

Regulation, IRP and DSM: Lessons from three Countries in Transition (United States, Austria and Czech Republic)

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1. SYNOPSIS

The authors discuss the prospects for deregulation, DSM and IRP in three western countries.

2. ABSTRACT

Comparing different countries, this can generally lead to a deeper understanding of the driving common forces of future developments. Three countries, Austria, the Czech Republic and the United States, were chosen to provide concrete examples of the status of the debate over IRP, utility regulation and DSM. The massive political and economic changes in the world are matched by the march of institutional, technological and market changes confronting the electric utility industry in these countries.

Since the "Velvet Revolution" the Czech Republic has been in transition to a market economy. Austria has recently joined the European Union and her energy utilities will be confronted by the competition within the Common Market. The United States, which has the longest experience in IRP and DSM, has set the course to a more competitive environment with bidding, retail wheeling initiatives, and the 1992 Energy Policy Act.

Even though each country is facing quite different circumstances, the authors maintain that the issues and principles involved in this public debate are very similar: What role should the government play in the energy sector generally, how can it contribute to improved energy efficiency and how can this all be put into a sustainable development strategy.

Conclusions are drawn with regard to the likely pace and nature of change in each country and the implications for the practical success of DSM over the next 10 years.

3. INTRODUCTION

National policies towards the regulation of electric utilities are being debated world-wide. The experience of these three countries represent the spectrum of evolving regulation in the Western economies: the United States, Austria and the Czech Republic. A comparison is presented in order to identify some of the common drivers in the political debate over the roles of government, industry and energy efficiency.

The paper first presents a summary of the recent history and current developments in each country:

1. U.S. - a highly regulated system with authority split among the states and Federal government; it is moving rapidly toward re-regulation with a rapid shift towards competitive power markets
2. Austria - a mixed economy with modest regulation moving toward the "EU model"
3. Czech Republic - a continuing movement from state ownership to private ownership of utility systems

The paper will conclude with a discussion of similarities and disparities for demand-side management (DSM) and integrated resource planning (IRP) in each country and reflect on the search for common principles to guide the changes underway.

4. UNITED STATES EXPERIENCE

4.1. Brief History of U.S. Electric Industry

Until the 1980's the traditional method for regulating energy utilities in the United States as natural monopolies was generally accepted. Most of these network-based systems, like electricity, gas, telecommunications, were vertically-integrated, privately-owned utilities regulated on a cost-based system with an allowed rate of return on investment. As industries changed and as the business environment and technologies changed around them, policy makers began to question the over-regulation of those parts of industry which were being increasingly driven by competition, e.g., telecommunications, airlines, banks, electricity, natural gas, and petroleum.

In the U.S. the states play the major role in regulating retail utilities. (The only exception is wholly owned public utilities which are directed by elected public officials or their representatives.) The Federal Energy Regulatory Commission (FERC) oversees utility wholesale rates for interstate systems and transactions. Historically the investor-owned utilities (IOUs) made the investment decision to provide the power for steadily growing demand and prepared tariff proposals for approval by the commissions. The utility usually accepted the investment risk. Into the 1970s the growing use of large, central station power plants, e.g., nuclear, at costs that were thought to be "too cheap to meter," the prospect of rapid growth and low rates seemed guaranteed far into the future. The economies of scale argument for a "natural monopoly" seemed to be guaranteed by this new technology. And there were seldom penalties for overbuilding the utility's system since high growth assured that each new resource would be needed soon.

As nuclear plants were scaled-up in size and orders for more were coming in rapidly to meet load growth in the mid-70's, aggressive construction programs became more difficult to manage. Little effort went into standard or modular designs. Many were built using "cost plus" contracting due to the lack of standardization and to growing lead times for permitting and construction. In the late 70's the rapid run-up in inflation and interest rates caused actual costs to rise dramatically. In states where these costs flowed directly into rates, the reaction to "rate shock" led to these mechanisms being replaced with more stringent regulatory provisions and prudency reviews. In the mid- to late 70's the number of major plants in the construction "pipeline" was very large, and the financial pressures were ballooning.

