

A word from your president



Too Many Green Schemes?

Over the past few years we have seen governments introduce numerous complex “green” schemes into the electricity mix. In NSW I can count five (5) separate schemes. The Commonwealth government has the Large Scale Renewable Energy Target Scheme (LRET) and the Small Scale Energy Renewable Scheme (SRES). In NSW we have the NSW Greenhouse Gas Abatement Scheme (GGAS), the NSW Energy Saving Scheme (ESS) and hidden in NSW Network Service charges is the “Climate Change Fund”. In addition to these schemes we have generous solar rebates across most states also adding to electricity costs. No doubt there are many other schemes across the country that I’m unaware of.

The obvious question is why do electricity customers have to pay for so many separate well meaning schemes? Are they all effective? Are we getting value for what we are paying as customers? Some of the schemes are already very expensive and some are pre-programmed to ramp up in cost due to ambitious targets such as the 2020 20% renewable energy target.

Most Australian electricity customers are unaware of the reasons for the recent very large price increases. While the green schemes are not the only cost drivers, the large cost implications of these green schemes are now becoming apparent and has to be dealt with. It is time for a full audit and cost/benefit analysis of all these schemes. As an electricity customer I’m very unsure of the specific objectives of these schemes. Is it to save carbon? Is it to conserve our fuels? Is it to cut electricity use? Is it to increase our sustainability? These differing objectives require different policies and approaches. It appears to me that we have lost track of what we are trying to achieve. A thorough cost/benefit analysis would weed out the less effective schemes and focus attention on what the objectives of all of these schemes should be.

And that brings me to the new Carbon Tax. This will be yet another scheme added on top of all the existing schemes. No one seems to looking at the big picture when it comes to green electricity schemes. If we are locked into a new carbon tax, governments should look at winding back some of the other schemes. We need some clear green objectives, some serious cost/benefit studies and governments that better understand the aggregate cost impacts these schemes have on struggling electricity users. Ineffective schemes need to be eliminated.

My last point is that we need transparency. Hiding green and other costs in electricity bills and pushing them onto electricity retailers and network service providers is no longer acceptable. The green schemes and their individual costs should be listed on all our electricity bills. Customer awareness of these schemes would improve along with a better understanding of the costs and the benefits. More transparency would mean a better informed public able to make better green choices.



Dr Robert Barr
EESA National President



Bulletin 5, October - November 2011
Please email submissions by 14th of October to the Bulletin Editor
Patrick McMullan @ pmcmullan@energy.com.au

Past Events

EECON NSW 2011 Conference and Trade Exhibition : 7 - 9 September 2011, Australian Technology Park, Sydney “ New Technologies in Energy Networks... topping up or tripping over? ”

The one constant in the energy sector seems to be change and the electricity sector is no exception. The news seems to be full of concerns about the introduction of a carbon tax , ongoing rises in electricity prices, aging infrastructure and reliability and the possible merger or even sale of the NSW electricity network businesses.

This in an environment of changing regulatory structures, an emphasis on energy efficiency and sustainability, and an unprecedented public spend by utilities in the electricity sector across Australia to replace aging infrastructure and cope with ongoing growth in energy peak demands.

The challenge for our industry is to work with customers and to be seen as an integral part of the solution to these challenges. At the same time, the growth in demand for electricity is putting pressure on all aspects of supply and delivery, including ageing networks and the supply of skilled resources, equipment and materials.

The major theme of the conference, namely “ New Technologies in Energy Networks- topping up or tripping over” was discussed by a host of key senior industry managers and chief executives in the first plenary session including the MD of TransGrid Peter McIntyre, Col Ussher from Essential Energy, Rod Howard from Endeavour Energy and Bob Simpson from TransPower, New Zealand. All speakers gave insightful and challenging views on the topic. In addition Ben Woodside from the AEMC outlined some of the emerging regulatory challenges facing the industry.

