The Possibilities for Policy Supporting DSM in the Liberalized Internal European Electricity and Gas Markets

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ABSTRACT

This paper presents results from a study analyzing the possibilities of IRP and DSM in the recently created European internal electricity market. The study, supported by the European Commission and finished in May 2000, is based on empirical surveys of electricity and gas market structures as well as of IRP and DSM activities in the European Union (EU) countries. A second paper for this Conference focuses on the empirical results; this paper presents the analysis of, and recommendations on, energy policy actions to support DSM (i.e., energy efficiency and load management programs and services by energy companies and ESCOs) in (fully or partly) liberalized electricity and gas markets like the EU.

The paper first presents an analysis and assessment of the possible DSM and IRP support mechanisms, including public benefit charges, ratemaking, obligations, support for energy efficiency services, and negotiated agreements. A common set of criteria for the evaluation of effectiveness and applicability in the various contexts of the support mechanisms was developed for this analysis.

Based on the analysis, a set of proposed combinations for policy actions to support DSM in electricity markets at different stages of liberalization were discussed with practitioners from the eight countries participating in the study. From this, proposals for common policy at EU level but allowing flexible implementation in the Member States, as well as country specific proposals, were developed.

Introduction and Methodology

The structure, ownership, and regulation of the electricity and gas businesses in the European Union (EU) show a much wider variety than in the USA. Historically, some countries, e.g., France, Italy, and Portugal, have had state-owned, nation-wide monopolies; some, like Germany and Sweden, had a mix of private and public/municipal companies similar to the USA; and some had competely municipal structures, e.g., Denmark and the Netherlands. A European Directive (further on referred to as the IEM/IGM Directives) requires the Member States to introduce wholesale competition and a minimum of retail competition (for electricity, for customers with more than 40 GWh/year; for gas, with more than 25 million m^3) by 1999/2000. But the market restructuring implemented by the Member States is at least as different, e.g., in terms of market opening and unbundling, as the situations were before the restructuring.

As a consequence, the adoption of a common policy at EU level for energy efficiency involving the electricity and gas industries constitutes a formidable challenge. It requires the

identification of intersections upon which to build actions, while simultaneously giving attention to "subsidiarity"[1] issues.

To investigate the subject, the European Commission, under the framework of the SAVE program, mandated a group of institutions from eight European countries (Germany, Belgium, Denmark, France, Italy, Portugal, Sweden, United Kingdom) coordinated by the Wuppertal Institute from Germany. This study (Wuppertal Institute et al. 2000) had two main objectives: (1) to investigate the possibilities of doing Integrated Resource Planning (IRP) and Demand-Side Management (DSM) in the restructured Internal European Electricity and Gas Market; (2) to develop recommendations to stimulate IRP and DSM in the liberalized electricity and gas markets, both at European and National level.

Methodology. The work was carried out in four steps (Phases). Phase 1 laid the theoretical foundations for the work, and developed useful definitions. Phase 2 analyzed the restructuring of the electricity and gas markets, and the incentives or disincentives for IRP and DSM which result from the restructuring for different types of energy companies. As a basis for this, extensive questionnaires were filled for the participating and other countries. In Phase 3, another detailed questionnaire gathered existing or planned policy mechanisms for support to IRP and DSM, and experiences with IRP and DSM. Based on this, a set of 6 'families' of policy mechanisms for support to IRP and DSM, which are compatible to the liberalized markets, were identified and analyzed with 6 common sets of criteria. In Phase 4, finally, recommendations to stimulate IRP and DSM in the liberalized electricity and gas markets, both at European and National level, were developed.

A second paper for this Conference (by Lopes et al.) focuses on the empirical results on the experiences with IRP and DSM, and on the critical factors which have led to the very different level of development of IRP and DSM in the different EU Member States.

This paper presents the analysis of, and recommendations on, energy policy actions to support DSM in (fully or partly) liberalized electricity and gas markets like the EU.

