DSMSpotlight

The Newsletter of the International Energy Agency Demand-Side Management Programme October 2013

task 16

State Grid China Hosts ESCo Manager Training on Detailed Economic Calculation and Analyses of ESCo Projects

Policy Background

In November 2010 the Government of the People's Republic of China issued a national DSM Rule "Guidance on Electricity Demand-Side Management Regulations" ([2010] 2643). This rule, for the first time, placed an energy efficiency obligation on the State Grid Corporation of China (SGCC) and China Southern Grid Company, the two large government-owned entities that operate electricity transmission and distribution networks and sell electricity directly to end-use customers in the majority of China.

This obligation requires the grid companies to achieve energy savings of at least 0.3% in sales volumes and 0.3% in maximum load compared with the previous year. The DSM Rule also lays a foundation for the expansion of demand response programs by requiring the installation of load monitoring equipment on 70% of the peak load and load control equipment on 10% of the peak load in any locality[1].

For Energy Service Companies (ESCos), China ramped up its support with a number of fiscal and tax incentive policies as well as some standardization requirements for the ESCos. Energy performance contracting (EPC), among other market mechanisms, is a key

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Note from the Chairman

The Pros and Cons of Being a -Sumer

The days of the old energy system will soon be over – the system where PRO-ducers provide CON-sumers with the energy that the producers, in their infinite wisdom, thought the consumers should have, and which the consumers accepted with gratitude. The new energy system, which uses flexible distributed generation, will change this paradigm entirely. The CON-sumer will have more say in the matter and will turn into a PRO-sumer

For a number of years the IEA DSM Programme has been studying how decentralized renewable energy can be integrated into the energy system and how flexible demand can increase reliability in the system. The questions being answered are: How do you integrate renewables in the network? How do you store energy?, What options do we have for storage, peak shaving and load shifting? In other words – how do you become a PRO-sumer?

In many parts of the world, the energy sector doesn't really appreciate these sustainable ways of dealing with production and distribution. Their reservation, however, does have an explanation – the energy sector is accountable for undisturbed energy delivery at a reasonable price, but wind and solar aren't 100%

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focus for the Chinese government in the 12th Five Year Plan, released by the State Council, China's cabinet.

SGCC Founds ESCo Subsidiaries in Each of its Serviced Provinces

In response to the DSM Rule, the State Grid Corporation of China (SGCC), which is the largest electric utilities company in the world, has created ESCos in all 26 provinces within its service territory as subsidiaries of the State Grid-owned provincial grid companies. The ESCos' main roles are to implement energy efficiency projects, deliver specialized energy and consultancy services, and help organize workshops and seminars to engage end-users in energy efficiency programs.

German-Chinese Cooperation on Capacity Building

To support the start-up ESCos, SGCC is focusing on capacity building within the framework of the Chinese-German 'Policy and Energy Efficiency Programme' (EPEE), which is implemented by the German Development Corporation GIZ and the Chinese National Energy Administration (NEA).

ESCo Manager Training

Among other activities, GIZ and SGCC organized a three-day intensive ESCo project calculation training for the managers of the SGCC ESCo subsidiaries this past June in Bejing. The goal was to train participants to develop and calculate their own complex energy service projects, perform risk analyses, and produce bankable project documentations. The training began with an introduction to life/project cycle cost calculations and basics of dynamic economic calculations. Next on the agenda was a detailed introduction to a comprehensive techno-economical ESCo calculation tool, which was followed by trainees doing some hands-on calculation of real world ESCo projects.

China plans to invest more than 2 trillion yuan (US$ 323 billion) to promote energy-saving and low-carbon projects by 2015.

The hands-on sessions were the main focus of the workshop. To ensure activity involvement, the participants were asked to bring input data from their own projects so that they could calculate and analyze information during the training. As a special feature, all the trainees received the Excel calculation tool and used it on their own laptops during the training.

The hands-on activities proved to be an excellent learning opportunity, as several of the participants stated in the training evaluation form, "communication in an interactive group work is ideal to discuss your difficulties with the other participants. It would be better to have even more time to exchange and discuss experiences and difficulties from one's own work".

To bridge the language barrier, the Excel tool was simultaneously available in German, English and Chinese. The tool also allowed participants to calculate both Energy Performance and Energy Supply Contracting business models. The training was delivered by Jan W. Bleyl (Energetic Solutions & Operating Agent of IEA DSM Task 16: Competitive Energy Services) and Simon Zellner (GIZ, Sector Project Technology Cooperation in the Energy Sector). Due to the success of this training, SGCC and GIZ are in the process of preparing a follow-up training for November 2013.

