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Work stalls while government treads water

The Integrated Resource Plan 2010 is soon to be a reality. And that is good news, I suppose, for anyone involved in the business of making electricity.

What bothers me about the document is that nothing seems be cast in stone other than the continued building of Medupi. There is some doubt over Kusile, just as there is doubt over the future of the nuclear build programme and over the contribution that renewable energy technologies will make.

There is also now some discussion over the tariffs that will be applied by the NER, which recently reduced the tariffs applicable to wind farms and is looking at possibly reducing the tariffs on other technologies as well. At the same time, Eskom has warned that it may not be able to keep the lights on over the entire winter period and that this pattern will continue for 2012 and probably 2013.

But exactly what plans it has to increase power generation capacity (by buying back generator capacity installed in major shopping centres and office blocks) remains a mystery.

Eskom says it will do so but it has yet to make a firm statement on the rates that it will pay for this electricity. And no details are contained in the IRP2010.

There is simply nothing concrete contained in the IRP2010 and that bothers me, just as it bothers thousands of engineers who are expectantly waiting for the government to unleash billions for infrastructural development.

South Africa's engineering community is in crisis: promised government work has not materialised, the major flood of development from Eskom has been largely limited to projects negotiated several years ago and the attendant infrastructure development (for villages, community centres, mass housing and so forth) has not transpired. Add to this the complication that not even the provinces have been able to spend their full infrastructural development budgets over the year, and the level of the crisis becomes apparent.

And the government appears to be doing nothing concrete to solve the problem.

Sure, Pravin Gordhan has stopped the allocation of the funds earmarked for provincial infrastructure – and has criticised the respective provinces for their tardiness – but that doesn't resolve the problem; the under-spending continues.

What can be done to resolve this?

At this stage I can see no real solution because the provinces do not have the manpower to compile or award the tenders – and the procedure is cumbersome. Eskom does not have a blanket mandate to go-ahead with any new projects and is working purely on the old ones and the municipalities do not have the ability to perform any better than the provinces.

And this is a deeply distressing situation for anyone who relies on the government sector for the bulk of their business. For those who rely on work from the private sector, the picture should be rosier but the truth is that the economic woes facing this country are such that there is little or no real work being done by the private sector.

So is it surprising that skilled engineers are looking to other parts of the world for work?

And they're doing so not because there is no work to be done but because work is not being awarded. And that's debilitating for a country that has such a shortage of engineers.

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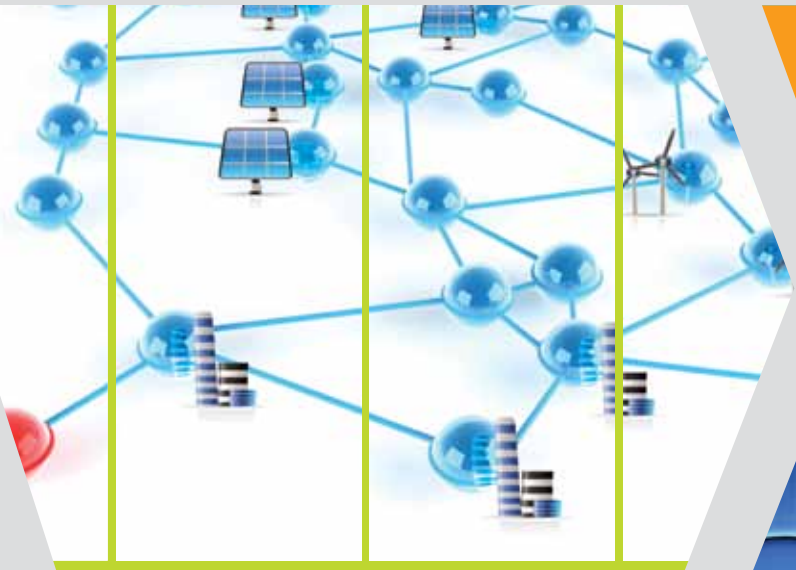

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The Integrated Resource Plan 2010

The Integrated Resource Plan 2010 (IRP2010) has been accepted by the Cabinet of South Africa's African National Congress and is awaiting promulgation. Once promulgated it should become the blueprint for South Africa's energy resources between now and 2030. Paddy Hartdegen reports.

What we know about IRP2010

As a plan it has been welcomed by many observers who participated in the process that led to its formulation: the first round of public participation started in June last year and led to the Revised Balanced Scenario that was published in October.

This scenario was based on what the document calls 'cost-optimal solutions' for the new power generation building programme that includes the direct cost of building new plants and then balancing this against qualitative measures such as job creation. The second round of public participation was held in November and December last year and resulted in several changes being made to the assumptions contained in the draft IRP.

The main change involved separating renewable energy technologies into components comprising solar photovoltaic (PV); concentrated solar power (CSP) and wind options.

It included adjustments to what the RBS refers to as 'learning rates' and cost adjustments of up to 40% for the newer nuclear units. The changes, along with some additional cost-optimal scenarios, resulted in the Policy-Adjusted Integrated Resource Plan that included:

- Bringing forward the installation of renewables to accelerate local industry.
- Accounting for some uncertainties associated with the costs of renewables and fuels.
- Maintaining the goal of emissions equivalent to 275-million tons of carbon dioxide after 2024.
- Maintaining levels of energy-efficient demand-side management.

These changes make-up the guts of IRP2010 so, in addition, to the build programme that is underway at the moment, the IRP2010 sets the following:

- The existing building programme will increase generation capacity by 10GW.
- New coal-fired power stations will contribute an additional 6,3GW to the electricity grid.
- Nuclear power will contribute 9,6GW.
- Renewables will provide a huge 17,8GW.
- Other resources will add 8,9GW.

From current generation levels South Africa can look forward to increasing its electricity capacity by 52,6GW over the next 20 years. It's an impressive blueprint for achievement but like any plan it seems to be long on goals and short on detail.

IRP2010 firmly asserts that it is 'a living plan' to be revised and updated as circumstances change. Thus the IRP2010 is rather quaintly referred to as the 'first iteration', which covers a limited period for new capacity development (from 2010 to 2013) and will be followed by a more inclusive process to develop the full plan.

A number of elements from the RBS have been included in the final draft of IRP2010. These include:

- Reducing carbon emissions.
- Uncertainties about new technologies such as costs and lead-time to build.
- Water usage.
- Localisation of technology and job creation.
- Integration of South Africa's regional development goals and responsibilities.
- Security of supply.

The IRP2010 brings forward the construction programme for renewable technologies and sets out to maintain a stable roll-out so there is an opportunity for localisation of the technologies – in terms of making essential equipment used by them – and for developing the skills that are necessary to support them.

The renewable technologies are not specifically categorised after 2020 so the ruling party has room to accommodate, include or direct alternative renewables to meet any changes that occur in the country's objectives.

Surprisingly, no own-generation or co-generation options have been identified for implementation before 2016 – five years from now – though why this is the case is unclear given that Group Five, for instance, has announced its plans to go ahead with a R5-billion power development and it's just one of a handful of similar announcements.

The co-generation projects are included from 2016 in terms of additional generation capacity but do not include any calculations regarding water usage, emissions or prices. So, many of the assumptions may be incorrect.

In terms of the RBS (and therefore the final IRP2010) the total new build capacity will increase by 809MW in 2011, taking the total system capacity to 45 344MW and the peak demand (net sent-out forecast) to 39 956MW. Demand-side management will contribute to savings of 494MW, made up of:

- 679MW from coal.
- 130MW from 'own build' co-generation projects (unspecified) and 'new-build' co-generation projects, also unspecified.

In 2012 the total new build capacity will go up by 1 103MW increasing system capacity to 46 447MW and the peak demand (net sent-out forecast) to 40 995MW. Demand-side management will contribute to savings of 809MW.

The 2012 figures are based on:

- 303MW from coal.
- 300MW from wind power.
- 100MW from landfill or hydro projects.
- 100MW from Sere (wind).

In 2013, the figures scale up by 2 901MW as a result of a number of projects coming online. The total capacity rises to 49 348MW with the peak demand (net sent-out forecast) climbing to 42 416MW and demand side management savings amounting to 1 310MW. The additional capacity comes from:

- 101MW from coal-fired power stations.
- 722MW from Medupi.
- 333MW from Ingula pumped storage scheme.
- 1020MW from the Department of Energy's open-cycle gas turbine partnership with an unspecified independent power producer.
- 400MW of wind energy.
- 25MW from landfill or hydro projects.
- 300MW from solar PV new-build projects.

In 2014, South Africa's power woes are likely to decrease even further as additional power plants come on stream. The overall forecast for that year is that capacity will rise by 3 021MW to 52 369 MW. The peak demand (net sent-out forecast) is 43 436MW and the demand-side management savings are 1 966MW.

In 2014, the increased capacity comes from:

- 722MW from Medupi.
- 999MW from Ingula.
- 100MW from concentrated solar power.
- 500MW from new-build coal-fired power projects.
- 400MW from new wind projects.
- 300MW from new solar PV projects.

By 2015 the forecast for South Africa's power capacity increases to 2 564MW, taking total capacity levels to 54 933MW and the peak demand (net sent-out forecast) to 44 865MW. Savings of 2 594MW are achieved through demand-side management. The new capacity comes from:

- 1 444MW from Medupi.
- 100MW from CSP.
- 500MW from co-generation new-build coal-fired power stations.
- 400MW from new-build wind power.
- 300MW from solar PV.

However, in 2015 180MW of power will be lost because of decommissioning of old plant.

Looking at the final year of the five-year plan, the total capacity increases by 1 432MW to 56 365MW with a peak demand (net sent-out forecast) of 45 786MW. Savings of 3 007MW are achieved through demand-side management and 90MW is lost through the decommissioning of old plant.

The IRP2010 declares that by 2017, 2 968MW will be added to the grid with Kusile contributing 1 446MW and Medupi adding another 722MW. New wind and PV power will add 800MW to the grid while demand-side management initiatives will save 3 420MW.

In 2018 the forecast is limited to another generator coming on stream at Kusile to provide 723MW, with wind and PV contributing 800MW and in 2019 the picture is much the same with new power from Kusile adding 1 446MW to the grid, wind and PW adding 800MW, closed-cycle gas turbine contributing 237MW and new coal power contributing 250MW.

When Kusile is fully operational it will add 723MW to the grid while other coal sources will add 250MW, closed-cycle gas turbines will provide 237MW and new wind and PV sources will add 800MW. By then South Africa's total energy capacity will have reached 65 362MW with peak demand (net sent-out forecast) reaching 52 719MW and demand-side savings contributing 3 420MW (the savings are identical to the previous year).

The nuclear build – which the IRP2010 says it is committed to – only starts post 2023, and then comes on stream at the rate of 1 600MW per year. Whether this will happen remains to be seen as with long term plans of more than 10 years many things can change.

The plan forecasts that between 2022 and 2030, 5 750MW of diesel-powered, open-cycle gas turbines will be commissioned and 10 600MW will be decommissioned. Similarly, renewable energy including wind, solar, CSP, solar PV, landfill, biomass and other technologies, will contribute 7 200MW.

Again who knows whether this figure is accurate or just educated guesswork?

In summary, the IRP2010 forecasts that by 2030 the total generating capacity from South Africa will rise to 89 532MW with new capacity of 56 539MW being added through existing commitments and 42 539MW being added in new capacity on which no commitment has yet been made.

The IRP2010 says that regulations require a feasibility study to be conducted on the potential capacity identified in the document and recommends that this be undertaken as soon as possible.

Looking at the actual commitment, however, the picture becomes somewhat clouded. In terms of new build options, nothing at all is added to the grid until 2012 when 300MW in solar PV is included.

In 2014, 500MW in new coal generation is added along with 400MW of wind and 300MW of solar PV. In 2015 those figures are repeated and in 2016, 400MW of new wind power is added along with 100MW of CSP and 300MW of solar PV.

So, the new build commitment outlined so far comes to a total of 4 100MW over the next five years. This figure pales into virtual insignificance when compared with those figures contained in the

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Watt's Going On?

overall plan, which outlines capacity increasing by significantly more than that.

Worse still, of the 4 100MW defined as new build, 3 000MW needs to have a firm commitment from government immediately if it is to be achieved and a decision on the balance of 1 100MW means a decision must be made before 2012.

Moreover, there are several veiled warnings contained in the figures. The first is that high-voltage infrastructure has to be built to accommodate the new power being generated.

The second is that a commitment for gas-fired power is needed sooner rather than later because gas infrastructure takes a long time to implement.

The final warning is that the entire electricity grid might need to be upgraded to cope with the increased capacity of the power plants.

In essence, the IRP2010 concludes that:

- A commitment to the nuclear fleet is given based on government policy and the reduced risk exposure to future fuel and renewable costs.
- A solar PV programme is recommended and should be pursued.
- The acceleration of the coal options should be allowed with an understanding of what impact this will have on emissions targets and carbon tax policies.
- The roll-out of renewable energy options should be accelerated and done in such a way as to derive benefits of localisation from these technologies.
- A commitment should be given to the construction of closed-cycle gas turbines options for 2019-2021 and the resulting import infrastructure to support this option should be made to improve security of supply and provide a flexible generation alternative.

The IRP2010 appears to be rather vague as a blueprint. It's not the sort of document you can pick up and say "In 2013, South Africa will build new power plants in X, Y and Z location at a cost of A, B and C and this will be done on the following basis, with finance from the following sources."

If you want those kinds of answers, you will have to wait for further announcements from government. The much more worrying factor, for me anyway, is that there is no clear pattern on how South Africa will finance its new generation capacity, which leads me to:

What we don't know

The IRP2010 provides a glowing review of how electricity consumption will increase and how, through a combination of new-build projects, with independent power producers and existing commitments, South Africa will be able to meet all its power needs and even help its neighbours too.

It paints a picture of significant demand-side management savings and presumes that all consumers are naturally going to reduce electricity consumption, favour renewable options and move towards greater frugality when it comes to using (or wasting) electricity.

But while this picture makes for good reading, the reality is that it is filled with conjecture rather than specific commitments.

My major concern is that much more has been left out than has been answered. The first point is that the report is remarkably vague about funding.

Already costs for the Medupi and Kusile power stations have rocketed and Eskom's expenditure has soared to more than R375-billion and that's just for two of the power stations and return-to-service projects of old ones.

How will the new capacity and new-build options be financed? Is Eskom meant to use its own resources? Are independent power producers expected to inject huge amounts of capital into the infrastructural development and then wait 20 years for the payback?

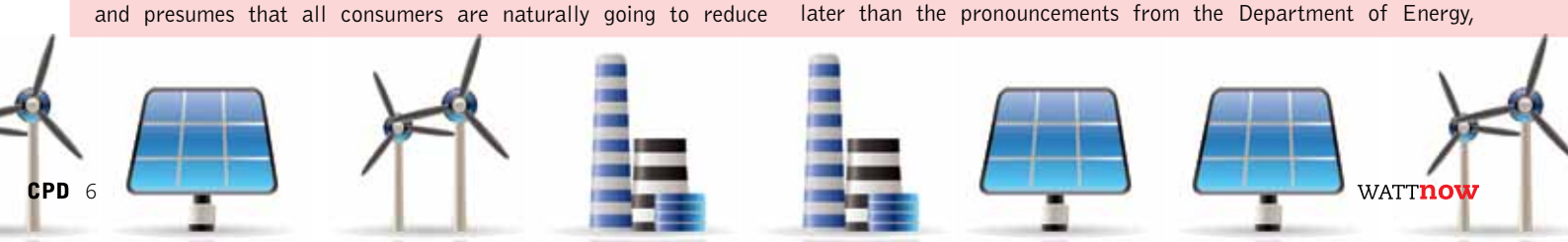
Will the funding options chosen mean that we will see a continuation of huge price increases in the tariffs for the next five or ten years? What will the cost of funding new generation mean to the competitiveness of the economy and the stability of our industrial and mining production? The same question might be asked if we don't go ahead with the building programmes.

