source

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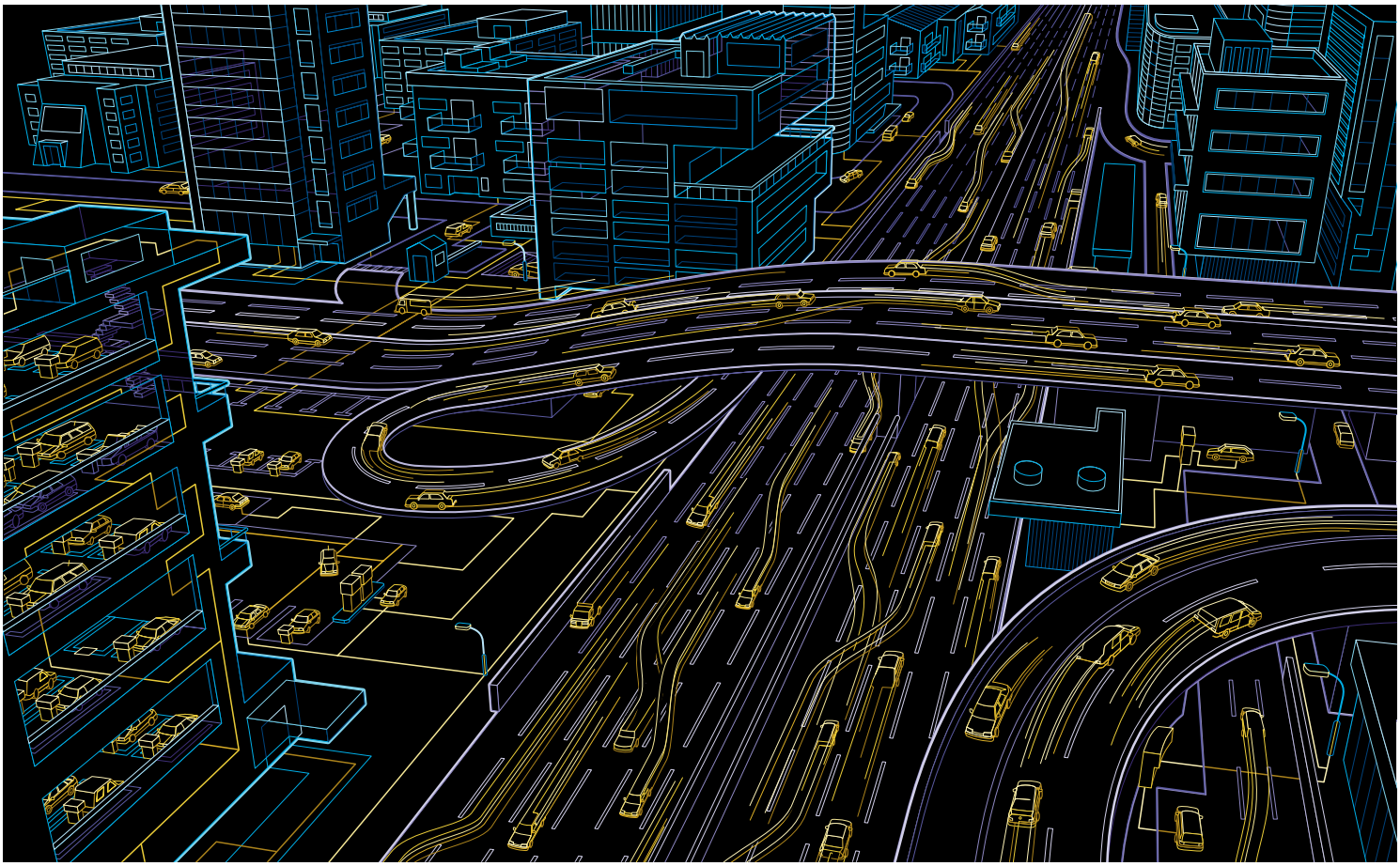
The customer magazine
of the ABB Group
New Zealand



Powering the future

Power and productivity
for a better world™

source 2|12

Grant Gillard
Managing Director
ABB New Zealand

Technological progress enables us to achieve things that were previously not possible, or to do what was previously possible more efficiently. In terms of technology we have always been looking to advance speed, accuracy, efficiency and power. In today's environment we can add to this list such terms as controllability, smartness and interconnectedness.

In this edition of Source we highlight two recent major innovations at ABB. In the first, ABB has partnered with General Motors to demonstrate the ability of recycling and reusing car batteries to power homes. In the second, ABB recently cracked the code on building circuit breakers for high voltage transmission; solving a 100-year-old engineering puzzle.