Market Outlook

Back to a broader market development perspective as outlined in the latest Chinese Five Year Plan, which intends to promote the energy-saving and environmental protection industry as one of the country's seven "strategic industries". China's ambition to shift to a greener economy is expected to provide more than 2 trillion yuan (US$ 323 billion) in investment opportunities over the next five years for the country's burgeoning energy-saving sector. Xie Zhenhua, vice-minister of the NDRC, said recently that the nation will invest more than 2 trillion yuan in promoting energy-saving and low-carbon projects by 2015. There is the potential to save 400 million tons of standard coal equivalent by 2015, which could stimulate investment of more than a trillion yuan.

The door is opening for energy efficiency and successful ESCos. It is our hope that the recent ESCo manager training will make a sustainable contribution, be it small, to economically sound project calculations, and thus foster long-term growth of the ESCo industry in China.

This article was contributed by Jan W. Bleyl, Operating Agent of IEA DSM Task 16: Competitive Energy Services, EnergeticSolutions@email.de and Simon Zellner of GIZ, Sector Project Technology Cooperation in the Energy Sector, simon.zellner@giz.de.

1 National Development and Reform Commission (NDRC), 2010, quoted in "Best Practices in Designing and Implementing Energy Efficiency Obligation Schemes", IEA DSM Task 22 Research Report, 2012).

task 16

ESCo Project and Market Development: A Role for Facilitators to Play

This article is the first of a series on Facilitators in the ESCO market. This new field of work is helping to foster ESCO market development and reach energy policy goals. The work is part of IEA DSM Task 16: Competitive Energy Services (Energy Contracting, ESCo Services) and this article and future ones are based on the Task 16 paper "ESCo Market Development: A Role for Facilitators". The objective of this work is to 1) create a scientific reference baseline for project/market Facilitators, which can be used for further discussions, 2) demonstrate the added value for a wider application of Facilitators in ESCo market development, and 3) provide guidance for facilitation services and activities as well as policy recommendations.

What is a 'Facilitator'?

A Facilitator is an independent intermediary between ESCos and (potential) clients. The job of a facilitator is to enable a client to develop, structure and procure energy service projects. A Facilitator also serves as a mediator between clients and ESCos "(corporate) cultures", interests and expectations in different phases of the project cycle.

What is the Optimal Scenario for Using a Facilitator?

To identify the know-how that is required, the processes and the needed skills to successfully outsource comprehensive energy service projects, IEA DSM Task 16 experts have taken the perspective of a (potential) client. To do this, they used a typical energy service project life cycle with four main phases 1) Project development, 2) Procurement, 3) Construction, and 4) Service delivery including M&V.

Figure 1 summarizes the main process steps for clients and ESCos following a negotiated procurement procedure, which is often applied in European public ESCo markets to select a best bidder for comprehensive energy service projects.

This approach is applicable to both basic energy service business models – Energy Supply and Performance Contracting – in fact the selection of the business model should be part of the Facilitator supported project development phase.

Figure 1. Outsourcing energy projects: overview of workflow (client and ESCo) and typical lead times

Based on the above workflow, the main non-technical challenges a client needs to resolve in order to structure and procure comprehensive energy service packages are:

1. Project Development Phase

- To begin the concrete project goals and resources available need to be established in consultation with the key stakeholders, which requires good communication skills. Also the facilities need to be identified and the scope of service and interfaces defined, typically based on an interdisciplinary feasibility study[1]. The client needs to make a basic 'make or buy' decision – whether to outsource or not. In the case of outsourcing, the ESCo business model (ESC or EPC) needs to be selected and adapted to the project. Last but not least, the project financing needs to be structured, which requires budget arrangements and sourcing (operating expenses, capital expanses, etc). All these tasks require good social and interdisciplinary project management skills.
- To justify decisions for capital-intensive measures with long payback periods, the economic appraisal requires a life cycle cost evaluation. This is still not common practice and tools and experiences are not often readily available.
- Financing requires multi-year commitments and

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sourcing from capital as well as operational budgets. To do so in the public sector, budget law provisions and budgeting procedures need to be adapted.

- ESCo contracts typically encompass a mixture of work, supply and services components with long-term contracts, which may raise concerns of contract security, etc.

