DSMSpotlight

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

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European Copper Institute Joins DSM Programme

European Copper Institute
Copper Alliance

In January 2013, the European Copper Institute (ECI) joined the DSM Programme. ECI has been active in recent years in several other IEA Programmes and also recently joined the Photovoltaic Power Systems Programme. Hans De Keulenaer, Manager of the Electricity Programme of the ECI, remarks that "We are very happy to join the DSM Programme. We see DSM as a crucial concept in re-designing the electricity system and bringing forward a more sustainable future."

ECI is a signatory to the declaration to pursue 100% renewable energy in the EU by 2050. It considers increased energy efficiency, a massive deployment of renewable electricity generation systems, and the electrification of transport vehicles and building heating systems as the main actions necessary to achieve this ambitious goal. Such large transformations of the energy system will require a significant shift in how the electricity grid is built and operated. DSM is an important element in the new concept of the grid. On one side, it enables the network operator to counterweight the variable output of renewable energy systems. On the other, it will enable consumers to valorize the energy buffers that they have at their disposal, such as heat pumps or electric vehicles. Evolving towards such a new concept of the electricity grid will be a long-term, step by step process and there is nothing to be gained in postponing it. ECI considers its participation in the DSM Programme as another contribution to this large-scale evolution. ECI is a strong proponent of the idea that a sustainable energy future can be gained in part through the

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Note From the Chairman

Energy Efficiency – Who is Afraid of the M Word?

A couple of months ago we were ecstatic about the attention the annual World Energy Outlook from the IEA, WEO 2012, was giving to Energy Efficiency. It clearly showed, for the first time by such a prestigious organisation, that the lion's share of the emissions gap to honour the 2 degrees target can be closed in a PROFITABLE way. That is by exploiting the energy efficiency opportunities that lay just before us like an open-cast mine.

Now the dust is settling, and I'm left with a bit of a hangover. Yes, the WEO is still a magnificent piece of work that shows the enormous potential of efficiency. A potential that is much bigger than any other option known to date. We have to admit though that we've known about this potential for a very, very long time, and unfortunately, stating the obvious doesn't bring us closer to a solution. The novelty of WEO was that energy efficiency was acknowledged by high level institutions. But now we need to take the next step.

We need an energy efficiency roadmap similar to the ones produced by the IEA. If we take a topic like CCS, we know the technologies, improvements that have to

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task 24

The Netherlands Holds 3rd Behaviour Change Workshop

On December 20, 2012, the third Dutch stakeholder workshop for *DSM Task 24: Closing the Loop - Behaviour Change in DSM: From Theory to Policies and Practice* took place in Utrecht. Smart grid technology developers and representatives from environmental NGOs, universities, the policy arena, DSOs and industry met to discuss what lessons could be learned from failed Demand Side Management projects and programmes.

The workshop opened with two superlative presentations, one from world renowned Evolutionary Psychologist, Professor Mark van Vugt, and the other from the founding father of the transport DSM project "ecodriving", Martin Kroon. After these presentations the stakeholders divided into break-out groups to discuss their own experiences with failed projects.

Professor Mark van Vugt teased the group with his statement that people, in principle, are not sustainable. Luckily he continued with the promise that people can be steered towards more sustainable behaviour if five principles are appreciated, taken into account and used to design effective DSM projects. These five are shown to the right.

What these five principles mean to developers and implementers of DSM projects appears straight forward. Van Vugt advises to trigger people's primary senses and to make the concept of sustainability easier to grasp. One way to do this is to evoke a sense of kinship—talk about Mother Nature instead of sustainability, or refer to ones' children. Other ways are to evoke a sense of reciprocity, "we created the most sustainable technology, can you support us for that in return?"; to focus on strong communities and people's ties to the communities because people can experience a strong feeling of kinship with fellow residents; and to increase the relative status of people behaving 'green'.

