

# Integrated energy services: the panacea for energy efficiency? - An analogy with the car service market

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## 1. SYNOPSIS

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The paper discusses the energy efficiency potential of energy services to households in France by using an analogy with the car service market.

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## 2. ABSTRACT

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It is said that in a liberalised market electricity utilities will become spontaneous providers of genuine energy services (e.g. lit or heated spaces), and that this transformation will naturally lead to a more efficient use of energy. In this paper, we challenge this view. In fact, the energy-related services proposed by the electricity industry appears more oriented to any value added commercial services that contribute to expand the industry's activities, and increase revenues and profits from energy sales. Among the large set of services proposed, there are services that do increase the efficiency of energy use. However, these services are generally subordinated to global commercial objectives.

This paper focuses on the offer of services to households, and the highly regulated French context is used as a case study. In the literature, when discussing energy services, a recurrent analogy is the business related to repair and refuel of cars, which is considered as a mature energy service market. This analogy is developed in this paper.

The paper analyses six specific groups of services in two markets - house and car related energy services. This analysis focuses on both technical and marketing aspects. The analysis carried out and the analogy made contribute to identify services with an energy efficiency content, and to discuss if the "one-stop shop" model is available and favourable to energy efficiency. Finally the need for support mechanisms that help the consumer identify the development of energy efficiency services is discussed.

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## 3. INTRODUCTION

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The integration of the markets for energy (kWh) and energy consuming equipment (and related services) is considered the panacea by various actors in the energy field who believe that, if the frame work conditions are set in the right way, this integration will lead to a better efficiency in the delivery of genuine energy services (e.g. heated or lit space). There is apparently a convergence of opinions between energy companies and "conceptualists" in the energy efficiency field. For energy companies, energy services are a mean to both expand their business area and consolidate their core business by retaining or gaining customers in a competitive environment. For many researchers and policy makers (e.g. Chesshire, 2000; Thomas, 2000), the present fragmentation (energy supply, building, maintenance, repair, appliances sales etc.) does not make sense, and the mentioned integration would contribute to provide genuine energy services at the least cost. In this paper, we will try to investigate this apparent paradox. It is however worth mentioning that not all authors in the energy efficiency field agree with this integration, e.g. Norgaard and Bradley.

It is well accepted that competition has favoured the development of "energy services" provision, or at least, that energy companies have tried to diversify their offer by adding services to their traditional energy supply activity. Whether these energy-related services contain energy efficiency is subject to serious doubts. For example, in the United Kingdom and Sweden, two countries where the Electricity Supply Industry is the most liberalised, studies carried out give different views. In the UK, Ofgem, the office of regulation of gas and electricity markets, stated that "*There is little evidence that energy suppliers are seeking actively to market energy services to domestic*

customers. Suppliers have reported that energy efficiency is not perceived as a strong marketing point and they see more potential in selling other home services” (Ofgem, 1999). In Sweden, in the period following liberalisation, energy services were used as a "smoke screen" to remove customer focus on price by including energy efficiency services and avoid price competition (Olerup, 1998). However, it appears that the situation has changed, and that "there is a strong evidence that more energy efficiency is delivered through electricity suppliers after the reform” (Bergmash *et al.*, 2000).

In the past, electricity companies have rarely offered a range of genuinely market based energy services not aimed at increasing or consolidating their market share. In some situations, non-cost-effective end-uses have been promoted like electric space heating in rural areas in France (De Gouvello *et al.*, 1997). It can be stated that the energy services market is still in its infancy. Energy *efficiency* services have been even more rare and their content of energy efficiency is not always proved. The sole understanding of the meaning of "energy services" is often subject to confusion, as well as "energy *efficiency* (or *savings*) services" which are only a small part of energy services.

However, we fear that the term "energy services" corresponds to a very different understanding depending on these two groups, i.e. the energy (service) companies on the one hand and energy efficiency analysts on the other. Thus, before proceeding, we will attempt to give some definitions to facilitate the understanding, although we do not pretend to produce "standard" definitions. The number of articles addressing the theme "energy services" in the professional press is impressive. However, specific services targeted at households are very seldom discussed, and a general discourse is often preferred rather than an analysis by "type of service". In this paper, we analyse specific groups of services to conclude on the evolution of these services and their possible energy efficiency content.

### How much efficiency in energy services? Some definitions

The common understanding of "energy services" by energy (service) companies, is any service that can fulfil - or create new - customer needs, and that can help to increase profits, revenues, and/or retain or gain customers. Most of these services are energy related (audits, advice, maintenance, etc.), while other services use the capacities (facilities, information about consumers, communication channels) that these companies have to sell additional services that are not related to energy. It is the purpose of the paper to identify services with an energy efficiency component.

We will refer to "**genuine energy services**" as the physical amenity provided by energy-using equipment, for example cooking, illumination, thermal comfort, food refrigeration, transportation or product manufacturing (Swisher, Jannuzzi and Redlinger, 1997). The provision of genuine energy services usually requires a combination of energy-using equipment, energy, and energy-related services.

Energy services provided to large consumers (notably industrial consumers) by **Energy Service Companies** (ESCO), are often defined as including identifying, developing, designing, installing, financing, maintaining, and monitoring energy projects (NAESCO, 1997; Bullock and Caraghiaur, 2001). The difference between engineering or installation firms, and ESCOs, is that the latter engages in a performance contract and thus assumes the risk for the results. When the performance is the level of energy savings, or the remuneration is proportional to energy savings, then the term **Energy Savings Performance Contracting** is used. This service is the one where the efficiency content can perhaps be the most obvious. However, this service is unlikely to develop in the household sector.