Many of the skills needed in the Development Phases are also needed in other phases of the project cycle, for example, economic life cycle cost appraisal for the assessment of the ESCo offers, detailed structuring of the financing, adaption of the contract model to the final project design and best bidder. In addition, communication and interdisciplinary project management skills are needed throughout the project cycle.

2. Procurement Phase (2a – 2f in Figure 1)

- The selection of a procurement procedure requires an estimation of the project value and a decision on company qualification and selection criteria. For the proposal evaluation project specific award criteria are needed.

- Instead of procuring individual pieces of the project package, the entire project cycle is outsourced, typically to one general contractor. Corresponding to the comprehensive nature and outsourcing of financial, technical and operational project risks, typically negotiated or competitive dialogue procurement procedures are applied. In terms of public procurement legislation, this is justified because "a prior and overall pricing is not possible, due to the nature or because of the risks associated with the delivery of the services[2]."

- Tendering is typically done using functional specifications that cover the entire project cycle (as opposed to detailed specifications for different trades and individual stages of the project cycle).

There is the potential to save 400 million tons of standard coal equivalent by 2015, which could stimulate investment of more than a trillion yuan.

JAN W. BLEYL
OPERATING AGENT, TASK 16

3. Construction Phase

No particular tasks besides building owner representation and oversight.

4. Service Delivery and Operation Phase

- Measurement & verification and quality assurance skills are needed to assess the deliverables of performance based energy services, in particular for savings achieved in EPC contracts

These requirements can present significant obstacles for procuring comprehensive energy service packages, particularly if the client is accustom to operating their facilities "in-house". In addition, project implementation often requires organizational and personal changes, which is often an overlooked. The challenge to create a comprehensive energy service package is compounded by the fact that energy efficiency is typically not a core business activity, life cycle cost minimization processes, regulations and tools are often not in place, and existing procurement processes are designed to buy individual components not integrated package solutions. To add another layer of complexity - ESCO contracting is a once per project cycle task and since the typical cycle is five to fifteen years (even up to 30 years for building envelope refurbishments) it is important to get it right.

There enters the Facilitator – who has the job of consulting with the client (and sometimes also the ESCo) and providing the specific know-how and experience needed to surmount the energy services specific requirements outlined above. Additional Facilitator activities can include feasibility studies, selection of the best suited energy service business model (e.g., ESC, EPC or IEC), structuring of financing from different internal and external sources or subsidies, preparing tender documents, evaluating ESCo proposal, and quality assurance and M&V on behalf of the client.

The next article in this series will be published in the December 2013 DSM Spotlight. So check back to read about the nuts and bolts of a Facilitator's role and the costs and funding options. For information on *IEA DSM Task 16: Competitive Energy Services (Energy Contracting, ESCo Services)* visit the DSM website or contact the Operating Agent, Jan W. Bleyl *EnergeticSolutions@email.de*.

This article is based on the paper, "ESCo market development: A role for Facilitators to Play" by Jan W. Bleyl, IEA DSM Task XVI c/o Energetic Solutions; Nathalie Adilipour, Swedish Energy Agency; Markus Bareit; Charles-Henri Bourgois and Johan Coolen, Factor4; Ger Kempen, Escoplan; Kim, Kil-Hwan and Jang, Hye-Bin, Korea Energy Management Corporation; Cho, Sung-Hwan, Jeonju University; and Lieven Vanstraelen, Fedesco Knowledgecenter.

1 This feasibility study does not need to be an (investment grade) audit, but should assess technical, economical, financial, legal and organizational project feasibility (an IGA should be done by the ESCos selected in our view).

2 BVergG 2006 § 30 (2) Austrian public procurement law (translation by authors)

switzerland

New Energy Strategy Turns to DSM

The Swiss energy policy is in an interesting and turbulent phase. The old power grid needs upgrading, the electricity market is gradually opening, discussions are taking place with the European Union about an integrated electricity market, and after the grave nuclear accident in Fukushima, Japan, the Swiss government has decided to phase out nuclear power and is developing a new energy strategy, where demand-side management will play an important role.

Switzerland's Energy Use

Switzerland's approximately 7.9 million inhabitants and its economy consumed around 59 billion kWh (59 TWh) of electricity in 2012. There are more than 800 electrici-ty suppliers and distributors, and the main electricity resources are hydro power (~58%) and nuclear power (~36%). Because of its advantageous geographical location and the possibility to store electricity at its pump storage hydro power plants, Switzer-land has a high electricity exchange with its neighboring countries (see figure 1), and therefore, an adequate transmission grid is important.

