Residential DSM Program Design in the United Kingdom

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The Energy Saving Trust (Trust) was developed as a mechanism to reduce carbon emissions due to the inefficient use of electricity and natural gas in the United Kingdom. The Trust is a non-profit, non-governmental organization, with a governing board representing British Gas, the regional electric utilities, and independent directors, with the latter category being a majority. Initially, its mandate is to provide DSM services in the residential and small commercial market segments, with funding provided from a surcharge on electric and gas bills throughout the country.

The Conservation Law Foundation (CLF) was retained by the Trust to provide assistance on regulatory issues relevant to the establishment of a "conservation utility," and to assist in designing the two residential DSM programs that will form the backbone of the Trust's efforts. Currently, the Trust has several relatively small pilot programs in operation, and intends to field the major residential programs in the fall of 1994. When fully operational, the budget for the residential programs is planned to exceed $300,000,000 annually.

The paper discusses the key decisions and strategic elements of the residential program designs within the unique regulatory and utility framework in the United Kingdom, as well as the issues that the Trust has had to deal with in establishing itself as a new and major player in DSM.

Introduction

In 1990, the U.K. government initiated a major restructuring of the electric power industry of England and Wales incorporating many elements of "retail wheeling," and going well beyond. The experiment, now in its fourth year, is being watched closely by utilities, government officials, and environmentalists throughout the world. For some, it offers an attractive "market-based" alternative to the traditional, vertically integrated and regulated model which prevails in much of the world, promising lower prices and better customer service. To others, it represents an inefficient and environmentally harmful balkanization of generation, transmission and distribution, and end use planning, with the specter of higher costs and dirtier air.

The overall merits of the U.K. electricity deregulation experiment are beyond the scope of the present paper. Instead, we focus here on the impacts of this restructuring on the practical implementation of electrical energy efficiency programs, and summarize the main lessons we learned from our involvement in advising the U.K. Energy Saving Trust in designing, financing, and fielding such programs in a deregulated industry environment. These lessons are likely to be highly relevant to coming debates in the U.S. and elsewhere concerning the compatibility of energy efficiency investment with various forms of retail deregulation.

Background: The United Kingdom Context

The U.K. electricity deregulation program had two key elements: the attempted privatization of a previously governmentally owned power system, and the simultaneous disaggregation of that system into separate generating, transmission, and distribution companies. This was accomplished through national legislation, followed by a sale of the system's pieces.

Two new generating companies, the National Power Company and PowerGen, were created to own and operate the nation's non-nuclear generating stations, predominantly coal-fired. A third generating company, Nuclear Electric, was created to hold the nation's nuclear power stations (about 20% of total installed U.K. capacity). When it was clear, however, that the "free market" would not assume the risk of the nuclear plants, Nuclear Electric was preserved as a government-owned monopoly, the

purchase of whose output was mandated on the new distribution companies described below. In addition, independent power producers were permitted to enter the market for bulk power generation.

The nation's distribution system was divided into twelve Regional Electricity Companies (RECs) which operate that system on a regulated, monopoly franchise basis. However, the RECs were given a diminishing monopoly franchise on retail electric service. From the start, customers using more than 1 MW of demand were permitted to purchase from any of the RECs; as of early 1994, approximately 40% of these customers were purchasing from outside their local REC. This monopoly will devolve to 100 kw and over customers in 1994, and to all customers by 1998. The historic "obligation to serve" was designed by the legislation to disappear as the retail franchise dissolves at lower and lower levels of consumption.

The U.K. transmission network was also split off, and is owned and operated by the National Grid Company, which is in turn owned by the RECs. System coordination and dispatch, as well as system account settling, is provided by the electricity Pool, which is in turn governed by the RECs and the generating companies. The Pool operates as a spot-market clearinghouse, and dispatches generation based on prices established by half-hourly bids offered by the generators a day in advance. Despite this spot market system, the majority of bulk power transactions are ultimately paid for through medium term (typically one year) "contracts for differences."