Definitions. DSM will be defined by us to include both services (defined as directly paid by the customer or market agent who directly benefits) and programs (less than 100 % or not at all directly paid by the customer or market agent who directly benefits), and all of end-use energy efficiency, fuel switching, and load management. The conditions to be called DSM is that these activities are implemented with an involvement of energy companies, and reduce the total costs of energy services to customers and society, and the energy related environmental damages (incl. CO_2 emissions and nuclear risks). So energy efficiency can, e.g., also be implemented by other actors, but we will only call it DSM if an energy company is involved.

Electricity and (natural) gas **companies** can be active in generation, wholesale, transmission network operation, distribution network operation, retail supply, or any combination thereof.

[1] The EU is a conglomerate of independent states, not (yet) a federal state like the USA. Therefore, EU legislation is only allowed to deal with matters that require EU-wide harmonization. All other matters are subject to national legislation. This is the principle of "subsidiarity".

Energy Market Restructuring and its Implications for IRP and DSM

Energy Market restructuring, with the unbundling of the functions of generation/wholesale, transmission, distribution and, in some cases, of retail supply, and the introduction of competition in wholesale and retail supply, has fundamentally changed the framework for IRP and DSM. In this section, we briefly present some results of our study in the form of hypotheses, to explain why we have analyzed a number of policy mechanisms to make DSM (more) attractive for energy companies.

The combination of unbundling, and competition in wholesale and retail supply, renders IRP as a method of planning for matching demand forecasts and supply capacities useless for most energy companies. Only for network operators, or for suppliers to captive customers where these exist, is a limited form of IRP feasible.

However, the methods for integrated assessment of the cost-effectiveness of supply-side and demand-side options, which have been developed under the IRP framework, can still be used to analyze the most cost-effective options to provide to the customers the energy services they need at least cost and with a minimized environmental impact.

Liberalization of the *supply* of energy will not reduce most of the barriers which exist on the *demand* side for a more efficient use of energy, e.g. lack of knowledge among end-users and providers of end-use technology, split incentives, high implicit rates of return, lack of funding, etc. Support to end users for energy efficiency is needed from market and policy.

There are many instruments, like incentives, standards, labels, co-operative procurement and other market transformation programs, which can be used by the state or other actors to stimulate energy efficiency, and not involving the energy supply industry. However, there are a number of important arguments from the perspective of society, why energy companies should continue to play a role in implementing energy efficiency. To give just three of the most important arguments: (1) As the markets of the future must be markets for energy services, not for final energy, the energy companies of today must become providers of energy services at least cost and least environmental damage in order to address the transition to sustainable energy systems. Of course, other market actors should supply such services as well. But it is easier to promote energy efficiency in co-operation with energy companies who have incentives to do so, than against energy suppliers who can only lose profits through energy efficiency. (2) Energy company DSM is an instrument of internalizing the abatement costs for avoiding damages ('external costs') into the costs of the sector, and reflect them in the tariffs to the end-user, who would otherwise—through higher energy use—ultimately cause the externalities (‘Polluter pays’ principle). (3) Without energy company DSM, a number of important possibilities are missed. In particular, the contact that distribution and/or supply companies have with their customers can help to access the customers for information, for installation, and for billing in the context of energy services. Participation of energy companies in energy efficiency activities can thus reduce the transaction costs and accelerate market transformation.

The crucial question is then: **Do the benefits and incentives that energy companies receive from DSM activities in liberalized markets match with the benefits to society just mentioned?**

Depending on the type of market restructuring, and on which actor in the energy business is concerned, there are a number of situations, in which **inherent economic incentives** exist. Such inherent incentive situations can be, e.g.:

- a situation, in which transmission and distribution system capacity upgrade investment costs in certain geographical areas can be avoided through targeted DSM activities (a 'regionalized' DSM/IRP) (Thomas and Zander 1997);
- a situation, in which building new generation capacity can be avoided or deferred (also higher avoided costs), which, however, does not seem very likely for the EU mainland electricity system for the near future, but maybe for some small isolated systems;
- a situation, in which it is attractive for an unbundled supply company to focus on load management (kW, particularly peak clipping and load shifting) rather than on energy conservation (kWh) (again, higher avoided costs);
- a situation, in which there is a demand for DSM services 100% paid by the customer or market agent who benefits; i.e., the energy company focuses on commercial strategies for implementing business-based DSM and energy efficiency services (e.g., though third-party financing, functional sales etc., maybe also selling energy efficiency services as part of a wider "customized retail energy service" [2]); raising additional revenue to the utility;
- a situation favorable for some DSM activities that can help to increase customer loyalty or the number of new customers in a competitive retail supply market;
- a situation, in which fuel switching towards the energy type offered by the company is likely to bring positive effects for the customer, the environment, and the energy company.

The question is how much DSM is done because of these inherent incentives. If the resulting DSM level is too low, policy mechanisms are needed, which have to be compatible with competition in the liberalized market. The empirical evidence so far suggests that without policy support little DSM is being pursued in liberalized energy markets, except some DSM services for large customers, and some heating services in the gas market. This has been proven, e.g., by a recent study on active energy services (CEC/Eurelectric 2000).

Policy Mechanisms to make DSM (More) Attractive for Energy Companies

We now want to look at **mechanisms** which could make DSM (more) attractive for energy companies. Such mechanisms are particularly needed to support the implementation of energy efficiency-DSM programs, but also for the development of the market for energy efficiency services; here, both the demand from the customer side and the supply of such services need stimulation. The objective of the mechanisms is to promote the development of DSM in a manner that is equitable, practical and compatible with restructuring of the electricity sector.

For the analysis of the mechanisms for policy support, we define three market types.

Market type 1: partial competition, i.e. a market which still has non-eligible customers, and hence franchise monopolies for the supply to these customers; in some cases, only the minimum market opening required by the IEM/IGM Directives is implemented. The unbundling of electricity or gas sector functions is of minor importance here.

[2] In such a "customized retail energy service", ESCOs and/or supply companies deliver a complete range of services to the customers (energy; energy information services, e.g. combined billing, end-use metering; energy management systems; end-use energy services, e.g. chilled water, compressed air, steam; facility management and support), so that energy efficiency is a consequence of broader value-added solutions.

Market type 2: full competition, i.e., all customers are eligible customers, but the rules for market access may not be very clear, and the distribution network companies and the retail supply companies are not clearly separated.
Market type 3: full competition, and the rules for market access are very clear, and the distribution network companies and the retail supply companies are clearly separated (i.e. at least by entity). Such separation can have both negative and positive implications for DSM.

Overview of Policy Mechanisms

M1 Schemes with dedicated funds to finance EE and DSM programs by energy companies, ESCOs and other bodies. To finance the EE and DSM activities, a dedicated fund is raised through a public benefit charge applied on all or certain actors of the electricity system, or through recycling a part of an energy tax. The type and amount of DSM services and programs to be funded, and, as a consequence, the amount of the fund, will depend on the specific goals to be reached. Furthermore, the administration of the funds, and the definition and monitoring of the DSM activities, can be in different hands (an existing or new, independent or government body, or the energy companies themselves, with independent oversight). In Europe, such a scheme has been introduced, e.g., in Denmark (the Electricity Saving Trust scheme described in Lopes et al. 2000).

M2 Change the ratemaking of monopoly segments to remove pressure to increase sales. With restructuring, the monopoly sector, and hence, price regulation, is reduced to the transmission and distribution networks and, at least for some time, to the supply to non-eligible (captive) customers. Price regulation for these market segments should try to better align the evolution of revenues and profits with the evolution of cost drivers (e.g., for distribution networks, this can be energy sales, number of served customers, grid length). A reduced weight of energy sales, typically 25 to 50 %, would also reduce or avoid incentives to increase sales. Outside the USA, such new regulation schemes have been introduced in UK in '94, and in more recent years in Portugal, Norway, New South Wales (Australia), and Italy.