Electricity consumption accounts for around a quarter of the whole energy consump-tion in Switzerland. Other energy resources are crude oil (19%), fossil fuel (34%), gas (13%) and others (10%). The distribution of the energy consumption can be seen in figure 2. The current law sets target to stabilize energy consumption by 2030 and re-duce CO2-emissions by 20% by 2020.

Energy Strategy 2050

After the severe nuclear accident in Fukushima, Japan, the Swiss government decided that existing nuclear power plants should be decommissioned at the end of their op-erational lifespan and not be replaced by new nuclear power plants. In order to ensure the security of supply, the Federal Council, as part of its new Energy Strategy 2050, is placing emphasis on increased energy savings (energy efficiency), the expansion of hydropower and new renewable energies, and, if necessary, on fossil fuel-based elec-tricity production (cogeneration facilities, gas-fired combined-cycle power plants) and imports. Furthermore, Switzerland's power grid is to be expanded without delay and energy research strengthened.

The new energy outlook shows that the demand for energy could rise to around 90 billion kilowatt hours a year by 2050 if tighter measures are not taken. The main rea-sons for this are population growth, increasing duplication of household appliances (e.g., second TV), new appliances and applications, greater living space per person, but also the increasing electrification of transport. The Federal Council therefore in-tends to encourage the economical use of energy in general, and of electricity in par-ticular. Enhanced efficiency measures include minimum requirements for appliances (best practice, energy label) and other regulations, bonus-malus mechanisms (effi-ciency bonus), measures to raise public awareness (strengthening of SwissEnergy), incentives to retrofit the building enveloped, and measures regarding the production of heat.

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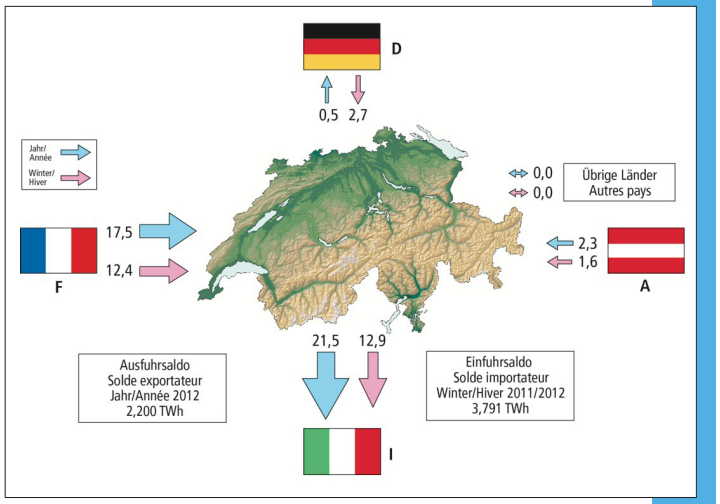

Figure 1. Import/export of electricity to/from Switzerland

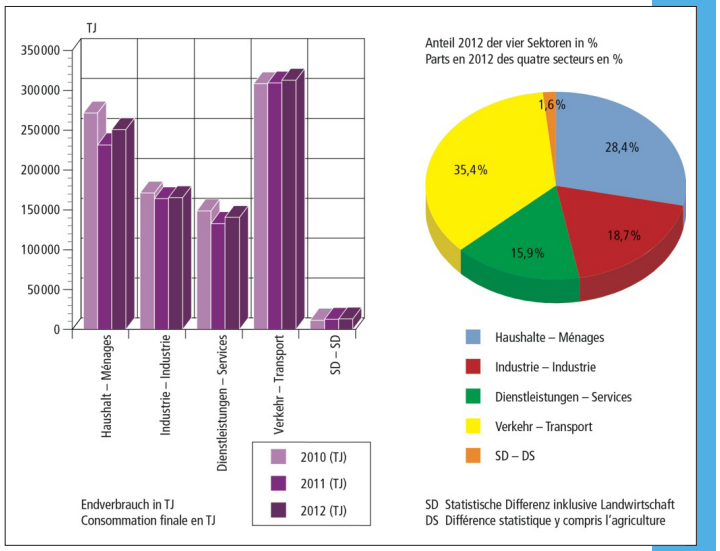

Figure 2. Distribution of energy consumption

Switzerland *from page 5*

The goals of the new energy strategy are to increase production of renewable energies by 24 TWh (see figure 4) and to keep electricity consumption on a constant level from 2020 onwards. The expansion of renewable energy comes along with a more random and decentralized energy production. For this reason, load management and storage options are becoming particularly important. Besides ongoing research and PD projects, Switzerland is, therefore, looking forward to the collaboration with the other international experts in the extension of *IEA DSM Task 17: Integration of Demand Side Management, Energy Efficiency, Distributed Generation and Renewable Energy Sources.*