I'm also proud to again feature stories of our local Napier team's innovative technology in a joint R&D grid connection development in Norway with Vestas, and ship-to-shore conversion in Bahrain.

To those with whom we have dealt with this year, thank you for your support. We look forward to working with you all again in 2013.

Have a happy and safe holiday.

Regards
Grant

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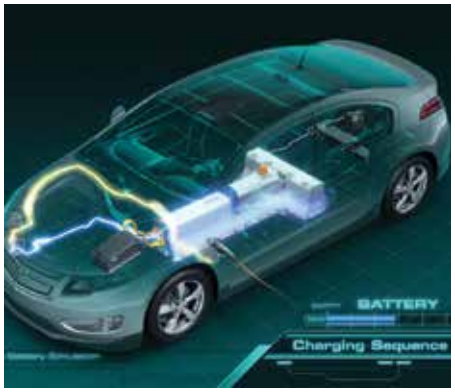


Powering the future

Electricity Industry Survey

Drives capabilities

Stories in short

High voltage test facility

ABB solves 100-year-old electrical puzzle – new technology to enable future DC grid

The development of a DC breaker for high voltage transmission will help shape the grid of the future

The birth of HVDC - Gotland 1954

ABB recently announced a breakthrough in the ability to interrupt direct current, solving a 100-year-old electrical engineering puzzle and paving the way for a more efficient and reliable electricity supply system.

After years of research, ABB has developed the world's first circuit breaker for high voltage direct current (HVDC). It combines very fast mechanics with power electronics, and will be capable of 'interrupting' power flows equivalent to the output of a large power station within 5milliseconds – that is 30 times faster than the blink of a human eye.

The breakthrough removes a 100-year-old barrier to the development of DC transmission grids, which will enable the efficient integration and exchange of renewable energy. DC grids will also improve grid reliability and enhance the capability of existing AC (alternating current) networks. ABB is in discussions with power utilities to identify pilot projects for the new development.

"ABB has written a new chapter in the history of electrical engineering," said Joe Hogan, CEO of ABB. "This historical breakthrough will make it possible to build the grid of the future. Overlay DC grids will be able to interconnect countries and continents, balance loads and reinforce the existing AC transmission networks."

The Hybrid HVDC breaker development has been a flagship research project for ABB, which invests over $1 billion annually in R&D activities. The breadth of ABB's portfolio and unique combination of in-house manufacturing capability for power semiconductors, converters and high voltage cables (key components of HVDC systems) were distinct advantages in the new development.

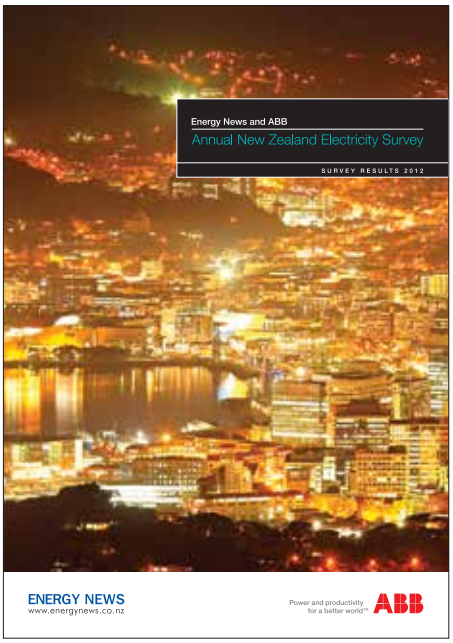
HVDC technology is needed to facilitate the long distance transfer of power from hydropower plants, the integration of offshore wind power, the development of visionary solar projects, and the interconnection of different power networks.

ABB pioneered HVDC nearly 60 years ago and continues to be a technology driver and market leader with many innovations and developments. With over 70 HVDC projects, ABB accounts for around half the global installed base, representing an installed capacity of more than 60,000 megawatts (MW).

Deployment of HVDC has led to an increasing number of point-to-point connections in different parts of the world. The logical next step is to connect the lines and optimise the network. ABB is already working on the construction of multi-terminal systems and the latest DC breaker innovation is a major step in the evolution of HVDC grids. In parallel to the new hybrid breaker development, ABB has an established HVDC grid simulation centre developing solutions for future DC overlay grid operations.

Energy News and ABB Annual Electricity Survey results 2012

Jointly sponsored by Energy News and ABB, the inaugural Annual New Zealand Electricity Survey polled representatives of New Zealand energy industries on key topics to provide a valuable snapshot of current opinion in this vital sector.