Then in the company of one hundred and seventy fellow utility members there was one and a half days of industry learning with current energy concerns and technology discussed. Industry experts provided topical information and encouraged discussions on such topics as:

- » Power quality issues in the brave new world
- » Smart grid applications and intelligent networks ,
- » An update on renewable projects for large scale generation
- » Large ambitious projects including carbon capture and sequestration in Australia ,
- » Telecommunications and electricity networks,
- » Innovations in substation design ,
- » Cables, poles and wires technologies
- » Recent disasters (fire and flood) and their implications for networks
- » Operations control and earthing developments
- » Energy efficiency , Demand Side Management and customer integration.

Two extra technical sessions were added to the conference program and these were well received. All sessions were well attended with many questions raised and answered. The prize winning presenters at the conference were Trevor Whitehouse from Essential Energy - member prize and Peter Whelan from United Energy- non member prize.

The conference finale was another plenary session which looked at international electricity system failures and the role of renewables in these scenarios. This was of great interest to the young engineers attending [a group whose numbers are steadily increasing at the conference] as dealing with renewables on a large scale is the future they will be inheriting.

The conference was held at the larger venue of the Australian Technology Park, Eveleigh and some 20 organisations exhibited their wares. The standard of exhibitions was very high as was the interest shown by all attending. The exhibition is a key part of the conference so all were pleased with its success.

The very popular and successful conference dinner was hosted by Schneider Electric.

Finally, we were fortunate to enjoy substantial sponsorship of the conference from our longstanding supporters and corporate members. Ausgrid, Endeavour Energy, Essential Energy and TransGrid took up Gold Sponsorship. Wilson Transformers were the Compendium and Pen sponsor.

The next NSW EESA Conference has already been set for the 14-16th November 2012 at the same venue, namely the Australian Technology Park, Eveleigh.

SAVE THE DATE 2012:
EECON QLD 2012 Conference & Trade Exhibition
 26th & 27th July, Brisbane Convention Centre
EECON NSW 2012 Conference & Trade Exhibition
 14th - 16th November, ATP Sydney



See the last page for conference photos...

News and Issues from around the Industry

Technology Emerge(MIT) - GE Invests in Solar Thermal Company

The company thinks adding solar-thermal technology to its natural-gas plants will make them run more cheaply and efficiently

GE has agreed to invest up to \$40 million in eSolar, a California-based developer of large solar thermal power systems. The investment follows a licensing agreement that GE struck with eSolar in June that will see the two companies supplying technology that combines solar-thermal and natural-gas power systems. The hybrid technology reduces carbon emissions and pollutants that would otherwise come from a stand-alone natural-gas plant.

GE wants to package eSolar's solar-thermal technology, which uses a large field of mirrors to focus the sun on a central tower to produce steam, with a new line of natural-gas plants known to as "combined cycle" systems because they capture their own waste heat to power a steam cycle. This process increases the plant's operating efficiency. The combined-cycle plants achieve up to 61 percent efficiency and use a new type of gas turbine that can more quickly adapt to the variability of some renewable energy sources, such as solar.

Adding eSolar's technology could boost that efficiency even further. Its precisely positioned mirrors achieve temperatures of up to 580 °C and produce enough heat to turn water into steam. When the sun is shining, the steam augments the steam cycle of GE's natural-gas plant, increasing overall plant efficiency to around 70 percent.

Such hybrid facilities, called integrated solar combined-cycle plants, are considered one of the most economical ways to introduce solar energy to a country's power mix. This is especially true in Africa, the Middle East, and the sunnier parts of Europe and the United States, where GE and eSolar plan to focus their sales efforts.

Integrating solar-thermal technology with gas plants means they can share the same steam turbines, generators, and switch gear, potentially cutting the cost of solar thermal in half, according to Justin Zachary, a solar thermal expert with Bechtel. "This is a natural fit," says Zachary. But he says there is still plenty to learn. "It will take some time to prove the current technologies," he says. "The integration of the two systems in terms of controls and water quality still represents serious challenges."