Each of these system pieces is subject to slightly different and evolving form of regulation by the government's Office of Electricity Regulation (OFFER). Under the legislation, OFFER has plenary supervisory authority over the entire system and is required to conduct periodic reviews of the parts and the whole to gauge efficiency, service quality, reliability, equity and environmental impact. This authority, in most cases exercised without U.S.-style regulatory adjudication, includes (1) review of the compliance of the RECs with their legal "economic purchasing obligation" to serve remaining franchise customers with the lowest cost supply (which, despite argument by U.K. efficiency advocates, has not been defined to include cost savings through end use efficiency); (2) setting of REC prices for supply cost recovery for the remaining franchise customers; (3) setting of REC prices for distribution services applicable to all customers, franchise or non-franchise, whatever their source of supply; (4) and setting of REC "standards of performance" for retail electric service to franchise customers.

The Regulatory Structure and End Use Efficiency Investment

The underlying design of the U.K. system reflects a commodity image of electricity as an unbundled good. Decisions to build generating plant, transmission systems, and economic decisions regarding the operation of those plants are generally imagined by the architects of the U.K. system to be guided by the decisions dictated by retail customer decisions. (In the interim, there are a number of exceptions to this rule, as the wholesale and retail supply prices for franchise customers are still regulated, an obligation to serve remains, and RECs are still required to purchase a roughly 20% share of their supply from Nuclear Electric). In short, the operation of short-medium term commodity contracts between RECs and end users are expected to ultimately govern generation mix and operation—not long-range planning decisions made by RECs assured of monopoly customers with a legal entitlement to be served.

This model of industry structure raises obvious questions for end use efficiency investment by RECs. In the U.S. and elsewhere, where retail customers still entertain a stable and long-term relationship with their local vertically integrated utility, end use efficiency can be conceived of as an alternative to traditional supply, with efficiency costs spread over all customers as with a power plant. In the U.K. system, however, no costs will ultimately be spread among all customers: even on the supply side, every supply contract will be allocated on a stand alone basis. This raises a substantial obstacle to U.S.-style DSM at the retail level which is not financed entirely by the customer receiving site treatment.

This disjunction between DSM and cost recovery opportunities does not diminish the underlying logic of end use efficiency investment for the U.K. system. Indeed, a recent and comprehensive assessment of DSM potential for England and Wales concluded that substantial savings potential exists within the U.K.—enough to reduce year 2001 electric demand by 8-12% at a net savings of $15-25 Billion through an expenditure of approximately $600 million–$1 billion per year. (FIELD and CLF 1993). However, the beneficiary of DSM investment in the U.K. system will ultimately be the nation as a whole, rather than any particular group of REC customers, whose composition may shift radically from time to time. Determining how these beneficial investments should be financed when the beneficiaries are so diffuse has occupied the attention of efficiency advocates in the U.K. and, more recently, OFFER.

This issue first arose in the context of the franchise customers, which the RECs must still serve on a mandatory and price-regulated basis. In recent rulings, OFFER has required each REC to spend the equivalent of $1.50 per franchise customer per year on energy efficiency, amounting to about $40 million annually nationwide—well short of the $600 million—$ 1 billion annual investment identified as optimal. OFFER also mandated that supply-side rate recovery for franchise customers be based mostly on revenue-per-customer basis, with the view that this will encourage additional end use efficiency investment. However, the effect of this ruling will only last until 1998, when the franchise is scheduled to disappear entirely.

Accordingly, efficiency and DSM advocates in the U.K. have focussed on the next regulatory review—the setting of the distribution price control which will govern distribution charges applicable to all U.K. retail customers. Efficiency advocates have proposed that OFFER require much larger mandatory DSM investment by U.K. utilities, to be recovered, with appropriate "share of savings" incentives" through the distribution portion of customer rates. In essence, this would create a nationwide" DSM fund" to be administered by utilities or their agents. (CLF and FIELD, 1994). On a national basis, distribution-level recovery of DSM investment in line with the FIELD/CLF study discussed above would require a 2-3.6% increase in near-term electricity prices.

