Energy Efficiency in a Restructured UK Electric Industry

The Regulatory Assistance Project

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In 1989 the United Kingdom embarked on a restructuring and privatization scheme aimed at increasing industry competitiveness and efficiency. Some elements of the restructuring plan, including the pool for dispatch and the extent to which customers are able to choose their own supplier, have earned substantial praise. Other values, however, may not have fared so well. UK energy conservation advocates argue that restructuring made unreasonable assumptions about the extent to which market forces would result in using energy more efficiently and that even after intervention to improve energy efficiency, DSM continues to be woefully underutilized.

This paper examines what has happened with DSM in the UK.

INDUSTRY RESTRUCTURING IN THE UK

Major actions that occurred as a result of restructuring include:

1.Government-owned generation (except for nuclear power plants) was sold to two private companies.

2.A National Grid Company was established to operate the transmission system.

3.An electricity pool was created to facilitate market-based, competitive commodity pricing.

4.The country's government-owned electricity distribution companies (twelve in England and Wales, two in Scotland, and one in Northern Ireland) were privatized into Regional Electricity Companies (RECs).

The RECs have two main businesses: distribution and supply. They operate a regulated monopoly, distribution company that delivers power to all customers in their service areas. This is where they have earned most of their profits. The supply business is divided into two parts. In the first part, RECs are a monopoly supplier of power to all customers

using less that 100 kW. These are franchise customers who do not yet have the right to choose their suppliers. In the second part, RECs are competitive suppliers for any customer, regardless of location, with demand in excess of 100 kW. These non-franchise customers can also purchase electricity directly from agenerator or via the pool. The supply business has a high volume potential but because it competes for price it has a low margin of profit.

In addition to these major functions, RECs also have unregulated subsidiaries and other associated companies. For instance, all RECs will broker gas, most have electrical contracting subsidiaries, generation subsidiaries (or part ownership in a generation company) and appliance retailing and servicing companies, although most are getting out of this business now. Some RECs are involved in telecommunications, combined heat and power companies and have (or are considering having) an affiliated energy service company.

Overseeing this newly structured industry and protecting against monopoly abuse is the government-established Office of Electricity Regulation (OFFER). OFFER sets price controls for the grid company and separate price controls for the distribution and franchise-customer supply functions of the RECs. Supply price controls do not cover non-franchise customers since they are presumed to be protected by competition.

In addition to setting price controls, OFFER imposed performance standards which, for the most part, targeted customer service, such as requiring restoration of lost power after outages within a specified time and stipulating the number of days within which the RECs must respond to written complaints. Whenever RECs do not meet a standard, they pay a pre-established penalty to the affected customer.

WHAT ABOUT ENERGY CONSERVATION?

Prior to restructuring, the extent to which energy efficiency had been offered in the UK was minimal. Programs that did exist were sponsored by the government, not by the utilities. As a result, at the time of privatization there was little pressure to consider how to ***continue*** providing energy efficiency. A handful of energy efficiency advocates, including the Association for the Conservation of Energy (ACE), urged that energy efficiency be built into the new structure, on both energy resource and environmental protection grounds. OFFER, however, believed that since market forces would meet demands as they arose, no special provisions for energy efficiency were needed. If customers communicated a desire for efficiency measures, markets would develop to serve them.

By 1992, it was apparent that the marketplace was not yielding either demand for or investments in energy efficiency. In the absence of an explicit government directive, RECs did not offer customers energy efficiency options. For the first time, though, ACE, which had continued as the major advocacy group, found that it was not alone in support of energy efficiency. The UK's Conservative Government, by signing the Rio Convention Accord, agreed to make reductions in the country's CO_2 emissions. This

commitment became a campaign issue for the 1992 election.Politicians, who subsequently were elected, proposed a CO_2 reduction plan that made the electric utility industry – primarily through energy conservation – responsible for 25 percent of the country's reduction.

Thus, three years after restructuring, the UK was prepared to take a more directive approach to promoting energy efficiency. The primary driver of this decision – complying with the Rio Agreement – made it clear that utilities were not meant to treat energy efficiency as an energy resource but instead were expected to pursue efficiency to meet an environmental obligation.

Programs for Franchise Customers

In November 1992, the Energy Saving Trust (EST or Trust) was established as an independent, non-profit body to advise OFFER on matters relating to energy efficiency and to design and oversee energy efficiency programs. Sponsored by the government, in partnership with British Gas, the 12 RECs and two Scottish utilities, its mandate was to reduce CO_2 emissions by 2.5 million tons per year by the year 2000, when compared to 1990 emissions.