Areva and Alstom, both of France, and Germany's Siemens have made similar investments over the past two years, and each have a hybrid solar-gas plant offering. There are several integrated solar-gas plants under construction in North Africa and the Middle East. GE's first project is a 530-megawatt plant in Turkey that will include 50 megawatts of eSolar's solar thermal technology. The project, expected to be operational in 2015, will also integrate 22 megawatts of wind energy.

Latest energy technology roadmap releases.

The potential exists to achieve at least a tenfold increase in the production of heat and power from geothermal energy between now and 2050 according to the Geothermal Heat and Power Technology Roadmap released on 14 June by the IEA. The report emphasises the need for economic incentive schemes, the removal of current regulatory barriers, and the development of publicly available international resource and technology databases. The report also calls for significantly increased research and development funding, as well as the creation of at least 50 additional pilot plants over the next ten years. Another recent release in the roadmap series is Energy-efficient Buildings: Heating and Cooling Equipment which shows how to achieve dramatic energy savings in the buildings sector by 2050. Much of these savings could be achieved rapidly as the required technologies are already available and because heating and cooling equipment is typically replaced every 7 to 30 years unlike the buildings themselves, which may last 30 to 100 years or more. To consult these and all past roadmaps in the series visit the IEA Technology pages.

CERT on the move. The first-ever meeting of the IEA Committee on Energy Research and Technology (CERT) to be held outside IEA headquarters, took place in Dublin on 7-9 June 2011. Hosted by the Sustainable Energy Authority of Ireland (SEAI) the meeting included a site visit to Ireland's first Sustainable Energy Community project in Dundalk (Dundalk 2020). Here local authorities are working with business, residential groups and state agencies to create dynamic networks, with the benefits enjoyed leading to a greater sense of local awareness and engagement, and greater energy autonomy for the community. Currently there are plans to partner with six other local authorities to support the development of similar sustainable energy communities. For more information visit the SEAI website.

Also on the agenda was a visit to an Irish energy technology company that designs and manufactures marine turbines to generate energy from tidal streams. It has been estimated (Source: UK Marine Foresight Panel) that if less than 0.1% of the energy available in the oceans could be captured and converted to electricity, it would satisfy the present global demand for energy more than five times over.

Free newsletters from IEA programmes.

IA-HEV The Road Ahead – July 2011-1 – from the IEA Hybrid and Electric Vehicle Implementing Agreement (IA-HEV).

EMSA Newsletter – No 2/2011 – from the Electric Motor Systems Annex of the IEA programme on Efficient Electrical End-Use Equipment (4E).

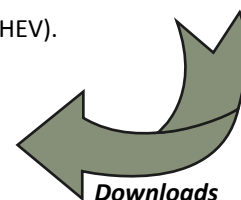
IEA Bioenergy News – Volume 23, June 2011 – from IEA Bioenergy.

IEA Bioenergy Task 34 Newsletter – June 2011 – from the IEA Bioenergy Task on Pyrolysis.

IEA HIA News June 2011 – from the IEA Hydrogen Implementing Agreement (IEA HIA).

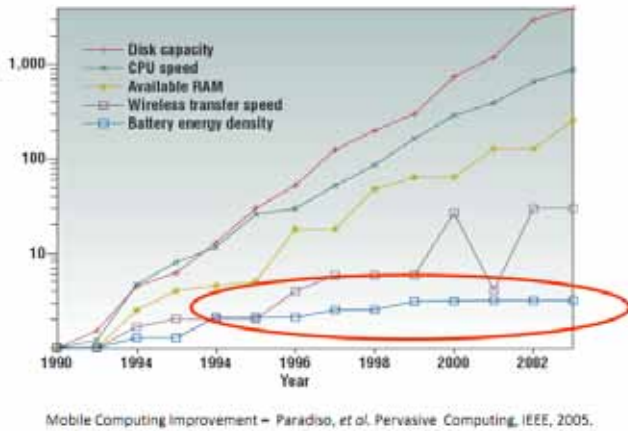
OES-IA Open Bulletin – May 2011 - from the IEA Ocean Energy Systems Implementing Agreement (OES IA).