M3 Actions in ratemaking of monopoly segments targeted at making Energy Companies neutral or positively affected by performing single EE-DSM programs. When performing an EE-DSM program (i.e., an energy efficiency—EE—program run by an energy company, see definitions), an energy company faces both direct program costs and net lost revenues due to reduced energy sales from DSM, which under certain regulatory regimes cannot be recovered and hence create extremely strong disincentives to DSM activities.

There are a number of actions, which still are available for the ratemaking of monopoly segments (transmission and distribution networks, supply to captive customers) and targeted at removing these disincentives:

- Recovery of strictly direct costs of an EE-DSM program within tariffs
- Recovery of net lost revenues because of reduced energy sales from DSM within tariffs
- EE-DSM additional incentives within tariffs (bonus, shared savings, markup)

DSM cost recovery has been quite common in Europe, but the cases of recovery of net lost revenues, or of additional incentives are few.

M4 Obligations to perform a certain level of EE-DSM programs. One very strict mechanism to stimulate a certain level of DSM is to set an obligation, i.e. a legally binding target for the energy companies. There can be different obligations for different actors (distribution and/or supply companies) and for different targets (as a percentage on revenues, as a saving GWh quota, etc.). There can also be different ways to set the obligation, e.g.

- By law or by the regulator;
- In the license;
- As an extension of public service obligations;
- Targeted to technologies and customers neglected by the commercial services market.

The UK Energy Efficiency Standards of Performance (Staniaszek 1999, Lopes et al. 2000) are the most prominent example of such an obligation in Europe. More recently, Belgium, Denmark and Italy have created DSM obligations for distribution network companies in their energy legislation.

M5 Negotiated agreements for DSM with the energy industry. Here, the government or the regulator negotiates the DSM target with the energy supply industry, and settled them in an agreement. Such a negotiated agreement can be an alternative to M4, the obligations, provided the number of energy companies is not too big (e.g., less than 20), and a good monitoring and enforcement of compliance is in place. This mechanism, combined with an allowance to fund DSM costs via the tariffs, has been very effective (savings of 7.4 TWh between 1990 and 1996) in the Netherlands.

M6 Legal and technical support and quality standards for the development of EE-DSM programs and services. There are a number of policy actions which are targeted to develop the market for DSM services, but also to remove some non-financial barriers to the implementation of DSM programs. Such policy actions can be, e.g.,

- Development of standardized monitoring and evaluation procedures;
- Development of guidelines for the tendering procedures in activities of DSM bidding and competitive sourcing of DSM resources;
- Technical support for EE-DSM preparation, implementation, evaluation (e.g. training for the staff on EE technologies, evaluation of savings etc.);
- Development and testing of standardized Energy Performance Contracting schemes;
- Guarantee fund for insurance of investments;
- Independent certification of ESCOs;
- Fostering co-operative processes of the relevant actors in the market for energy efficiency services (network building, see California Collaborative and similar processes in the USA and Europe).

A Multicriteria Analysis of the Policy Mechanisms

The mechanisms described above were each analyzed using the same 6 sets of criteria. The analysis was based on the empirical evidence as presented in the related paper by Lopes etal. (2000). Where no empirical evidence in Europe or elsewhere exists, theoretical considerations were made. Space does not allow us to present details for all 6 sets of criteria. Therefore we give the full set of criteria only for the set C1, and the analysis by mechanisms

for this set of criteria in Table 1 below. For the other sets of criteria, only a short overview is possible. A more detailed description and analysis of these sets of criteria is available in (Wuppertal Institut et al. 2000). The order in which the criteria are given does not imply a ranking in importance.