When deregulation was proposed for the gas industry, environmental groups were concerned, and wanted some aspect of the plan to support energy efficiency. The gas regulator (OFGAS), headed by James McKinnon, proposed an additional charge on gas to finance efficiency investments, called the E-factor. E-factor expenses could be passed on to customers through rates.

The primary concern, both of McKinnon and of British, appears to have been to provide some level of customer service to franchise customers, especially for low-income households. The conservation supplied through expenditures of E-factor funds was not viewed as an alternative source of supply. There was long and open debate about how the spend the funds, with British Gas primarily interested in measures that were competitive with other fuels. In the end, a decision was made to fund an independent entity to provide the energy efficiency services.

Enter the Trust

After the privatization and regulation of the electricity system, U.K. policy makers faced a new power-system related challenge-control of greenhouse gases. The U.K. was one of the signatories to the Framework Convention of Climate Change at the UNCED Rio de Janeiro "Earth Summit." The Convention aspires to stabilization of climate change through control of greenhouse gas emissions. The U.K. and other signatories are required to report back to the first Conference of the Parties of the Framework Convention in 1995 on their progress towards this goal.

The power sector in the U.K. accounts for roughly a third of the nation's total CO_2 emissions—believed to be a principal driver of the greenhouse effect. Yet, because of the deregulation of the power industry, as described above, achieving desired CO_2 reductions through the application of DSM in a least cost planning context would be difficult, if not impossible. Recognizing the need for an institution to fill this regulatory gap, in 1992, the U.K. government created the Energy Saving Trust, a private corporation. The Trust's charge from the Department of the Environment was "to propose, develop and manage new programs to promote energy efficiency" and "by the year 2000 to provide carbon savings in excess of 2.5 Mt." Initially funded by British Gas and the 16 RECs, the Trust's Board of Directors consists of representatives of the RECs, British Gas, and independent directors.

The Trust sprang fully into action in April 1993, when Chief Executive Eoin Lees was hired. Their mission is the reduction of total energy consumption in the United Kingdom, and the consequent environmental impact. They intend to accomplish this mission by (1) identifying, selecting and managing energy savings projects, (2) forging relationships with all major constituents in the energy efficiency field to gain support for their initiatives, and (3) promoting the training of relevant trades in energy savings practices and promoting the education of energy users. The Trust's mandate at this time includes only residential properties and commercial properties below 100 KW or 2,500 therms annually, as after 1994, larger properties are permitted to negotiate with a variety of energy suppliers. There is not yet any provision to deliver DSM services to larger users within this competitive market framework. Also, the Trust will only work to conserve electric and gas in these properties, as these are the regulated fuels.

At present, the Trust's total scope, role, and funding base is being negotiated between the Trust, the government, and the utilities. It is assumed that the Trust's two initial programs, described below, will be funded at least in part by the $40 million annual DSM pass-through which OFFER has authorized the RECs to implement, and by a similar or greater contribution from British Gas; it is clear, at a minimum, that any DSM program designed or implemented by one of the RECs must bear the stamp of approval of the Trust. As of early 1994, it was expected by most observers that, if the DSM mandate on RECs or DSM funding base were widened through OFFER's ruling in the distribution price control review, total DSM

spending by British Gas and the RECs by the year 2000 would be on the order of $600 Million dollars annually (for a population about twice the size of California's), or about 2% of total electric and gas revenues, and that the Trust would have a central role in overseeing and influencing the design and implementation of these programs. Recent events, however, described in the Re-Enter Ideology section below, have cast these expectations into doubt .

Under Lees's leadership, the Trust began to focus its near-term mission more narrowly towards projects to save energy in low-income housing and owner-occupied housing. Among the reasons for this early domestic focus was the government's desire to blunt the impact of a proposed 17% sales tax on domestic electricity and gas consumption.