Download the full survey results from www.abb.co.nz, or email tracey.paver@nz.abb.com

The survey was completed throughout May 2012 by 407 participants. The largest proportion of respondents was from New Zealand's 'gentailer' organisations (electricity generator-retailers) but there was also significant input from professionals involved in distribution, consultancy, services and transmission, amongst the wide range represented.

Up-to-the-minute topics

Topics covered include questions about electricity supply, government policy and regulation, environmental issues, emissions trading, technology and expertise, and other issues unique to the New Zealand context.

The survey got straight down to business, asking respondents about the pressing issue of what should replace the 1000 MW Huntly coal-fired power station when it is retired. From there, discussion turned towards questions about renewable energy and the costs and practical considerations associated with it.

Government policy and regulation is the next subject for scrutiny and lightning-rod issues such as the emissions trading scheme are discussed.

The second half of the survey is concerned with a range of general issues, including important questions for the energy retail sector, and how New Zealand's energy infrastructure and expertise should be maintained.

Impressive experience and expertise

The questions used in the survey were designed by an advisory panel of six, chaired by John Hancock from HP. Other panel members were Grant Gillard of ABB, Matt Freeman of Energy News, Murray Dyer of Simply Energy, John Small of Covec Consultants and Bruce Stubbing of Smart Power; together providing significant experience and expertise.

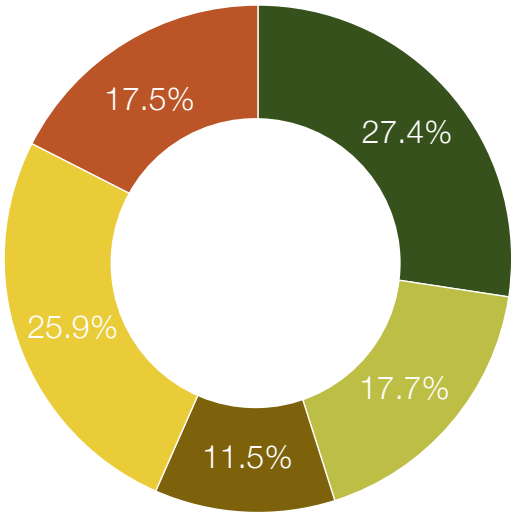
"Increasingly the digital age is making tools like surveys a vital part of any decision-making process," says Matt Freeman of Energy News. "The results of the survey contain some fascinating reading and we look forward to conducting the survey again in 2013."

Read the document

The full document can be downloaded from **www.abb.co.nz** and over the next few pages we have included some of the thought-provoking questions and answers covered by the survey.

Question 2

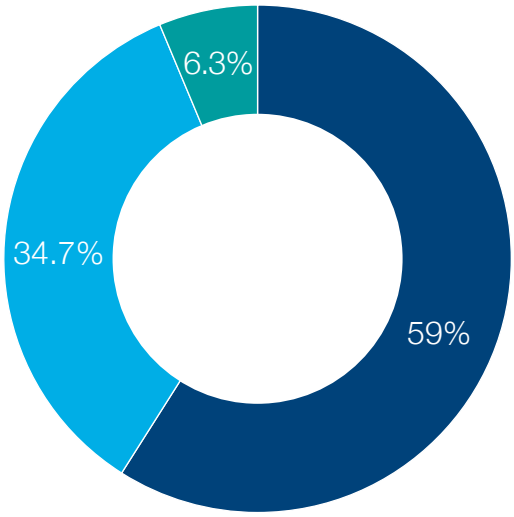
Do you agree with the government's target of 90 percent of electricity generation coming from renewable sources by 2025?



- Yes – 27.4%
- Yes but from an emissions reduction point of view we should be focusing on transport – 17.7%
- Yes but this will only work with a significant amount of residential solar PV – 11.5%
- No. We already have a high level of penetration of renewables by world standards and we should otherwise leave fuel mix to the market(s) – 25.9%
- No. Achievement of 90 percent would result in an unstable electricity supply – 17.5%

Question 4

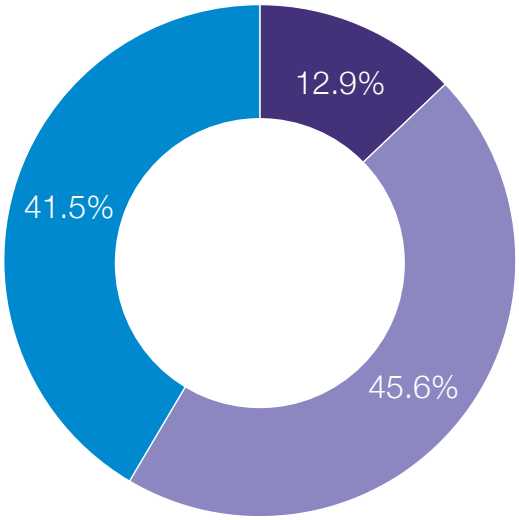
As we continue to build large scale renewables generation around the country, the transmission grid will continue to need building out, strengthening and smartening. What do you think about the costs associated with this?