Table 1. Multicriteria Analysis of DSM Support Mechanisms: C1, Strength in Transforming the Energy Markets Towards the Inclusion of Energy Efficiency

M1 Dedicated Funds to Finance EE and DSM	HIGH for *Promotion of DSM programs and services* and for *Development of markets for energy efficiency services* (Single programs approach), if energy companies and DSM involved in EE implementation and if the amount of funds used for EE-DSM is adequate. LOW / MEDIUM in respect to *Transforming energy companies to providers of least-cost energy services* (it does not remove pressure on energy companies to increase sales)
M2 Ratemaking to Remove Pressure to Increase Sales (only monopoly segments) (Revenue Target,/ Multiple Driver Target Regulation)	*Market type 1*: HIGH because there are captive customers. Since it removes artificial incentives to increase sales it achieves a global objective of influencing energy and CO2 evolution trends *Market type 2*: MEDIUM because there is a full competition in supply but the role of distributors (as parts of distr./supply companies) is still important *Market type 3*: LOW / MEDIUM because there's a full competition in supply and the role of distributors is limited by the action of suppliers The evaluation gets better going from Multiple Driver Target to Revenue Target or adding some mechanism that directly promotes the DSM activity (M1 and/or M3)
M3 Ratemaking to Promote EE-DSM Programs (monopoly segments)	For *Promotion of DSM programs and services* and for *Development of markets for energy efficiency services*: from HIGH to LOW for Market type 1 to 3 for the same arguments of the M2 mechanisms. For *Transforming energy companies to providers of least-cost energy services*: from MEDIUM to LOW for Market type 1 to 3 (it doesn't remove pressure on energy companies to increase sales)
M4 Obligations to Perform EE-DSM	MEDIUM to LOW for *Promotion of DSM programs and services* and for *Development of markets for energy efficiency services* (Single programs approach) if the level of obligation is adequate (if obligations are adopted alone) LOW in respect to *Transforming energy companies to providers of least-cost energy services* (doesn't remove pressure on energy companies to increase sales) POTENTIALLY HIGH if implemented in conjunction with mechanisms allowing to fund direct DSM costs (M1 and/or M3) and to recover net lost revenues (M2, M3)
M5 Negotiated Agreements to Perform EE-DSM	LOW TO MEDIUM if adopted alone; LOW if high number of actors in the market, and incomplete coverage of all actors POTENTIALLY HIGH with companion mechanisms (DSM funding, obligation to report on EE-DSM)
M6 Legal and Technical Support to EE-DSM	LOW TO MEDIUM if adopted alone POTENTIALLY HIGH with companion mechanisms (DSM funding, and negotiated agreement or obligation)

C1 Strength in transforming the energy markets towards the inclusion of energy efficiency. These Criteria refer to:

- Magnitude of contribution in implementing the EE-DSM potential,
- Kind of approach (remove disincentives/provide incentives to the implementation of single programs or services; or harmonize energy companies' interests with the societal goal of a control on the global evolution of sales and CO2 emissions;
- Barriers to IRP/EE-DSM addressed by the mechanism;
- Effectiveness in transforming energy companies to providers of least-cost energy services;
- Effectiveness in developing self-sustaining markets for energy efficiency services.

C2 Compatibility with IEM legislation at EU and national level and other rules/constraints. Depending on how the mechanisms are designed (e.g., which actors targeted, which funding mechanism chosen), they all can achieve high compatibility with the restructuring process and with the introduction of retail competition. They also can be made independent from general taxation if this is seen as a problem.

C3 Ease of introduction in the legislative and regulatory framework. Here, all mechanisms except the legal and technical support (which is actually a number of "smaller" policy actions) can face some difficulties, but they should not be insurmountable. For instance, the levy and funds system may need the creation of a new agency, and an extra levy may be seen as a new tax. The ratemaking mechanisms M2 and M3 can only be introduced for the increasingly restricted monopoly segments. Obligations may face strong political opposition. Negotiated agreements may not be feasible where a high number of companies exist in a market. Therefore, "Ease of introduction in the legislative and regulatory framework" is a **key factor** in the choice of the appropriate mechanism for one market.

C4 Ease of integration in Energy Companies' objectives and practice. Training of staff for new functions, and new accounting and reporting procedures are required for any of the mechanism families except for the legal and technical supports, which have the aim to create such results. The effectiveness in reducing economic barriers is of course best for the three funding mechanisms (M1 to M3); therefore, the obligations/negotiated agreements should be coupled with a funding mechanism.