ENARD Newsletter – No 10, May 2011 – from the IEA Electricity Networks Analysis, Research and Development programme (ENARD).



News and Issues from around the Industry

MIT Technology news



Why Your Battery Life is Terrible, in One Handy Chart

Not every technology is on an endlessly compounding growth trend approaching some kind of technological singularity

The seemingly intractable problem of how to increase the energy density of batteries means that researchers have begun in earnest to think about abandoning them altogether. In other words: How can we harvest energy from sources outside of our devices, whether it's powering our smart phones with **ambient light**, or running large-scale deployments of wireless sensor networks on vibrations and the movement of our bodies. The average human expends between 100 and 200 watts of power when exercising vigorously, but your iPhone can only accept up to 2.5 watts when charging. Somewhere, somehow, there's got to be an inexpensive and reliable way to connect these two realities

MIT - Technology Emerge

China Reveals Solar Sail Plan To Prevent Apophis Hitting Earth in 2036

Apophis is a 46 million tonne asteroid that will pass within a hair's breath of Earth in 2029. However, Apophis's trajectory is likely to take it through a region of space near Earth known as a keyhole that will ensure the asteroid returns in 2036.

Nobody knows how close Apophis will come on that pass. But if there's a chance of a collision, we'll have only 7 years to work out how to avoid catastrophe.

Today, Shengping Gong and pals at Tsinghua University in Beijing say they've come up with a plan that will ensure Apophis never returns to Earth on this timescale.

They point out that keyholes are tiny, in this case just 600 metres wide. So deflecting Apophis by only a small amount in the near future will ensure it misses the keyhole and so cannot return to Earth.

There are various ways to deflect an asteroid. Gong and pals say their preference is to use a solar sail to place a small spacecraft into a retrograde orbit and on collision course with Apophis. The retrograde orbit will give it an impact velocity of 90km/s which, if they do this well enough in advance, should lead to a collision large enough to do the trick.

Putting a spacecraft into a retrograde orbit about the Sun using little or no fuel is a pretty neat trick by anyone's standards.. The Chinese team's calculations demonstrate the point. They show that a 10 kg sail in retrograde orbit, that hits Apophis a year before 2029, would deflect it enough to miss the keyhole, thereby eliminating the chance that the asteroid will return in 2036.

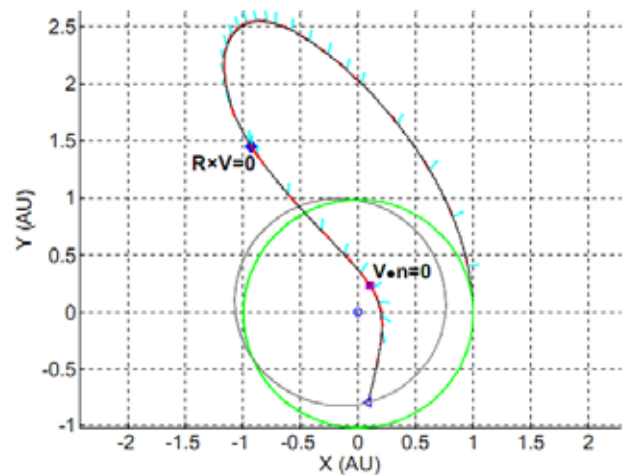
And such a mission ought to be relatively cheap and relatively easy to deploy.

That sounds easy enough. In practice, however, threading this camel through the eye of a needle will be extremely tricky. There are all kinds of variations in the solar wind that could send such a spacecraft wildly off course.

It also requires a huge sail that will be difficult to unfurl and also liable to damage during the course of the journey, which will itself take years.

Then there's the structure and make up of Apophis, which is a complete mystery. Without knowing the material properties of the asteroid, it's impossible to determine how the impact will affect it.

So there's a little more work to be done in Beijing before this plan can get off the ground.



