initiatives. This is at least partly because of a perception in Germany that energy saving and climate policy can create energy security and economic benefits for the future. The UK has tried to project similar messages, but so far with less intensity, consistency and supporting policy, and less success.

The Green Deal, Energy Company Obligation (ECO) and the Green Investment Bank are all welcome new policies in the right direction. But on the basis of the KfW experience, they do not go far enough on any of the key dimensions: the regulatory framework, the level of the financial incentive or the clarity of the message about integrating home energy efficiency and micro-generation using renewables for both electricity and heat¹. More will need to be done. In considering this, much can be learnt from what the KfW bank has achieved, how it has achieved it, and the overall policy framework that has supported these achievements.

¹ On October 27 2011 in a speech at a Solar Power UK event in Birmingham, Energy Minister Greg Barker was quoted as saying: “So, I can announce today that we will be bringing forward proposals to ensure that all new domestic PV sites from April 2012 must meet minimum energy efficiency standards.”, so that this deficiency in UK Government policy seems likely to be speedily rectified (Click Green 2011).