The founding father of the ecodriving movement in the Netherlands, Martin Kroon, then discussed how to design a successful intervention and lessons learned from ecodriving. The ecodriving campaign made explicit use of psychological theories to design the intervention, with very successful outcomes and up-scaling of the programme. The intervention clearly addressed the primary senses of people: the advertorial demonstrated that "tough guys" can drive ecologically minded, and instead of focusing on the collective longer term benefits of ecodriving behaviour, the campaign provided concrete tips to follow in the here and now: change gear before 2000rpm, and the benefit was concrete: less trips to the petrol station and consequently less money spent. Kroon was also very honest about the potential failure of this programme, in spite of a well-developed and theoretically underpinned programme, external factors can still create a failed project.

After several years of success, the ecodriving programme is in danger of collapse. Kroon blames a strong governmental reliance on technology to fix unsustainable driving behaviour and a lack of attention to the cause for a certain behaviour; its meaning. This theory is backed-up by a recent study into the antisocial behaviour of full electric and hybrid car owners. The workshop group commented that this technology push and technological fix was very much an issue in smart grid and smart metering projects as well. Too often it is thought that simply by introducing a smart meter in a home, the behaviour of the household will change and curtailment and savings will follow without any additional service or support.

Another threat to the ecodriving programme identified by Kroon is the discontinuation of governmental support for the campaign despite a new target group every year (with young people being targeted) and the programme's national outreach and scale, which means that the only stakeholder able to support it is the government. In addition, Kroon noted that the social learning around the programme is insufficient even though ecodriving is taught at driving schools and by fleet owners because there is a lack of generational learning where experienced

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"Big Five" Social Psychological Explanations for Unsustainable Practices

1. People prefer individual interest above collective interest.
2. The present (here and now) is more important than the future.
3. Relative status (am I doing better than my neighbour, colleague) is more important than absolute status.
4. Human beings are copycats and continuously copy other human beings.
5. People are actually not fit to live in our modern, technological, fast world. They are adapted to pre-modern natural environments. This also implies that people tend to be risk aversive and go for high chance pursuing behaviour.

Prof. Mark van Vugt

centre of excellence

DSM University in the Works

The establishment of a DSM University (Centre of Excellence) is being considered by the members of the DSM Executive Committee. The University would offer five key activities:

1. Courses on DSM topics related to the Programme's work.
2. Training at the national level on DSM topics related to the Programme's work.
3. A platform for professionals and institutions to network and collaborate with the Programme's experts.
4. Links between the DSM Programme and organizations in need of specific expertise.
5. Enhanced access to DSM publications posted on the DSM website.

A three-phase approach is proposed to achieve these goals.

Phase One

Perform a market assessment to appropriately define: 1) the needs of the Market, 2) the values of certain types of information and activities, 3) the effective approaches to be used in delivering value, and 4) the technical approach for maximized information sharing, learning and collaboration.

Phase Two

Develop a business plan for the Virtual Centre of Excellence that addresses the following areas: 1) market scan and competitive analysis, 2) products to be offered and pricing, 3) marketing strategy, 4) delivery mechanisms and other logistics, 5) risk management, and 6) revenue forecasts.

Phase Three

Implement the business plan including the construction of products, organization and packaging of intellectual property, course development, creation of certification programs, deployment of an online portal for delivery of content, and collaboration and initial launch of the Centre.

The next steps will be discussed during the April 2013 DSM Executive Committee so look forward to hearing more as the year progresses.

For more information contact Hans Nilsson, DSM Advisor, nosslinh@telia.com.

Task 24 *from page 2*

ecodrivers help train younger generations. Kroon's fail factors were also voiced by many of the workshop participants as factors that confront their own projects as well as many others.

The next Dutch stakeholder workshop is planned for May or June 2013, and possible topics include remote control, architectural design to make sustainable behaviour more attractive than unsustainable behaviour, and more concrete examples of the benefit of using social science in designing DSM projects, programmes and policies.

DSM Task 24 focuses on the complexities of human energy-using behaviour. Experts from participating countries are collaborating to unravel these complexities in order to access the large end user behaviour change potential for DSM programmes. Only once the 'loop' between behaviour change researchers, funders, policymakers, DSM implementers, and energy end users is closed will this potential be realised. To do this, DSM Task 24 is creating a global expert network and designing a framework to allow policymakers, funders of DSM programmes, researchers and DSM implementers to:

- Create and enable an international expert network interacting with national expert networks.
- Provide a helicopter overview of behaviour change models, frameworks, disciplines, contexts, monitoring and evaluation metrics.
- Provide detailed assessments of successful applications focussing on participating/sponsoring countries' needs (smart meters, SMEs, transport, built environment (in particular, refurbishment and/or renovations)).
- Create an internationally validated monitoring and evaluation template.
- Break down silos and enable mutual learning on how to turn good theory into best practice.