**Energy efficiency services** (e.g., audits directly paid by the customer, third party financing, renting of energy-efficient equipment...) are taken by energy companies and ESCOs targeted to energy end-users or market agents (e.g. manufacturer or retailer of energy-consuming products which increase end-use energy efficiency (Thomas *et al.*, 2000).

### The household sector: implications for energy services

The possibilities for the provision of energy efficiency services to households are very different from those of large consumers due to a number of reasons:

- The transaction costs involved are considered too high when compared to the energy bill;
- The energy bill is composed of usually two or three energy types and consumption per end-use is usually not metered separately;

- The end-uses that represent the most important part depend heavily on behaviour and the end-user might lose the motivation to be "energy conscious". This constitutes a barrier to energy performance contracting and facilities management (a guaranteed temperature in the whole house or building will remove the incentive to end-users to switch off the heating in unoccupied rooms). Therefore, it is very important to separate the performance and operational factors so that correct incentives and reward schemes can be formulated;
- The energy supply to households is still highly regulated for electricity and gas in France, which imposes legal barriers to service provision. These barriers are expected to disappear with the introduction of "real" competition.

This situation is particularly valid for "active energy services", defined as "*such as consumer- and household-specific energy advice and audits; building insulation; more efficient appliances, metering and control technologies; and, if necessary, the financial packages to fund these for small domestic and commercial sector consumers*" (Chesshire *et al.*, 2000). This type of services is the one with the highest energy efficiency potential but, due to the reasons above mentioned, it is not attractive for energy companies and ESCOs that search value added services. However two exceptions exist for the following situations where the energy-related services could be attractive for providers:

- The services to the "global household", including the car repair and maintenance market;
- The services to a co-operative housing or any systems that serve an apartment building such as a collective heating system.

The first possibility is already being addressed in the United Kingdom by Centrica (a company resulting from the de-merger of British Gas) as stated by Roger Wood "from services to the house to service to the household", including car repair and maintenance (The economist, 2000). Further, this bundling is a step towards the so-called "one-stop shop". It also shows the similarities and justifies somehow the interest of comparing the two markets - "in-house" energy services and car services. The second possibility exists in France and is considered as one of the first and most valuable experience in energy performance contracting as stated by Hansen and Weisman (1998) "most agree that the first major impetus came from France" and is detailed further in this paper.

Energy-related services will only appear in the building sector if they provide a value added (both to the provider as well as the recipient) or if they help to retain the customers. It is therefore necessary to analyse the costs of purchasing, maintaining and operating a car or building systems and appliances studied in this paper. An estimation of the breakdown by component is presented in table 1.

**Table 1. Typical annualised costs for purchase, energy and services for private cars and houses**

		Car	Appliances	Heating
Purchase	Euro/y	1060	490	300
Fuel, water or detergent	Euro/y	1090	480	630
Maintenance	Euro/y	680	50	100
Insurance and others	Euro/y	500	0	30
Annual total cost	Euro/y	3330	1020	1060

Based on INSEE - "Consommation des ménages - 1998", 2000

### Services studied in the paper

This paper focuses on energy related services provided to houses, including domestic appliances, heating and cooling. Similarly the car related services used in the analogy refer to private cars. The investigation was carried out for energy-related services offered in France. To better understand its unique characteristics, the market for services in France is analysed in detail. However, despite some specific characteristics (strong monopolies and inertia to competition, principle of speciality), we believe that the findings of this analysis is applicable to different contexts.

### From commodity suppliers to "one-stop shop" energy service suppliers: the panacea for energy efficiency?

It seems that there is no doubt that value added services are an inevitable component and consequence/condition of liberalisation. However, "active energy services" do not seem to appear, and energy efficiency active services even less, as stated by Chesshire *et al.* (2000) "With occasional exceptions, electricity suppliers have rarely offered a range of genuinely market based energy services to smaller consumers that have not - directly or

indirectly - defended or expanded electricity's market share". This also derives from an urgent need that electricity suppliers are facing with electricity sales augmenting at a rate that is not sufficient to compensate the decrease in prices, thus reducing the revenues and especially the profits. Selling pure kWhs is becoming a hard way to live from and, as a consequence, energy companies feel an urgent need for other solutions. However, if these solutions - possibly value added services - can avoid reducing revenues and profits from kWh sales, they will certainly be a better means to reach the objectives of creating value for the shareholders that most electricity companies seek. Nevertheless, situations could appear in the future where energy efficiency services are directly interesting for the energy company, for example when supply is not sufficient to satisfy the demand, or when the company has to fulfil environmental compliance like GHG reduction.

The concept of the "one-stop-shop" is often encountered in the literature as the panacea for increasing the efficiency - both economic and energetic - of delivering genuine energy services. This concept can be found for example in a vast study for Eurelectric (Union of the European electricity industry) performed by diverse applied research and consultants that state "Market and policy attention should encourage emergence of a 'one-stop shop' capability for provision of energy services to small customers. It would be pointless to stimulate interest in, and market demand for, energy services without ensuring high quality, multi-skilled, 'hassle free' provision to supply it. This is especially the case if energy suppliers do not evolve as major actors in this market; or else engage in collaborative arrangements to outsource these crucial functions." (Chesshire *et al.*, 2000).