Overall Project Scoping

The Conservation Law Foundation (CLF) was retained by the Trust to provide support with regulatory issues and to design two residential programs. Additional partners in providing regulatory support were the Foundation for International Environmental Law and Development (FIELD) and the Association for the Conservation of Energy (ACE). Both FIELD and ACE are based on London, and both have had substantial involvement in energy issues in the United Kingdom and elsewhere. The Trust was interested in assistance from CLF because of CLF's prior experience in the development of successful DSM programs in collaboration with utility partners in the United States, and because of the arguments developed by CLF to convince regulators and utility executives to support DSM .

The programs that CLF was asked to design with the Trust were the two primary programs that the Trust intends to operate, accounting for more than half of all planned expenditures over the next decade. CLF budgeted for about two months of consulting staff at the Trust headquarters in London to design the programs, and a lesser amount of time from CLF and affiliated entities to assist with regulatory issues. David Hewitt served as CLF's technical representative in this collaborative process and worked closely with the Trust during the summer and fall of 1993 to design these programs.

Housing Issues

Housing in the United Kingdom differs substantially from the average house in the United States. First, separate single-family homes are relatively less common, as most urban areas and many rural ones are dominated by attached housing. Second, the vast majority of housing are constructed with masonry walls, as the typical American stick-built construction is considered to be short-lived. Third, the typical central heating plant is gas fired hot water, usually with only one zone, and frequently controlled by a time clock. Many houses in the United Kingdom still lack central heating, although the presence of central heating systems has been greatly expanded over the last 20 years.

Moisture problems are common, with about one out of three households noting significant moisture related problems in their homes. Problems tend to be caused by uneven heating and/or cold temperatures in the houses as much as or more so than absolute levels of ventilation. Additionally, the older masonry construction, i.e., that without air cavities in the wall, are more likely to allow rain penetration and/or water seepage through the wall.

Owner occupied housing is the largest housing segment in the United Kingdom, accounting for two-thirds of the 21,300,000 housing units. Most owner occupied housing is either detached or attached housing, although there are some owner occupied flats as well.

The next largest category of housing is generically called social housing, which includes local authority housing (5,000,000 units) and housing associations (600,000 units). Social housing is primarily attached housing and flats. Local authority housing is managed and largely owned by local government. Although similar in some ways to public housing in the U.S., the housing serves a broader range of incomes with only about 63% of local authority tenants being classified as low income. The national government provides funding and approves renovation and building plans for local authority housing. In recent years, the national government has pushed to promote owner occupiers in local authority housing, and a substantial number of houses have been sold, albeit mostly in the better quality housing stock. Even when the housing is sold to individuals, the local government is still involved in overall property management. Housing Associations are typically controlled by tenant groups, and also can receive specialized government support for repairs and renovations.

Energy Saving Measures

The Trust is only interested in installing energy saving measures that are determined to be cost-effective. Measures were screened by the Building Research Establishment to determine societal cost-effectiveness compared to the cost of supply. Cost information is readily available for reviewing electric measures, as electric supply is now operated separately from the distribution utilities. For reviewing gas measures, CLF had to review costs

somewhat more rigorously to determine distribution costs and future price escalations in the cost of supply. Environmental externalities were not considered in the cost of supply, as the environmental impacts were viewed as a "free" benefit of the efficiency efforts.

Measures found to be cost-effective for both electric and gas heated homes were:

Attic insulation (when 50 mm or less of insulation is present),

Wrapping of hot water cylinders and pipes,

Infiltration reduction,

Improved heating controls,

Compact fluorescent lighting, and

Cavity wall insulation.

For electric heat properties, higher levels of attic insulation and infiltration reduction will be provided, heating control strategies differ, and some additional measures will be considered as the program develops. In social housing complexes, custom analysis will be used to determine cost-effective measures beyond those listed above.