For a more detailed overview of the workshop's outcome or DSM Task 24 please contact the Operating Agents, Ruth Mourik (ruth.mourik@duneworks.nl) and Sea Rotmann (drsea@orcon.net.nz), or visit the DSM Task 24 website.

case study

Energy Australia Pricing Strategy Study - Australia

This is the 14th and final article in a series highlighting the case studies of DSM Task 15, Network Driven DSM. This Task demonstrated that DSM can be successfully used to support electricity networks in two main ways 1) by relieving constraints on distribution and/ or transmission networks at lower costs than building 'poles and wires' solutions, and 2) by providing services for electricity network system operators, achieving peak load reductions with various response times for network operational support.

Introduction

In 2007, EnergyAustralia comprised two businesses, an energy retailer that sold electricity and gas to retail customers and an electricity distributor that owned and managed an electricity distribution network covering the eastern part of metropolitan Sydney, the New South Wales Central Coast and the regional city of Newcastle. (Note: Subsequently the energy retailing business was sold and now comprises part of a larger energy retailing business that is still called EnergyAustralia. The electricity distribution business is now called Ausgrid and still covers the same geographic territory.)

Peak loads on the EnergyAustralia distribution network were growing. Figure 1 shows the annual aggregated load curve for the distribution network on weekdays in 2005/06; peak loads above 5000MW are coloured red. In winter, quite narrow peaks occur in the early evening caused by the use of electricity for space heating and cooking. In summer, broader peaks occur across most of the working day caused mainly by increased use of air conditioning.

Figure 2 demonstrates this more clearly by showing the occurrence of peak loads above 5000MW during 2006/07.

The Pricing Strategy Study was initiated by EnergyAustralia's distribution business to investigate whether pricing measures could be used to reduce peak loads on the network.

The Pricing Study

The purpose of the EnergyAustralia Strategic Pricing Study was to investigate the effectiveness of critical peak pricing (CPP) in achieving peak load reductions on the distribution network. EnergyAustralia referred to critical peak pricing as "dynamic peak pricing" (DPP).

The study included about 750 residential customers and 550 business customers. All had a smart meter with GPRS communications installed on their premises and some had an in-house display connected to the meter with powerline carrier technology.

The experimental groups comprised:

- a control group;
- a group provided only with information about peak load reductions;
- a group placed on a seasonal TOU tariffs;
- one group placed on a medium critical peak pricing tariff with an in-house display; and
- two groups placed on a high critical peak pricing tariff with and without an in-house display.

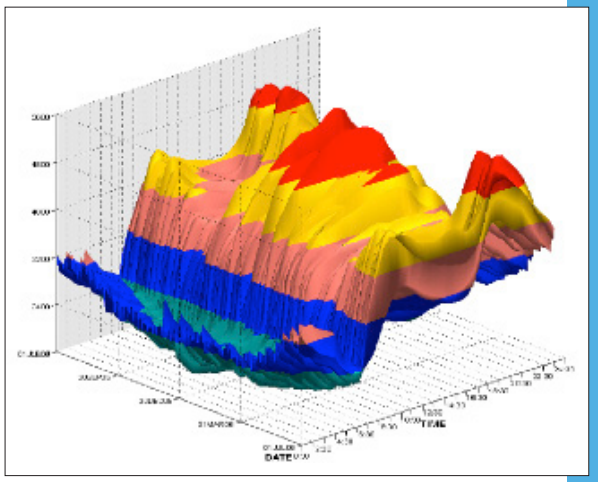

Figure 1. Aggregated Load Profile for the EnergyAustralia Network, July 2005 to June 2006.