Researchers in the energy efficiency field also defend this opinion: "the Energy Service Utility is the "ideal" supplier of genuine energy services at least cost in the future, i.e. a company which offers to the customers optimised (i.e. well adapted, least-cost and with minimum environmental damage) packages of energy efficiency technologies and services plus the reduced end-use energy needed to fulfil the demand for (genuine) energy services. On the other hand, in a liberalised market, it is possible for privately owned ESCOs to include the provision of energy into their offer, and become ESUs this way" (Thomas *et al.*, 2000). Also the director of ACE<sup>1</sup>, Andrew Warren, states that "there is a need for a gradual, but inexorable, shift in the energy structure of industrial societies involving a "new alliance" of skills and competencies (e.g. including those in the utilities and in the building and appliances/equipment supply industries)" and that "EuroACE is a response to the recognition of the fragmented company structure and skills base" (Warren, Personal Communication, 2000).

Some issues that arise from these rather convergent opinions are transparency and competition. Regarding transparency, one can ask if the consumer is able to compare offers from service suppliers. An analogy has been mentioned by Bradley "with the huge 'brand building' budgets of the downstream oil companies (free coffee mugs, Air miles, etc) and the absence of any real commitment to energy efficiency" (Bradley, personal communication, 2000). Regarding competition issues, several questions arise. For example how to ensure that these integrated service suppliers will not favour some technologies (resulting from links with an equipment manufacturer for example), or a specific energy type (especially if the service company evolved from a commodity company). Another competition issue is the preservation of highly qualified professions (e.g. HVAC engineers and designers) that can face unfair competition by evolving energy companies with no expertise in the field.

The integration of the energy services provision in the retail energy function seems to come "against the stream". In fact, the electricity and gas industries have been experiencing a restructuring process that involves the unbundling of the production, transmission, distribution, retail and some new and separated functions are appearing. The French situation is particularly interesting to analyse since a paying "one-stop-shop" is simply not authorised as far as non-eligible customers are concerned for gas and electricity companies. Furthermore, the reasons for these legal limitations are related with the issues mentioned above. However, a strong competition between gas and electricity suppliers exists and has originated a large number of non-paying services, with a real energy efficiency content in the use of the energy form supplied.

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#### 4. METHODOLOGY: THE CAR SERVICE ANALOGY

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In order to analyse the potential benefits of bundling offers, we believe that it is necessary to analyse existing services being proposed, which bundled offers have appeared, and which could emerge in the future. It is also necessary to analyse who are the best actors to deliver the services, e.g. in terms of expertise and possibility for disincentives to energy efficiency.

The similarity of the two markets (automobile and appliances) has been stressed by many authors (Bradley, Chesshire etc.). According to Bradley, energy efficiency services play no part in petrol retailers, even if these compete for brand recognition and green image. Considering that petrol is a mature market, why to expect that this could happen differently in the electricity supply industry? (Bradley, personal communication, 2000). While energy efficiency services provision by electricity and gas companies is quite a recent trend, and that significant differences exist between the two markets (the characteristics of installed appliances, the occupancy schedules in buildings that originate a great potential for energy management not found in cars etc.) we believe that there is something to learn from a mature market like the one of the car services. Thus, the following methodology was adopted:

- Step 1. To establish a list of services for private cars, and an analogous list for houses;
- Step 2. To analyse the services according to a set of features divided in two groups: technical (who is well equipped technically to propose this service?) and marketing (who is likely to market it in good conditions?);
- Step 3. To conclude on the advantages of bundling two or more services in the lists and on the potential evolution;
- Step 4. To answer the ultimate question: is there a potential for energy efficiency related with new services and especially with the bundling of services?

The investigation was based on a set of interviews to entities and professionals involved in the energy service market, consumer associations, building co-operatives, anti-trust state administration, consultants etc. Part of these interviews was carried out in the framework of the Eurelectric-SAVE project (Cauret *et al.*, Chesshire *et al.*) and as a preparatory work for the new Task 10 on Performance Contracting of the International Energy Agency - Implementing Agreement on Demand-Side Management. The services offered by energy companies were also analysed as well as the traditional technical and marketing literature. This paper presents only the main findings of the analysis carried out.

## 5. ENERGY-RELATED SERVICES FOR PRIVATE CARS AND HOUSES SELECTED FOR ANALYSIS

The first step consisted in establishing a list of services for private cars, and an analogous list for houses. These lists are presented in table 2.

**Table 2. Definition of selected services and domain of potential analogy**

<b>Energy-related services for private cars</b>	<b>Energy-related services for houses</b>
<b>C1. Energy purchase (petrol refuel)</b> Takes place in a service station <sup>2</sup> . Other services include convenience shop with spare parts for the vehicle, car washing, etc.	<b>H1. Energy delivery to the house</b> Fuel oil (delivered by truck), and electricity and gas (grid based). Meter reading is increasingly automatic, or accomplished manually but with poorly trained staff.
<b>C2. Full maintenance and repairs</b> Complete audit and important parts replacement (shocks, brakes, clutch, distribution chain, etc.)	<b>H2. Full maintenance and repair of boilers</b> Significant maintenance contracts of collective heating system are supplied by "exploitants de chauffage" and defined by law (called "P3")..
<b>C3. Simple maintenance and scheduled parts replacement.</b> Replacement of small parts and consumables (oil, filters, tyres, sparks and escape replacement, air-conditioning system tune up, etc.)	<b>H3. Simple maintenance and tuning.</b> Simple maintenance lumped contracts for collective heating systems by "exploitants de chauffage", defined by law (called "P2"). These include tuning of boilers, radiators, pumps; small consumables replacement; safety check.
<b>C4. Advice associated with car sales</b> Advice on fuel consumption, safety rating, O&M cost, rational driving, etc.	<b>H4. Sale and installation of new heating equipment.</b> Advice on fuel consumption, comparison with existing energy efficiency standards, user instructions, training, safety measures, guarantees and maintenance, etc.
<b>C5. Technical audits and technical inspection</b> Technical audits for insurance, emissions compliance, compulsory technical inspection, etc.	<b>H5. Energy audits and personalised advice</b> Energy audits to houses provided by electricity companies by various ways (phone, visit, internet), to meet incentives provided by energy companies for being energy efficient.
<b>C6. Financial services</b> Credit cards, credits for car purchase, insurance, etc.	<b>H6. Financial services</b> Credit for new equipment purchase, life-cycle cost analysis/payback on investment, leasing, discounts in new equipment.