Funding has not been addressed at all, but perhaps when the feasibility studies have been completed, it will be addressed then. But let's look at some of the other, slightly more technical specifics:

- Between 2011 and 2016, 10 398MW is to be added to the grid without including any modifications to it, the high-voltage power lines or the distribution networks. We do know that Regional Electricity Distributors have been scrapped and that local authorities and Eskom will control distribution. How is South Africa going to cope with this huge capacity injection without undertaking major maintenance work, without building new transmission and distribution lines or putting in the rest of the infrastructure required to carry the additional capacity?
- Five years later, between 2017 and 2023, a further 10 429MW will be added, placing even more strain on the existing transmission and distribution infrastructure. Where will the money for such infrastructural and maintenance work come from?

Getting down to project specifics, there are numerous reports of new concentrated solar power projects coming on-stream in the Karoo and in Upington. There are announcements from Group Five that it will build a R5-billion solar power plant that will start producing power in 2013. But it will go ahead only if it is selected as part of the country's renewable energy procurement process.

There is talk of a $21-billion solar power park being in operation by 2012 and supplying 5 000MW of power. This power park is not included in the projections. And in 2014 and 2015, several years later than the pronouncements from the Department of Energy,



the IRP2010 shows that 100MW a year will be added to the grid, followed by new build capacity coming on stream in 2016 and adding a further 100MW a year over the five years to 2020.

In a separate announcement, the government has said that it will cut the feed-in tariffs that are paid to independent power producers. The announcement came unexpectedly at the end of March when the National Electricity Regulator of South Africa published a new set of prices.

According to the MEC for local government, environmental affairs and development planning, Anton Bredell, the cost of putting up a wind farm is around R2-billion. Now, he says, Nersa has cut the tariff payable to the power producers, sending the wrong message to potential investors in South Africa's generation capacity.

Worse still, not one of the existing projects has been awarded a 20-year power purchase agreement under the 2009 tariffs and the proposed tariff amendments are likely to make most of the existing projects no longer feasible. The tariffs are meant to encourage investors, not dissuade them.

Referring to renewable energy, the Cabinet has announced that it intends to increase its share from 30% to 42% in the next 20 years. Again this announcement is not reflected in the IRP2010 that Cabinet has just adopted so what does it mean and how will it be achieved?

According to the New Growth Path for development, renewables are expected to generate 17 800MW with 8 400MW from photovoltaics, 1 000MW from concentrated solar power and 8 400MW from wind.

Oddly enough, this doesn't gel with the IRP2010 so it would seem that the New Growth Path for development is embarking on a different strategy from that of the IRP2010.

Government wants about 30% of its new power generation to come from independent producers in terms of the growth plan, but nowhere near that amount is indicated in the IRP2010. Then Nersa cuts the tariffs anyway so it's difficult to make sense of what the government really is doing and planning.

In an entirely separate announcement – one that again highlights shortcomings in the IRP2010 – Eskom has announced that it will spend R53-million on trying to stamp out fraud and corruption in its own ranks. It is partnering with the Special Investigating Unit to do so too.

The IPR2010 does not address how electricity theft in South Africa will be prevented or give any clues as to what sort of savings could be achieved if the police – and other branches of government if necessary – were to prevent illegal electricity connections throughout the country.

Current estimates are that illegal connections are equivalent to the output of a medium-sized power station and while the IRP2010 talks about demand-side management, it says nothing about rooting out fraud, corruption, tender-fixing or even illegal connections. Bear in mind too that Eskom is the wholesaler of electricity and the distribution network is controlled, largely anyway, by the major metropolitan councils, opening an entirely new avenue for further fraud, corruption and bid-rigging.

There is no clarity on the amount of electricity that will supplied to South Africa's neighbouring territories or on what impact this is likely to have on future electricity generation. Some recognition given to power from Botswana and Mozambique in the Appendices of the IRP2010 and they make for interesting reading because it seems that South Africa is largely concerned, on paper anyway, with meeting its own power needs for the future. The reality is that countries such as Lesotho, Zimbabwe and Swaziland certainly do rely on South Africa for their power needs and this is unlikely to change. Once again, the fundamental question of how power will be funded remains unanswered.

The more important unanswered questions cover relatively simple elements:

- The role of IPPs in the future and how they will make money out of providing power without fleecing the South Africa public in the way the tolls road consortium is seeking to fleece motorists around Johannesburg.
- Where will the skills be found? Already South Africa has a critical shortage of electrical engineers and maintenance staff that are so urgently required just to keep the generation wheels turning and the power flowing from your plug point and mine. Where are these skills expected to come from in just three or four short years?

Academics will tell you that it takes between seven and ten years to take an intelligent student with excellent grades in mathematics and science and transform him or her into a working, efficient electrical engineer. Yet in five years South Africa seeks to increase generating capacity by about 10 000MW and says nothing about where the engineers to run these systems will come from. Five years later, another 10 000MW will be added. The students at university today will, in 2021, be productive electrical engineers capable of running and maintaining the new installations, but what will happen in between? "No answer," comes the stern reply from the IRP2010.

So, while some South Africans may believe they can possibly relax, secure in the knowledge that over the medium and longer terms the country should be able to meet its electricity requirements, the truth of the matter is that this is largely conjecture if we use the IRP2010 as a basis for the any projections.

What is known at this stage is that Medupi and Kusile are going ahead; a wind farm is producing power at Darling in the Western Cape; more wind farms are planned and old power stations are being returned to service. More than that we will have to wait and see as the specifics of the IRP2010 leave too many questions unanswered.

The complete IRP2010 document can be download freely off the Internet.

Wedding will be a 'first' for media worldwide

The marriage of Prince William to Kate Middleton will be commemorated by a series of 'firsts' for the media, including the first Royal wedding to be streamed live on the Internet.

It will also be the first to provide mobile streaming solutions and its soundtrack will be released within hours and be available, worldwide, through iTunes stores in various parts of the world. These are just a few examples of the devotion that major media groups have given the Royal wedding including all the television news services. The event is fast becoming the biggest interactive, multimedia, multichannel, cross-platform, 24/7, user-generated, hyperlinked, search-engine-optimised, downloadable extravaganza ever witnessed by the modern world.

American channel NBC's vice president of special and digital media, Mark Lukasiewicz says that audiences throughout the world love the pomp and ceremony of a British Royal wedding and as a result NBC is putting a lot of resources behind covering every aspect of the wedding for every audience, everywhere.

Within days of Prince William announcing his engagement to Kate Middleton, mainstream media around the world had created a special online section on their web pages devoted to the couple and their wedding. The BBC – unsurprisingly – has its own Royal section along with papers such as The Washington Post, the New York Times and locally even IOL's Tonight section, which carry daily or weekly posts of the latest news and gossip from the royal couple.

While digital media are expected to play an important role in the build-up to the Royal wedding, television will come into its own on 29 April and ITV, the biggest commercial broadcaster in Britain has announced that it will start wedding-related programming at 06h00 and continue until at least 16h00 that afternoon.

Only a handful of journalists will be allowed to watch the ceremony in Westminster Abbey in London according to the Abbey's spokeswoman, Victoria Ribbans. However, television coverage will be pooled, with the BBC manning most of the cameras inside the Abbey. ITN, which works with ITV and Sky Broadcasting, will film the procession through the streets of London prior to the wedding and then the procession as it leaves the Abbey for the reception.

Broadcasters from all over the world are sending their own crews to London in the hope of getting some exclusive footage to supplement the pool coverage that will be available to networks around the world – for a fee of course.

At this stage media experts expect that the wedding will not be watched by nearly as many people as witnessed the opening of the Beijing Olympics in 2008. That event attracted about a billion viewers worldwide. According to Kevin Alavy, an analyst at television audience analysis company, Initiative, it will be a big event in the UK and many of the British Commonwealth countries, but in places such as China, South and North America and Eastern Europe it is unlikely to attract much attention other than to be included in various news broadcasts during the day.

Other channels, however, disagree and TLC, a cable company in the United States that is owned by Discovery Communications, plans to provide live coverage to 30 countries around the world. Luis Silberwasser, executive vice president of Discovery Networks International says that this is not just a news event but a brand-defining event for the whole of the Royal family which tends to remain aloof.

The Royal family has set up its own official website and has a digital presence for the Royal wedding on Facebook pages and Twitter feeds. Most of the tweets come from Clarence House, where Prince Charles has his office, and tend to be rather bland with quotes such as "I think they will make a perfect match," supposedly from Prince Harry, William's younger brother.

The Royals have apparently been receptive to the ideas from Universal Music Group to release the soundtrack of the wedding moments after the end of the proceedings via Apple's iStore. Universal will not pay royalties to the musicians but members of the Chapel Royal Choir at Westminster Abbey, the musicians in the London Chamber Orchestra, as well as the fanfare team making up the Central Band for the Royal Air Force will all share in a moment's fame if the soundtrack happens to top the charts for a day or two.

When it comes to drawing a distinct line as to what is, and is not acceptable, the Royals still hold the trump cards. For instance, when Sky put forward a request to broadcast the wedding in full 3-D that included the couple staging a mock wedding at a church near London ahead of the official event, the family rejected their suggestions saying, "Enough is enough".

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Renewables suitable for base-load applications?

According to a report by the World Economic Forum, the global implementation of energy efficiency measures has been extremely low, despite the potential that such solutions have for reducing carbon emissions and introducing energy savings.

The report, produced as a joint venture with Accenture, describes energy efficiency as the cornerstone of plans to meet global energy needs and reduce global warming caused by high emissions of carbon, methane and other gases.

Eskom is looking at a number of solutions to avert South Africa's own energy crisis in the future and aims to secure about 42% of its energy from renewable resources in terms of the 20-year Integrated Resource Plan for 2010 (IRP2010).

According to the World Economic Forum's senior director Roberto Bocca, energy efficiency measures are not being implemented in any significant way and he emphasised that the private sector in markets around the world will have to lead the way when it comes to implementing energy efficiency initiatives.

It seems that in South Africa several private sector companies are committed to using renewable energy resources and Group Five has unveiled plans to build a R5-billion solar power plant in the Northern Cape. The project, with an initial capacity of 150MW may be scaled up to 450MW. The electricity it generates will be fed into the national grid. Group Five wants the solar project to be included in the Department of Energy's renewable energy procurement process.

It is expected that at least 1 000 jobs will be created while the power plant is under construction and a further 80 permanent employees will be appointed to run the plant.

Local content for the concentrated solar power plant will reach about 70% according to Group Five's Rowan Goeller. The company has already submitted its environmental impact assessment to the Department of Energy for the new plant.

In terms of the IRP2010, approved by the Cabinet in March, the Department of Energy and Eskom plan to press ahead with the $21-billion solar power park in the Northern Cape that will eventually supply about 5 000MW of renewable energy into the national grid. The IRP2010 sees about 20% of South Africa's power emanating from independent suppliers.

Base-load renewable energy supplies – the most critical of South Africa's future energy needs – could be viable within the next 20 years depending on the amount of risk that the government and private sector are prepared to take.

This is the view of Energy Minister Dipuo Peters who told an international Power and Electricity World conference in Johannesburg in March that the department intends to intensify its involvement in public-private partnerships and build capacity in the renewable energy sector. She says that Africa faces serious socio-economic challenges as a result of poor electricity supplies and warns that significant levels of investment are needed into all energy resources. High capital costs of renewable energy resources, coupled with the fact that renewable energy is seen primarily as a means to augment power supplies rather than supply base-load capacity, were fast becoming a myth according to various people who attended the conference.

Mainstream Renewable Energy's managing director David Chown said that renewable energy solutions can cost less than the fossil-fuel alternatives such as coal-fired power stations. "It is simply not true that renewable energy sources increase the cost of electricity generation," Chown said. "Renewables can reduce the risk for national energy generation as each unit of wind-generated electricity saves eleven cents when compared with other generation technologies," he added.

According to Chown, a study in Ireland showed that wind power generation in 2011 would reduce the country's cost of electricity by €74-million. He said the current Renewable Energy Feed-In Tariff (Refit) incentives did not need to be amended but should rather focus on the benefits that renewable energy could provide for rural communities, skills development and job creation. A stable Refit environment without any regulatory uncertainty would result in greater agricultural development and job creation, particularly in rural areas.

Other delegates at the conference pointed out that the wind power sector alone had the capacity to provide an additional 40 000 jobs and represented perhaps the cheapest option for local energy generation. It was also quick to implement and deploy.

Early in March the National Energy Regulator published a consultation paper in which it proposed a substantial decrease in the Refit tariffs that range from 7,3% in some technologies to as much as a 41% reduction in others. The changes come ahead of the release of the Request for Proposals for the first 1 025MW of power for phase one of the Refit programme.

Delegates highlighted the fact that government was vacillating when it came to renewable energy projects and the changes to the tariffs published in the consultation paper were evidence of the fact that government had established clear guidelines for the renewable energy sector.

The country also needed to have a stable and firm policy for foreign investment in renewable energy and this was not the case at the moment. This resulted in private sector companies battling to raise the necessary capital for renewable energy projects.

Key barriers for the renewable sector at this stage were said to be access to finance; supporting policies and frameworks from government; access to information; capacity shortages and lack of training.

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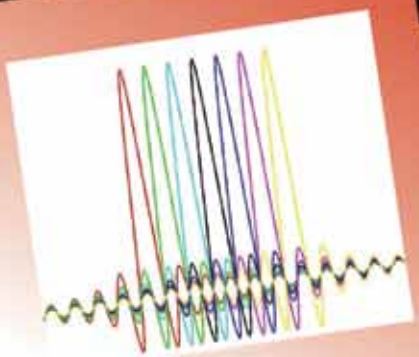

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UNIVERSITY OF JOHANNESBURG

Eskom spends millions to root out corruption

Eskom, working with the Special Investigating Unit (SIU), will spend R53-million to root out corruption and fraud within its ranks. Three key areas, contracts, conflict of interest and general misconduct will be the main focus of its efforts.

Eskom is currently spending about R90-billion a year on procurement of goods and services and the SIU says it has identified a significant number of Eskom employees who have interests in businesses that are currently doing business with Eskom.

The SIU and Eskom have agreed that such conflicts of interest will immediately be investigated. Moreover, scans will be conducted every six months to establish where any employees are benefiting from fraudulent housing subsidies or social grants.

All drivers' licences held by employees will be checked for validity, particularly those for people who use Eskom-owned vehicles.

Eskom says that the process will strengthen its internal audit functions and will include representatives from its own forensic investigations units. According to Eskom spokeswoman, Hillary Joffe, the decision to work with the SIU came about after management's strategic review process.

She says that Eskom wants to position itself as an ethical, well-governed and trusted entity for its stakeholders and that means rooting out all fraud and corruption within the organisation.

energy efficiency @ work

The energy efficiency@work convention and exhibition, the Southern African Association for Energy Efficiency Convention (SAEEC), is the flagship event of the SAEE and annually draws over 60 knowledgeable speakers from across the world to address a niche audience of delegates.