Congress enacted the National Environmental Policy Act in the early 70's, and there were many similar state laws. Utilities were required to provide extensive analyses to government agencies granting licenses and permits of the direct environmental impacts of their proposed facilities and to compare them with alternative actions, including "no action" alternatives. In 1978 Congress enacted the Public Utility Regulatory Policies Act (PURPA) which created a market for independent power producers. They got the right to sell their power to the local utility at its avoided cost.

In the early 80's this combination of factors produced a crisis. Many utilities found themselves heavily in debt and financially over-extended, due to lengthening lead times, cost overruns, exorbitant interest rates, more stringent economic regulation, and eventual reductions in load growth caused by to the higher rates for covering costs. A ratepayer revolt led to repeated initiatives to close plants or stop construction, with many protests and successful lawsuits on procedural matters. Environmental interests began to push DSM and renewables in the environmental review processes. As a resource DSM had many desirable characteristics that were becoming increasingly attractive and demonstrable in planning circles. Prudency reviews became common practice among commissions, threatening disallowances of cost recovery for utility investments. This pushed utilities to cancel plants early in order to minimize the financial exposure for the utility shareholders in investments which were becoming increasingly dubious.

In the 1980's independent power producers (IPPs) under PURPA became the prevalent resource developers. PURPA required electric utilities, under the direction of state utility commissions, to purchase power from small generators and cogenerators at their avoided cost, called a "standard offer." Although states struggled to implement these requirements in the 80's (with some notable failures), by the end of the decade most had moved to a resource bidding process in place of standard offers. A large share of the new generation was developed by these non-utility generators. Decentralized plants became the new standard, and the natural monopoly rationale for the vertically-integrated electric utility began slipping away.

In the mid-80's many utilities and state commissions moved to create a "new regulatory compact." Instead of the traditional adversarial processes for resource planning, a cooperative planning process based on "least cost planning" was instituted where all available resources were considered equally, including DSM. The utility brought in all interest groups to produce its resource plan. A plan was generally presented to the state utility commission in hearings with information on all available alternatives and trade-offs. The commission was much more easily convinced that the ultimate decisions were reasonable and prudent because all of the issues and analyses were freely available and openly discussed. With final approval of the plan the utility could be reasonably assured that its investments would be accepted and their shareholders

would not be exposed to undue risk. Financial risks were shared between the ratepayers and shareholders. Also many utilities negotiated financial incentives for pursuing aggressive DSM programs. Previously DSM programs were viewed by utility management as antithetical to their financial interest.

The National Association of Regulatory Utility Commissioners (NARUC) took the lead in developing materials for model regulatory practices and for training commissioners and staff in IRP and DSM. Industry associations such as Electric and Gas Research Institute developed databases and analysis techniques for their memberships.

Finally some states expanded the resource bidding process to include DSM, the "all sources bidding" approach. Utilities were directed to acquire some of their resource requirements from outside vendors, independent power producers for generation (IPPs) and energy service companies (ESCOs) for DSM. For DSM the cost to the utility had to compete with generation alternatives on either a societal cost or revenue requirement basis. Sometimes additional credits were given for DSM for environmental or other reasons. By the close of the 1980s IRP and DSM were dominating the regulatory scene: big programs, collaborative processes and much reduced utility-owned generation.

4.2. Effects of Recent Federal Legislation

In 1991 Congress passed important amendments to the Clean Air Act. This increased the controls on emission from power plants and instituted a program of pollution rights trading. Some of the key issues in the formulation of the bill were the disparities it created for certain fuels and geographical areas. It also has a possible indirect effect of forcing industrial self generators to put their loads on local utilities rather than acquire pollution rights in constrained areas.