Basic Program Design Descriptions

Ultimately, two programs were designed by CLF for the Trust, Homes 2000 for owner occupiers and the Energy Efficiency in Social Housing Program. Combined, the goal of these two programs is to reduce carbon emissions by 1.05 million tons annually by the year 2000.

Owner Occupied Program

The Homes 2000 program will offer a standard package of services which are selected based on the pre-existing conditions of the house. A services advisor will visit the home, determine the services needed, and prepare a contract for the services on-site. All measures must be installed as a package if recommended by the audit except for lighting and cavity wall insulation. The incentive offered by Homes 2000 for this basic package of measures will be a grant for 33% of the cost of the package, with a maximum grant of about $400. The grant will be payable to the approved contractor to reduce the out-of-pocket expense to the owner occupant.

While cavity wall insulation is cost-effective, it is separated from the basic measures due to its relatively higher costs. This provides owner-occupiers with an optional measure, while keeping the cost of the basic measure package affordable. To encourage owner-occupiers to take this additional step to fully insulate their homes, the incentive provided for this measure is 50% of the measure cost, with a maximum grant of about $400. Owner-occupiers must agree to install the basic measures (if needed) before they can receive the grant for cavity wall insulation.

The program will also provide energy education during the visit to the house. Provision of all services will be coordinated through a single entity so that the customer is inconvenienced as little as possible.

In general, the provision of services is based on the "direct installation" principles used by CLF in New England collaborative, where all identified customer barriers to installation of measures are removed. The notable exception in the United Kingdom is the substantial customer cost-share. The cost-share provision was required by political necessity. Although clearly the cost-share will affect the willingness of many customers to participate, the goal of the program is very modest compared to the size of the market, i.e., on the order of 3% per year participation. To reduce free-ridership, the Trust intends to use geographically confined marketing and require comprehensive treatment of the dwelling. Although customers can elect not to proceed with the cavity wall insulation, which is the single most expensive measure, it is hoped that the larger incentive for cavity wall insulation will encourage comprehensive treatment.

For low-income owner occupiers, all services are provided free of charge. To the extent possible, the Trust will coordinate service delivery to low-income households with the existing Home Energy Efficiency Scheme (HEES), which provides limited treatment. Overall, participation of low-income households is limited to 30% of treated owner occupied houses, so that all rate payers have an opportunity to benefit. Low-income households are about 22% of owner-occupiers overall.

Social Housing Program

The Energy Efficiency for Social Housing Scheme is designed to work with the property owners of social housing, primarily local government. The Trust will operate a competitive annual process for funding, but will rank proposals to favor poorer quality housing stock and those with a higher percentage of low-income tenants, and to achieve geographical distribution. Purveyors of social housing will develop and manage their own energy efficiency projects, and the Trust will provide technical assistance and monitoring of projects. Social Housing providers also will have to demonstrate substantial matching funds, at least equalling the contributions of the Trust.

The scale of both programs is quite large. When achieving full scale operations after a 5 year graduated start-up, the Homes 2000 program will serve about 400,000 homes annually. For social housing, annual units will be about 140,000 units. Still, these numbers represent only about 3% of the total eligible market for each program on an annual basis. In the Homes 2000 program, the cost to the Trust for an average unit will be about $540, while the somewhat more extensive work in the social housing program will cost the Trust about $800 per housing unit. In 1994, the combined budget is estimated at $28,000,000, rising to over $300,000,000 annually at full scale.

Issues in Program Development

Target Markets

The initial residential target groups of the Trust were owner occupied housing and low-income housing. Owner occupied housing was targeted because it is the largest single classification of housing in the United Kingdom, and therefore had the greatest potential for energy and carbon savings. Low-income housing generally had the greatest need and substantial political pressure to remedy housing problems. More than 2,500,000 households are both low-income and owner occupiers.