The EST has set an efficiency target for each REC to be achieved from energy savings of franchise customers by March 31, 1998. The target is measured in terms of the number of gigawatt hours to be saved as a result of installed energy saving measures. Franchise customers support the energy conservation programs with a œ1 ($1.60) per year wires charge. The œ1 charge was not set using an analysis that explicitly linked targets to cost but rather at a level the regulator deemed reasonable. The basis for his judgement is not clear. It represents the equivalent of .0377› on the average rate of 12›/kWh (a 0.3 percent rate increase) and raises œ25 million ($38 million) per year.

Funds collected from the wires charge are allocated to RECs taking into consideration a number of factors, including number of customers and load. Using this allotment, each REC develops programs to meet its target.

EST developed three different approaches through which the RECs could meet their targets.

1.National programs. These are planned by the EST and run by a hired, central managing agent. RECs may choose whether or not to participate.

2.Framework programs. The EST provides a program concept and guidelines. RECs may choose to tailor a program within these guidelines for local implementation.

3.Regional programs. These are developed and implemented by individual RECs.

In the second and third categories, the REC submits a proposal to the EST which includes an estimate of savings. EST is required to respond within a month of the proposal submission.

With the national program, EST has already estimated the savings. RECs opting to participate pay a proportionate share of the program costs and are credited with a proportionate share of the savings. Roughly 20 percent of the budget is dedicated to Framework and National programs.

There is limited opportunity for third parties to use monies from the wires charge to develop and operate programs. Third parties can propose a national program to the EST. Alternatively, since it is primarily RECs who develop programs, a proposal can be submitted directly to a REC. There are no provisions for competitive bidding.

Removing Disincentives Through Decoupling

Another change to the original restructuring plan that aimed at encouraging energy efficiency was a revision of the price control formula for the supply arm of the RECs. When the RECs were formed, revenues and profits were directly linked to sales of kWh, thus creating a disincentive for the RECs to save energy. The new formula partially decouples revenues and profits by basing 25 percent of the revenues on sales and 75 percent on the number of franchise customers served.

Because the supply business is already a high volume, low margin business, removing profit disincentives from it will not make a big difference. Most RECs derive the bulk of their profits from the distribution business with prices based exclusively on the number of kWh units distributed. A proposal adopted by OFFER in April 1995 decoupled half of the revenues for distribution services from the volume of sales.

WHAT HAS HAPPENED?

It may be too early to evaluate conclusively the impact of this effort. EST programs began in late 1993, and RECs began offering programs in April 1994. As of January 1995, over 70 REC schemes had been submitted for review, most for residential compact fluorescent lighting and building envelope insulation. Well over half had been endorsed by the EST and approved byOFFER. RECs have participated in a number of national programs promoting compact fluorescent lights (CFLs), providing home weatherization and proffering energy advice. Regional programs also promote CFLs and weatherization of owner-occupied and rental properties.

Missing from the list of programs (and proposals) are what could be some very successful schemes, including interactive effects of measures and end uses, design assistance for new construction and replacement of equipment at the end of its useful life.

The removal of disincentives to energy efficiency has not yet increased efficiency efforts above the mandated targets. Again, it may be too early to judge, and there is more that

could be done, such as setting higher performance standards and a higher wires charge, adding provisions for lost revenues adjustments and offering incentives for outstanding performance.

Initiatives Independent of Performance Standards

There are some limited examples of RECs initiating or exploring DSM programs independently of performance standards. For the most part, these are load management programs which lower cost but contribute little to energy savings and therefore result in minimal CO_2 reduction and environmental improvement. Nearly all RECs have, at least, explored DSM as a tool to postpone the need for distribution upgrades. Such investigations target rural distribution lines, overloaded substations and small villages.

Services to Non-Franchise Customers

That RECs depend only on savings from franchise customers to meet energy savings targets does not preclude RECs and other suppliers from offering energy savings to non-franchise customers. However, this has not occurred. For the non-captive customer, market forces have not resulted in either a demand for or provision of DSM. RECs explain the absence of such programs by citing that unit price is the single determinant by which most customers choose suppliers. Today's large customers equate efficiency with low prices and are not shopping around for a supplier who offers energy conservation services. Another significant barrier which makes suppliers reluctant to provide services to these customers is the short (usually one-year) contract period of non-franchise customers. By the time the pay back for DSM savings kicks in, the customers might have found a new supplier.

A final limitation is that energy service companies have made very few inroads in the non-franchise customer market. These companies predict that until customers shift their focus from short-term unit price there will be very little customer interest in energy efficiency.

Limited Program Evaluation

Little has been done to evaluate the actual savings from implemented programs. In large part this is because programs are guided by compliance requirements instead of actual performance. From the RECs' perspective, what matters is that the EST accepts their planning estimates of savings because this is the basis for determining whether the RECs' targets are being met. The EST isplanning after-the-fact evaluations, but most of the programs are too new for any to have been conducted.

