



INNOVATION REPORT

Services-oriented platform provides new approach to residential energy sector



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Today, the European Utility sector faces a dramatic challenge: how to reconcile the three major constraints of deregulation, increasing demand for energy and preservation of natural resources? SHOPS aimed at providing part of the answer by delivering a services-oriented platform dedicated to the residential energy consumer segment and enabling utilities to offer differentiated energy services whilst improving overall efficiency in energy use.

A new paradigm in the utility world

Many changes are questioning the current Utility business model:

- Generation capacities and grids have become obsolete and huge investment is needed \$16 trillion worldwide;
- Demand is booming and, because of the lack of electricity generation capacity, peak prices are becoming very high and volatile;
- As natural resources – oil and gas – are declining in the consumption regions such as Europe and North America, energy sourcing is becoming crucial;
- Deregulation of both production and supply of gas and electricity – while transmission and distribution remain regulated – implies the need to build new business models;
- Technological breakthroughs are being made; and, most importantly,
- Political and environmental issues – such as the Kyoto protocol implementation – are new constraints to be integrated in today's Utility business models.

The Change Agent – Market Deregulation

Market deregulation in electricity and gas opens up new perspectives and opportunities for more competition and innovation in the Utility market.

Regulators will switch from cost-based to performance-based regulation, focusing on customer satisfaction and security of supply.

While utilities will be regulated for the transmission of energy, the regulators will seek to drive the tariffs down at every opportunity. Any option for additional revenue from existing assets will be encouraged.

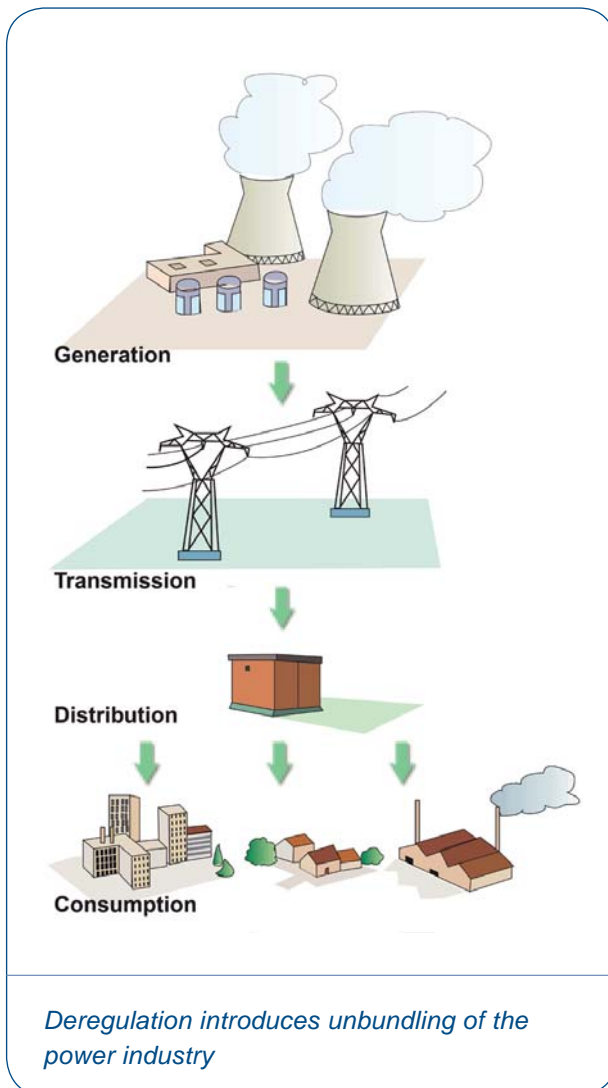
Energy retailers will have to offer attractive products to energy end-consumers. Utilities will have to develop both better pricing and differentiation while at the same time complying with the regulatory framework.

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The Wild Card – Climate Change

Kyoto introduced the Utility industry to the idea that it had a role to play in global climate change and preventing damage to the world's climate. This role is only now being fully defined. In some countries, the role is very specific and the penalties are extensive. In others, the role is still strictly the supply

of energy and the costs are not yet defined. Most utilities globally are working to define their response to the need for emissions reduction. They are looking at changes in power generation, reduction in the use of fuels, diversion of emissions to other uses and – most importantly for SHOPS – consumer involvement in the reduction of consumption and management of the time of consumption.



The Enabler – Technology

A new Utility landscape will emerge as the future unfolds. Technology is the enabler of this new Utility, making it not only possible to do things that were impossible ten years ago but also routine.

Customers will be able to choose the product and price they desire from a menu of choices, an opportunity that was unheard of in the past and impossible for the Utility to support. Demand control contracts will allow the Utility to switch off specific loads at customers' premises at a keystroke, to avoid having to buy additional power at peak prices, while in turn providing rebates to those customers affected.

The distribution networks will carry multidirectional power, gas and, most importantly, data flows. Utilities will be in a position to have detailed visibility of the flows of energy at all levels in the energy value chain in a near-real-time fashion. This real-time information will be swiftly analysed and translated into actions to control the flow of energy.