The 1992 Energy Policy Act included several important provisions for energy utilities. The Public Utility Holding Company Act of 1935 (PUHCA) was amended to allow independent power producers to apply to FERC for designation as Exempt Wholesale Generators (EWGs). This would relieve them from the regulatory requirements of being a utility under current law, and free them from the limiting requirement to become "qualifying facilities" under PURPA. The law also required utilities to grant transmission access to EWGs based on a "reasonable and fair" standard. This is still to be defined.

These changes added new impetus to the competitive fires in power supply. Three years later the industry is still trying to catch up with the changes in the law. Meanwhile at the state level new challenges were being undertaken based on the experience of re-regulation in the United Kingdom.

4.3. Direct Access and the 1994 California Blue Book

Pressed by the deep recession in the state of California and the increasingly aggressive power marketers and industrial users, the California Public Utilities Commission (CPUC) released the 1994 California Blue Book for the electric utility sector in the spring of 1994. The marginal cost of new generation was one-third the level of some retail power rates, and large users were rebelling. A huge debate began on the appropriate role of economic regulation of an industry which is rapidly becoming competitive in the supply of electricity. Much like the re-regulation of the industry in the United Kingdom, the CPUC set out goals to move rapidly towards "retail wheeling" before the year 2000. This violated the "new regulatory compact" of the 1980s, which had driven the use of IRP and the DSM collaborative process that had dominated California resource development in recent years.

This debate over retail wheeling shows no sign of abating. The CPUC appears no closer to resolving the debate at this time. The issue raised many important and fundamental questions about the role of government and utilities in the marketplace, viz.:

_The source of new resources has changed dramatically. New generation is available in large quantities with costs much lower than utility embedded costs. The combustion turbine technology is relatively clean, modular, efficient and cheap. IPPs (including utility subsidiaries) and industrial customers are solidifying their power. It's a buyer's market and wide open to new supply entrants.

_There has been the de facto loss of exclusive franchise for utilities; the only question is how far will it go and how fast. Utilities have become increasingly timid about any new capital investments for regulated markets. The obligation to serve is on the chopping block and it's not clear what the new organizing principle will be.

p The political battle lines will be drawn over the stranded investment problem, including DSM. No one wants to be saddled with paying off old debts while there are attractive new supplies readily available.

How can there be a public IRP process in a competitive market?

_Corporate strategic planning must now focus on the marketplace and look beyond a regulated market.

_Electric reliability standards require reassessment and redefinition for the new business environment.

_There is an effective dis-integration of utilities; parts of the business are subject to competition (generation) and others aren't (transmission and distribution). This is likely to cause internal rifts in corporate philosophy. Purely distribution companies can watch the battle in peace.

_What should be the DSM funding source? Energy efficiency will revert to a public policy issue for general government. Environmental or social goals will have to revert to general government, using standards, environmental regulation or tax incentives.

_Competition will continue to force change - the only question is the pace of change.

_Customer service will be the most important thing to utilities. DSM may have a critical role, but it will be greatly diminished from the aggressive DSM acquisition programs based on regulatory IRP.

_The complexity of the issues in the political debate means that the eventual compromise will take several years to develop and will come in many forms throughout the states.

With the political split in the federal government yielding increasingly conservative, market-oriented policies, there should be limited changes in energy law or regulation beyond the implementation of previous acts.

5. AUSTRIAN EXPERIENCE AND THE NEED FOR IRP

5.1. Organisation of the Austrian electricity sector

The organisation of the Austrian electricity industry is a hierarchic system with three levels. The legal background is the 2. Nationalisation Act from March 1947. With an amendment in 1987, the possibility was created for private ownership up to a maximum of 49% in previously exclusively public utilities.