International Snippets from around the Industry

Perry Sioshansi in EEnergyInformer writes that Exxon Acknowledges Decline In Oil's Supremacy

You don't have to believe in peak oil theory, but one look at the accompanying graph says all you need to know about the subject. Despite investing enormous sums of money and going to great lengths in far corners of the Earth, Exxon Mobil Corp., the world's largest publicly traded oil company, cannot find enough oil to maintain, let alone increase, its oil reserves. The company recently reported that for every 100 barrels of oil pumped out of the ground in the past 10 years, it could only find 95 new ones.

And Exxon is not the only oil company facing this conundrum. Nearly all oil majors are facing similar challenges in maintaining – let alone increasing – their reserves. In an internal document, Peter Voser, the CEO of Royal Dutch Shell PLC, for example, recently acknowledged that as early as 2012, Shell would produce more gas than oil – a significant milestone for an oil company.

Call it what you may, it is happening and very few experts see a way around it. The simple explanation may be that the days of easy oil found in large fields in accessible locations may be over. There is still plenty of oil left to be found, but it will most likely be in smaller fields, in less accessible locations, and at higher extraction costs.

The good news is that there is plenty of natural gas, and at least in Exxon's view, it will grow to replace coal as the second biggest source of global energy by 2020. That is a lot faster than many others, including the International Energy Agency (IEA) and the Energy Information Administration (EIA) are projecting.

IEA does not see the crossover to occur until after 2035 – a rather different perspective. Perhaps Exxon is ahead of the game or knows something the others have not figured out yet.

One explanation is the emergence of unconventional gas. Bill Colton, Exxon's VP for Corporate Strategic Planning, said the company recognized the growing significance of shale and other unconventional types of gas as early as 3 years ago and this has been reflected in the company's longer-term forecasts.

The conventional wisdom is that the new technologies that have resulted in discoveries of vast new resources of gas at reasonable cost is a game changer with long-lasting impact on global energy resources. The successful application of the so-called fracturing technologies, so far limited to North America, is expected to be transferable to other parts of the world. Companies with the expertise are intent to try it in Asia, Europe, Australia and elsewhere where the geology is favorable.

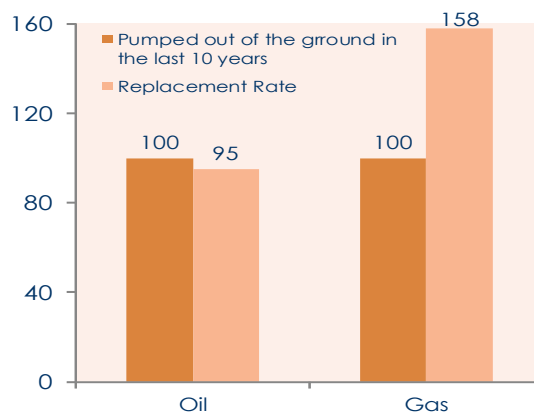
In its latest annual energy outlook, Exxon reckons that the demand for natural gas will grow 60% between 2005 and 2030 while coal demand will grow at a more modest level. By 2030, Exxon projects oil supplying 32% of global energy demand with natural gas supplying roughly 26%.

For an oil company, Exxon must be praised for its analysis of alternative transportation fuels. It sees a decent size market developing for hybrid and all electric vehicles with a noticeable penetration in North America, Europe and China. This is another acknowledgement of the growing competition for oil – especially with oil prices rising as they have been.

The most stunning feature of Exxon's latest annual outlook, however, is a rather coherent discussion of greenhouse gas (GHG) emissions – a distinctly new twist for the oil giant. It points out that at current growth rates, by 2030, per capita emissions in China will be nearly equal to those in OECD Europe. China is clearly catching up with the West in more than one way.

Looking for oil, finding more gas

Replacement rates for oil (left) and gas (right) for Exxon during the last decade*



* The chart shows that for every 100 barrels pumped out in the past decade 95 new barrels were discovered (left). By comparison, for every 100 cubic feet of gas, 158 units were discovered (right) Source: ExxonMobil

International Snippets from around the Industry

TheStar.com TYLER HAMILTON, ENERGY REPORTER

Get a thousand bees together and something remarkable happens. They communicate with each other using a simple language. They co-ordinate. They organize. They exhibit behaviour that suggests, well, that they're working through problems. Just as interesting is that there's no single bee giving orders from central command. Bees just miraculously figure things out from what appears to us as chaos.