Electricity Network

The ageing Swiss transmission and distribution networks face new challenges. On the one side, the flow with the neighboring countries is increasing, and on the other side, the grid has to be adjusted to the new renewable energy goals of the Energy Strategy 2050. The rapid expansion of the electricity transmission grid and the transformation of transmission networks into smart grids are absolutely essential for future domestic production infrastructures and electricity imports. These 'intelligent' grids allow direct interaction between consumers, the network and power producers and offer great potential with regard to optimizing the electricity system, delivering energy savings and consequently in bringing down costs. Switzerland's power grid should optimally be integrated into the European grid and the future European 'supergrid'.

Energy Research

The restructuring of the energy system needs to be supported by the strengthening of energy research. To that end, the energy research portfolio at the universities is being reviewed and the cooperation between universities, businesses and centers of technological expertise are being encouraged. To support these changes, a plan of action on 'Coordinated Energy Research Switzerland' with relevant roadmaps will be drawn up for efficiency enhancing technologies, power grids and the storage and distribution of electricity. And, the necessary federal funding for pilot schemes and demonstration facilities will be provided. Besides research in specific technology areas to improve energy efficiency and renewable energy, the socio-economic interdisciplinary research program Energy - Economy - Society (EES) of the Swiss Federal of Office of Energy focuses on economic, social and environmental issues relating to the extraction, distribution and use of energy. In order to reduce energy consumption significantly, awareness and changes in behavior are as or even more important than technological improvements. Recent and ongoing studies of the EES program examine, for example, the role of Smart Meters with different feedback schemes on the energy consumption behavior or potential rebound effects due to the use of energy efficient appliances.

Switzerland is also taking part in *IEA DSM Task 24: Closing the Loop - Behavior Change in DSM: From Theory to Practice* and is benefiting from the fruitful exchange with experts with different backgrounds from all over the world.

The Role of DSM

Besides regulations and efficiency standards for home-use appliances, there exists a wide spectrum of different measures on the federal level to promote energy efficiency and CO2-emission reductions on the demand side in Switzerland.

- SwissEnergy conducts activities on awareness rising, information, consulting, (further) education, quality control, and networking and promotion in the fields of energy efficiency and renewable energy.
- The building program gives financial incentives to retrofit buildings and install efficient and renewable heating systems.

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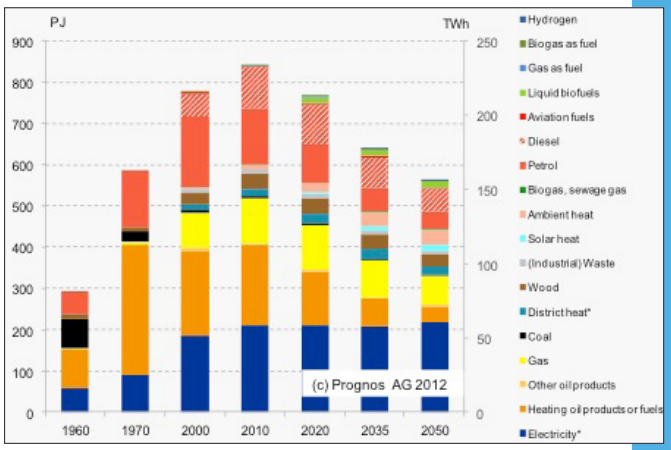


Figure 3. New energy mix in the package of measures

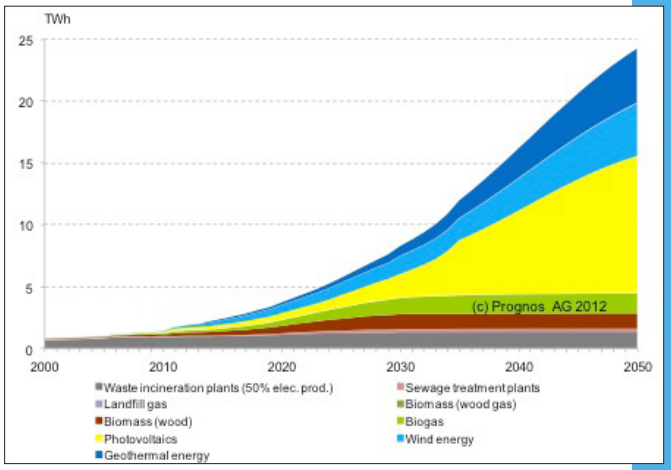


Figure 4. Long-term approach to electricity production from new renewable energy sources

task 21

Standardisation of Energy Savings, Will the US Move Forward?