The second step started with the definition of topics to be used to characterise the services selected in step 1. These topics are divided in two groups: technical (addressing the issue of who is better equipped technically to deliver the service) and marketing (addressing the issue of who could market the service in good conditions) and are listed below:

**Technical features showing: who is well equipped technically to offer the service? In which conditions?**

1. Is the delivery of various services in a single stop or visit feasible?
2. Is continuity of technical work essential to performance?
3. Is there a gap between various levels of quality of service?
4. Does specialisation (due to economies of scale, automation staff expertise) benefits service provision?
5. Is there a good knowledge by consumer of costs, quality and risks associated with the service?

**Marketing features and customer expectations showing: who is likely to market the service? In which conditions?**

1. Is branding possible (use of brand for other products than the initial one)?
2. What are the possibilities of consumer loyalty with this service? Can energy efficiency bring benefits?
3. Is differentiation of product by customer among competitors possible?
4. Is the customer interested in bundling the service with others vs having them offered by various actors?
5. Is the consumer able to make a rational choice?
6. Are there some natural monopoly segments allowing funding of additional services? Is there an interaction with a regulatory power?

The analysis carried out allowed to determine the "connectivity" between groups of services in terms of the providers that can deliver them. The following figures illustrate the relationship between the provision of groups of services. Each circle represents a group of services, and an intersection between two circles signifies that they can be packaged and delivered by the same provider. The analysis of such intersections is essential to analyse potential benefits resulting from integrating services in a single package.

**Figure 1. Relations between groups of services and providers - Cars**

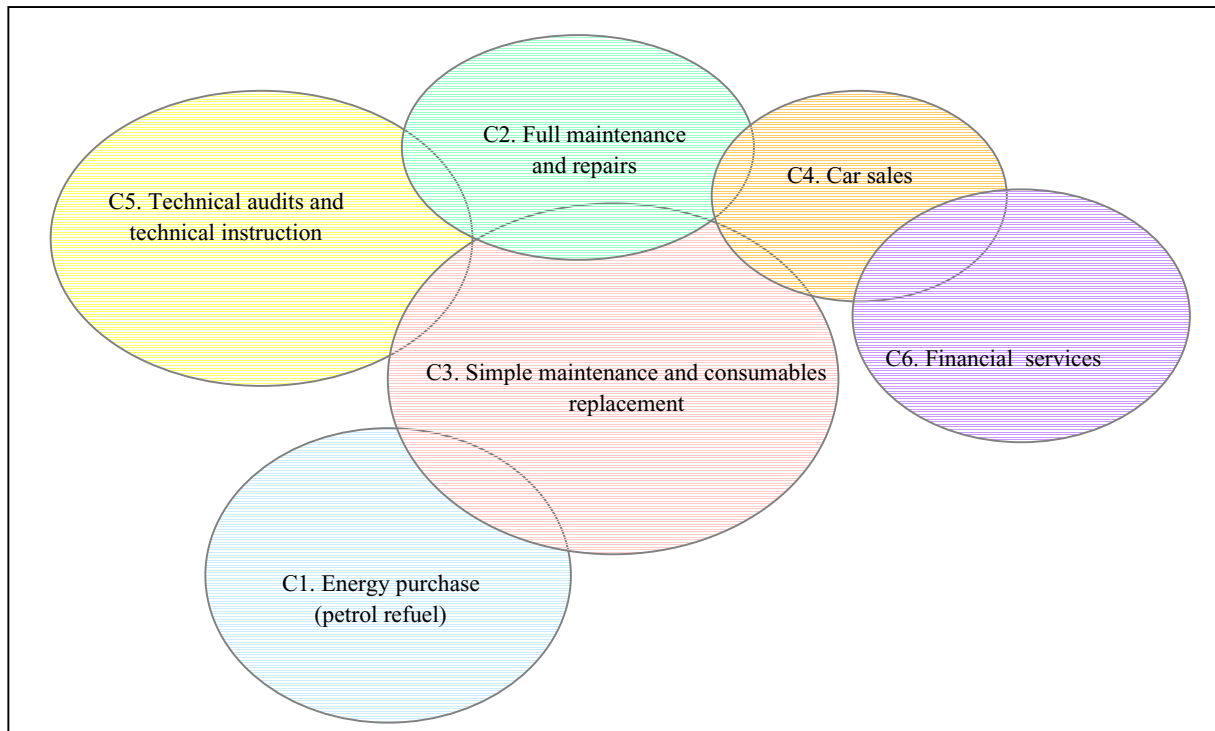
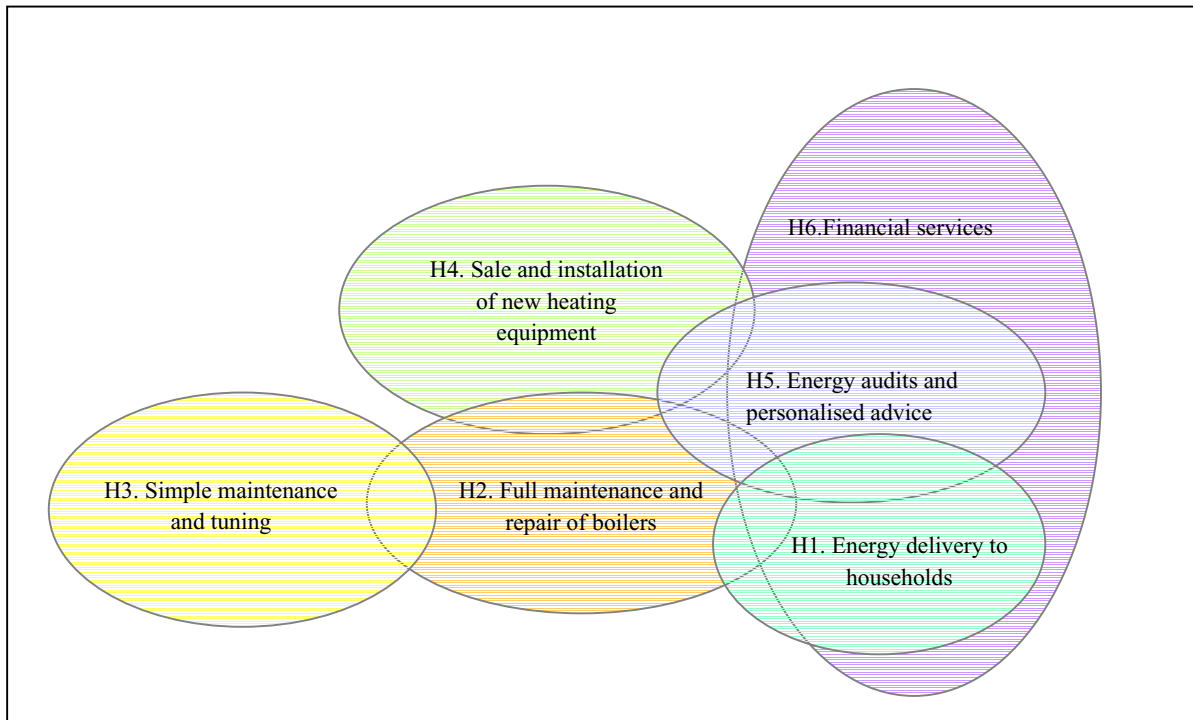