There are great opportunities for exhibitors to display their products, solutions and services to delegates. Attendees have the chance to present case studies, share knowledge and discuss matters surrounding the energy efficiency and related industries by presenting a paper and sponsorship possibilities also exist.

The Southern African Association for Energy Efficiency (SAEE) is a non-profit energy efficiency co-ordinating body and is a chapter of the US-based Association of Energy Engineers (AEE). AEE is widely recognised for its energy certification programmes and has over 13 000 professionals in 81 countries with a network of 71 local chapters world-wide.

The energy efficiency @ work convention and exhibition will be held on 16 and 17 November 2011 at Emperors Palace, Gauteng.

For more information, logon to www.saeec2011.org.za.

Africa needs to **pool** its **power**

Africa needs to pool its energy resources and then use these power pools to provide electricity to a continent that is starved of it. This is according to Musara Beta, chief market analyst of the Southern African Power Pool, addressing delegates at the Power Generation Africa conference held in Johannesburg in March.

He said the need for interconnectivity between countries was fundamental, as this would allow member states to pool resources, share the gains of power, and minimise risks that included droughts and power outages.

Beta said that examples of interconnection were Zimbabwe and Zambia, which both use the water flowing from the Zambezi into Kariba Dam for electricity generation, and Mozambique and South Africa who draw power from Cahora Bassa, also on the Zambezi. He recommended that various Memoranda of Understanding be drawn up between different governments, utility companies and private companies to govern how the joint operations would function, particularly in times of emergencies or when there were energy imbalances.

Power pools facilitated the sourcing of power cheaply and resulted in increased security and reliability of supplies, said Beta. He went on to say that they provided an improved environment for private sector investment, a critical element within the overall African context.

The East African Power Pool is expected to be fully operational later this year and, at this stage, comprises Kenya, Tanzania and Uganda although more countries are expected to join.

There are cross-border power sharing deals in place, mainly with Ethiopia which has extensive hydro-power potential that is not being used. Other countries that may join the EAPP include the Democratic Republic of Congo, Rwanda and Malawi.

According to Titus Mbathi, chairman of Kenya Electrical Generating Company, the country is currently spending about 3,4% of its gross domestic product ($130-million) on geothermal drilling to accelerate geothermal developments in that country.

It has also established the Kenya Electricity Transmission Company, which will be responsible for building new transmission lines and extending the national grid throughout the country. The Kenya government has committed $190-million to the company for the current financial year.

Germany to close its nuclear plants

Germany intends to phase out all of its eight nuclear power plants by 2020 according to the country's deputy environment minister, Juergen Becker. This decision was made in the wake of the Japanese earthquake that damaged four nuclear plants in that country.

The planned phasing out of nuclear power will have serious implications for the four big utility companies in the country, namely RWE, E.ON, EnBW and Vattenfall, which are expected to lose hundreds of million of Euros in profits every year.

The country's utility industry association, BDEW says that Germany will become a net importer of power, mainly from France where the state-owned EDF currently operates 58 reactors including the oldest plant at Fessenheim on the German border.

Becker told delegates at the International Renewable Energy Agency's annual meeting in the United Arab Emirates that the country has been importing about 50GWh of power a day since an order by the German government to shut down some reactors. However, German Research Foundation president, Matthias Kleiner says that it makes no sense to shut down the country's nuclear power plants and then import nuclear energy from abroad.

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To register and view information about the SAEEC2011 logon to www.saeec2011.org.za.

Does **Europe** really want to turn a new leaf?

A Europe-wide survey by consulting firm Deloitte points to widespread acceptance of electrically powered motor vehicles though customers stopped short of saying that they would buy such a vehicle.

The survey, conducted among 4 760 consumers, showed that 53% of respondents expressed an interest in having the option of buying an electric car but 31% said they would not be interested in owning one. About 16% of respondents were considered 'potential first movers' – a term used to express acceptance and immediate adoption of an electric car.

The survey found that customers' expectations of an electric car were at odds with the actual performance of these vehicles. For example, 74% of respondents expected the electric car to have a range of at least 480km before they would consider switching.

The Nissan Leaf and the Mitsubishi i-MiEV have a range of less than 200km. However, the manufacturers say that the typical mileage covered by the average person in a single day is well within the range of both the Nissan and Mitsubishi models.

When asked about charging times, 67% of respondents said that they would expect the batteries to fully recharge in less than two hours. At the moment electric vehicles need to charge overnight to fully replenish the batteries.

On the question of pricing, 57% of respondents expected electric vehicles to cost less than the current fossil fuel models, which is way out of line with the price of electric vehicles in Europe.

The Mitsubishi costs £23 900 after the government subsidy of £5 000 and that follows a price cut of almost £10 000 from the launch price of £38 699. In the case of the Nissan – a bigger car than the Mitsubishi – the premium that users would be prepared to pay for an electric vehicle was more difficult to assess as there is no direct equivalent for the Leaf running on petrol or a hybrid technology. Deloitte says that while the obstacles facing manufacturers are significant when it comes to adoption of electric vehicles, the investments in research and development of these cars is likely to continue unchanged.

Furthermore it says that economies of scale may help to reduce vehicle prices and research efforts are likely to improve performance levels of these new cars.

Experimental fracking in the UK

Amid the major furore over South Africa's plans to possibly use fracking (hydraulic fracturing) to get gas from shale beds in the Karoo, Britain is exploring similar plans to get shale from the Lancashire's Fylde region.

While commentators claim that Britain has outlawed the use of fracking to extract gas, at least one company, Cuadrilla says that its fracking technique is safe. Mark Miller, a veteran of America's gas industry admits that careless fracking has caused problems.

"Things are different in Britain where we operate. We put down a bullet-proof well where it's impossible to get any leakages and we use industry best practices when we're drilling. There are no shortcuts here and the method we use is entirely safe," he claims.

Now Cuadrilla's assertions are being put to the test by the Commons Energy Committee, which is investigating shale gas in the UK. Cuadrilla currently has permission to do some test drilling but the Environment Agency has confirmed that the company will have to apply for a licence if - and when – the time comes to go into full production.

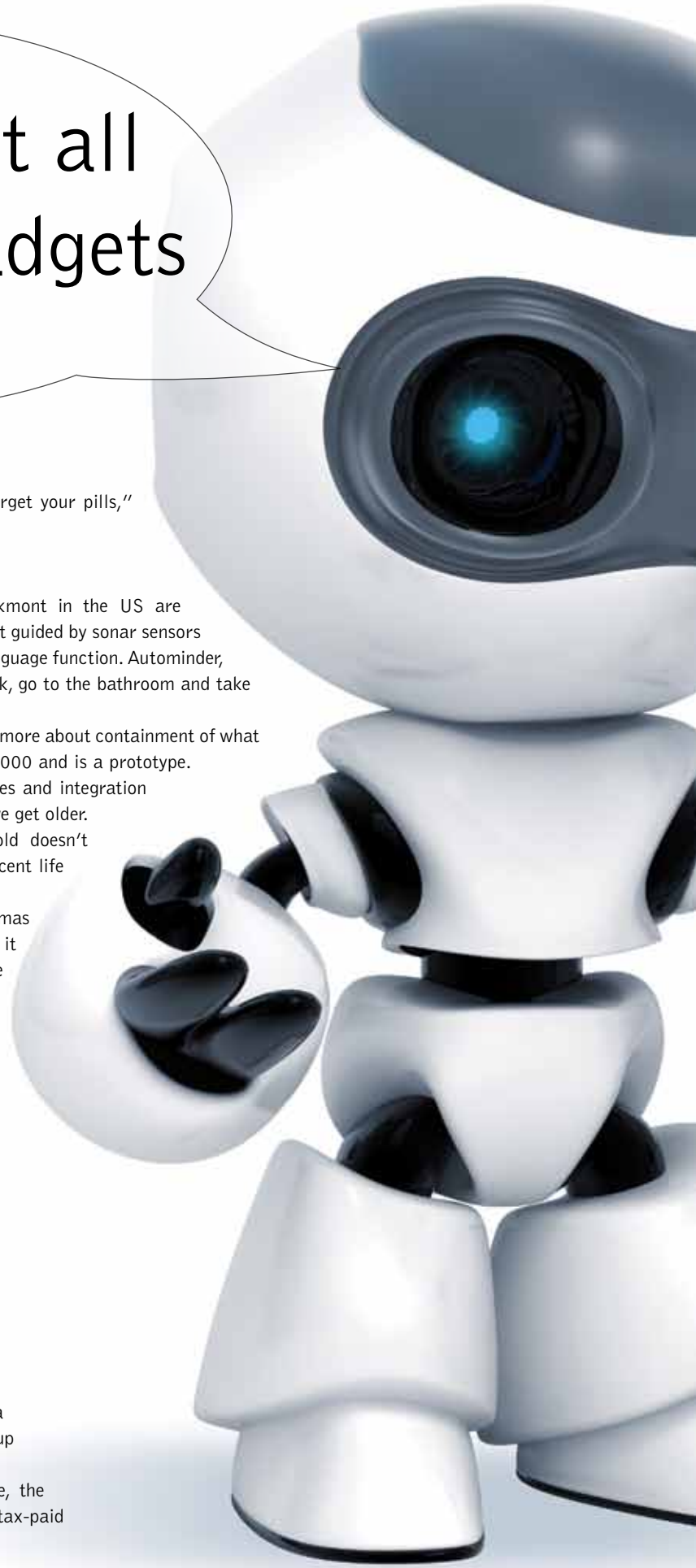
Environmentalists in the UK want the licence to be withdrawn pending a major review being undertaken by the US Environmental Protection Agency but Britain's Department for Energy and Climate Change appears to be cautiously welcoming the possibility that shale gas could be found in the UK.

Shale gas is not expected to supply a large proportion of Britain's gas needs but it will contribute to the worldwide flow of gas that has seen gas prices drop by about 50% in the US market and has let to a glut of supply on international markets.

Gas producers have, so far, succeeded in pegging gas prices to the oil price but this is likely to change if gas remains in plentiful supply. Current estimates are that the UK has gas resources that will last for at least 200 years and because of this, gas is expected to play an increasingly important role in the UK's energy mix.

Old people get all the COOL gadgets

By Gavin Chait



Maggie you need to go to the bathroom, and don't forget your pills," says Pearl.

"I don't wanna," says Maggie.

"Please take your pills," says Pearl.

The residents at Longwood Retirement Community in Oakmont in the US are undergoing a long-term experiment. Pearl is a sophisticated robot guided by sonar sensors and laser range finders, with speech recognition and a natural language function. Autominder, the software system behind Pearl, reminds residents to eat, drink, go to the bathroom and take their medicine.

This type of technology isn't about improving quality of life, its more about containment of what sound like a bunch of senile delinquents. Pearl costs over $100 000 and is a prototype. General versions of the software are available for mobile phones and integration into walkers. Not really the cool toys we were hoping for when we get older.

However, companies are starting to realise that getting old doesn't necessarily mean confinement to a nursing home and the senescent life of a geriatric toddler.

In 2007, on a whim, Universal Music put together a Christmas compilation album based on hits from the 1950s. They called it 'Dreamboats and Petticoats'. It sold 2.3 million copies in the UK alone and went double platinum around the world. The median age of CSI, a US television series, is now 55. Desperate Housewives is watched by a median age-group of 50; 46 percent of American newspaper readers are over the age of 55.

The global economic downturn is making the old-young divide even starker. As consumer expenditure has fallen amongst those under the age of 65 it has actually risen for the over-75s as they've headed off to buy big-screen television sets and new cable television services. It would do well to remember that if Winston Churchill had retired at age 65, as was expected, he would never have become one of history's most respected statesmen. In 1940, when he became Britain's war-time Prime Minister, he was only a few months short of his 66th birthday.

As average ages rise around the world, and the global population stabilises, those over the age of 65 are becoming a greater proportion of the population. In Japan, those 65+ make up 22 percent of the nation.

Pensions are supported by the actively working. In France, the average person retires at 59 and can expect to draw a full tax-paid

pension for another 24 years. This sort of thing is happening across the world and is financially unsustainable. Clearly, the over 65s have to keep working. Technology is shifting from containing the worst excesses that time and age bring to all of us, to extending our independence and productivity as long as possible.

Postponing ending up in a care-home is good. Not going there at all is better. Demos, a UK think-tank, found that 18 percent of the 500 000 UK citizens who die every year do so at home against the 60 percent who would like to. This is more difficult than it sounds. A person can remain on acute care for an average of six years prior to death and will require monitoring and support to keep them comfortable. There too technology can assist.

Accenture is developing a talking medicine cabinet that keeps track of what medication it contains, what you're taking, and what you should be taking. That way when you stare blearily at the mirror it reminds you to take your Lipitor. MedicAlert, of the ubiquitous steel bracelet fame, has a small USB-mounted chip that stores an electronic patient record.

Some innovations have even gone mainstream. By 2020 a quarter of Japan's population is predicted to be older than 65. As one of the leading nations in consumer technology, it would be expected that such developments would have an impact on what we buy.

Take cars. Push button controls on steering wheels allow you to control the radio, heat and air conditioning and are now available even in budget cars. This makes it easier for older people who find it difficult to maintain concentration on the road while also leaning across to fight with the radio, which has inexplicably decided to broadcast Gareth Cliff.

Sensors already exist to assist with parking, providing acoustic feedback if you get to close to the curb, or the tiny Smart car behind your SUV. There are also plans for such sensors to govern vehicle speed to prevent accidents.

A number of companies are working on wireless systems that can monitor people living at home. This got a boost in 1999 when the FCC established the Wireless

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Riba, robot nurse. Images courtesy of RIKEN-TRI Collaboration Center

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Medical Telemetry Service, which designates specific radio frequency bands for medical telemetry in the US, including 608-614MHz, 1395-1400MHz and 1427-1429.5MHz. Because neither land-mobile radios nor television are allowed to operate on these frequencies, this band is safe from the sources of RF interference that are common to medical telemetry.

Wireless sensors around a home monitor the circadian rhythms of the resident. What time do you normally bathe, for how long? When do you eat, watch television? If your routine changes dramatically, or the shower stays on for a long time, or the fridge door is left open, or movement stops, the system can trigger an alarm.

Under the name E-Neighbour, Healthsense plans to market such a product starting in the US in May 2011. The initial cost to wire and set up a home is about R2 600 and then R140 a month to remain connected to an emergency call centre. The system can monitor the absolute location of a person, their blood pressure and pulse rate. The person being monitored wears a wireless sensor that provides this data as well as a 'panic' button they can use.

The University of Virginia's Medical Automation Research Centre has developed a bed which monitors vital signs and transmits these wirelessly. No, not particularly different from the systems used by new parents to monitor their babies.

All of this is becoming big business, so much so that the annual Consumer Electronics Show (CES) in Las Vegas held a day-long Silvers Summit this year. The purpose was to highlight technologies which gather information and detect warning signs, and allow older people to remain in their own homes with less medical supervision.

Gadgets on display included a bathroom scale from Tustall Healthcare which monitors your weight and asks simple questions to build a profile of your wellbeing. This data can be shared wirelessly with your doctor. Other devices monitor whether a person falls (a major killer for those over 75), their blood pressure, sugar levels and so on. Many, many machines that go ping. And possibly all a little frightening. Much of technology for the aged is rather mundane. Larger font keyboards for computers. Swivel seats to get out of your car. Larger handles for keys. But really, sometimes that's all a person needs.