An initial decision suggested by CLF was to slice the market up slightly differently. The owner-occupied program would include low-income, owner-occupied households, with all services being the same except funding, which would be fully provided for low-income households. The second market was social housing, which included both low-income and non-low-income households. Although it seems like a subtle difference, the end result was that in social housing the Trust program was oriented to the building owner, not the tenant. This conflicted with the current low-income energy program, HEES, which was marketed to tenants with limited property owner involvement. This approach initially met with strong resistance, because it did not provide services directly to the low-income households. CLF argued the property received the services (excepting education), not the tenant, and the tenant benefitted equally no matter who let the contractor in the door. In addition to this philosophical and to some degree historical debate, the CLF articulated four primary reasons why the approach to the market should be adjusted. First, while the HEES program offered very limited services (loft insulation, tank wrap, and limited infiltration treatment), the Trust was promoting much more extensive treatment that would require working with the property owner. Second, the Trust intended to enlarge the funding pool by requiring matching funds, which would not be available from low-income tenants. Third, analysis of the technical measure package was more appropriately carried out on a building basis rather than a dwelling unit basis. Fourth, it was more efficient from an operations perspective.

Although this seemed (to the authors) like a straightforward issue, the recommendation caused considerable concern and turmoil, and stopped progress on the social housing program for several months. CLF was not alone in initial support of this strategy, which also made sense to social housing providers, utilities that had worked on energy efficiency programs in this sector, and the Building Research Establishment, which had operated a similar program. The issue was resolved in favor of the CLF suggested approach and planning work continued.

Social Responsibility

Another low-income related issue for the Trust was whether the Trust was to focus solely on energy and carbon savings, or whether the Trust's mission was broader and included some energy related social issues. These issues included the provision of central heating for homes currently lacking it, occupant comfort (related both to affordability of energy and house characteristics), reduction of moisture related problems, and energy affordability. While the Trust viewed these areas of concern as clearly legitimate, attempting to resolve them would likely not result in energy and carbon savings.

In the end, the answer was that the program designs developed by the Trust focused on operational economies, leveraging of other funding sources (both public and private), and limiting energy conservation measures to those that were likely to prove cost-effective. In part, this solution simply recognized that the scope and scale of the housing problems of Britain's low-income citizens were beyond the ability of the Trust to solve, and that maintaining a targeted focus was appropriate, as that was how the Trust would be judged. However, the primary program targeted to low-income, i.e., the Social Housing Program, requires matching funds to carry out the energy related work and defines the energy related work broadly enough to permit solutions to other problems. For example, while the program will not fund the addition of central heating systems, it will allow the cost of the heating system to be counted towards the matching fund requirement. Furthermore, part of the scoring for awarding funds includes comprehensiveness of treatment and the amount of matching funds above basic requirements. Thus, the Trust supports more extensive renovation work while limiting direct funding to cost-effective measures.

Delivery of the Homes 2000 Program

Delivery of the primary services for the Homes 2000 program was constructed in a novel way. The Trust needed to provide services throughout the country, but did not have an infrastructure to do so, nor any desire to develop one. The mechanism selected to coordinate and deliver services was a franchise mechanism. The Trust will competitively bid territories, with the winner, selected in terms of price, capabilities, and other criteria, retaining an exclusive right to market the Trust's financial incentives in the designated territory. The franchisee may subcontract any parts of the work, as long as the quality and price are maintained.

In essence, this key management/service delivery layer does not exist in the desired form in the United Kingdom. There are, however, large contractors with energy experience, home energy rating businesses, housing management business, non-profit community groups, and utilities that possess the skills to assemble such an entity. (In the U. S., firms such as Conservation Services Group, MassSave and DMC provide these services.) The expectation is that the market will respond to provide the marketing support, technical support and management needed to operate the program at the ground level.

A separate entity will be charged by the Trust with responsibilities for quality control and data processing. The inspection rate of completions will start with a very high rate initially (50% to 100%) to clearly communicate expectations for service quality, and drop to a level of less than 5% random inspections in about 5 years.