The first level of the electricity system is formed by Verbundgesellschaft, which is mainly owned by the Federal government. It is the holding company for nine bulk electricity generators, with a share of about 50% of the total installed capacity (hydro 63%, thermal 24%), and the largest producer. Verbundgesellschaft has a monopoly for all national and provincial cross-border electricity deliveries. Verbundgesellschaft owns most of the high voltage grid (220/380 kV) and operates the national load switching centre. It is responsible for the construction of "large plants" and for the coordination of the "10 year power plant expansion plan" with the province utilities. Because the law doesn't define what "large plants" are, province utilities and Verbundgesellschaft have been, and are, competing in building new large power plants. Verbundgesellschaft has the responsibility to ensure the national security of supply, and therefore the obligation to serve the second level (the province utilities). In 1992, Verbundgesellschaft bought the distribution company STEG and in this way got involved in the retail business for the first time. With the main argument to protect national interests against the power of German capital, Verbundgesellschaft is also interested in buying other regional utilities.

At the second level nine province utilities (including one for the City of Vienna) have been established. Their share of generation capacity is about 37% (hydro 27%, thermal 56%). They have the obligation to serve the customers in their distribution area, and thus they have the exclusive right to supply their regional market. With one exception all province companies are vertically integrated and are mostly involved in the natural gas and district-heat business too.

The third level consists of five large municipalities (supplying province capitals) and about 200 smaller municipalities and private utilities (which "survived" the 2. Nationalisation Act). They serve small regions and individual industries which are excluded from the service area of the province utilities.

5.2. Reorganisation of the electricity sector

In its working agreement of November 1994, the new government stated its intention to abolish the Nationalisation Act and to create a new Act on the Organisation of the Electricity Sector. The initial task is to open utilities to more than 49% private ownership. But a broader discussion will be unavoidable, including questions like the integration of price and investment regulation, obligation for IRP and reorganisation of Verbundgesellschaft and Province utilities. The latter have proposed to take over Verbundgesellschaft and split up the power plants among them. Verbundgesellschaft would remain the national load manager.

5.3. Regulation of prices and tariffs

The Minister for Economic Affairs can set economically justified prices for grid-based energy (electricity, gas, district heating) and connected additional services (1992 Price Act). The "economically justified price" is fixed by a two step procedure: first the focus is on the utility's cost level, and second this price is adjusted in the light of the Austrian economy (e.g. ROR compared to the macro interest rate). The economically justified price has to cover the costs of the utility.

The Minister for Economic Affairs can establish guidelines on how to prepare tariffs and tariff structures. The main objectives are that tariffs are cost-orientated (that they reflect costs induced by a customer group who is characterised by a specific pattern of electricity consumption) and that capacities are optimal for meeting load requirements.

The price regulation of Verbundgesellschaft (wholesale price), of the nine Province utilities and of the five largest municipalities is done by the Minister for Economic Affairs according to the rules of the 1992 Price Act. For other utilities the Minister delegates price regulation to the Heads of the Government of the Provinces. Only delegates of the so called "social partners" (Federal Economic Chamber, Chamber of Labour, Standing Committee of the Presidents of the Austrian Chambers of Agriculture) can participate in the procedure and can give their comment and advice. They are bound to secrecy.

The Minister is considering a change from price control to anti-monopoly regulation (called "mis-use supervision"; e.g. to examine if electricity prices have decreased as a reaction to lower fuel prices for electricity generation). However, the criteria for "mis-use" are still unclear.

5.4. Investment control

Price regulation and investment control are divided. The licenses to build plants, transmission and distribution lines are given by the Province. Only if transmission lines cross province borders is the Minister for Economic Affairs responsible. Major guidelines for the Electricity and Transmission Acts of the Provinces, which are the legal bases to get the licenses, are enacted by the Federal Government. But there is no obligation for DSM or IRP. These terms are not mentioned in the laws; therefore it depends on the legal interpretation if DSM is permitted. The utility has no assurance that its demand-side investments are taken into account.

5.5. Request from the Parliament to implement LCPFe! Bokmärket är inte definierat.

In its report from May, 1992 the Committee of Trade of the Parliament, which discussed and improved the draft of the 1992 Price Act, asked the Minister for Economic Affairs to include in future price regulation procedures the examination of: if, and in what sectors, electricity conservation programs should be undertaken? DSM programs are to be carried out, especially if the costs of additional electricity production are higher than the costs for the improvement of energy efficiency (least-cost-principle). In reality, however, no such examination has been made.