In the UK, the government has committed R180 million to the Delivering Assisted Living Lifestyles at Scale (DALLAS) programme to improve the quality of lives of the elderly living at home. Most of this is towards rather basic assistive technologies.

For the really cool toys we have to go back to Japan. The Japanese have been living with a massed elderly population for far longer than any other country.

Panasonic has a robotic bed that transforms into a joystick-controlled wheelchair at the user's spoken command. Riba, a robotic nurse disguised as a giant plastic teddy bear, can lift patients weighing up to 60 kilograms.

.....➤

Riba, robot nurse. Images courtesy of RIKEN-TRI Collaboration Center.

Images courtesy of Prof.Sankai, CYBERDYNE®, Inc./Univ. of Tsukuba.

Watt's Technology

Japanese manufacturing has taken the concerns of the elderly to heart. Kao, one of Japan's largest cosmetics companies, has developed standardised containers to allow the visually-impaired to easily distinguish between shampoo and conditioner bottles. Tactile notches allow them to be distinguished by feel. Other technologies help the hearing-impaired: alarm clocks that vibrate under a pillow, flashing names and numbers in public places. Frailty has led to kitchen utensils that are lighter and easier to use, and bottles that are easier to open.

The most exciting is a robotic exoskeleton manufactured by a company called Cyberdyne®. Worse, it's called HAL® (Hybrid Assisted Limb). This isn't accidental, Cyberdyne® CEO, Yoshiyuki Sankai, is a fan of both the Terminator movies and 2001: A Space Odyssey. However, his products are life-changing.

HAL® uses sensors attached to the wearer's skin to react to nerve impulses as the person uses his or her arms and legs. Then its servo-motors supply additional support. Demonstrated at the Seiko En nursing home in Tsurugashima in July 2008, it allowed a 75-year-old Parkinson's sufferer to walk for the first time in two years.

The system responds to sensor input in 0.0125 of a second, learning how you move to give you greater control when standing up, climbing stairs and lifting objects. The latest version weighs in at 23kg and will last about two hours 40 minutes under continuous use. The weight isn't a problem as it is self-supporting. It's also designed to look futuristic, with slick curves and blue LED rings at the joints. Of course, you have to be typically Japanese-sized to use it (1.6m in height). Cyberdyne® has received R40 million in funding from the Japanese government to continue development.

The exoskeleton boosts the wearer's strength by two to 10 times. Rentals start at around R7 000 per month. Yes, this is the technology you were looking for.

Let's also not forget all the technologies that can easily be co-opted into supporting the elderly: capacitive touch screens with oversized digital buttons, voice-recognition commands, multiple remote-control devices.

The future of being older is also becoming cooler.

Britain upgrading to high-speed copper lines

Britain's largest telecommunications company BT says that it will upgrade 80% of homes in the UK to 20 megabits-per-second (Mbps) copper broadband. The current standard is 8Mbps.

The move comes as part of BT's ADSL2+ copper broadband service, called Wholesale Broadband Connect, which is currently available from 1 017 exchanges serving more than 15,5-million premises. BT says it is now upgrading about 30 000 lines a week to the advanced copper service. About 2,25-million people will benefit from the upgrades. BT Wholesale will offer the upgraded options to Internet Service Providers such as TalkTalk, BT Retail and others. It currently offers up to 8Mbps service to about 99% of Britain. It has also announced that it will invest £2,5-billion to roll out fibre broadband to about 70% of the UK by the end of 2015. This will provide home users – and others – with Internet speeds of up to 40Mbps. The service is currently available to about four million homes and businesses located in major centres.

BT Wholesale says that it has reached 1 000 live fibre Ethernet nodes in the country and plans to increase this to 1 090 nodes by the end of this year. The improvements will mean that customers will benefit from high broadband speeds allowing providers to stream additional services to them without a loss of quality.

Cyber attacks up by **93%** in 2010

Targeted and potentially life-threatening cyber attacks are likely to escalate and will pose a growing threat to companies around the world, claims security software manufacturer Symantec. It says the Stuxnet worm that hit Iran's nuclear programme last year is typical of the cyber attacks that companies can expect.

The number of measured web-based attacks rose by 93% in 2010 compared with the previous year and was boosted by a proliferation of shortened Internet addresses that are increasingly being used.

According to Sian John, a security strategist at the company, attackers posted millions of these shortened links on social networking sites to trick victims into phishing and malware attacks and this dramatically increased the levels of infection achieved by attackers. Social networking sites are attracting the attention of hackers and Symantec says that the mobile platform is also becoming a victim of cyber attacks with a 42% increase in mobile vulnerabilities reported to Symantec last year.

The attackers are following consumer trends, as social networks have gained popularity, so there has been an increase in cyber attacks aimed at capturing new victims. The success of Twitter is expected to prompt even more cyber attacks.

Symantec warns that serious hackers are also focusing their efforts on breaching the security systems set up by major organisations around the world. South Africa has seen a sudden increase in the number of successful hacking attacks against Web sites and while some of these have clearly been pranks, others might represent a more serious threat.

Three of the most recent of these happened in March this year when first the ANC's Youth League site was hacked and a spurious message said that its leader, Julius Malema, had resigned. The website was down for a few hours.

Another site that fell victim to hacking was Marie Clare, which had a message 'Hacked by Trex' on its homepage. This was followed by the hacking of the Gauteng Department of Local Government's web site which was defaced with the phrase 'Hacked by CeCeN Hack Team. AllahuEkber !denmarkisrael asshole Americas 45 thousand people will give account Hooray Chechnya'.

According to Mervin Pearce of Security and Audit Control Systems, defacing websites was akin to painting graffiti on walls and is more of an embarrassment than a real threat. However, it can lead to more serious consequences such as when the owner of a site doesn't realise that it has been compromised and loses valuable personal data belonging to individuals or employees.

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JOJEN SUPPLIES

iPad replicas burned in Chinese festival

Religious Chinese families in Malaysia have been buying millions of paper replicas of Apple's popular iPad 2 device so they can burn them for their dead as part of a centuries-old rite.

During the Qingming festival – also known as the tomb sweeping festival – Chinese communities in Asia honour their dead ancestors by burning fake money or replicas of items such as designer handbags or models of flashy cars.

The festival stems from Confucian teachings of loyalty to family and tradition and is widely celebrated among the Chinese community in Malaysia who account for about seven million of the 28-million people living in the multi-cultural country.

A prayer-item shopkeeper, Jeffrey Te said that he had filled cardboard chests with fake money at his shop and yet people were buying the cardboard or paper replicas of the iPad 2 in preference to the chests of fake money. He only has stocks of the older iPad (Version 1) left on his shelves and even those are still being sold alongside the iPhone and the Samsung Galaxy tablet models.

Apparently Te sold about 300 iPad 2s in just a few hours and the unexpected frenzy left him struggling to get more stocks in time for the eager (living) buyers. The first- and second-generation iPads – each with a fictitious 888 gigabytes of capacity, an auspicious number in Chinese culture – were selling at a dollar each. An actual iPad 2 sells for about $499 in Malaysia.

Want speed?

Plug your laptop into the router

Tests conducted in Europe and Britain suggest that people who opt to use a Wi-Fi network experience significantly lower speeds than those with a fixed line connection and the average drop-off is about 30%.

The study ran a million tests over 14 000 Wi-Fi connections in Britain, the United States, Spain and Italy. However, it also highlighted the fact that users will tolerate lower speeds for the convenience that Wi-Fi connections provide for them.

The study, conducted by network measurement firm Epitiro says that some people are voting with their feet and trading the benefits of speed for the convenience of mobility, claims company spokesman Iain Wood.

He said that the most common use of the Internet was for e-mailing and web-surfing and that there is precious little difference between a 50Mb/s and an 8Mb/s connection. Web surfing, specifically, uses relatively little data. However, the picture is different if people are using services such as Internet television, YouTube or other streaming video or radio services. "The degradation in service because of speed will be particularly noticeable when streaming television services are viewed," says Wood.

He points out that while more and more Internet Service Providers are keen to deliver greater speeds, there are thousands of consumers who are quite content to accept the lower speed services and would probably switch to them if there was a financial saving for them.

For those people who are using Wi-Fi there are some solutions that work well. One is to change the channel used by the Wi-Fi router as this will reduce interference, particularly if they live in high-density areas like apartments or complexes. Other devices in the home – including baby monitors, television remotes and cordless phones – all add to interference levels and reduce connectivity speeds.

For people who are keen to do large system downloads or watch streaming video, the solution is to plug the computer directly into the router using a cable, as the speeds will generally increase by about 30%.

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Warning for Boeing 737-300 operators

Boeing, one of the world's largest passenger airline manufacturers, has recommended that all airlines operating the older Boeing 737-300s should monitor the planes for cracks in the airframe.

The recommendation resulted in Southwest Airlines in the United States cancelling hundreds of flights. Boeing said that it is currently preparing a service bulletin for airlines operating the 737-300s. There are 900 of these planes in service around the world.

Apparently the directive applies only to those aircraft that are defined as being heavily used. Early in April, a Southwest Airlines plane landed in Arizona with a hole in its fuselage and this led to the grounding of at least 100 planes owned by the company.

It cancelled almost 700 flights immediately after the hole in the fuselage was reported but, within a week, more than 50% of these planes had already returned to service. Sub-surface cracks in the fuselage were found on three of the planes and Southwest reported this to Boeing, which responded by sending out an alert to all airlines.

Southwest's flight 812 was flying from Phoenix to Sacramento when a 1,5m tear opened up in the fuselage about 20 minutes into the flight. Two years ago a similar incident occurred and the US Federal Aviation Administration smacked Southwest with a $7,5-million fine for not carrying out routine fuselage inspections.

According to Robert Herbst, an independent airlines analyst, at AirlineFinancials.com, the Southwest fleet did more take-offs and landings per aircraft than any other commercial operator in the US. This was probably the cause of excessive wear and tear on the aircraft, resulting in the fuselage cracks.

The narrow-body 737-300 is Boeing's top-selling plane. There are about 280 of these operating in the US and about 900 throughout the world. South African Airways operates two of these planes but they are both restricted to carrying cargo.

Mooted as the largest motoring festival South Africa has ever seen, the 2011 Top Gear Festival held at the Kyalami race track last month was the first ever to be held outdoors. Hosted by Top Gear's combative trio, Jeremy Clarkson, Richard Hammond and James May, the centrepiece of the four day event was the Top Gear Stunt show and its finale, a Nissan Micra doing a bungee jump from the highest point of one of Johnson Crane Hire's long reach mobile cranes. Peter Middleton reports.

A high-performance crane and **Top Gear's** bungee jumping car

The Top Gear Live World Tour held at Kyalami last month was filled with highlights, stars and lots and lots of cars. Over three laps of Kyalami, the bickering boys settled the dispute over which supercar is the best: James May's Ferrari 458 took the honours with Richard's Porsche 911 GT3 RS coming second and Jeremy's Mercedes SLS third. The Red Bull F1 car was driven by David Coulthard, racing against superbikes Jody Scheckter's 1979 World Championship winning Ferrari; James May in a RenaultSport Twingo; and Sabine Schmitz, who beat him in RenaultSport Megane. The Stig was routinely on hand to do lap times in supercars from his 'garage' and Jody Scheckter was honoured at a gala event and presented with a Top Gear-modified vehicle; a Jaguar powered racing ice cream truck. Several other driving legends were also on show: Sir Stirling Moss; Derek Bell of Le Mans fame, Eddie Jordan, now the BBC's F1 pundit; and Nick Mason from Pink Floyd, now a car collector and Le Mans addict.

But the highlight – held at the appropriately named Thunderdome, thunder being the unwelcome early guest of almost every performance – was the Top Gear Stunt show. A monster truck, fitted with a massive air cannon, launched a scooter in a 100m race against Sasha Maritinengo in an Ariel Atom. The same truck launched a fridge 100m at a Mazda, just for fun. Stunt bikes performed aerial acrobatics and a five-strong Top Gear Stunt team demonstrated 'motor-aerobics' in RenaultSports Meganes. Jeremy and James used their favourite cars for a 'blow-off', to inflate 15m-high plastic dolls – to see which car was the most powerful, in case you were wondering. They played a Jeremy-invented game in four Jozi taxis called 'splat the rat', the taxis doing their best to stomp out a dozen or so radio controlled toy cars (the rats). They didn't get many. The Stig broke the world record for doing doughnuts – in a London Taxi – and then came the grand finale. Sasha Maritinengo was strapped into a Nissan Micra, hoisted over

Sasha Maritinengo, strapped into a Nissan Micra, bungee's from 70m above the stage.

70m into the air and dropped for the first ever in-car bungee jump. Vintage Top Gear.

With all the noise and excitement it was easy to miss the towering Liebher crane sitting behind the Thunderdome Arena, a vehicle just as packed with technology as the toys being ogled onstage.

"This is a 275t Liebher LTM 1250-6.1 mobile hydraulic crane," said Peter Yaman of Johnson Crane Hire before the event. "It's a medium sized crane for us, as we also go several sizes above this one: to 330, 440 and 550 tons. We chose this crane because it has a very long main boom, 72m. The higher tonnage cranes are limited to 60m boom extensions," he explains.

The specs? The LTM 1250-6.1 mobile crane features a 15,5-72m hydraulically operated telescopic boom with a maximum lifting capacity of 250t at 3,0m radius and a 108m maximum lifting height. It has six axles, offers improved operating safety in travel mode and a top speed of 80km/h. The 0-60 acceleration data is not available but it does have two engines: an 8-cylinder, turbo-diesel, 450kW carrier engine and a 180kW turbo-diesel crane engine to drive the hydraulics. I wonder how fast it could have inflated the plastic dolls?

For the stunt, the Micra had been stripped of its engine, its airbag and as much unnecessary weight as possible. The car weighed about 620kg, including the weight of the 'driver', Sasha. It was fitted with a new seat and harness to hold Sasha firmly in place and a wireless camera in place of the rear view mirror so that his falling experience could be shared with the outside world.

"The car is positioned in a cradle with sloping aluminium ramps. One of the guys from the UK bungee club will sit up on the ramp, from where he will operate a quick release mechanism and the car will roll down the slope of the ramp and fall straight down towards the ground," Yaman explained.

"Before the stunt, the crane will lift and extend to its full 72m. Sasha will get into the car and it will be pulled back onto the ramp. The crane will then begin to hoist the cradle. When it clears the screen above the stage, it will slew across at an angle to the left of the screen, while continuing to hoist the cradle up to above 70m," he added.

Two guy ropes pull back to secure the platform as tightly as possible to stop it swinging. "The big issue here is that you don't simply have to deal with static load. As the car rolls off the cradle, the load is released from the crane, and taken up again as the bungee begins to stretch. This creates quite a bit of movement on the boom – but it is designed to move under load, so it's not really a problem. At the working radius we are using here, the crane is capable of 14t. The actual static load we are pulling is just about 3,0t and the dynamics adds a further 1,5t, so we never get above 5,5t during the bungee," Yaman assured me.