Figure 2. Relations between groups of services and providers - Houses



## 6. MAIN FINDINGS OF THE DETAILED ANALYSIS

This chapter presents the main findings of the analysis carried out in step 2 (characterisation of the groups of services), step 3 (advantages of bundling two or more groups of services) and step 4 (the energy efficiency content resulting from bundling services). These results are summarised in table 3 to 8.

**Table 3. Main findings for energy purchase (petrol refuel) and energy delivery to houses**

<b>C1. Energy purchase (petrol refuel)</b>	<b>H1. Energy delivery to houses</b>
<b>Summary and main findings</b>	
<p>Pure commodity market. Only quick additional services can be delivered. Commodity price is determinant. Continuity does not contribute to improve the overall efficiency of the service.</p> <p>New staff would be needed to create associated energy services. Diverse non energy related services are proposed to attract customers to the station. Conversely, fuel prices are also used to attract people to supermarkets, which have won a significant part of the fuel market in France.</p> <p>Only a very small differentiation on the product is possible. The consumer's concern is only the price and proximity in case of empty fuel-tank. Consumer is anonymous, i.e. the supplier does not get information about the consumer.</p>	<p>Loyalty can be greater than in the car service market due to the grid connection (electricity and gas). Fuel-oil suppliers are not subjected to "speciality principles" but have failed in getting the maintenance market. Even if price is determinant, loyalty may be built. Continuity does have interest for load management and equipment maintenance.</p> <p>Differentiation of the energy itself is only possible through reliability ("number of 9's") and origin of electricity (e.g. "green").</p> <p>The consumer has sometimes good information about prices but packaged offers cause confusion (Olerup, 1999). Grid based energy suppliers have a fair knowledge of the customer.</p>
<b>Energy Efficiency related with this group of services and/or with the bundling of services</b>	
<p>None. There is no evidence that the better grades of petrol claimed (especially in the past in Europe) improves efficiency or reduce pollution.</p>	<p>None in the supply activity. Concerning electricity supply, the relation created can be used for load management and advice on energy efficiency. Associated services can be delivered commercially or, if required, as public service obligations.</p>