- I am comfortable with the cost of the renewables-related grid upgrades being borne by the state and shared amongst all consumers – 59%
- More mechanisms should be in place to pass more of this cost on to the renewable generators – 34.7%
- New grid build should be paused beyond the current round of projects – 6.3%

Question 12

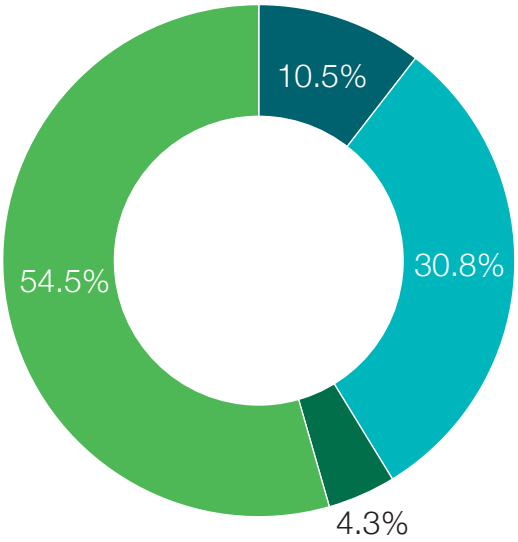
New Zealand energy professionals and engineers in general seem to be working all round the world and we have some trouble retaining them here. We also have trouble importing talent. While a number of companies are already exporting their energy expertise and competing well, should we be doing more to encourage IP export rather than human export?



- No. The market is working – 12.9%
- Yes, there is room for some action. Government and the industry should be further encouraging local energy businesses with talent pools to contract or sell their services offshore and tap into richer income streams – 45.6%
- Yes but leave it up to industry to work out – 41.5%

Question 13

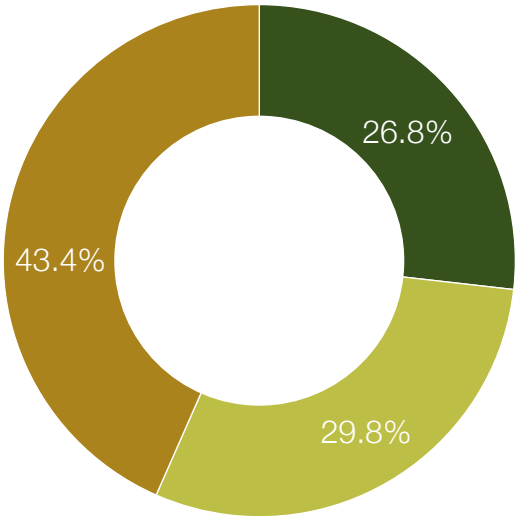
The average age of a transformer on Transpower's network is 31 years and the oldest is over 80 years. New Zealanders are great at maintaining old assets with a 'number 8 wire' mentality. This…



- is a triumph – 10.5%
- flies in the face of conventional asset management – 30.8%
- is making it difficult to attract young new engineers – 4.3%
- is a commercial reality we face due our scale – 54.5%

Question 14

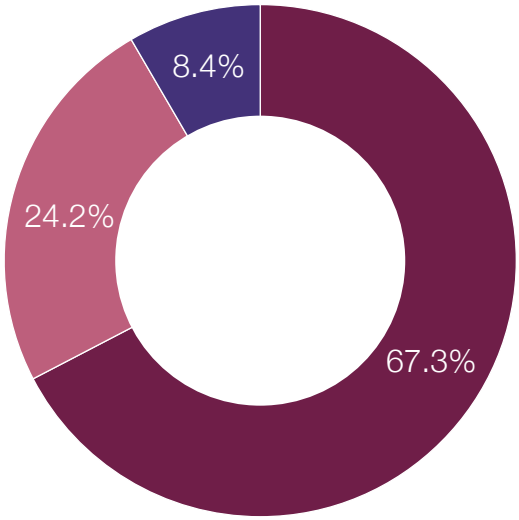
New Zealanders thrive on a legend of frugal innovation where world-beating best practice is born from the constraints of isolation – world class engineering made on a tight budget. Is the legend really true in the electricity industry?