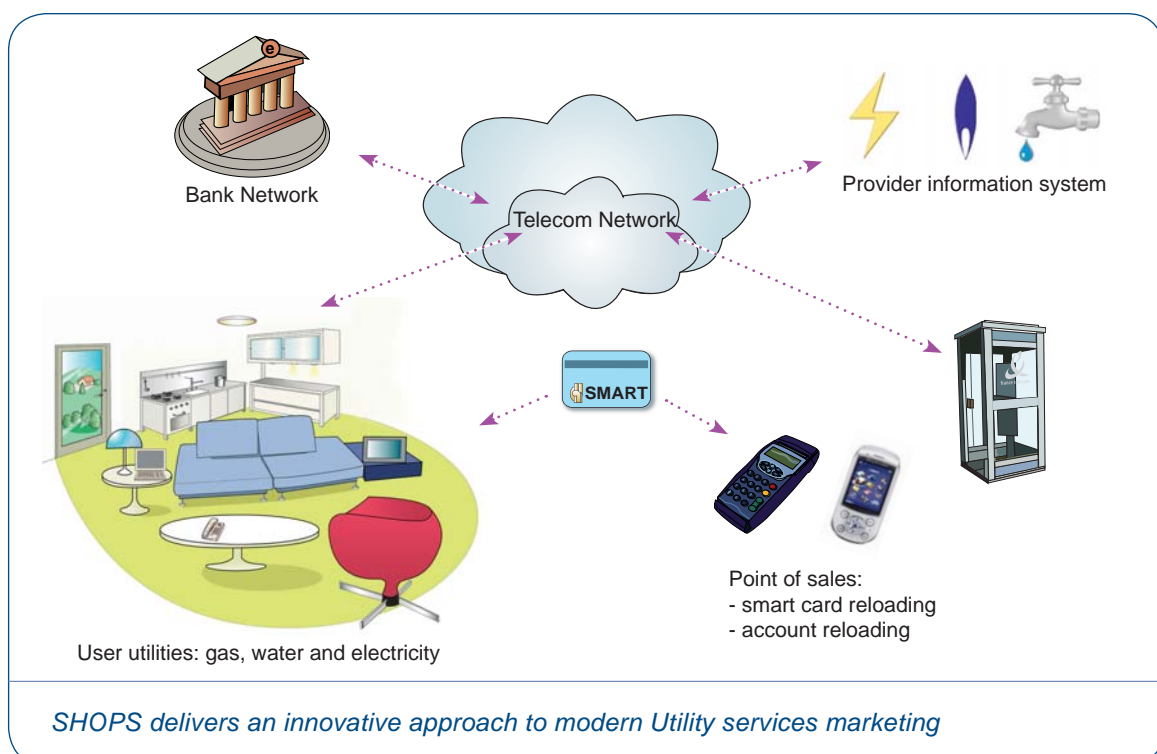
In such a challenging context, the objective of SHOPS has been to provide an innovative solution to help utilities to face this paradigm shift. Leveraging the latest technology advancements in the field of ICT, SHOPS has concentrated on delivering the foundation for a flexible, open platform between energy suppliers and consumers to help promote energy efficiency in a competitive new market.

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What kind of residential service offerings are supported by SHOPS?

SHOPS supports services related to home utilities such as:

- **Information services:** the possibility to receive information – such as energy consumption – by email, the Internet, digital television or an SMS sent to a mobile phone, depending on customer preferences;
- **Consumption simulation:** the residential customer has the ability to use simulation to buy a fluid or energy more efficiently;
- **Smart measurement:** to optimise consumer costs, the SHOPS platform includes a new metering device that is able to monitor and classify consumption according to types of use – such as lighting, heating or cooking;
- **Smart control and delegation:** the customer is able to use the retailer's subsystem to hand over the activation of equipment to the retailer. In this way, it is possible for the retailer to act remotely on the customer's home equipment power consumption during peak hours, or offer the residential customer the ability to control remotely some of his home equipment – such as washing machine or heating system – to reduce energy consumption;
- **Roaming:** the consumer is able to access the system – such as supply of energy or managing his account – elsewhere than in his usual consumption location, with the advantage of adding the price of this consumption to his personal subscription; and
- **Payment:** one of the most important services provided by SHOPS; the payment system offers a wide set of payment methods. The selected mode does not depend just on the environment or device in use but takes into account customer preferences.