**Table 4. Full maintenance and repair cars vs. of boilers**

<b>C2. Full maintenance and repair of cars</b>	<b>H2. Full maintenance and repair of boilers</b>
<b>Summary and main findings</b>	
<p>Due to the technical interest of a continuous service delivery, loyalty is feasible and two strategies exist: repair by brand concessionaires and usual garage. This last strategy might decrease in importance due to the increasing need for electronic and computerised diagnostic/testing auditing equipment specific to products from single manufacturer. As a consequence, car manufacturers are re-capturing the market for maintenance services. Consumer knowledge is low.</p>	<p>Proximity is essential to deliver the service. Audit is included in the contract.</p> <p>Service suppliers are certified by utilities (EDF, GDF, Total) which also gives them the possibility to be differentiated from competitors (examples are the programmes Valiance, PGN comfort, PGP, Qualibat and Chaleur Fioul).</p> <p>Consumer knowledge about the service is very low.</p> <p>Indirect capture of installers by utilities due to regulatory constraints that prevent them from delivering the service but these constraints should disappear as liberalisation progresses.</p>
<b>Energy Efficiency related with this group of services and/or with the bundling of services</b>	
<p>High content, especially in the tuning of the engine. Important changes occurred with the end of carburettors engines. More standardised and automated tuning equipment due to compulsory pollution audit. Compulsory technical inspections include emissions control and therefore contribute to energy efficiency.</p>	<p>Potentially high energy efficiency content. However, certification of audit and maintenance providers is, in France, accomplished by energy companies, when it should be the responsibility of public authorities. Performance monitoring and verification can be provided by 3<sup>rd</sup> party verifiers but the process is costly, complex, and not standardised. Boiler efficiency is being pushed by European Union regulation ("SAVE Directive")..</p>



Table 5. Simple car maintenance and scheduled part replacement and Simple maintenance and tuning of boilers

<b>C3. Simple maintenance and parts replacement</b>	<b>H3. Simple maintenance and tuning of boilers</b>
<b>Summary and main findings</b>	
Fierce competition for standardised equipment. Oil companies are very interested in this market and car manufacturers try to avoid standardisation in order to secure the market. Fixed-price-contracts exist.	These services remain under control of installers, with an umbrella of utilities. Installers try to sell large and expensive repair since these can originate higher profits, taking advantage from the low consumer knowledge. Likelihood of strong entrance of utilities when legal barriers are removed. Potential conflict of interest area as simple measures that will enhance the energy efficiency of equipment may not be pursued if it is not cost-effective.
<b>Energy Efficiency related with this group of services and/or with the bundling of services</b>	
Very little.	Tuning brings benefits particularly in old non electronic fuel burners. Possibility of associated advice or audit.

Table 6. Advice associated with car sales and sale and installation of new heating equipment

<b>C4. Advice associated with car sales</b>	<b>H4. Sale and installation of new heating equipment</b>
<b>Summary and main findings</b>	
There are only comparable products. European Commission is launching an initiative to remove "concessions". This will enhance the efforts to retain car repair market by claiming a better expertise than the independent garages and previously fixed service prices.	Bundling the purchase of a system or an appliance with other services (e.g. advice, maintenance, finance) is beneficial. Installers affiliated with energy companies provide efficient choices within the same energy source, which might not be the best choice. Consumer has insufficient knowledge especially on the investment / operating cost trade off and decisions on energy source.
<b>Energy Efficiency related with this group of services and/or with the bundling of services</b>	
None. Potentially some benchmarking on fuel consumption could be introduced and EU Directive requiring an energy/CO2 labelling for cars.	Traditionally, French energy companies involved in the equipment/systems decisions have proposed efficient solutions, but limited to those using the energy source they supply. Standards, labelling and certification are necessary to ensure an energy efficiency content in this group of services.

Table 7. Technical audits and technical inspection (cars) and energy audits and personalised advice (houses)

<b>C5. Technical audits and technical inspection (cars)</b>	<b>H5. Energy audits and personalised advice (houses)</b>
<b>Summary and main findings</b>	
Audits are often offered to detect repair needs or as part of preventive maintenance schedule checks. Consumers appreciate independent auditing. European Union audit and insurance audits are regulated.	Services offered by energy companies are mainly aimed at increasing loyalty, imposing solutions using their energy source and inducing "new needs". Electricity companies are in a very good position to deliver the service but conflicts of interest exist. Customer has little knowledge.
<b>Energy Efficiency related with this group of services and/or with the bundling of services</b>	
Some energy efficiency is connected with gas emissions control in compulsory technical inspection.	High potential of energy efficiency content but conflicts of interest prevent adequate global energy efficient solutions.

Table 8. Financial services

<b>C6. Financial services - cars</b>	<b>H6. Financial services - houses</b>
<b>Summary and main findings</b>	
Financial services have no impact on technical and energy efficiency issues.	The development of energy savings performance contracting and third party financing would help the implementation of energy efficient solutions. These solutions are only possible for central systems in collective housing due to the high transaction costs associated with using these solutions in houses. Also, the consumer has to be knowledgeable and demanding to get the full benefits.
<b>Energy Efficiency related with this group of services and/or with the bundling of services</b>	
None.	Only for ESPC and TPF for collective housing.

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## 7. ANALYSIS OF ENERGY-RELATED SERVICES TO HOUSEHOLDS IN THE ELECTRICITY SECTOR IN FRANCE

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Besides the empirical characterisation of existing energy-related services, the factors that have influenced the shape of the offer of services is particularly important. France is a particularly interesting case due to its peculiar legal and regulatory barriers to energy-related service delivery by grid based energy suppliers. This situation leads to original services and to a stronger co-operation with networks of actors. In this chapter the energy-related services in the electricity sector are analysed (Adnot *et al.*, 2000). This analysis needs a rapid description of two dominant particularities of the French electricity system: the principle of *spécialité* and the high development of electric space heating (Cauret *et al.*, 2000).