He pointed to a looping chain just below the top of the crane's boom. "The crane hook will be hoisted to within ½ metre of the top of the boom. That chain is called an anti-two block. It is

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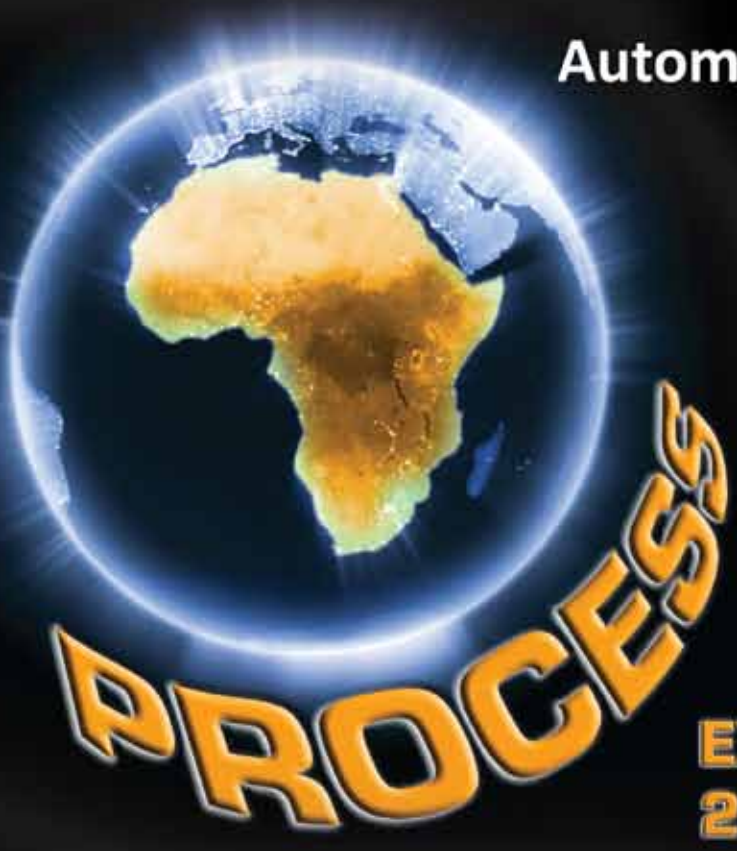
The car and passenger arrive safely back to ground level.



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connected to a cut-off limit switch so that when the hook gets up to its highest point, the anti-two block chain activates the switch, which tells the computer system to stop the hoist," he explained.

Andy Riddle from the UK Bungee Club is the manager of the bungee jump itself and the lucky man elected to go up with the cradle to release the car: "It's interesting up there, unnerving being so high. It swings around a bit and as soon as the car's weight shifts off, the whole cradle jerks away and then gets pulled back the other way as the bungee stretches," he said. "This is the first time we have ever done a stunt like this. We are using five separate bungee cords in a tape 40 strands wide. Everything is completely bespoke specifically for this stunt. If it goes well, we may do more in other parts of the world," he added.

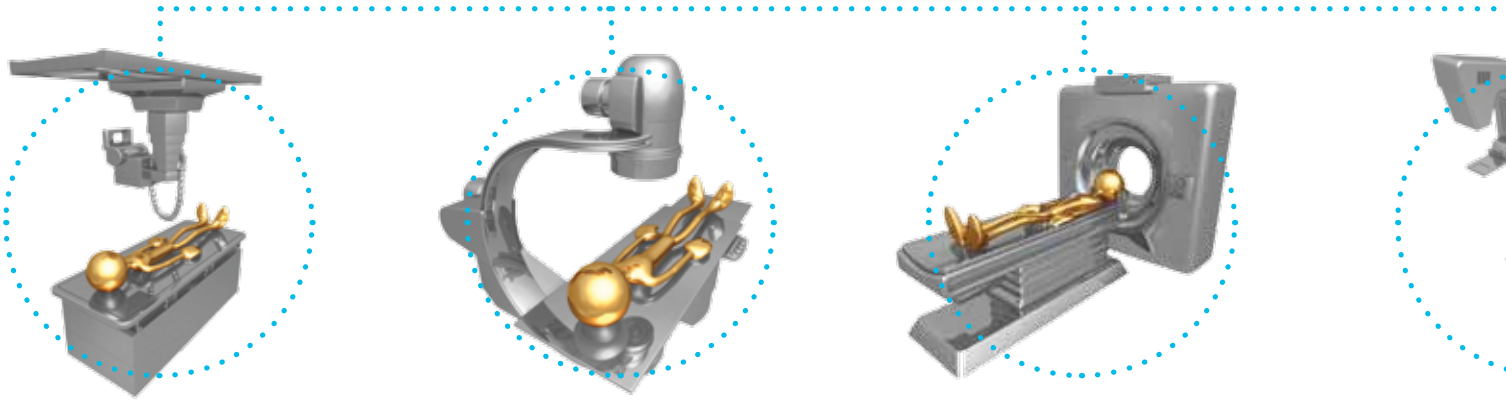
The celebrity crane driver of the moment? Ticky Mabaso, supported by two assistants.

The jump itself was over in a flash. The jokes about Sasha's dangerously excessive weight took longer to tell. The car was hoisted up. The bungee was counted down and out it came. It sprang back a few times and then the car was carefully lowered to the ground. "All of us were offered the opportunity to do this," said Clarkson before the jump, "and only the South African volunteered to give it a bash. He's a very brave man and deserves massive applause." As do Ticky Mabaso, Peter Yaman, Andy Riddle and Johnson Crane's LTM 1250-6.1.

A 275 t Liebher LTM 1250-6.1 mobile hydraulic crane with a 72m boom was used to hoist the car in its cradle.

For the stunt, the stripped Micra is positioned in a cradle with sloping aluminium ramps.

Peter Yaman, Johnson Crane Hire's general manager for projects in the heavy lift division.



Keeping track of health, ELECTRONICALLY

A breakneck trip to the emergency ward is fraught with waiting; waiting for tests, waiting for results, waiting for diagnosis. If that clinic can't handle treatment then the patient will be dispatched to another facility. There tests will be repeated, all wasting precious time.

Wouldn't it be better to have some sort of electronic record to keep track of your patient history? It's such a grand idea that governments around the world have leapt into action.

In 2002, the UK launched the world's most expensive civil IT project; the R120 billion National Programme for IT (NPfIT) in the National Health Service. The software is set to replace hundreds of different computer systems spread across hospitals and doctors' practices with new, compatible versions that will allow NHS staff anywhere in England to access a patient's medical records.

In 2009, it was announced that the project is likely to be four years late and over budget. Even the proposed savings to the NHS budget – of R11.4 billion by 2014 – don't come close to covering the cost of the investment.

That said, there is evidence that investment in IT does yield efficiencies and economic opportunities. More than 10 million patients have used the UK's Choose and Book system (part of the NPfIT), accounting for 20 000 actions a day, and bookings can be made for almost all public and private hospitals.

Under various names – electronic health record (EHR), electronic patient record (EPR), computerised patient record (CPR) – electronic versions of medical records are on the march. The records are supposed to include anything and everything related to a patient, including demographics, medical history, medication and allergies, immunisation status, laboratory test results, radiology images, vital signs, personal statistics like age and weight, and billing information.

Such a record requires tremendous coordination. Medical devices manufactured by thousands of manufacturers across multiple countries must be made to conform to set standards. Infrastructure, from software, to computer hardware, to network connections must span doctors' offices, clinics and hospitals. It's also very expensive. Governments wishing to fund such expenditure better ensure that they're getting something in return rather than just a big IT bill.

A Brookings Institution study, in July 2007[1], found that – in the US – "... for every one percentage point increase in broadband penetration in a state, employment is projected to increase by 0.2 to 0.3 percent per year." However, numerous[2] studies[3] have pointed out the difficulty of quantifying the economic effects of such a ubiquitous and pervasive product. The benefits of healthcare IT come from scale and such scale can only happen if systems are ubiquitous.

Hospitals and healthcare providers have different computer systems for everything from billing, to prescriptions, to patient monitoring in wards, to medical imaging storage, to individual patient files. Each of these systems requires the interoperation of countless different systems.

CT and MRI units may be in a special ward in a remote part of the hospital, while the specialist may be in another city. If a patient image can't be sent over a network then it must be downloaded and physically dispatched. If the specialist doesn't have access to a compatible device in which to view the image then further delays will follow.

Even where the specialist is in the same hospital, such lack of mobility will cause problems. An agreed set of standards – much as web standards permit people across the planet to communicate – are necessary before electronic patient records can become ubiquitous.

Healthcare is a rather political beast and many countries have developed their own standards with a view to keeping competitors out. However, that also has the impact of limiting their local champions to the local market as well as leaving them outside the technical breakthroughs happening elsewhere.

Internationally there are two main standards: HL7 and DICOM.

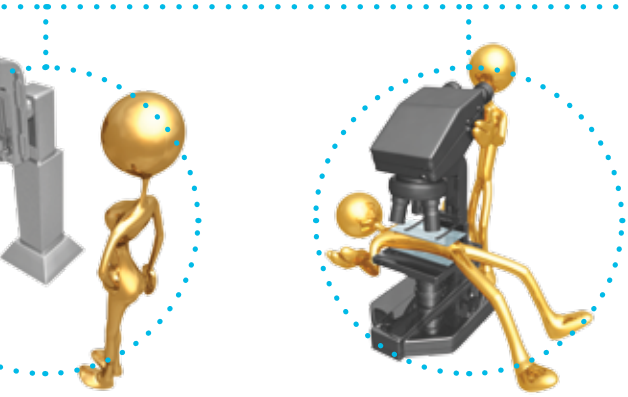
Health Level Seven is a volunteer, non-profit organisation which has developed interoperability standards for healthcare information exchange. HL7 was accredited by the American National Standards Institute (ANSI) in 1994 and has subsequently been adopted in Europe and around the world. HL7 develops conceptual-, document-, application-, and messaging standards. Messaging standards define the language, structure and data types required for seamless integration from one system to another.

Digital Imaging and Communication in Medicine is rather more specific being the standard for handling, storing, printing and transmitting information in medical imaging. The standard was developed by the National Electrical Manufacturers Association (NEMA) whose members include the world's largest medical devices manufacturers. DICOM permits integration of scanners, servers,

[1] The Effects of Broadband Deployment on Output and Employment: A Cross-sectional Analysis of U.S. Data - Robert Crandall, William Lehr and Robert Litan, The Brookings Institution, July 2007.

[2] The Digital Road to Recovery: A Stimulus Plan to Create Jobs, Boost Productivity and Revitalize America - Robert D. Atkinson, Daniel Castro and Stephen J. Ezell, The Information Technology & Innovation Foundation, January 2009.

[3] Measuring Broadband's Economic Impact - William H. Lehr, Carlos A. Osorio, Sharon E. Gillett, et al., presented at 20., the 33rd Research Conference on Communication, Information, and Internet Policy (TPRC), 23-25 September 2005, Arlington, Virginia; revised as of 17 January 2006.



workstations and network hardware from different manufacturers into a picture archiving and communications system (PACS). You may take it for granted that a JPEG image can be viewed on your mobile phone, a pc, Mac or Linux box. That only happens because it's an agreed standard. Why not just use JPEG? DICOM groups information into data sets. That way a patient's lung scan contains his patient ID so that there is no way a misdiagnosis can take place. DICOM can also contain multiple frames allowing ultrasound scans, which can show motion, to be stored in the same standard. The pixel data itself is compressed using a variety of standards which include JPEG.

While electronic patient records and standards are not yet ubiquitous, hospitals do run on comprehensive Hospital Information Systems (HIS). These provide an integrated financial, administrative and clinical database for the hospital. DICOM images are then stored in the Radiology Information System (RIS) component of the HIS. RIS allows patient tracking, scheduling and reporting.

Given the billions of dollars involved, and the comprehensive nature of the services required, patient records have attracted companies from all over. Oracle, CSAM International from Norway, InterComponentWare from Germany teaming up with AGFA, and even Google and Microsoft, along with more traditional healthcare companies like GE, Siemens and Philips are all in the mix. Google's 'new' CEO, Larry Page, is likely to put Google Health on the backburner for the moment, but Microsoft's HealthVault is now lead by Kirill Tatarinov in the group's business solutions division and is guided by a healthcare strategist.

But, just because electronic systems are available doesn't mean they will be used. IDC Health Insights reports that more than 51 percent of American consumers haven't even heard of the services available to them. Those who have are concerned about confidentiality in such systems and doctors' experiences have been with the complexity of their use. Only four percent of doctors surveyed in 2008 by the US Institute for Health Policy acknowledged having a comprehensive electronic records system and 13 percent had basic systems.

This is still better than in American hospitals where the American Hospital Association reports that only 1.5 percent of their members have comprehensive electronic records systems.

None of these fears have stopped governments rushing to cope with the increasing demand from their aging populations. And the investments aren't small. France is to spend R70 billion on its Hospital 2012 initiative with 12 percent allocated just to IT. Germany has invested R12 billion into its Electronische Gesundheitskarte (eGK) or electronic health cards.

Even South Africa has joined in with eHR.za, a R1 billion, 10-year project launched in 2008 aimed at creating a health record system across the country. It was awarded to a consortium of three vendors: Meditech, Medicom and Clinicom. The Patient Administration and Billing System has been developed by the National Department of Health in addition to PADS, a web-based patient registration and billing system. However, these do not offer extensive functionality. The EHR consists of a large-scale hospital information system and other modules. Only one-third of the hospitals in South Africa have an EHR.

The OpenROSA/JavaROSA project is coordinated by an international consortium of open-source developers, including the Medical Research Council (MRC) and Cell-Life that aims to develop open-source health data collection and management applications for mobile phones and personal digital assistants (PDAs).

Telemedicine is the major thrust area for companies and a lot of companies with solutions like Cell-Life, SIMpill and GeoAxon

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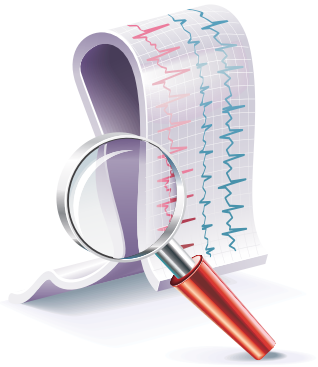


have come out with good telemedicine applications. There is a growing importance given to application of mobile technology in healthcare. International standards, such as ICD-10, HL7 and ISO / TC 215 have been adopted across South Africa.

Additional expenditure can go to increasing the physical scale of healthcare (adding in additional hospital beds, for instance) or it can go to increasing the efficiency of the existing infrastructure. However, that efficiency return is a function both of the quality and capability of existing capacity, and of its cost.

No country is going to reduce overall expenditure on healthcare. There are waiting lists for services and continuing un-met needs for improved care. Aging populations in developed countries and growing populations in the developing ones will continue to place pressure on existing capacity. Any savings realised from efficiency gains will be channelled back to serve more patients.

In other words, a given amount of cash spent on healthcare IT must return at least as much as the same amount spent on increasing capacity (in bed day equivalent terms, i.e. for the cost of adding in additional hospital beds or physical medical care capacity). If healthcare IT is capable of returning these yields then it can be considered a good investment, no matter how expensive it may appear.

A European Commission study in 2009[4] set out to investigate an expected range of socio-economic returns from just such healthcare IT investments.

"For all cases, the socio-economic gains to society from interoperable EHR and ePrescribing systems eventually exceed the costs, albeit quite often only after a considerable length of time. This is why investment in such systems is worthwhile, and justifies their net financial boost. A typical development can reach annual SERs of up to 400%," conclude the authors. "EHRs and ePrescribing are not quick wins, they are sustainable wins. It takes at least four, and more typically, up to nine years before initiatives produce their first positive annual SER, and six to eleven years to realise a cumulative net benefit."