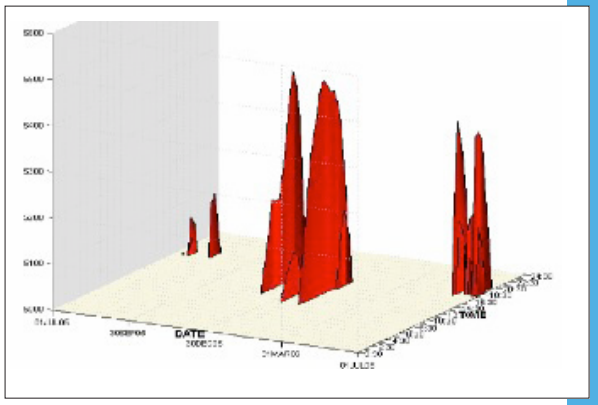

Figure 2. Peak Loads above 5000MW on the EnergyAustralia Network, July 2005 to June 2006.

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Table 1. Tariffs Schedules Used in the EnergyAustralia Pricing Strategy Study				
Tariff Component	SAC ($/day)	Peak (¢/kwh)	Shoulder (¢/kwh)	Off peak (¢/kwh)
Tariff EA057 powerAlert medium (DPP-M)				
NUoS	0.128	40	3.13	2.885
Retail	0.192	60	6.37	4.615
Total	0.32	100	9.5	7.5
Tariff EA058 powerAlert high (DPP-H)				
NUoS	0.128	80	2.8	2.3
Retail	0.192	120	5.7	4.2
Total	0.32	200	8.5	6.5
SAC = System availability charge NUoS = Network use of system charge				

The price levels for the critical peak pricing (CPP) tariffs are shown in Table 1. In the case of the DPP-M tariff, the critical peak price level was set at 1052% of the Shoulder rate and for the DPP-H tariff the multiple was 2352%. The latter was one of the highest multiples set in any CPP tariff worldwide. The "shock" price of AUD2.00 per kilowatt-hour provided a stimulus for customers to manage or reduce consumption during peak events.

Results

Some initial results with the DPP-H tariff are shown in Figures 3 and 4.

Demand decreased significantly during the critical peak period, but increased after the end of the period. On 22 February 2007, the reduction in peak demand was lower than on 11 January. This was probably because the temperature on 22 February was lower and therefore there was less discretionary load available (e.g., from air conditioning) that could be reduced.

Figure 5 shows the average percentage consumption reductions on a day with a critical peak event, for three situations:

- households with the medium DPP tariff plus an in-house display (DPPM);
- households with the high DPP tariff plus an in-house display (DPPH); and
- households with the high DPP tariff and no in-house display (DPPH-NIHD).

Figure 5 shows that, in summer, DPP tariffs achieved reductions in consumption during critical peak periods equivalent to reductions in total daily energy use on days with a critical peak event of between 5.5% and 7.8%. The majority of this reduction came from energy conservation. On critical peak days, there was not a great deal of shifting of consumption from the critical peak period to shoulder, off-peak or non-peak periods.

The EnergyAustralia study also found that energy consumption during the critical peak period was between 21% and 25% of the total average daily consumption on non-critical peak days.

This article was contributed by David Crossley, Managing Director of Energy Futures Australia Pty. Ltd and Senior Advisor at The Regulatory Assistance Project. For more information on this case study and others, visit DSM Task 15, Network Driven DSM.

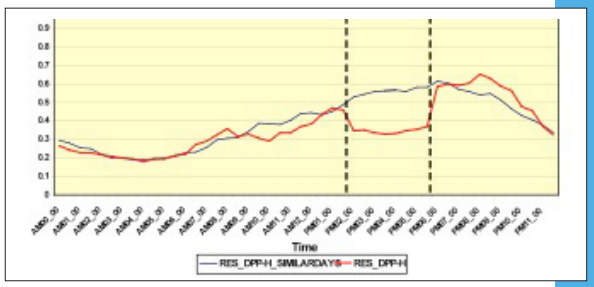

Figure 3. Impact of 11 January 2007 CPP Event in the EnergyAustralia Pricing Strategy Study.