C5 Ease of integration in ESCOs objectives and practice. This set of Criteria refers to the same issues as C4, but for the perspective of independent ESCOs, instead of energy companies. Of course, the legal and technical support (M6) is most helpful for the ESCOs. For the levy and funds system, it depends on whether ESCOs are allowed for implementation of the DSM funded. The tariff mechanisms are likely to stimulate ESCOs, which help the energy companies to implement the DSM activities. Such stimulation of ESCOs will be much less likely, if obligations on, or negotiated agreements with energy companies to perform DSM, are used as stand-alone mechanisms.

C6 Ease of evaluation and ensuring compliance. Apart from some of the legal and technical supports, all mechanisms require a certain amount of control and enforcement, which is best secured through the joint definition of a set of standard energy efficiency and market transformation programs. The obligation and negotiated agreement mechanisms are

more prone to litigation, and more difficult to ensure compliance than the financing mechanisms (M1 to M3).

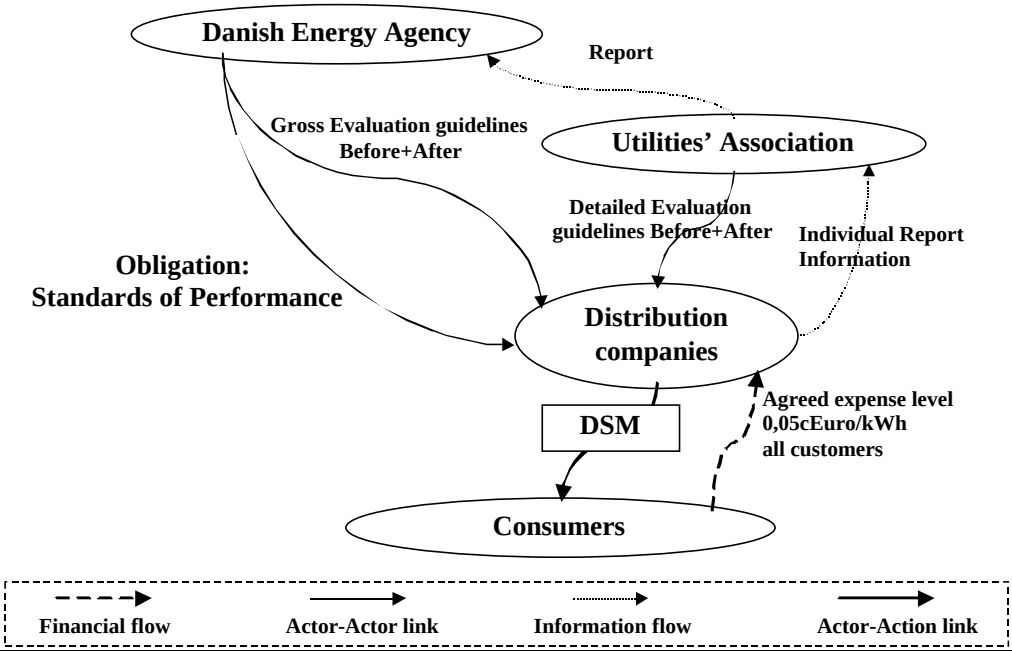
Conclusions: Useful Combinations of Mechanisms for Individual States

As the analysis of the experiences with IRP and DSM in the past (see Lopes et al. 2000) has shown, and the multicriteria analysis has confirmed, DSM has been most effective where a combination of

1. an agreed, quantified target for energy savings,
2. a channel or an allowance for raising funding, and
3. a standardized and mandatory scheme for cost-benefit evaluation of the DSM has been created (e.g., in Denmark--see Box No 1, the Netherlands, or the USA). Sometimes the target is imposed by an obligation (e.g., in the UK or the USA). Furthermore, a policy package with the appropriate and needed legal and technical support mechanisms (from our M6 'family' of mechanisms) is useful in any circumstance.