Their analysis concludes that, for 2008, the socio-economic return (net benefit to cost ratio) for healthcare IT investment ranged from a minimum of 0.15 percent to 4.62 percent, with an average of 1.66 percent.

Countries in the developing world frequently lack sufficient infrastructure to support their societies. Networks can only go so far in supporting services; but they cannot compensate for such service absence. It may allow such states to feel as if they are 'leapfrogging' by implementing sophisticated networks, but this does not allow them to escape the need to ensure basic healthcare services are in place. Even the most sophisticated healthcare IT system still assumes that hospitals and clinics exist along with skilled healthcare professionals. No number of computers and cables can replace these things.

A healthcare IT system is not a single device, like a CT scanner or MRI system, which can in and of itself increase the quality of care. Healthcare IT is a network and requires that there be sufficient nodes that, when networked, allow for synergies and resource optimisation. A network on its own cannot create value. It can unlock value in existing infrastructure (as in Western and Eastern Europe) but it cannot compensate for absent infrastructure (as in South Africa).

For both developed and developing nations healthcare IT can act to connect existing capacity in new and innovative ways. Like all networks, this allows for collaboration and new efficiencies. But it does not replace healthcare services. Supporting a common framework for information interchange and demanding cross-platform compatibility will do much to ensure that investments achieve their expectations.

[4] The socio-economic impact of interoperable electronic health record (EHR) and ePrescribing systems in Europe and beyond - Alexander Dobrev, Tom Jones, Karl Stroetmann, Yvonne Vatter, Kai Peng of empirica Communication & Technology Research, Germany and TanJent Consultancy, UK, October 2009.

A falcon

that can lift 53 tons

Space Exploration Technologies (SpaceX) has announced plans to build a heavy-lift, low-cost rocket that will have twice the carrying capacity of the space shuttle but will cut launch costs.

The new booster, called Falcon Heavy, is based on SpaceX's Falcon 9 rocket which made two successful flights and which NASA has bought to fly cargo to the International Space Station.

A test flight for Falcon Heavy is scheduled for 2013 according to Elon Musk, chief executive of the company. It has a payload of 53 071kg, more than twice the space shuttle's capacity of 22 680kg. The flights will take off from the company's launch complex at Cape Canaveral Air Force Station in Florida but might also use the nearby Kennedy Space Centre.

The Falcon Heavy has a price tag of about $100-million per launch and while this might sound like a lot it is actually equivalent to about half the price of heavy-lift rockets built by Boeing and Lockheed Martin. Currently it costs about $22 000 per kilogram to carry a payload into space but Musk says that the price could be cut to about $2 200 using the heavy-lift rocket.

He says the company is "very, very confident" of being able to maintain those prices when the test rocket is launched in 2013. The company is currently ramping up production of its Merlin engine which will power the Falcon rocket family. Musk was the co-founder of PayPal and is also chairman and chief executive of electric car manufacturing company, Tesla Motors. Clearly he is not short of a bob or two.

Design gear tested for **MARS** mission

A team from NASA has successfully tested a space suit that might be used by astronauts on a mission to Mars. The $100 000 suit was designed by Argentine aerospace engineer Pablo de Leon and tested at Argentina's base in Antarctica.

The NDX-1 space suit endured freezing temperatures and winds of more almost 80km/h as researchers collected samples from the frozen Iceland. Astronauts need to be able to collect soil samples from Mars if – or rather when – the first manned flight to the Red Planet takes place sometime in the future.

During the Mars in Marambio mission, named after the Argentine Air Force Base at Antarctica, a team of NASA scientists went on simulated space walks, operated different drills and collected samples from the ice while wearing the NDX-1. De Leon himself donned the pressurised suit, which he said made him feel claustrophobic with its helmet and built-in headset for communicating with the outside world.

The Marambio site was chosen because, compared with other Antarctic bases, they had easier access to the permafrost, or soil that remains frozen all year round. De Leon says that Antarctica is an excellent mixture of many different and harsh environments including deserts.

Last year US President Barack Obama said that by the mid-2030s it was likely that a team of astronauts would orbit Mars and return safely to Earth. A landing on the Red Planet would take place some time after that. However, the US National Research Council says that a robotic mission to Mars and to Jupiter's icy moon Europa should be at the top NASA's to-do list for the immediate future.

De Leon remains confident that a human mission to Mars will take precedence and is equally confident that his suit – perhaps with new iterations – will be the basis of the designer clobber that spacemen or women will wear when they venture onto the ground on the Red Planet.

Jodrell Bank is the headquarters for the SKA

Jodrell Bank Observatory in Cheshire is set to be the site for the headquarters of world's largest radio telescope, the Square Kilometre Array (SKA) that will be built either in South Africa or Australia at a cost of about £1,3-billion.

An agreement to run the SKA from Jodrell Bank was signed in Rome by Australia, China, the Netherlands, New Zealand, South Africa, France, Germany, Italy and the UK. The SKA is expected to answer some key questions about the formation of the universe but a final site for the radio telescope has not been chosen as South Africa and Australia both bid for the project. The new headquarters will open in Jodrell Bank in January next year, superseding the existing project office that is based at the University of Manchester. It is expected that about 60 jobs will be created at Jodrell Bank and Professor Richard Schilizzi, director of the SKA, says that the move to Jodrell Bank Observatory comes at a time when the project is transforming from the concept stage to an international mega-science project.

"The new location and facilities will support the significant expansion that is planned at the observatory," he told the signatories at a function in Rome. There are 20 partner countries involved in the SKA project that takes its name from the total collecting area of thousands of small radio dishes. The SKA will have about 50 times the sensitivity and 10 000 times the survey speed of the best current-day telescopes in the world.

Construction is due to being in 2016 and the radio telescope is due to be completed by 2024. It is hoped that the SKA will reveal how planets and galaxies are born, reveal the function of dark energy and help to detect any signs of alien civilisations.

Artist's impression of a Square Kilometre Array substation
Credit: Chris Fluke, Swinburn University of Technology.

Need an artificial eye? **Well just grow one**

In a move that might have religious zealots up in arms, genetic engineers have grown embryonic eyes in an ordinary petri dish. The pouch-like optic cups grew spontaneously from transformed embryonic cells taken from mice.

British experts who were told about the Japanese scientists' achievements have described the eyes as "extraordinary". It is hoped that the experiment will eventually lead to treatments for human blindness. The Japanese researchers were able to artificially create the highly complex biological structure of the retina, which consists of a group of cells that line the back of the eye and enable creatures to see. It is these cells that are damaged in many different kinds of eye diseases.

The researchers at the RIKEN Centre for Development Biology in Kobe, Japan – and led by Yoshiki Sasai – began with pluripotent stem cells, the universal starter-kit for virtually every specialised cell in an organism. Using new laboratory techniques, Sasai and his colleagues managed to set in motion the transformation of the embryonic stem cells so that they became the optic cup, a layered, three-dimensional structure that forms the retina.

Significantly, the cells did the work without being 'pressurised' into taking a particular shape or form. Sasai says the experiment proved that retinal precursors have the inherent ability to make the complex structure of the optic cup. He says they are well on the way to becoming able to generate not only differentiated cell types but organised tissues that can be used in regenerative medicine. The development would be extremely useful in treating diseases such as retinisis pigmentosa that lead to blindness.

The surprising thing for scientists and engineers is that the researchers were able to get several elements that make up the eye growing together in the right order because the artificial eye looks very similar to that of an eye growing in normal circumstances. Sasai points out that there are a lot of similarities between a mouse's eye and a human eye. He says that it provides a starting point for the study of the complex layers of nerves that make up the eye and may lead to a whole number of cures for eye disease in the future. The findings of the research team are published in the journal *Nature*.

GE builds huge new thin-film plant

General Electric has announced plans to build what it claims will be America's largest photovoltaic factory as part of its goal to be a major manufacturer in this growing market. According to Victor Abate, vice president of GE's renewable energy business, the company has invested heavily in photovoltaic developments over the past five years. He says the factory – that will employ about 400 people – will produce solar panels that could generate 400MW of energy.

The thin-film panels will be made from cadmium telluride and production is due to start in 2013. While these are less efficient than conventional solar panels, the thin-film photovoltaics can be produced at a lower cost. Utilities building large-scale power plants have all opted for the thin-film panels.

Abate says that GE has already signed agreements to deliver 100MW of electric power to customers. The company has also bought PrimeStar Solar, the company that made the thin-film panels. The US Energy Department's National Renewable Energy Laboratory has certified that PrimeStar panels had set a 12,8% efficiency record for cadmium telluride technology.

Abate says that GE's goal is to be a cost and technology leader in the 75GW solar market that is expected to emerge over the next five years. At the moment First Solar is the dominant producer of thin-film voltaics and cadmium telluride panels.

First Solar plans to have a capacity of 2 300MW online by the end of this year and GE's plant will only be a fraction of its size. However, Abate claims that the solar market is where wind energy was in 2002 when it was worth a couple million dollars a year.

"Today the wind business represents a $6-billion platform," says Abate. He concedes that the company is likely to face stiff competition from Chinese manufacturers who are often subsidised by the government there. However, Abate projects that the cost of thin-film solar panels will reduce by about 50% over the next five years.

IEAC guidelines revised after Fukushima event

A new report compiled by analysts at Maplecroft suggests that one-in-ten nuclear plants could be in danger of being damaged by tsunamis or earthquakes. Analysts warn that scores of nuclear plants are at risk of damage similar to that emerging from the Fukushima reactor.

There are 76 operating power stations in Japan, Taiwan, China, South Korea, India, Pakistan and the United States that are located in areas close to the coastlines and deemed vulnerable to tsunamis. Helen Hodge, Maplecroft's natural hazards analyst says that while the Japanese plants are particularly exposed, other countries within the 'ring of fire' region could be vulnerable to tsunami or earthquake damage.

Nuclear safety experts are quick to point to experiences in the Armenian capital of Yerevan where, in 1988, a powerful earthquake killed 25 000 people but did not damage a nuclear reactor that was just 30km from the site. The following year, the Metasamor nuclear reactor was shut down because of seismic concerns and one of its reactors was decommissioned. However, the other reactor is still producing electrical power.

The risks of future natural disasters damaging nuclear plants have been a cause for concern for some years and the International Atomic Energy Commission set up its own International Seismic Safety Centre almost three years ago. Its safety guidelines are being revised following the incident at Fukushima.

The Japanese crisis has reignited the debate over nuclear safety, prompting Germany to announce plans to close its reactors. Italy and Switzerland have also put plans for new nuclear reactors on hold although Britain has said that it will go ahead with nuclear plants sometime after 2030.

Plan to drill deep into **Chicxulub**

Geologists and exploration scientists are planning to drill 1,5km into the seabed in the Chicxulub crater off the coast of Mexico that was carved out by an asteroid strike 65-million years ago, effectively killing off the dinosaurs that freely roamed the Earth.

The Integrated Ocean Drilling Programme (IODP) also plans to stage expeditions to study earthquakes and ancient climate features in the Antarctic.

Kiyoshi Suyehiro, president, and chief executive of IODP, says that earthquake research is likely to be stepped up in the light of the massive quake that hit south western Japan in March. He says the long-term plan is to place instruments in boreholes in the earthquake-producing areas, enabling real-time monitoring in three dimensions of the Earth's tectonic plates as they slide beneath each other.

The project to drill into the Chicxulub crater is expected to be up and running by 2013. According to Dr Joanna Morgan of the Imperial College in London, boreholes have been sunk in some parts of the crater that are on land but no work had been done under the sea. Chicxulub is the only impact crater on earth with a peak ring, features that can be observed in craters on the Moon and on other distant planets. She says that small craters are shaped like a bowl while larger craters tend to have a peak in the centre.

"Really big craters such as Chicxulub have a central peak that becomes a ring, and it is the only crater of its type on Earth," she told delegates at a recent European Geosciences Union meeting in Vienna. Dr Morgan says that the Chicxulub structure is known from seismomentry but the drill cores will be needed to take any geological research further. She wants to collect about 900m of peak ring material.

"Something very strange happened to the rocks that were struck when the asteroid hit the Earth and these cores will tell us what sort of shock pressures they were subjected to at the point of impact or shortly after it," she says. The crater is underneath the Yucatan Peninsula in Mexico and is more than 180km in diameter.

The asteroid that hit the Earth was about 10km in diameter and released about $4x10^{23}$ Joules of energy, equivalent to 95-billion tons of TNT or two million times more powerful than the most explosive device made by man with a yield of 50 megatons that was detonated at Tsar Bomba.

The impact would have caused mega-tsunamis with waves reaching hundreds of metres high. A cloud of super-heated dust, ash and steam would have spread from the crater in less than a second and would have been heated to incandescence, broiling the Earth's surface and probably igniting wild fires.

Huge shock waves would have led to global earthquakes, volcanic eruptions and the emission of dust and particles would, in a few weeks, have enveloped the earth, plunging it into a huge freeze for years. The cloud would have blocked out the sunlight, stopping it from even entering the atmosphere, cooling the whole surface of the Earth and destroying photosynthesis in plants. This, in turn would have caused plants to die, with dire consequences for the entire food chain, most notably the poor old dinosaurs themselves.

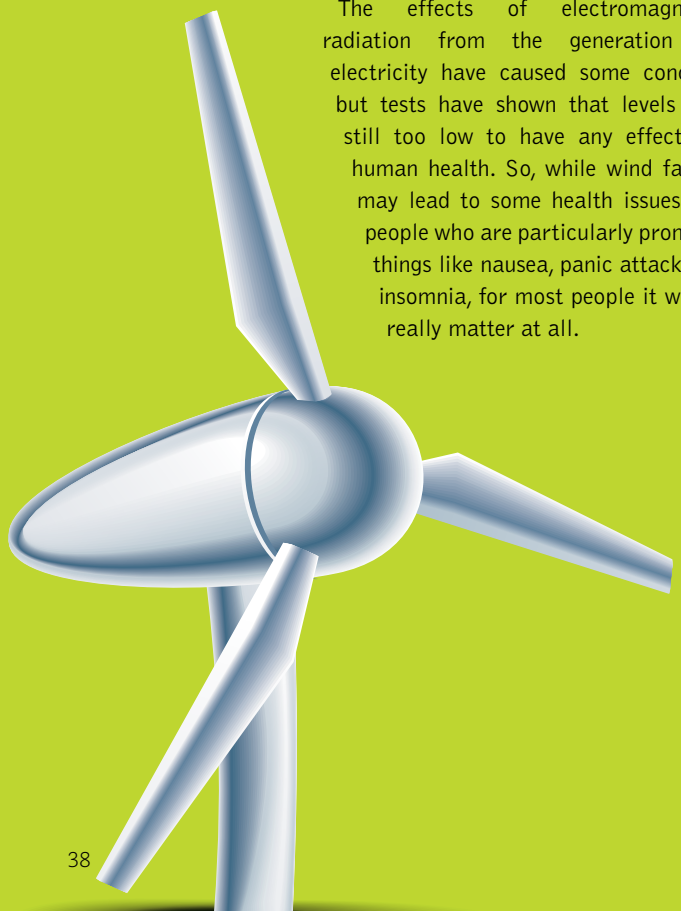
Wind turbines can make some people sick

Wind farms are a reality in many parts of the world and even in South Africa wind power is seen as being a viable option for renewable energy sources. However, a study commissioned by the American Wind Energy Association has found that irritation caused by a swishing noise around wind farms can have some unpleasant side effects.