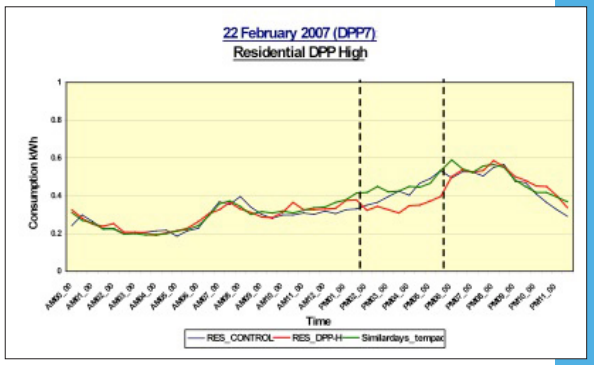

Figure 4. Impact of 22 February 2007 CPP Event in the EnergyAustralia Pricing Strategy Study

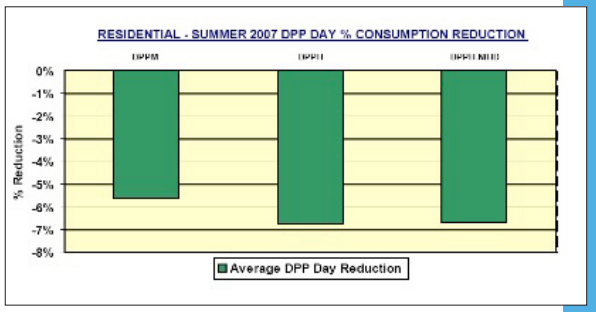

Figure 5. Average Reductions in Consumption on Days with a CPP Event in the EnergyAustralia Pricing Strategy Study.

new member *from page 1*

physical characteristics of copper. Copper is a key material for realising this transition. The high electrical conductivity of copper is a favourable attribute for the construction of renewable energy systems and the manufacturing of energy efficient motors, transformers, and cables. Copper is also a highly durable material and is 100% recyclable into new copper of the same quality as that of a device's end-of-life.

ECI has created Leonardo Energy (LE) with the aim of accelerating the transition to a sustainable energy economy. This information platform serves sustainable energy professionals and provides free education, training, and the comprehensive exchange of expertise. It is also active in various standardization committees and provides regulatory advice. The extensive network of professionals that LE has built up will now be at the disposal of the DSM Programme to improve its outreach. Likewise, LE will profit from the knowledge and insight in DSM-related matters that other participating stakeholders bring to the Programme. "We are looking forward to a fruitful collaboration", concludes ECI's Representative Hans De Keulenaer.

Chairman's Note *from page 1*

be made, possible test sites and estimated costs. But when we talk about energy efficiency we get stuck on phrases like "it has short payback periods" and "it makes a lot of sense to be efficient". I won't go as far as stating that no attempts have been made to tackle the problem with a systematic approach; including efficiency in energy policies is often discussed. A good example is the 2012 USA Environmental Protection Agency's (EPA) *Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans*, which offers a systematic approach to include EE. But like the European Energy Efficiency Directive, it stops as soon the M-word peers around the corner.

By using labelling and building codes we are taking the first steps, but then we refuse to mention what really has to be done, we have to set Mandatory goals. That is the missing M! Then, and only then we can develop the instruments and technology to realize our goals. We don't need a lot of new bright ideas. Instruments such as green financing, domotica (IT playing a smart role in the daily household), energy services, integrated resource planning and supplier obligations are all out there. Some of these instruments have been well studied in this Programme, as well as the social and behavioural attitude towards them and we are learning more on how to sell them and make them acceptable every day by including social and behavioural knowledge in our work. The M as in Market we know, and yes it is powerful, but not enough. M (the market) is necessary, but not sufficient for the problem to be solved.

The assumption that energy efficiency is free because it often has a short payback time is a mistake. The reality is that energy efficiency will cost us billions, if not trillions. And yes, it will save us trillions if not quadrillions, but energy efficiency is still for many investors a great unknown. This is why we need a roadmap for them (and us) to follow. One that gives us a bold figure what we're facing if we want to mine the known energy efficiency gold. Yes, only if the M-word, Mandatory, is in the scope of this roadmap, will energy efficiency become more then the next hype. It will offer the IEA technology network a matrix to speed up research and implementation of methods and technology. With our Programme in the vanguard.

Rob Kool
Chair, IEA DSM Programme

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