5.6. Experience with DSM

Due to a long tradition the Austrian electricity utilities have a great experience in load management. The promotion of the efficient use of energy is part of the utilities' policy and business. But there are no regulatory incentives for DSM; quite the opposite is noted by utility managers. Recovery of costs for supply side projects is guaranteed (after the utility has got a licence to build a plant, no investigations have been made if it is "used and useful"). However to recover costs for DSM measures is uncertain, and in addition their net impact is unknown. Therefore the key motivation of DSM is limited to improve the public image (e.g. promises of local politicians during election campaign to start a DSM program). Information and advice programs are the most common. Impact evaluation are rare and rarely considered in the original program design. On the other hand the lack of information on the cost-effectiveness of energy saving measures is mentioned as a major barrier by the utilities. Critics of DSM refer to the "market forces" which will automatically induce the appropriate investments into conservation measures and conclude that the occasional evaluations of DSM programs (cost of conserved electricity 0,1 \$/kWh for freezers up to 1,6 \$/kWh for electric stoves) show that close attention to DSM reveals economically unjustifiable results.

5.7. No legal basis for LCP and IRP

The price decisions (which are the allowances of the Minister to increase electricity prices by a certain amount) contain a number of conditions which influence the behaviour of the utilities on the one hand and reflect the weak points of the Austrian electricity and regulation system on the other hand. The relevant conditions are

- _profits which remain after paying the dividends must be invested in the building of power plants or the grid
- _the utilities have to cooperate with the goal to optimize the production of electricity (especially the hydro plants) and to minimize system costs. They shall also coordinate the building of new plants and power lines. They have to report about it every six months to the Ministry for Economic Affairs
- _the utilities have to examine if, and in what organisational framework, the profit-sharing methods in electricity production of the Netherlands and Scandinavian countries can be implemented in Austria

- _the export prices have to be set on an equal level to domestic deliveries (except surplus energy, mainly hydro in summer)
- _the utilities have to carry out rationalisation analysis (e.g. if the number of employees is appropriate) and have to report about it to the Ministry
- _they have to report about their R&D and other research activities
- _they have to inform every tariff-customer about his electricity consumption compared to the year before
- _the utilities have to prove that prices and tariffs of different consumer groups are based on the costs which they cause

One utility has appealed to the Constitutional Court, and it abolished all these conditions because they are not justified by the 1992 Price Act. On the one hand this means that the existing legal framework provides no basis for IRP and DSM. On the other hand IRP and DSM are being requested by the Parliament.

5.8. Overcapacity - A Need for IRP ?

These days - ten years after the public uproar about building the Hainburg hydro plant (cancelled so far) - an open controversy between Verbundgesellschaft (which is also the Federal Dispatcher) and the Province utilities has broken out on the question of over-capacity. Verbundgesellschaft claims that even in winter peak periods there will be stand-by capacity of 20% (this was already argued by people outside the electricity sector in the last decade), and that no plants shall be built in the next several years. The Province utilities argue that: (1) this is a result of excessively large import contracts by Verbundgesellschaft and (2) they have a demand for new capacities in their distribution area because of continuous increase in electricity consumption. This controversy supports the thesis that the consumer used to have to pay for overcapacity, but, with competition "on the horizon", suddenly costs are visible and important. A further point of discussion is: whether new IPPs are replacing hydro generated electricity which could be exported only at low prices and results in an increase of the Austrian CO₂ emissions.

5.9. Proposal for next steps

A number of measures are necessary to remove the above mentioned uncertainties. The "upgrade" of the legal and economical conditions for the utilities should include:

- _creation of a new organisational framework (including IPPs)
- _bringing together price and investment control in an independent utility commission (e.g. with members nominated by Federal and Province government)
- _ensuring public involvement and participation
- _including DSM and IRP in the energy legislation by (e.g. to set incentives for successful conservation programs by regulation or to develop IRP); as a first step the proposal of DG XVII (Commission of the European Union) for an IRP directive can be used, though it only concerns the distribution utilities.