According to the study, noise from wind farms often keeps people awake and induces stress. It says that vibrations in the air from wind turbines lead to headaches, nausea and even panic attacks.

Flicker from the rotating wind turbines creates a strobe effect for a tiny percentage of the population who suffer from epilepsy. It says that past studies suggest the problem was a 'significant nuisance' but an official report by the Department of Energy and Climate Change found that it would not pose a significant health risk in Britain. Sunlight glinting off the turbine blades was seen as an irritation with no lasting effects but most of the manufacturers of turbine blades are now using dull coloured paints to stop reflection.

The effects of electromagnetic radiation from the generation of electricity have caused some concern but tests have shown that levels are still too low to have any effect on human health. So, while wind farms may lead to some health issues for people who are particularly prone to things like nausea, panic attacks or insomnia, for most people it won't really matter at all.



US publishes rules on toxic emissions

The United States' Environment Protection Agency (EPA) has released its emissions rules for power plants after almost 20 years of delays. The rules are meant to reduce emissions from coal- and gas-fired power stations.

These rules will limit the amount of toxic pollution that can be released into the air for every unit of electricity generated. In total, the plant will reduce mercury and acid gas emission by 91% and cut sulphur dioxide pollution by 53%.

The reductions will protect Americans from asthma, development disorders and other health problems according to the EPA. There are currently about 17 000 premature deaths and 11 000 heart attacks each year in America that are linked to emissions from power stations.

The new rules replace those set up under George W Bush's administration through the Clean Air Mercury Rule. A final rule is due to be published in November this year and could force utilities to spend hundreds of millions of dollars to upgrade older power stations or to install anti-pollution measures. Moreover, the new rules will add between three and four dollars to the average householder's electricity bill.

According to the EPA, benefits estimated to be worth $59-billion and $140-billion would accrue if the new rules were followed. Companies will have just three years to comply with the new rules.

About 40% of the power plants in the United States – responsible for generating 129GW – do not have scrubbers installed at this stage says consulting firm MJ Bradley & Associates. About 10GW of power will be retired because it is not economically feasible to spend the money fitting efficient scrubbers to the older plants.

Drinking **Pepsi** from a plant bottle

PepsiCo is planning to replace its plastic bottles with a new vessel that is made from plant-based materials. The bottle is made from switchgrass, pine bark and corn husks and PepsiCo is working on plans to make bottles from orange peels, potato skins and other agricultural by-products.

The pilot production of the bottle will start in 2012 and once proved economically successful the company will move to making all its bottles from these (or other similar) by-products.

PepsiCo created a stir some years ago when it launched a fully-compostable SunChips bag and then pulled it off the market because there were so many complaints from consumers who said that the bag, while environmentally friendly, was 'far too noisy' to use.

Since then PepsiCo has re-launched a new bag that is said to be quieter and less disturbing to consumers even though it is not as environmentally friendly as the SunChips bag was.

While PepsiCo is launching its new bottles, Coca-Cola, which began manufacturing its PlantBottles from plant-based materials more than two years ago, announced that it has reached an agreement with HJ Heinz and Company to switch all its ketchup containers to the patented PlantBottles.

It is the biggest change for HJ Heinz since it introduced plastic bottles – replacing the well-known and immediately identifiable glass ones – in 1983.

Habitat report warns of hazards of rapid urbanisation

A United Nations report has warned that urban areas are set to become the focus for global efforts to curb climate change and an assessment by UN-Habitat says that the world's cities are responsible for 70% of emission and yet occupy just 2% of the planet's land.

The report entitled: 'Global Report on Human Settlements 2011, Cities and Climate Change: Policy Directions' says that its goal was to set out what adaptation measures are necessary and available.

Joan Clos, executive director of UN-Habitat says that global urbanisation is worrying when it comes to curbing emission levels, particularly as more than 50% of the world's population currently lives within urban settlements. Every year the number of people living in cities and towns increases by about 67-million and 91% of this figure is being added to the urban populations of developing countries.

The main reason for the increase in energy use in urban areas is the result of increased transportation, higher levels of heating and cooling of homes and offices as well as greater economic activity required to generate enough income to live in urban areas.

The report says that cities and towns are particularly vulnerable to:

- Increases in heat waves over most land areas.
- Greater number of heavy downpours over urban centres.
- Growing number of areas affected by droughts in rural regions.
- Increase in the incidence of extremely high sea levels in some parts of the world.

The report notes that apart from the impact of climate change, many cities are increasingly unable to deliver adequate services to residents and this affects water supplies, physical infrastructure, transportation, urban eco-systems, energy provision and industrial production.

Regions most likely to be at risk from climate related hazards such as droughts, landslides, cyclones and flooding include sub-Saharan Africa, South East Asia, southern Europe, the east coast of South America and the west coast of North America.

CPD Overview

WATTnow, in conjunction with the SAIEE, launched this programme for engineers who need to meet their professional development commitment by acquiring Continuing Professional Development (CPD) credits in Category One (10). In terms of the renewal of registration requirements, all registered professional electrical engineers, technologists and technicians must earn CPD credits so that after five years they have acquired at least a total 25 CPD credits in all categories and at least five credits in Category One (1). The **WATTnow** CPD Programme provides a convenient and cost-effective way for engineers to acquire the Category One (1) CPD Credits. Failure to certify CPD credits could jeopardise renewal of their registration (CPD credits in the other Categories Two (2) and Three (3) must be acquired by other means – see the ECSA Rules on this aspect).

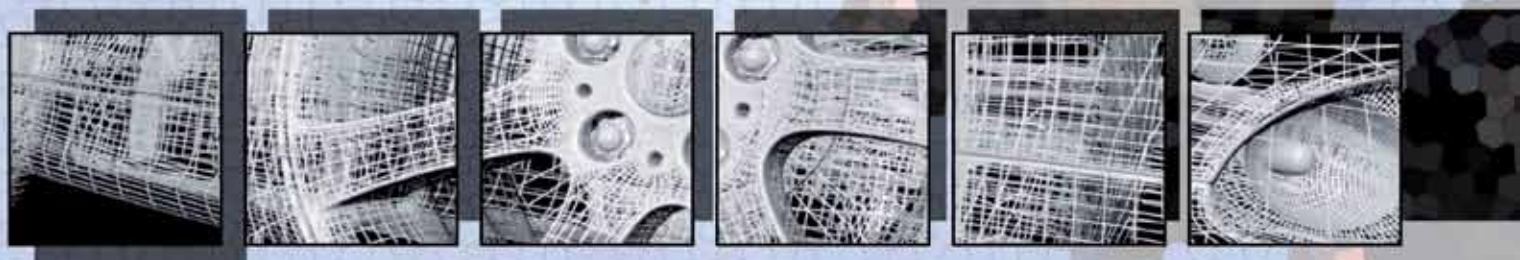
WATTnow publishes CPD articles in each issue that entitle subscribers to the scheme to claim for Category One (1) CPD credits. The programme requires engineers to respond to set questions posed on articles that are specially designed and validated to provide CPD credits. Engineers using the programme can accumulate 0.1 CPD credits per month if all the questions are answered correctly. **WATTnow** is published monthly so a total of 1.0 CPD credits can be acquired annually by this method. The articles and questions set are independently validated and reviewed by the SAIEE to which Validation numbers are allocated and should be recorded by subscribers.

Each year, **WATTnow** will supply a series of DVDs of lectures/conferences on topics that have been validated for CPD by the SAIEE. These DVDs can be ordered via the **WATTnow** website by subscribers to the CPD Programme.

Questions relating to the DVDs will be available on the **WATTnow** website and members of the programme can submit their answers online. Correctly answering the questions on the presentations in the DVD will entitle the subscriber to claim credits in Category One (1). These credits are in addition to the credits acquired by answering the questions to the CPD articles.

The SAIEE will provide subscribers with a certificate that records the exact number of credits gained for his or her records.

The **WATTnow** CPD Programme is based on a subscription service that will cost non-members of the SAIEE R2 400 a year while members of the Institute will pay an annual subscription fee of R1 000. The programme offers all members of the **WATTnow** CPD Programme a one-stop-shop to participate in and comply with the professional development criteria laid down by ECSA and ensure that all professional engineers can maintain their status without having to search around and pay significantly more to attend CPD courses or conferences in order to acquire sufficient credits for Category One (1) to meet the ECSA requirements.



For further information visit www.wattnow.co.za

Stop cows **BURPING** and you reduce methane levels

Scientists have been looking at ways to genetically modify – or engineer – animal feeds so that cows, sheep and goats will burp less and produce lower levels of methane.

The study by British scientists suggests that certain feedstocks could reduce the yield of methane by as much as 30%. The agricultural sector currently accounts for about 43% of Great Britain's methane emissions and the study aims at improving the environmental performance of this sector.

According to the Department of Environment, Food and Rural Affairs (Defra) – which funded the feedstock study –methane emissions could be reduced by:

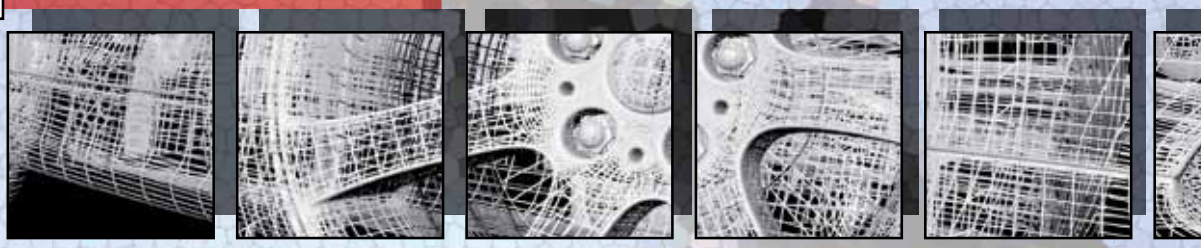
- Increasing the proportion of maize silage from 25% to 75%. This cuts methane emission by 6%.
- Using high-sugar grasses that reduce methane emissions by 20% for every kilogram of weight gained by cattle.
- Using naked oats to feed to sheep. This resulted in methane emissions from sheep falling vby 33%.

By genetically modifying the feedstocks, even greater reductions might be achieved. However, Defra warns that the long-term benefits of the cuts in methane emissions would have to be measured against other environmental impacts coupled with the practicality and cost of implementing these new foods.

If successful, the feedstocks might be exported to cattle- and sheep-farming countries such as New Zealand, where livestock accounts for 90% of that country's methane emissions with about 43% of its total greenhouse gases from human activities. Apparently New Zealand and Australian cattle and sheep farmers have been seeking ways to stop animals from the potent burping that seems endemic in this sort of farming. According to the United Nation's Food and Agriculture Organisation, when the entire food chain is taken into account (rearing, feedstocks, transportation, slaughter, packaging and distribution) livestock accounts for 9% of the human-induced carbon dioxide and 37% of the methane emissions.

Researchers at Bangor University have come up with an alternative solution. They suggest housing animals in enclosed sheds that would allow farmers to harvest the methane emissions as a fuel source and prevent it from escaping into the atmosphere. The researchers are carrying out a pilot study into the feasibility of such a plan.

Enrol for the WATTnow CPD programme



1. Monthly articles, published in **WATTnow** and validated by the SAIEE CPD provide credits for Category One (1) by answering appropriate questions.

2. A series of DVD recordings of lectures/conferences held throughout South Africa also provide CPD credits by answering appropriate questions.

4. A simple, quick and efficient online answering system via the **WATTnow** website for subscribers to submit answers to CPD questions makes this method of acquiring credits easy and convenient.

5. A complete administrative system to ensure that credits acquired are correctly recorded and available to all subscribers.

6. Subscribers to the **WATTnow** CPD Programme receive an annual certificate from the SAIEE detailing credits obtained in a calendar year.

CATEGORY ONE CPD CREDITS

Special rates for members of the SAIEE or members of voluntary associations approved by SAIEE

Open to all engineers who wish to maintain professional registration whether resident in South Africa or living overseas.

First Name: ..... Surname: .....

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Please fax completed form to Crown Publications on 011 615-6108 or e-mail this form to cpd@crown.co.za

Note: Voluntary associations registered with ECSA can apply to the SAIEE to allow their members to gain credits at the reduced rate.

Dear Paddy

You asked for our views on the LHC, string theory, etc.

I assume that was not meant to be an exhaustive list. Even if it were, engineers would probably interpret your request as broadly as they see fit ... .

It is essentially human to want to make sense of our world, and create a worldview that we can live with; we need answers to the "What? When? Why?" in our lives, and so of course build models of reality – maps and models – that result from our mathematical, philosophical or religious premises.

Unfortunately, those models become the real in our minds.

For example, in spite of ever-increasing adjustments to get its predictions to conform to reality, the Ptolemaic model of the universe was so real that the people who challenged it were at great risk.

The guardians of our modern established worldview are no less critical of dissenters (although less violently so than the Inquisition was).

Our models also tend to flow from our presuppositions; Copernicus assumed circular orbits for the planets since the prevailing idea was that a circle is the limiting or "perfect" case of an ellipse, and Kepler had to come along to fix the model with his ellipses.

A model that fits the facts over a limited range (such as a Fourier transform or the models used by bankers prior to the 2008 credit crash) is useful, but experimental or actual data outside that range often shows up the divergence from reality, and reminds us that we have not yet "arrived".

Tools such as the LHC, ALICE, and their relatives are of course necessary to verify the predictions of a set of models – strings, dark matter, dark energy – that have appeared as some sort of fine-tuning of the Standard Model (which is pretty much of a given as Ptolemy's model was).

There may be debate as to the utility of such costly experiments, but, as esoteric as they may seem, they do form part of our efforts to understand the ultimate questions of our existence. Perhaps they are looking in the wrong areas, but isn't it better to have played and lost than not to have taken part in the game at all?

Regards,
Francois Duminy
Cedarville

Dear Paddy,

In the article on the introduction of IPv6 (WATTnow, January 2011) you seem to have fallen victim to a common journalist's error.

The figure of two-thousand-one-hundred-and-twenty-eight addresses said to be offered by IPv6 is not really such an enormous number. However, if you print it as 2^{128}, using the correct superscript notation, then it is (equivalent very roughly to a 3, followed by 38 zeros: I have lost count in the list of superlatives of billions, trillions, etc. for that number, quite aside from the disputes around British and American usages in such naming).

Unfortunately, so many reports in the media (not just WATTnow) make the same blatant type of error, and then the perpetrators wonder why they enjoy such a low degree of credibility. Many years ago, I heard the view (referring then to the daily newspapers) that "Whenever they print anything technical, they usually get it wrong!"

I wonder whether going over to the 'computerese' e-notation for large numbers would not be a solution: surely a large proportion of your readers would already be familiar with this. The number in question would then be written as "3.4E38", meaning "3.4 times ten-to-the-power-of 38", and would avoid the typographical problems of printing a superscript. There seems to be no uniformity in expressing powers of numbers other than base-10: FORTRAN used the symbol " ** " (double asterisk) and BASIC used " ^ " (caret), but Pascal and C have no such inbuilt notations. (In a computer source-program, explicit superscripts and subscripts are just not allowable.)

Regards,
Tony Fisher
Retired SAIEE member

To contact our Editor at WATTnow Magazine with your comments, please email Paddy on paddyh@crown.co.za

Mentorship

The SAIEE is offering mentorship and advice to young engineers.

The offer comes at a time when our country is suffering a shortage of skills, and we believe that mentoring is an essential requirement in the training and development of the next generation of engineers.