WHAT DOES THE FUTURE HOLD?

In a recent and surprising announcement in Energy Paper 65, the Government reported "that it is confident of meeting and indeed exceeding its commitment under the Climate Change Convention, with emissions of CO_2 expected to be significantly below 1990

levels by the year 2000. As a result of these changes, the EST has recently revised its direction, and it is now working to develop a role as an effective catalyst for change in the energy industry. It is in the process of developing new and innovative ideas which will promote the efficient use of energy at a time of increased competition in the gas and electric industries..."

At this time, despite this finding, the wires charge is still being levied on franchise customers, and the EST is continuing to support the implementation of energy conservation programs. While it is too early to define the role EST will have in the future, it expects to continue working closely with electricity companies on a range of national and regional electricity programs.

HOW APPLICABLE IS THE UK EXPERIENCE TO THE US?

Geographically, the UK is much smaller than the US. There are many fewer utilities to deal with, and they are relatively homogeneous in terms of size. The UK has just the one regulator, the Director General of Electricity Supply, whose decisions can apply to all utilities, and there are no federal/state jurisdictional issues to deal with. These factors make it easier to impose a common national solution in the UK. In contrast, the US has hundreds of utilities governed by many different rules, and within a state there may be significant differences. This means that a national, top-down solution is unlikely in the US.

What is transferrable is a wires charge to fund energy efficiency. A wires charge is non-bypassable, meaning that every retail customer must pay his or her fair share. Thus the costs of providing system benefits cannot be shifted to other customers. Also by treating all sellers equally, the charge is competitively neutral. No supplier is placed at a disadvantage for collecting a cost that a competitor can avoid.

The use of an independent entity, the Energy Saving Trust, to manage the money collected and to provide oversight for the programs, is a good idea. Its primary, if not sole, focus is the achievement of energy savings goals, and it does not face the inherent conflicts that utilities face when considering lost revenues and reduced profits as a result of effective programs.

DIFFERENCES IN IMPLEMENTATION

While the concept is sound, there are a number of differences in implementation that US regulators and utilities should consider. These include how targets are set, how the level of the charge is determined, who is targeted for savings and how energy savings are acquired.

In the US energy efficiency has been undertaken primarily to meet resource acquisition goals rather than environmental targets, although some utilities have used energy savings to create tradeable emissions allowances to comply with Clean Air Act Amendments requirements. Integrated Resource Planning has encouraged and in some cases required

utilities to consider DSM as an energy resource alternative. If done well and if the financial incentives are properly aligned, acquiring energy efficiency as a resource can increase the level of cost effective savings over what can be expected from mandated targets. As the UK experience shows, mandated targets result in compliance, no more and no less. Reducing long run costs through energy efficiency has the potential to get more.

The level of the wires charge for energy efficiency should be based on an assessment of the size of the cost effective resource potential. Preferably this would be done by IRP so that all resources are considered. No matter how it is done, planners should know how much resource is available, how much can be acquired that is cost effective and how much it will cost. Once this information is gathered, a charge should be set to support that level of acquisition. In the UK, the levy of œ1 per customer per year was established by the regulator without a visible justification. This amounts to about 0.15 percent of revenues which is just one-tenth of the average US effort of 1.5 percent of revenues.

Many US studies have estimated a significant potential for energy efficiency in the commercial and industrial sectors. Programs addressing these customers are often more cost-effective than residential programs. In the UK these larger customers do not pay the charge or receive the benefits. As a result, a large potential resource is overlooked. The theory that the market will provide the energy efficiency services to these customers because they have the option to choose supplier, has not been demonstrated yet. Meeting the full potential for energy efficiency will mean all customers should both contribute system benefits and in return have the opportunity to benefit from resulting energy efficiency investments.

In the UK, only the RECs and the EST propose and implement (sometimes by contractor) energy conservation programs. The programs to date are primarily residential lighting and insulation. One REC may propose a program, and when the EST approves it, other RECs copy it knowing what the EST will approve. The fixed allowance does encourages each REC to locate and propose low-cost programs. It does not, on the other hand, encourage innovation in program design. Implementation in the US should encourage other service providers to propose programs. Utilities, energy service companies and customers should bid competitively on the basis of price, quality factors and market segment served. This competition would encourage innovation and delivery of the most cost-effective resources.

A final lesson from the UK experience is the importance of building in a mechanism to deliver energy efficiency right from the start. Programs that get tagged on at a later date look like orphans to a larger restructuring effort. This must not be the case. The benefits of energyefficiency are too important to allow them to be lost in a move to a competitive market. The wires charge is a good tool to ensure that that does not happen.

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