6. CZECH POWER INDUSTRY IN TRANSITION AND OPPORTUNITIES FOR IRP

The transition of the Czech energy industry is significantly different from the U.S. and Austrian cases. The energy transition in the Czech Republic is just a part of the fundamental change of the whole economy after the complete political change since 1989. In the dynamic environment of economies in large-scale transformation it is relatively easy to implement any dramatic legislative, organizational or ownership change along the way.

6.1. Organization

The Czech power industry was vertically integrated in one state-owned utility responsible for power production, transmission, dispatching, and distribution. There were also independent power producers, such as industrial self-generators and municipal power and heat co-generators, which produced about one-fifth of the total electricity generation.

In 1991 power distribution was separated from the national utility, and eight independent regional distribution companies were established. High voltage transmission, dispatching and 80% of the power generation is now organized within one national utility. Seventy percent of Czech power generation is based on coal, and 25% on nuclear power. And, if the second Czech nuclear power plant is finished and put on line, nuclear plants would represent over 50% of the total Czech power production.

The national generation and transmission utility, as well as the regional distributors, have been partly privatized and are now owned by a mix of state, private and municipal shareholders. The state will keep majority ownership until the transition is finished and all energy legislation is modified for private ownership.

6.2. Price Regulation

The Ministry of Finance sets up maximum electricity prices and tariffs as parts of its general authority for price controls. The major unwritten criteria for the price decisions of the Ministry are macroeconomic stability, control of inflation, social feasibility, and ability of the utility sector to finance its new construction. The average kWh price in the Czech Republic is about 6 US cents, and the average subsidized residential price is 3 US cents. The cross subsidies are gradually being eliminated, and electricity prices in the residential sector will rise by 10-15% annually. The government still controls major utility investment and has decided to finish the construction of a 2 000 MW nuclear power plant. The construction of this power plant began prior to 1989 and should be finished in two years.

6.3. Limited Programmatic DSM Experience

The Czech utilities have long-term experience with load management using different tariff structure and remote control of electricity heat-storage appliances for water and space heating. There has been very limited experience with energy efficiency programs prior to 1989. Utilities activities focused on some information projects on how to use energy in more efficient way.

After 1989 the first information about Demand-Side Programs and Integrated Resource Planning was widely disseminated. The Czech power utility set up its DSM department, developed its first DSM projects, and created an energy information center to disseminate information on the efficient use of electricity. The first DSM projects covered a rebate program to sell compact fluorescent lamps, tested domestic electricity appliances for efficiency, and metered and evaluated real savings achieved in a small-scale demonstration project. The biggest DSM program was a \$0.5 million rebate program for 140 000 compact fluorescent lamps.

The major barrier to developing further significant DSM programs is price regulation that does not allow the utility to recover its DSM costs from customers. All DSM expenditures are paid from profit after-tax profits. The only reasons for DSM activities are public relations reasons, and DSM is not part of the utility's resource planning process.

6.4. New Energy Legislation

The former energy legislation did not pertain to the private ownership of the energy enterprises. Drafting of new energy legislation started in 1992, but it has not become a top priority until 1994. A new "energy production" law was passed in November 1994. This law defines rules for enterprises in the energy industry. It introduces licenses for power, gas, district-heat production and distribution/transmission, and it sets up a general framework for utility regulation. A detailed related statute on utility regulation is drafted, and it should be finished by the summer of 1995.

Development of another new energy law on energy management was started at the end of 1994. The development of the bill has been open for the first time for the public input and all interested parties have been invited to present their proposals. Proposed principles of the bill cover governmental support for energy efficiency, such as, appliance efficiency standards, tax incentives, etc.

During this period there is a unique chance to shape the new legislation to support energy efficiency and to implement DSM as an integral part of the utility planning process.