If, as a member of SAIEE, you believe that you need a mentor you can request a mentorship service from the Institute.

The service will be of particular benefit to those young engineers working under the leadership of busy and pressurized engineers, who may not have the time to spend with the young engineers discussing and planning their career paths.

This service is particularly relevant to young engineers who are working in an environment devoid of engineers or with non technical managers. The young engineer may feel frustrated because he or she cannot benefit from the wisdom of an experienced engineer.

It will give a young engineer, the mentee, a chance to talk to a mentor, who will be his or her advisor, teacher and role model, away from the work environment. His or her mentor, matched to a similar profile, will understand the mentee's work and personal situation, having been there him- or herself.

The mentee will be able to discuss problems and frustrations with his independent mentor, who would have no stake in the outcome, and who would be able to provide an unbiased opinion and advice. The mentee might not be able to do so with his superiors, particularly if he is unhappy, and is considering an alternative career.

The mentor and mentee could arrange to meet regularly, but not too often, say a few times a year, when both should have enough time to listen properly to what the other has to say.

The mentor could recommend to the mentee what course of action to take without being too prescriptive while the final decision and the consequences remain with the mentee.

Among its more than 5000 members the SAIEE has many experienced engineers who are willing to act as mentors. They are are spread across the country and include engineers who are experienced in steelworks, furnaces, rolling mills, mining, manufacturing, electrical generation, transmission and distribution, through to light industrial, process control, instrumentation, telecommunication, robotics, automation, software development and engineering management of these sectors.

So if you feel that you would benefit by talking to a mentor, please contact Ansie Smith on the number below. She has a database to match the profiles of mentors and mentees.

Prospective SAIEE Mentors
If you feel you that you have the time and interest to help mentees, please contact Ansie Smith on smitha@saiee.org.za or 011 487 9050,
In addition you gain CPD credits, for when you are required to re-register.

Unveiling the 'Foundation Stone'

President of SAIEE, Dr Angus Hay.

Chairman of the Building Committee, Paul van Niekerk.

It's been a long time coming and Thursday 31 March 2011 saw SAIEE's building project reach a major milestone, the unveiling of the Foundation Stone. To quote the Beatles, it has been "a long and winding road" to get this far, after years of thinking, discussing and planning.

The ceremony was held in what will be The Council Chamber and was ably compèred by Andries Tshabalala, President Elect, and Stan Bridgens. Dr Angus Hay did the honours on his last day as SAIEE President while the 2010/2011 Council Members and the Professional Team looked on.

Paul van Niekerk, Chair of the Building Committee, during the course of his speech, recounted how Dr Hay approached him during April 2010 and asked him to form a committee to get the building built! Since then, life at Innes House has not been the same. Both Stan and Paul thanked Luigi Salemi, the architect, for his tenacity in getting the project this far.

The building is expected to be completed August this year.

The Secretariat, Professional Team and SAIEE Council.

SAIEE past Presidents' lunch

The annual SAIEE past Presidents' luncheon took place on Friday the 18th of March at Titolino's restaurant in Kyalami. SAIEE president Dr Angus Hay was joined by nine of the Institute's past presidents to celebrate and reflect on a successful year under his leadership.

Dr Hay delivered his progress report, citing the activities and developments of 2010/2011 and thanked his colleagues in attendance for their presence and continued support of/for the Institute.

It was a thoroughly good afternoon filled with laughter, fine cuisine and great company.

SAIEE past presidents enjoying pre-lunch drinks: (From left) Pierre Ballot, Viv Crone, Bill Calder, Ian McKechnie, Angus Hay, Mike Crouch and Paul van Niekerk

Meet our branch **Execs**

Elyssa Spreeth

Chairperson Mpumalanga Centre

Elyssa grew up in Rustenburg and matriculated from Hoërskool Bergsig in 1997. She obtained a bursary from Iscor Mining (today Kumba Iron Ore) and went on to study Electrical/Electronic Engineering at the then Rand Afrikaans University (now UJ). Elyssa served on the RAU Student Representative Council from 1999 to 2000 and also represented the Engineering Faculty on the RAU Academic Council in the same term. She joined the SAIEE in her student years and actively participated in all the SAIEE events on campus. She was passionate about promoting engineering and for two consecutive years organised the RAU Engineering Week, aimed at promoting engineering amongst Grade 11 and Grade 12 school learners. Elyssa obtained her B.Sc (Information Technology) at the end of 2001 and continued to obtain her B.Ing (Electrical Electronic with Information Technology as endorsement) at the end of 2002.

Elyssa started working in the Northern Cape at Sishen Iron Ore Mine in 2003 and remained there until the end of 2007. At Sishen, she started as an Engineer in Training, and was appointed as a Project Engineer and later as a Senior Reliability Engineer. Elyssa's projects at Sishen were concentrated in the open-pit mining environment, and her largest project was the rebuild of six Unit Rig Mk36 haul trucks. She presented her project at the 2006 Haulage and Loading Conference at Phoenix Arizona.

At the beginning of 2008, Elyssa moved to Sasol Mining in Secunda where she was appointed as a Senior Electrical Engineer. Elyssa was on the first committee chosen to start the SAIEE Mpumalanga Centre under the Chairpersonship of Grant Muller. She was elected as the secretary of the committee and later as Vice-Chairperson and then as Chairperson. Elyssa loves promoting engineering as a career and plans to build on the good work done at the SAIEE Mpumalanga Centre.

Willem du Toit

Chairperson Southern Cape Centre

Willem du Toit has a diverse background, having been involved in various private and governmental organisations related to town engineering, health and safety management, factory engineering, biomedical hospital engineering and the management of various business ventures.

He is currently involved in a managerial capacity at SAFTEK Technologies and Cape Inspection Services. These businesses provide consulting services for local and international clients, related to electrical engineering, petrochemical, health technology, construction management and health and safety.

Willem is registered with the Engineering Council of South-Africa as a Professional Certificated Engineer. He is a senior member of the South African Institute of Electrical Engineers (SAIEE), the South African Association of Hospital Engineers (SAFHE), the International Commission for Occupational Health (ICOH), the International Council for Research and Innovation in Building and Construction (CIB) and the South African Institute of Marine Engineers and Naval Architects (SAIMENA).

Willem is in the process of completing his PhD in construction management at The Nelson Mandela Metropolitan University in Port-Elizabeth, with a research thesis related to risk behaviour in the electrical engineering and construction industry. He holds an MBA and B.Tech degrees, a Diploma and Higher Diploma in electrical engineering and various certificates including Class 3 Commercial Diver and Master Installation Electrician certificates.

TC Madikane

Chairperson KwaZulu-Natal Centre

TC started his career as an engineering technician in training with Iscor in 1990. He underwent training in basic and advanced mechanical, electrical and electronic courses. In 1992, he joined the Department of Works as a technician. In 1997, he was one of the founder members of Izigi Engineers where he specialised in township reticulation, building services and demand side management projects. He has been with Igoda Consulting Engineers since 2001 as a Director and Shareholder.

TC has a Post Grad Diploma in Business Management, B.Sc Eng, Diploma in Project Management, National Diploma in electrical engineering and he is a Professional Engineer. He is a member of Institute of Directors and fellow of SAIEE. He won the SAIEE Engineer of the Year award in 2006.

TC serves on various ECSA subcommittees and he is a Vice-Chairman of the Professional Advisory Committee (Electrical) as well as council member for ECSA. Furthermore, he has been on SAIEE council since 2007.

In January 2011, he was appointed by the Minister of Water and Environmental Affairs as a Board Member of Mhlathuze Water.

Marius van Rensberg

Chairperson Western Cape Centre

Marius van Rensburg is currently the Eskom Transmission Grid Manager of Western Grid and is based in Cape Town. After completing his engineering studies at the University of Stellenbosch in 1976, he joined Eskom as engineer in training and started his career at System Operations in Simmerpan, Germiston.

Once he became principal engineer (production planning), he decided to change direction and joined Eskom distribution in 1976 in the newly formed Southern Cape Region in George. He filled several positions in George up to 1994 when he moved to Cape Town as Network Services Manager for the then created Cape Distributor with offices in Cape Town, George and East London. He also served for more than two years as Field Services manager in the Western Region.

Marius holds a B.Sc (Eng) from University of Stellenbosch, a B.Sc (Eng) Hons from University of Pretoria and a GCC. He is registered professional engineer with ECSA.

Continued Professional Development

The successful and well attended Electric Power Cable tutorial took place at the South African military museum in Saxonwold on the 6th of April. Delegates thoroughly enjoyed the energetic and insightful presentation delivered by Dick Hardie. Aberdare cables kindly sponsored the catering for the event.

During the tea and lunch intervals the delegates were given the opportunity to appreciate the sights of the museum, getting up close with Army tankers and aircrafts used in battle.

The day concluded with Dick Hardie presenting the attendees with their CPD credits and certificates.

Dick Hardie presenting the Electric power cable tutorial.

FORTHCOMING EVENTS

The Technical Document Writing for Engineers course takes place in Johannesburg on the 8th and 9th of June and in Bloemfontein on the 14th and 15th of June, 2011.

This course is worth 2 CPD credits.

For further information contact Sue Moseley on 011 487 9047 (suem@saiee.org.za) or Craig Smith on 011 487 9042 (craigs@saiee.org.za).

Visit to the SABC

Nineteen SAIEE members visited the SABC headquarters in Auckland Park on April 7, 2011. Getting there proved tricky because of on-going road works surrounding the Auckland Park site, however, the group was warmly welcomed by Gelfand Kausiyo, General Manager of Radio Broadcast Facilities (RBF) and shown three dual-radio station studios. The studios boast highly sophisticated equipment, built to be immediately switched over if anything untoward happens; this includes pre-set settings for each DJ. The group left the radio studios and were led through a maze of passages and tunnels to the television studios, two of which were sets for Isidingo. There they were also shown some of the complex editing that is needed for recorded shows and were taken aback at the cost, quality and complexity of the studios and editing equipment needed for HD TV.

On the last leg of the tour, the group was taken to the outside broadcast facilities – huge, state-of-the-art pantechnicons with separate power supply trucks. The logistics required to cover events such as the Comrades Marathon are mind-boggling. Finally, and wearily, the visitors were shown the best equipped theatre and recording studio in Africa, which had been commissioned a few days previously.

This worthwhile tour gave a fascinating insight into what we take for granted each day. If another tour is arranged, make sure you are on the list!

Thank you to our donors

The SAIEE has a substantial Education & Training Fund that has provided many bursaries since its inception in 1909. Since South Africa's move to democracy in 1994, the SAIEE has channelled over R8-million to fund some 70 bursaries to applicants with potential who are unable to afford the costs of tertiary education. In addition, each year financial rewards are presented to the best 3rd year students at most universities, to encourage their pursuit of excellence.

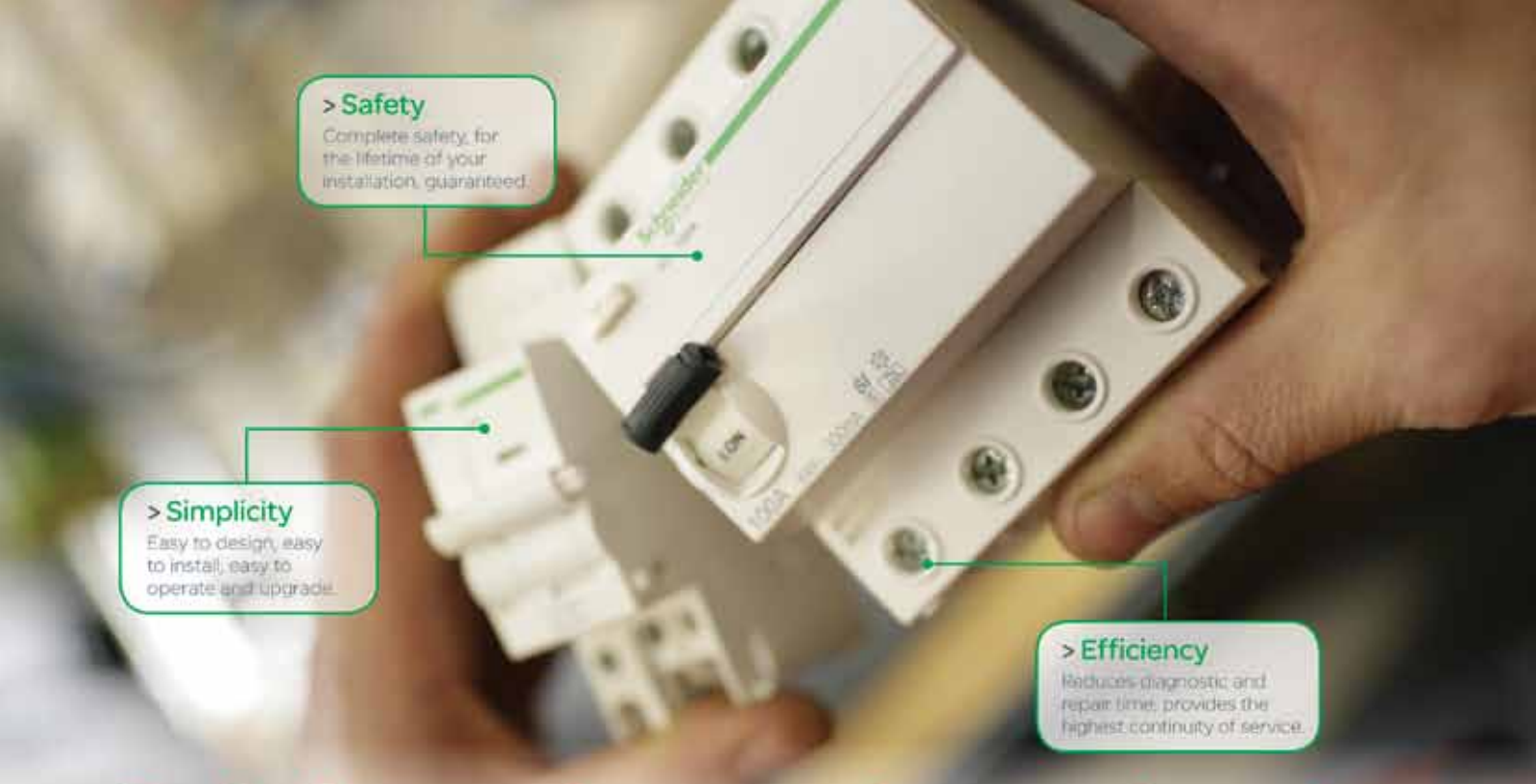
In 2010, the SAIEE received two legacies and an award mandated for the furtherance of education and training.

Christa van Schalkwyk, wife of Victor Wilson (who was President of the SAIEE in 2008 and unable to complete his term of office due to his terminal illness) donated over R50 000 to the SAIEE to award and administer a bursaries scheme. A tree has been planted on the Observatory site to honour Victor for his contribution to the Association.

The estate of John Robert O'Reilly (Senior Member for over 21 years) bequeathed over R100 000 to the SAIEE for education and training. Old Mutual is the administrator of the estate but there are no details of surviving relatives and it would be greatly appreciated if any of our members could assist in this regard.

An ex-South African who now lives in Canada and wishes to remain anonymous has donated R20 000 (with the possibility of further donations) to the SAIEE to administer awards at CPUT to the two best 3rd year electrical engineering students for the next five years.

The SAIEE Council and Office Bearers would like to express their appreciation to, and take great pleasure in acknowledging, the above donors for their generous contributions in assisting the Association



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