The way the bees come together as part of a larger, seemingly more intelligent collective is an example of an emergent system – a controversial area of study that's sometimes called "swarm logic." We see it with crickets, with ants, with all kinds of animals, and now a Toronto-based company called Regen Energy is applying the concept of swarm logic to the area of energy management.

Regen has developed a wireless device that allows major electrical appliances in a building to communicate with each other at a very basic level, with the goal of minimizing how much power these appliances collectively use at a given point in time. The devices are attached to power-intensive equipment that cycles on and off, such as air conditioners, compressors and pumps.

"The devices broadcast wirelessly to each other saying, 'Here's what's going on with me, what's going on with you?' and every 15 minutes they make decisions. They ask, should I be on or should I tell my load to back off and come on 15 minutes later?" Now, the approach doesn't necessarily achieve energy conservation. After all, the appliances still need to operate for a certain number of minutes each hour to achieve their purpose, such as cooling or heating.

But they also don't need to be on at exactly same time. By making sure the fewest number of appliances are operating during a given minute, Regen's wireless devices help building owners smooth out their electricity consumption. Regen claims that its system, on average, can reduce a building's peak load by 20 to 30 per cent.

David Chassin, a staff scientist in the energy and environmental technology division of Pacific Northwest National Laboratory, in Richland, Wash., is a recognized expert in emergent systems who sees tremendous potential for managing the electricity system – whether it's designing selfhealing grids or making the most efficient use of limited transmission capacity.

"If you let the devices figure it out for themselves, yes, some of them make mistakes, but on average the mistakes wash out. The larger number of participants, the more they get it right, and that's what this type of emergent system does."

He says when numbers are large – that is, hundreds of thousands of appliances operating on the grid – a central command system begins to break down. Still, engineers tend to assert that the top-down, central control model is superior. "My response is that you can do it, but you're going to spend a lot of money and it will only work in the right conditions. It won't have the flexibility to work in the real world," explains Chassin.

"If there's a big change, if something dramatic happens, these engineered systems fail dramatically. Whereas these emergent systems tend to be much more robust in the long run, and tend to survive these big disturbances a lot better."

Upcoming Events

The Electric Energy Society of Australia in cooperation with Prescient Associates Ltd presents...

Networks for Distributed Generation Course Speaker: Geoffrey Hensman

Course Synopsis

Most countries now have targets to increase electricity generation from renewable sources resulting in substantial increases in alternative renewable supplies. These may be wind turbines, photovoltaic panels, diesel power, electricity from waste, commercially-sized biomass fuelled systems providing electricity and heat and micro-generators for home electricity generation, heating and hot water.

With more alternative sources being connected to national electricity distribution and transmission networks, there is a growing need to ensure compliance with safety, quality, continuity and reliability standards. Whether these new connections are for standby or running in parallel with the utility or, indeed, local use it is important the relevant safety standards are understood and are being applied.

Formerly the UK had a number of engineering standards relating to the connection of distributed generation to the public electricity network and, recently, these have been combined in a single standard, G59/2-1. Electricity utilities concerns are, principally, related to the safety, quality and continuity of supplies to their customers and, quite naturally, they are wary about generator connections compromising these standards. Whereas the commercial considerations for a connection of generators will vary from country to country the issues relating to the technical connection of generators will be based on the capacity of the network, its resilience to instability, fault level and generator and network protection considerations.

The experience gained in the UK when connecting generators to public networks will be discussed and the key issues noted above will be illustrated by three detailed case study examples. Recommendations for the connection of domestic-scale distributed generation up to 16A per phase in parallel with public distribution networks will also be discussed.

Sydney: 8 & 9 November, Amora Hotel Jamison Sydney

Brisbane: 16 & 17 November, Novotel Brisbane

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