SHOPS delivers an innovative approach to modern Utility services marketing



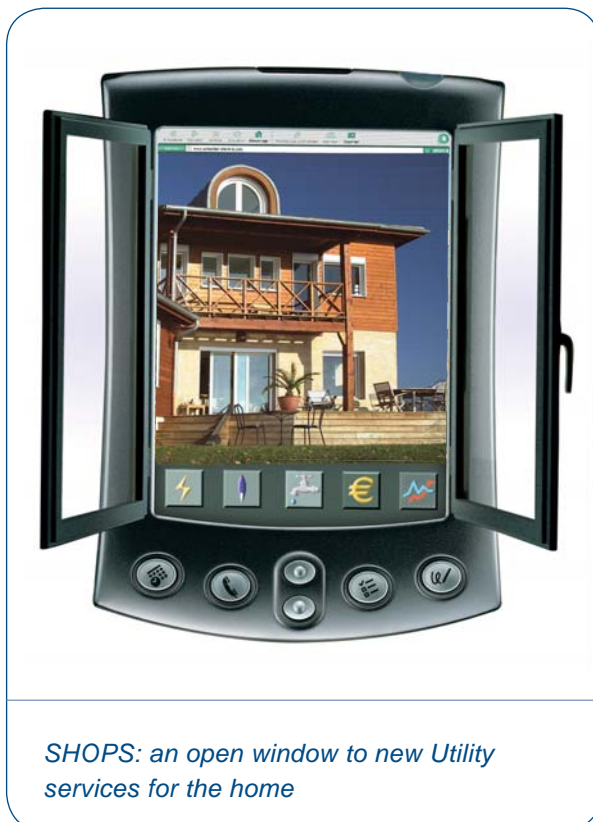
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The SHOPS platform is based on the Internet which is the most widely used communications network for distributed systems. SHOPS is making use of emerging ICT and standards such as the Liberty Alliance specification, device profile for web services (DPWS) and biometrics. It introduces a mediation technology based on open-source middleware to collect and secure home user data.

As an example of openness, web-services-based technologies offer a way to implement a standard and secured payment service, so all technologies related to web services and web-services security (WSS) are addressed: XML, simple object access protocol (SOAP) and web-services description language (WSDL). For payment over the web, security must be improved for both the customer and the merchant without too many constraints. New payment technologies – such as VISA 3D Secure™ – are used for payment by credit card. This provides the basis for global interoperability of authenticated payments. Payment is addressed by the clients in the same way, independently of the terminal used – PC, PDA or mobile phone – so that not only the use but also the time needed to learn how to use the service is minimised. In this way, the inclusion of any new device for accessing a service is considered as natural.

Integration of the SHOPS platform in existing systems has been a major concern, taking into account that a legacy system is not just a software application but also includes business processes and, sometimes, specific hardware.

SHOPS is also bringing solutions to ambient intelligence within the home. The smart control function provides an illustration of that concept: home appliances are controlled depending on customer situation. The customer may use different human interfaces, including his mobile phone or TV set, to activate predefined home control scenarios – for example 'Wake up the home' is going to open the shutters, switch on the lights and turn on the music programme.



What market for SHOPS?

The main drivers enabling implementation of platforms such as SHOPS are:

- Strong energy policy for more environmental care (greenhouse-gases and carbon-emission restrictions) and natural resources conservation;
- Deregulated framework;
- Reality of competition in the market;
- High consumer purchasing power to be able to pay for more advanced services;
- Broadband Internet access for residential customers;
- No reluctance for on-line payment practices or prepayment for residential customers; and
- Added value of SHOPS service offerings as perceived by the end customer.



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The major target market for SHOPS, according to these drivers, is in developed countries where Utility markets are both deregulated and competitive – and where the incumbent no longer has the monopoly, the market is open to alternative suppliers. Denmark, Norway, Sweden and the United K are currently concerned, and Belgium as well as Finland will be involved as of July 2007.

This market in terms of energy – gas and electricity – consumption purchases amounts to \$60 billion, based on 94 million residential consumers and a \$28,216 GDP/inhabitant. Of this \$60 billion, roughly 10% can potentially be captured by SHOPS – based on a 10% average broadband subscription rate. This represents a \$6 billion market. Considering 5% of additional turnover for services linked to the commodity supply and a 15% additional turnover for other services such as telephony, the total market for SHOPS amounts to \$7.4 billion.

A secondary target market for SHOPS is located in developed countries where Utility markets are deregulated but still concentrated, hence displaying marginal effective competition either at a national level, such as in France, or at a local level as in Germany. In this case, new entrants have greater entry barriers and have to be very aggressive and customer attractive to gain market share. Moreover, development of dual-fuel offerings – for example gas and electricity – offers an opportunity to create new dynamics in these markets.

France, Germany, Italy, the Netherlands and Spain are particularly concerned as of July 2007 – the date for mass market deregulation in those countries. This market, in terms of energy – gas and electricity – consumption purchase amounts to \$171 billion, based on 290 million residential consumers and a \$25,471 GDP/inhabitant. Of this \$171 billion, one third may be captured by SHOPS – IDATE estimates that, in 2007, one third of European households will have a broadband subscription. This represents a \$56 billion market. Considering 5% additional turnover for services linked to the commodity supply and a 15% additional turnover for other services such as telephony, the total market for SHOPS amounts to be \$68 billion.

In the long run, if we consider a European convergence of energy pricing with better networks interconnection, a genuine fluid energy market, allowing real competition in every single European energy market, then the whole of Europe could become a global market for SHOPS.

Conclusion

SHOPS has delivered a technical foundation to support new business models for home utilities which, in turn, will contribute to promoting a higher quality of service, social sensitiveness for basic services, brand strengthening and attention to environmental protection and natural resources conservation.