Re-Enter Ideology: The OFGAS Meltdown

As noted above, it was widely assumed in early 1994 that, with the Trust programs being readied, and with continuing cooperation of OFGAS through the E-factor pass-through, total gas and electric DSM spending in England and Wales would reach approximately $600 million annually. In March 1994, however, this assumption was thrown into doubt by pronouncements by Clare Spottiswoode, appointed to succeed James McKinnon as head of OFGAS.

Appearing before Parliament's Select Committee on the Environment, Ms. Spottiswoode stated her view that requiring gas DSM funding through the E-factor was in fact beyond OFGAS's legal authority, and represented a "tax" which could only be proposed by the Government and approved by Parliament-in effect, accusing McKinnon of having acted illegally in instituting the E-Factor to begin with. A firestorm of criticism ensued during March and April 1994 from Members of Parliament, and environmental and energy groups, stoked further allegations of personal scandal; the Government was believed to be embarrassed by the fray. In a May 1994 return appearance before the Parliament Select Committee, Spottiswoode was forced to recant her earlier statement that gas DSM finding through rates was unlawful, but continued to insist that "this is an area that the regulator should not be taking on herself. "

With E-factor funding shut off, joint gas and electric DSM program planning under the Trust's eye has effectively ground to a halt. CLF understands that, as of early June 1994, negotiations have re-started between OFGAS and the Trust to establish an E-Factor charge significantly below initial targets, but the outcome is uncertain. Meanwhile, sensing drift in Government policy concerning DSM, the RECs have proceeded to spend their $40 million/year DSM allocations on schemes without consulting the Trust in most cases; typically such schemes have involved isolated lightbulb distribution and similar technology-specific rebate programs.

Conclusions

The ultimate success of the residential programs designed by the Trust and CLF is yet to be determined. Viewed from a short-term perspective, the efforts of CLF to support and assist the Trust were successful, in that many of the lessons learned in the United States were useful in establishing the regulatory context of DSM in the United Kingdom, and in designing the details of DSM programs with a high chance of success.

Viewed from a larger perspective, CLF's U.K. experience points up the significant and possibly irresolvable tension between a U.K.-style electric industry structure and balanced electric resource planning which integrates end use energy efficiency investment. The basic U.K. structure is, in fact, almost entirely antithetical to planning of any sort: over time, the entire market for new resources will be driven by the aggregation of thousands if not millions of separate purchasing decisions made by retail customers. As in any commodity market, the U.K. retail electricity market is driven by minimization of short-term price. Reliability, long-run cost, and environmental impact are secondary considerations, or ignored entirely.

The Trust was designed to fill the obvious planning gap created by the U.K. retail wheeling structure. Its poor success to date in establishing a significant DSM acquisition program (which could, however, be remedied through a favorable ruling in the distribution price control) should give pause to those who assert that retail wheeling structures can be reconciled with IRP and DSM. Once

DSM is shorn from its political context as an alternative to specific power plant investments that would otherwise be made, as must occur when resource planning is replaced by retail wheeling, DSM becomes more or less permanently ghettoized as a "social program" or an "environmental program," as if it offers no significant power system benefits in terms of minimizing long run service costs or environmental regulatory risks. (Cohen and Kihm 1994). In short, DSM's internal system benefits are obscured and marginalized in a structure, like retail wheeling in the U. K., which places the focus almost exclusively on short-run commodity electricity prices.

In such an arrangement, the politics of DSM look quite dismal. Despite the Trust's effort to peg DSM investment levels to U.K. avoided costs, Chicago-school regulators such as Littlechild and Spottiswoode can more easily criticize DSM as an exogenous "tax" to the system, possibly illegal, with no directly observable economic benefit. We believe that the U.K.'s balkanized regulatory arrangement, more than any other factor, will make the implementation of serious levels of DSM uncertain at best in the U.K. Those who are confident that DSM, renewable and IRP can be "retrofitted" into a retail wheeling structure in the U.S. should take note.

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