Box n° 1. DSM policy support in Denmark: a mix of negotiated agreement (before restructuring)/ obligation (after restructuring), an allowance to fund DSM, and a revenue target regulation

The Danish Energy Agency reached an agreement with the energy companies to implement DSM activities identified in IRP (obligatory since 1994). DSM costs are collected through the tariffs by electricity distribution/supply companies on all customers and on average amount to 0,05 cEuro/kWh, corresponding to 1% of the revenues. The administration of the funds, the program design and the measurement and verification of the activities are done by the distribution/supply companies following guidelines from the Danish Energy Agency which controls and evaluates the overall mechanism. With the new energy law, the DSM programs are now an obligation on the unbundled distribution network companies.



The empirical analysis (see Lopes et al.) also showed that it is possible to maintain and develop not only DSM services, but also DSM programs in liberalized electricity and gas markets. As DSM services will at least for the first years concentrate on the larger customers,

there will continue to be a need for DSM programs. Furthermore, there is a need for policy support since also DSM services face a variety of barriers for their development.

In the previous section, a number of mechanisms for the support of DSM and IRP have been analyzed. The applicability and the political feasibility of these mechanisms certainly depends on a variety of national circumstances and framework conditions. Two sets of the above criteria deal with the applicability to restructured energy markets (C2) and the political feasibility (C3), but in reality a closer look to the national situations is needed. The study group has drafted recommendations for each of the 8 participating countries, for which mix of DSM support mechanisms they think adapted to the national situations (Wuppertal Institute et al. 2000).

The applicability of some of the mechanisms depends on the stage of liberalization. As a guiding principle for developing a national policy mix, we display in the following table, which of the mechanisms we think adaptable to which of the three basic market types. The table also displays for which types of energy companies (generation, transmission, distribution, supply or combinations thereof) we think each mechanism is applicable.

Table 2. Applicability of DSM Support Mechanisms to Different Market Structures

Mechanism	Market Type 1: With non-eligible customers Market Type 2: All customers eligible; **no** clear network access Market Type 3: All customers eligible; clear network access
M1 Dedicated funds to finance EE and DSM	Applicable in all Market Types; all energy company types can apply/tender for funds
M2 Ratemaking of monopoly segments to avoid incentives for increased sales	Applicable, where regulation exists, for the distribution prices in all Market Types, and for the supply prices to non-eligible customers in Market Type 1
M3 Ratemaking of monopoly segments to target single EE/DSM programs cost recovery	Applicable in all Market Types, where regulation exists, for the distribution companies or the distribution parts of the companies, and for the suppliers to non-eligible customers in Market Type 1
M4, M5 Obligations or Negotiated Agreements to implement EE-DSM	Applicable in all Market Types, for the distribution companies, and for the suppliers to eligible or non-eligible customers However, depends on number of companies—the fewer, the better
M6 Legal and technical support for DSM services and programs	Applicable in all Market Types; all energy company types can benefit
Obligations or Negotiated Agreements on reporting about IRP plans	Applicable for suppliers to non-eligible customers in Market Type 1, not applicable in Market Types 2 and 3
Obligations on reporting DSM results	Applicable in all Market Types as companion to other mechanisms

The analysis of the individual mechanisms--multicriteria analysis and that of the applicability in defined market types--allowed us to identify the **useful combinations of mechanisms adapted to the market types**. These combinations are presented in Table 3. For each market type, the combinations considered most appropriate for that market type are written in bold letters in the respective column in Table 3.

Table 3. Useful Combinations of DSM Support Mechanisms

Combination of mechanisms	Market type 1	Market type 2	Market type 3
M1 funds/allowance + M2 (for monopoly segments only) + M6 (supports) + obligation to report on DSM results	yes	**yes**	**yes**
M4 (obligation) + M2/M3 (for monopoly segments only) + M6 (supports) + obligation to report on DSM results	**yes**	yes, D[1]	**yes, D[1]**
M5 (agreement) + M2/M3 (for monopoly segments only) + M6 (supports) + obligation to report on DSM results	**yes**	yes, D[1]	yes, D[1]

[1] "yes, D": applicable, but M2/M3 only applicable for distribution network companies; if the obligation is set for supply companies, only an allowance to fund DSM costs is feasible.