In August the biennial International Energy Program Evaluation Conference (IEPEC) took place in Chicago, Illinois, USA. Harry Vreuls, Operating Agent for IEA DSM Task 21 on the harmonisation of energy savings calculations, presented results of the DSM Task in combination with the potential impact of future energy providers' obligations on evaluations. Harry Vreuls summarised the 7 key elements ("building blocks") for the transparent documentation of energy savings calculations:

1) A clear presentation in a formula or an algorithm for estimating savings;

2) Information on how baseline issues are handled;

3) Unit of the calculation;

4) Time period the calculation is dealing with;

5) Specification (or operationalisation) of the parameters used;

6) Normalisation applied; and

7) Corrections.

During one session a panel discussed the relevance of current US actions on harmonisation using regional Measurement and Verification Guidelines, Protocols, US Uniform Methods, Model Practices, etc. Most of these actions are presented in the DSM Task 21 report *Roadmaps for Improved Harmonised Energy Savings Calculations*.

The panellists (one of whom was Steve Schiller, the US expert for DSM Task 21) agreed that increased harmonisation is needed and that they look forward to learning from the experiences with the use of the US Uniform Methods. Harmonisation will result in more (cost) efficient evaluation of energy savings and generate more trust in the value of energy savings, but additional work is still needed to make progress in this area.

To capitalise on the discussions of IEPEC, Harry Vreuls is researching how a new Subtask in *DSM Task 21 Standarisation of Energy Savings Calculations* could use the US actions in a broader, international approach for combining energy and greenhouse gas calculations.

This article was contributed by Harry Vreuls, DSM Task 21 Operating Agent, harry.vreuls@agentschapnl.nl

Switzerland *from page 6*

- In yearly public calls for tenders, companies and individuals can apply for financial support for electric efficient projects.

- Energy labels for cars, buildings and appliances inform customers about the energy efficiency and other attributes of the product.

On the cantonal and municipality levels there are additional, complementary attempts to improve energy efficiency, for example, the label EnergyCity for municipalities with a sustainable energy policy or the 2000Wattsociety, an attempt to reduce per capita energy consumption to 2000Watt or one ton of CO2.

Despite the high energy saving potential and different monetary incentives in the building sector, the energy service company (ESCO) market and their energy performance contracts are still underdeveloped in Switzerland. Participation in *IEA DSM Task 16: Competitive Energy Services* is proving to be a great opportunity to profit from the wide knowledge of the other experts and their ex-perience in their home countries.

Conclusion

Although the Swiss Energy Policy is well developed, the decision to phase out nuclear power bears new grave challenges. Improvements in energy supply and technological progress in the energy efficiency of appliances combined with the development of soft measures on the demand side – the Demand Side Management – will play an indispensable role.

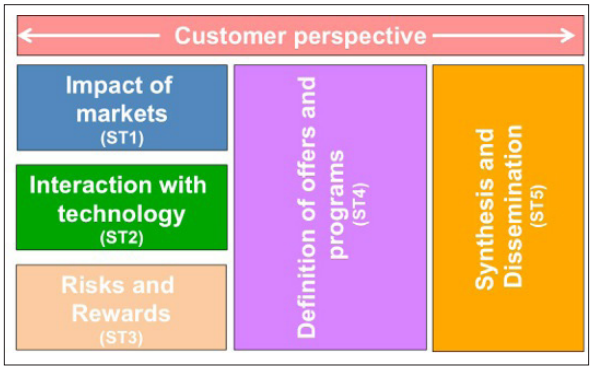
This article was contributed by Markus Bareit, the Swiss Executive Committee member of the IEA DSM Programme, markus.bareit@bfe.admin.ch.

task 23

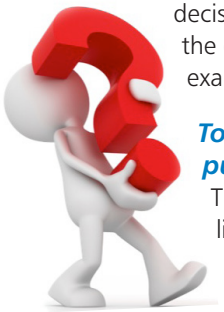
Accessing Risks and Rewards and the Impact on Smart Grids

IEA DSM Task 23, Role of Customers in Delivering Effective Smart Grids, is exploring the potential risks and rewards associated with Smart Grids from the perspective of consumers. The project is drawing together international experiences and identifying best practices in order to ensure that the demand side contributes to the delivery of effective Smart Grids.