### **First unique characteristic: the principle of spécialité**

Since the Law adopted on 1946, the French power system must respect a series of principles which defines the notion of public service in France. That is the case for the principle of *spécialité* which implies that EDF is not authorised to intervene beyond the meter or to develop activities which are not directly relevant to its power activities. It must maintain its development in a limited number of activities defined by the State. As a result, for small customers, the French electricity system is partly settled on two components : in one side, EDF as the (quasi-) unique distributing utility ; on the other side, 35000 atomised companies for installing and repairing electrical equipment.

Mainly since 1988, EDF has wanted to use its knowledge and abilities in derived fields such as engineering, HVAC designing and other energy service, and thus questioned the principle of *spécialité*. Finally in 1995, the National Council of Competition and the National State Council finally did not allow EDF to develop these requested activities for small customers, under the argument that a so large company could develop unfair competition in these markets against smaller private companies and craftsmen. This interdiction has been confirmed regarding non eligible consumers by the new Law on the "public service of electricity".

### **Second unique characteristic: the importance of the thermal uses of electricity**

The very large penetration of electrical space heating (ESH) and electrical water heating in France must be pointed out. The ESH development has been highly supported by EDF mainly for managing the large generation overcapacity existing since the eighties because of a too large nuclear programme. ESH represented in 1995 39.7 % (44 TWh) of the total residential consumption of electricity. ESH remains today the main objective for EDF concerning the domestic customers. But the competition is high, notably between electrical heating (pushed by EDF) and gas systems (pushed by GDF). Such a strategic objective is regularly announced by EDF's officials (EDF, 1998): "*electric space heating generates a turnover (28 GFF, 4,2 GEuro) equal to that of eligible customers. [...] The recovery by quality must be intensified. Let us focus on space heating.*"

### **Consequences on EDF's service supply**

If the utility has been for a long time a "technician company", the end of the large investment programmes and the saturation of the domestic electricity market made it turn to a customer-orientated policy in the eighties. As a consequence, in the early 80's, EDF adopted a new strategy based on the notion of service to customer. For the small customers, this new strategy was at the beginning mainly targeted at improving the quality of the electricity supplied. EDF has usually been able to propose special deals for the largest customers. The utility has also increased the variety of its tariffs. Different switch-off options during peak-load hours enable it to propose lower rates in exchange. In the nineties, many improvements addressed the quality of the passive service supply to small customers (information, historic consumption etc). They improved both the technical quality of supplied electricity and the relationships between the small customers and the utility<sup>3</sup>.

All these service improvements to small customers just concern 'administrative issues' for reinforcing the good image of the utility. The strategic priority given to electrical heating also imposed to reinforce the commercial support for it, in respect of the limitations imposed by the principle of *spécialité*. EDF is just authorised to supply free advice for tariff optimisation and for end-use equipment like the following programmes (called "services"):

**Promotélec** : *Promotélec* is a label for promoting an "electrical comfort" "sure and of high quality" based on efficient electrical equipment. Too labels exist: 1) *Promotélec Confort Electrique* for new housings, certifying that the labelled housing has a reinforced thermal insulation, a controlled ventilation, an efficient electrical heating equipment, a room-per-room regulation and a programming system; 2) *Promotélec Confort Sécurité* for existing housing, certifying that the electrical heating equipment is well sized and well installed for comfort and energy savings.

**Vivrélec** : *Vivrélec*, certified by the *Label Promotélec Confort Electrique*. EDF and some professional associations in the building and the electricity sectors joined their efforts to propose to families living in a new housing (renter or owner) a global solution for electrical space heating. This service is composed of: 1) an adapted ventilation system and a high level of insulation; 2) the supply of new efficient electrical heating, i.e. equipment convectors called *Elexence*, reversible systems, radiating floor / ceiling, etc; 3) an advanced temperature regulation; 4) advice for efficient use of electricity. Separate meters for heating and other uses are offered.

**Conseil Juste Prix**: it ensures that the customer has the most adequate tariff option.

**Conseil Confort Electrique** : This advising service goes further than the *Conseil Juste Prix*. It is proposed jointly by EDF and by installers and targets households that are already equipped with electrical heating. It is supposed to improve the comfort and the energy management. An EDF employee or an installer certified by EDF visits the customer and gives advice on the use of the electrical space heating, tariff options, possible reinforcement of insulation, etc. One year after this visit, a 'birthday visit' is planned to be offered.

**Service Co-marketing** and **Bilan Rénovation Electrique**. usually, the final decision for the energy choice for domestic space heating is not taken by the customer himself, but by professional installers, as confirmed by a survey published by Le Moniteur, 2000. EDF (like GDF) can influence directly and actively the market of new housings for the choice of space heating via agreements with builders and installers. But in the existing housings, this leading role belongs firstly to installers themselves. The main reason is that this market is very local, and partly escapes from the national networks. EDF tries to improve its involvement in the existing housings where its market shares are not so high than those existed in new housings. The main reason is that the global thermal quality of existing (old) houses is not so good and then, the electrical space heating is less competitive. As a consequence, EDF has implemented partnership and training with some professional commercial networks of electrical installers like *Bien Etre* and *Alliance Electrique*. With the service *Co-marketing*, EDF gives to affiliated installers information on sociological particularities of inhabitants into the area concerned by their activities. Professionals can also propose since 1998 the *Bilan Rénovation Electrique* to small customers, a service co-ordinated by EDF and proposed by any installer to owners wanting to improve and renovate their existing electrical equipment. The installer recommended by EDF verifies the abilities of electrical equipment notably thermal ones and proposes improvements, including energy efficiency. These services are not free and are paid by the customer to the installer.