Conclusions and Recommendations for EU Policy

In conglomerates of states like the EU, which are trying to create integrated markets for electricity and gas, legislation is usually needed to harmonize the targets and sometimes the methods for achieving them. Likewise, legislation will be needed to harmonize at least the targets for DSM, to ensure that customers in all member states get the benefits of cost-effective DSM, and to avoid problems of cross-subsidization.

For policy action at the EU level, we believe that the best way to support a coherent development of DSM services and programs would be to complete and harmonize the EU Internal Markets for Electricity and Gas by **a Directive on DSM**. This Directive should set a substantial, harmonized quantitative target for DSM **to the Member States**, but leave it up to them by which policy mechanisms for supporting the network-associated Energy Supply Industry (ESI) the Member States wish to achieve this target. In this way, the subsidiarity principle is strengthened, allowing an implementation of DSM services and programs adapted to the national electricity markets and regulatory frameworks.

Based on these considerations, on the comments and conclusions from the national workshops held in the eight participating countries during autumn 1999, and on intensive discussions within the group, we put forward the following **draft proposal for the contents of an EU DSM directive**.

1. The Directive should address **support by the Member States for DSM** activities by electricity and natural gas transmission network, distribution network, and supply companies; and by independent ESCOs.
2. The Directive should have as the main feature:
   a **mandatory, quantified target for each Member State** to ensure a certain level of **DSM programs.** This should be defined as a **harmonized** target for **both**
   (i) a certain minimum level of **energy efficiency improvement**; the minimum level for each Member State which is recommended by the study group, based on international experiences, is an annual saving of 1 %, respectively and separately for electricity and natural gas, of the consumption in that Member State in the year before the Directive comes into force, expressed in TWh to be saved per year per Member State;
   and
   (ii) a certain minimum level of **investment** for DSM programs; the minimum level for each Member State which is recommended by the study group, based on international experiences, is 2 %, respectively and separately for electricity and natural gas, of the total

net revenue in that Member State from sales to final customers, i.e. net of taxes or levies; the sum of the investments should be cost-effective; this DSM program investment must be additional to other energy efficiency activities financed from the state budget.
Furthermore, the DSM Directive should specify that:
The Member States shall dedicate to an appropriate **authority** the task to approve, and to monitor the energy savings and the cost-effectiveness of the DSM programs which are implemented to fulfill a Member State's target. **Standardized methods** shall be used for the assessment of the energy savings and the cost-effectiveness of the DSM programs before and after their implementation. The European Commission shall, in co-operation with the Member States, organize the development of such standardized methods.
In addition to this, the Member States shall support the development of a market for **DSM services**. The Member States may achieve half of the savings target through encouraging DSM services, if they can prove--through the standardized evaluation methods--that these services really achieve the savings. The investment target would then be reduced proportionate to the share of the savings target achieved by DSM services.

3. The Directive should **leave it up to the Member States how** they achieve the quantified target (i.e., using which specific mix of DSM support mechanisms), but give a **non-exclusive list** of some important DSM support mechanisms (e.g., those analyzed here) ;
4. The Directive should include an **obligation for Member States, where** price regulation of the remaining monopoly segments exists, to **align the development of revenues** over time more closely to the development of the relevant cost drivers in the price regulation.
5. The Directive should include an **obligation for Member States** to **report,** on an annual basis, to the European Commission on the amount of energy saved, and the cost-effectiveness of the DSM implemented. The Member States should be obliged to also use the standardized evaluation methods for their reporting to the European Commission.

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The authors thank the participants of the study "IRP in a changing market" for their contributions, and the EU SAVE program for funding.