DSM Task 23 is comprised of five Subtasks, as highlighted below.



Subtasks 1 and 2 are completed, and Subtask 3 is due to be completed in the next month. These Subtasks have focussed on gathering experiences and knowledge about consumers and how they interact with Smart Grids. This article provides an overview of the early findings from Subtask 3, which looks at how consumers assess risks and rewards. In particular, the work focusses on the growing body of knowledge to support the hypothesis that individuals do not make decisions that fit within a rational economic approach.



That is, consumers do not make decisions based on whether or not the gains outweigh the losses. Some examples are presented here.

Too many choices cause purchasing paralysis

There are many examples in daily life where individuals are provided with an exhaustive arrange of choices from which they need to make a selection. For example, a quick look at the online choices available from a UK supermarket shows that there are almost 100 different types of salad dressings available and over 645 bread products. In this case, many shoppers have already formed their preferences and know what they like and what they want to purchase. However, when faced with too many choices, individuals can be paralysed by an inability to choose from the myriad of options available to them[1]. This has been attributed to factors such as:

- Concern that they may make the wrong choice, or
- Difficulty of assessing the trade-offs between various options.

This was highlighted in a retail market review conducted by Great Britain energy regulator Ofgem that supported the principle that too much choice is not good for consumers, and was thought to help explain the low numbers of consumers that switch their energy supplier in the UK.[2]

Framing Effect – How choices are presented

When customers are given a number of options, then their decision can be influenced by the way that the offer is 'framed'.

The following is a well-cited example of the powerful effect of framing on decision-making originally developed by Tversky and Kahneman[3]. They present a scenario where an unusual disease is expected to kill 600 people and two alternative programs have been proposed to combat the disease, with different outcomes expected. The following shows that how these options are framed has a significant impact on the decision made.

"Does this Smart Grid initiative look good in this frame?"

When the same situation is presented to different groups of individuals, but framed in a different way – the outcome is different.

The different response is attributed to the fact that when options are framed in terms of gains, then choices are risk averse. However, when options are framed in terms of losses, then choices tend to be risk taking.

This might suggest that framing a Smart Grid initiative in terms how much would be wasted if a certain behaviour was not adopted or if a particular piece of technology was not employed would be met with a different response than one focussing on the potential gains to be made.

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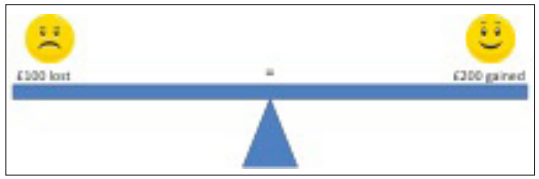
1 Predictably Irrational Customers, Optimizing Choices for How People Really Buy, Not How we Think They Buy Bill Abbott, Alex Mannella, Kyle McNamara, Amaresh Tripathy
2 Retail Market Review: Domestic Proposals, Publication date: 1 December 2011, Ofgem
3 The Framing of Decisions and the Evaluation of Prospects, Studies in Logic and the Foundations of Mathematics, Volume 114, 1986, Pages 503-520



Individuals do not treat risks and rewards in the same way

There is a tendency for individuals not to treat risks and rewards in an equivalent way. For example, the pain of losing $100 is much more than the equivalent 'pleasure' of winning $100[4]. It has been estimated that losses are twice as painful as gains are pleasurable.

For example, consider the following two options offered to an individual as a one-time offer[5]:

A) 50% chance of winning £200
B) 100% chance of winning £100

The utility or risk associated with each option is the same,

A) Risk = 50% x £200 + 50% x £0 = £100
B) Risk = 100% x £100 = £100

In this situation, when the options are framed in terms of gains, the majority of respondents (75%) are risk averse, selecting the sure gamble, i.e. Option B. The same would also be true if the gamble had a higher value than the sure bet.

When an alternative pair of options are presented in terms losses, see below, the majority of respondents become risk seeking.