Table 9. Services and programmes provided by EDF to households - Analogy with the services analysed

Services for heating to households	Example : present EDF's service supply to small customers
H1. Energy delivery to households	Improvements of 'administrative' relationships with small customers (24h/24 7d/7 services ; phone number, etc) <b>Conseil juste prix</b> , advice for adapting tariffs to equipment <b>Maintien de l'énergie</b> , 1 kW supplied continuously to low-income families in extreme situation
H2. Full maintenance and repair of boilers	None. Principle of "specialité" does not authorise this service.
H3. Simple maintenance and tuning.	None. Principle of "specialité" does not authorise this service.
H4. Sale and installation of new heating equipment.	No direct service for installation but advice including: <b>Promotélec Confort Electrique</b> , label for new highly-insulated housing equipped with best electrical space heating. <b>Vivrélec</b> for advising the best global elect. heating system (including a special meter) in new housings highly-insulated. <b>Promotélec Confort Sécurité</b> , label for existing housing equipped with well-sized and well installed elect. Heating <b>Service Co-marketing</b> , information by EDF to affiliated installers on local particularities concerning the heating market.
H5. Energy audits and personalised advice	<b>Conseil Confort Electrique</b> , advice on use and on existing heating equipment when a family moves. <b>Bilan Rénovation Electrique</b> , advice proposed by affiliated installers and co-ordinated by EDF for improving an existing electrical heating system (paid service to installer).
H6. Financial services	None. Principle of "specialité" does not authorise this service.

The list of EDF's services and programmes presented may not be exhaustive, but it reveals the priority given to electrical heating. In respect of the principle of *spécialité*, they try to make electrical heating competitive compared to other fuel-based heating systems by reducing the electricity bill (better equipment, better housing insulation, etc). It is a good example of the capture of the services to serve the core objective: selling the commodity in good conditions for both parts. With full retail competition, the principle of "spécialité" would disappear but the objectives should remain unchanged. It is worth to mention the case of a local power & gas distributor Gaz & Electricité de Grenoble (GEG), that without any competition for small customers, does not implement any strategy that favours one particular energy for space heating.

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## 8. CONCLUSIONS

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The paper attempted to investigate if bundling the offer of energy services, which may ultimately reach a "one-stop-shop" delivering genuine energy services, was favourable to energy efficiency. The household sector was chosen for investigation in the particular French context. Since there is no strong evidence yet about how the market for energy and energy-related services to households is developing towards the so called "one-stop shop", the analogy with the car refuel and repair services was chosen as an example of a mature market. A list of six groups of services were defined and investigated in the car service market, and in the heating and appliances services in houses.

Not surprisingly, the market for active energy-related services, notably energy efficiency services, to households is not attractive by itself to suppliers (energy companies or energy service companies) due to the small size of households and the consequent high transaction costs. However, energy service packages are attractive to providers for central systems in collective housing, as the large tradition of the "exploitants de chauffage" in France proves.

Concerning the transformation of utilities from commodity suppliers to suppliers of genuine energy services, only a limited trend to bundle various energy service, in packaged offers was observed. Conversely, non-energy related services are proliferating. This situation also occurs in the car service market, where the packaged offer of energy related services is also limited, while other disparate services appear. However, some experiences of packaged offers exist e.g. in the United Kingdom, where a packaged offer includes services for the car and for

the household systems and appliances. In France, one reason for the low development of energy-related services by energy companies in the household sector is simply because grid energy suppliers have not been allowed to do so. The constraints that energy suppliers are facing will most likely be removed with the introduction of retail competition in the electricity and gas sector. Energy suppliers (except the few local energy distributors) are anticipating these changes and will obviously try to gain the market for services and stimulate more use of the energy they supply.

Concerning the real content of energy efficiency resulting from bundling the offer of services and eventually of a “one-stop shop”, it can be expected that improvements will not happen naturally. Conflicts of interest between energy suppliers and energy savings will continue in the new market "full of services", and efforts to improve efficiency will only be made to retain or gain new end-uses (of their core energy source) and customers. Also, the preservation of highly qualified professions (e.g. HVAC engineers and designers) might face unfair competition by evolving energy companies with no expertise in the field, with negative effects in energy efficiency. Thus, it can be concluded that if this trend for packaging offers of services is to contribute to increase energy efficiency, strong support mechanisms have to be adopted. These include: certification programmes for companies providing energy efficiency services; compulsory energy audits; promotion of Energy Performance Contracting by establishing standardised tendering procedures; adaptation of procurement rules in order to remove the barriers that public agencies in most countries face to buy energy efficiency services (e.g. authorisation to retain part of the achieved economic savings within their budget); development of standardised monitoring and evaluation procedures; harmonised definitions allowing tax reduction on energy-efficient equipment and services.

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## 11. END NOTES

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<sup>1</sup> Association for Energy Conservation - UK, an association of energy conservation industries. A new European Association called EuroACE has been created.

<sup>2</sup> Note that the term "petrol station" or "gas station" is more often used than service station. However, the "service" part is "increasing", mainly with services completely independent from the energy area. These stations, after serving as convenience shops, are now being used as product delivery point for catalogue selling companies (3 Suisses, La Redoute), internet commerce and in collaboration with express mail companies.

<sup>3</sup> Concerning the administrative relationships between the small customers and the utility, let us remember that EDF (electricity) and GDF (natural gas) which are two different utilities, share their offices in contact with customers.