6.5. New Trends

The transition of the whole economy in the Czech Republic can be characterized by the typical slogans of the current governmental coalition: demonopolization, competition, deregulation. Czech Prime Minister Vaclav Klaus commented on the case of natural monopolies at the Bretton Woods Conference in October 1993, saying that "regulatory practices suggested by [the World Bank] missions are, in my opinion, really wrong and too regulatory for us. Our task is to dismantle the monopolies and not to regulate them."

This policy as applied in the new energy bill eliminated guaranteed monopoly status of the utilities, even in transmission and distribution. Any competitor is allowed to enter the franchised market and compete with, for example, the existing power distribution utility. However, there is no common carrier or wheeling obligation, and a new entrant has to build its own power line if he does not make an agreement with the distributor. The obligation to serve applies to this competitor's service area as well. On the other hand, the government plans to gradually eliminate cross-subsidies by the year 2000.

One cannot expect that free competition will become wide-spread in a cross-subsidized industry. The law authorizes the regulator to control the costs of the utility for "appropriateness". Integrated resource planning is just another step from this cost-based regulation.

1995 will be probably be a key year for the Czech energy industry since a comprehensive new energy legislative package will be developed. Integrated resource planning can be incorporated into the new legislation right now. If these bills do not allow utilities to invest into DSM options in the same way they invest in new energy generation, it will probably be much more difficult to change it in the future.

7. COMMON THEMES AND CONCLUSIONS

Although the debate and progress is different, each country is undergoing major transitions in the government's role in the electric marketplace. No single model seems to dominate, but there are several common factors which will dominate the developments in each country. These common principles or market realities may make the outcomes more similar than would have been expected in the past:

1. After the fall of communism there is a greater consensus emerging on a more limited role of government in the marketplace. Government intervention is now seen as the exception, not the rule. Each government will need to form a political consensus on the appropriate role of government to secure environmental protection, economy, efficiency, national security, equity, etc. The outcome may be the laissez faire form of government as espoused in the Czech Republic or the more deliberate and bureaucratic processes in the U.S. or EU.

2. Technology change and lower fuel prices are encouraging new entrants in the supply markets with eager industrial users providing political and economic pressure. None of these countries can ignore the power of the marketplace. Attempts at artificial constraints or roadblocks to these changes will encourage circumvention. The governments will have to struggle to stay ahead of the changes, and may be tempted to abandon their responsibilities. But the distributional issues are very large. Some awkward compromise is needed for those utility investments which clearly made in the past for the general public benefit.

3. The push for the liberalization of international trade will open all energy markets. Reciprocal arrangements for access to markets will create a greater consolidation of inter-connected systems, standardization of technology and free-flowing international finance. National governments will have diminished autonomy in controlling their domestic energy systems. The old domestic "compacts" will melt before the forces of freer trade and competition.

4. There is growing consensus for international cooperation in environmental policy and standards. In part this represents a shared vision of environmental hazards, but it also is tied to the free and "fair" trade movement. National governments will be increasingly bound by international agreement and will relinquish a degree of autonomy. Certainly protection of the global environment is one major rallying point for an international goal for energy efficiency, and this is one of the principal reasons for all governments to continue a DSM focus.

It's clear that the industry will dis-integrate in some form. Only the remaining natural monopoly portions of the industry could be successfully tasked to fund DSM, e.g. through "wires charges", for the collective benefit of their customers. Otherwise DSM reverts to a general government policy question - with many possible policy options, e.g., surcharges, standards, tax incentives, environmental controls, etc. Or if there will be a mature power market with many competitors, DSM might become an important marketing tool for utilities. The remaining public role is to protect the public's interest in promoting efficiency to overcome market failures. As these issues are debated and tested globally, we will get a lot of very productive experimentation. It should be very instructive as long as we are ready to learn from our collective experience. Both ACEEE and ECREE have demonstrated leadership on the need to judge performance on the basis of demonstrated results, instead of invoking ideology from any extreme of the political spectrum to formulate national energy policy.

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