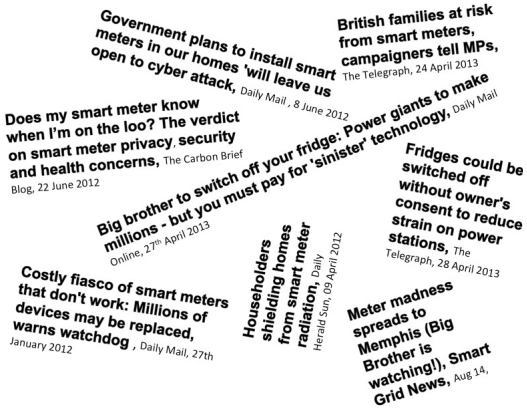
C) 50% chance of losing £200
D) 100% chance of losing £100

When the options are framed in terms of losses, the majority of respondents (65%) are risk seeking, preferring the gamble, Option C, rather than the sure loss. Again, suggesting it may be beneficial to highlight the avoidance of energy wastage (losses) rather than financial savings (gains) when discussing the potential benefits of Smart Grid initiatives.

Priming

Consumers remember an item best in the form and context in which they first learned about it. This can be shaped by advertising and product placement. This could also be from press articles.

Scenario 1	
If Option A is adopted, then 200 people will be saved. Or, If Option B is adopted, there is a 1/3 probability that 600 people will be saved, and a 2/3 probability that no one will be saved.	When the options are framed this way, the majority of people take the risk-averse option and select Option A; the prospect of saving 200 lives for sure (no gamble) is more attractive than a risky prospect that on paper has the same expected value.
Scenario 2	
If Option C is adopted, then 400 people will die Or, If Option D is adopted, there is a 1/3 probability that no-one will die, and a 2/3 probability that 600 will die.	When the options are framed this way, the majority of people take the riskier option and select Option D; the prospect of losing 400 lives for sure (no gamble) is less attractive that the risky prospect.



Selection of headlines from online newspapers

For example, a UK online newspaper published an article on 27 April 2013 declaring that refrigerators could be turned off without warning and without consent in order to manage shortages in generation capacity. If this is the first time that customers become aware of smart appliances, then it is seems reasonable to expect that they will have concerns over the possibility that their appliances could be turned off without warning and without consent. Such articles are not uncommon as shown above.

Therefore, it is important to consider what consumers first hear about Smart Grids, and to ensure that any concerns are addressed quickly.

Next steps

These are just a small selection of the many different factors that influence the decision making process of individuals. These examples highlight the difficulties associated with calculating the risk and rewards associated with Smart Grid interventions from the perspective of an individual. DSM Task 23 is currently looking at how this information, combined with that obtained from Subtasks 1 and 2 can be used to ensure the effectiveness of the Smart Grid by engaging with consumers and achieve their "buy-in".

This article was contributed by Linda Hull, DSM Task 23 Operating Agent linda.hull@eatechnology.com.

4 Rational Choice in an Uncertain World: The Psychology of Judgement and Decision Making, Reid Hastie, Robyn M. Dawes, 2001
5 Eldar Sharif 'Decisions Constructed Locally' in Kruglanski, A.W. and Higgins, E.T. (2007) Social Psychology: A Handbook of Basic Principles The Guilford Press: New York, London

Chairman's Note *from page 1*

guaranteed so this creates a tension at the "undisturbed" delivery front.

For a long time, energy delivery was a one-way street from production via distribution to consumption. The energy sector deserves lots of credit for its development and ability to provide stable delivery for decades. The downside, however, is that their modus operandi has become a steady state, where improvements are primarily based on thick cables and more efficient production.

In countries such as Germany, where solar is a really big thing, the system seems to be bursting at the seams. And on the technical side, balancing the grid with the increasing renewable input is turning out to be a challenge, but far from impossible.

The new PRO-sumers, the people and entrepreneurs with solar panels and/or small windmills are small actors, but often active ones. They do not only want to buy and sell, but also want to have the best service energy can deliver.

The emergence of the PRO-sumers is pushing the energy sector to make a huge turn and evolve from a kWh selling industry to service based companies. The one-way street has already become a web, a mesh, with many energy entry and exit points.

The energy system must change and technology is providing new options. Smart meters have the potential to become information providers, both to the demand and the supply side. Charging electrical vehicles and local energy storage will become part of the new service demand by the end user.

Different countries will, certainly at the start, find different solutions to these growing and changing demands of the end-users. But eventually, the aim has to be that the CON-sumers are gradually replaced by the new breed – the PRO-sumer

Within the IEA DSM Programme, experts are demonstrating what can be done and taking on the challenges being presented. Renewables, in combination with demand response and knowledge of human behaviour, will help to create decentralized networks with multiple inputs and to use the dominating model of the "small" end-user.

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