- Yes – there are countless examples of home-grown solutions which are a fraction of the cost of international ones, but more effective – 26.8%
- No, it's a myth – we spend far too much time and money trying to invent world-beating solutions which never take off and where we could just be a "fast follower" of leading practice from overseas – 29.8%
- I'd like to believe it's true, but in my heart, I suspect I'm kidding myself – 43.4%

Question 17

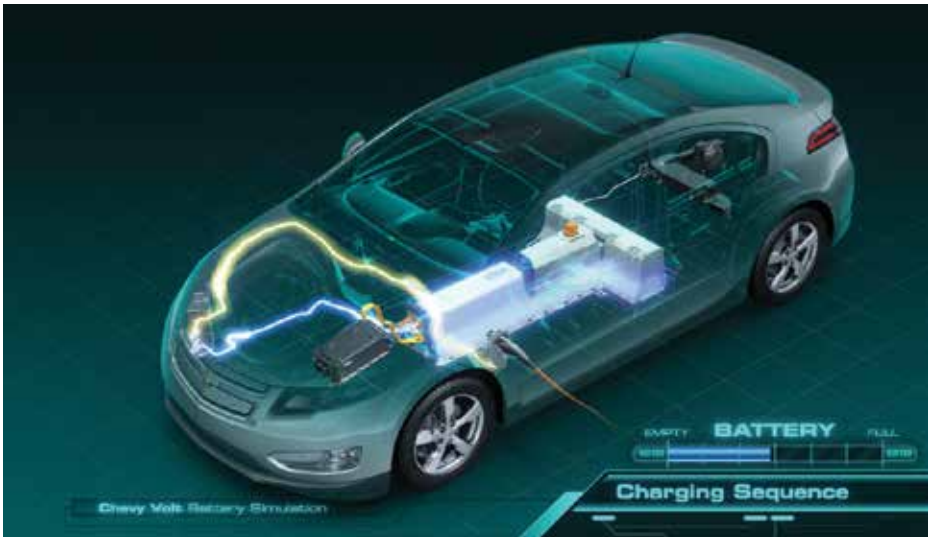
Wide-scale adoption of electric vehicles is possibly one of the most disruptive technology changes the industry will face in coming years – a car has a similar peak demand to a home. Uncoordinated vehicle charging could completely overload existing lines. How should we prepare for this?



- It's up to the market to work out how best to roll electric vehicles out – when it's economic, people will buy them and lines businesses will have to work out how to cope – 67.3%
- The impact on distribution network loadings will be too difficult to manage without regulation of connection terms and lines business control of vehicle charging – 24.2%
- It'll never happen, so we don't need to worry – 8.4%

GM and ABB demonstrate Chevrolet Volt Battery Reuse – world's first use of electric vehicle batteries for homes

General Motors and ABB have shown the next stage in battery reuse, with the repackaging of five used Chevrolet Volt batteries into a modular unit capable of providing two hours of electricity needed by three to five average American homes.



Chevy Volt battery simulation

The uninterruptable power supply and grid power balancing system was demonstrated during GM's Electrification Experience. The prototype unit provided 25 kW of power and 50 kWh of energy to power all the support lighting and audiovisual equipment in an "off-grid" structure used for the event.

"GM's battery development extends throughout the entire life of the battery, including secondary use," said Pablo Valencia, GM senior manager of battery lifecycle management. "In many cases, when an EV battery has reached the end of its life in an automotive application, only 30 percent or less of its life has been used. This leaves a tremendous amount of life that can be applied to other applications like powering a structure before the battery is recycled."

GM and ABB last year demonstrated how a Chevrolet Volt battery pack could be used to collect energy and feed it back to the grid and deliver supplemental power to homes or businesses.

During the demonstration in mid November, the energy storage system was run in a "remote power back-up" mode where 100 percent of the power for the facility came from Volt batteries through ABB's Energy Storage Inverter system. A similar application could one day be used to power a group of homes or small commercial buildings during a power outage, allow for storage of power during inexpensive periods for use during expensive peak demand, or help make up for gaps in solar, wind or other renewable power generation. These functions, along with frequency regulation on electric distribution systems, could someday be used by utilities to reduce cost to customers and improve the quality of power delivery. These applications are referred to as community energy storage to distinguish them from substation-size energy storage projects.

"We showed today how fast this research concept is turning into reality," said Allen Burchett, ABB's senior vice president for Business Development in North America. "The ABB-GM Volt battery system is the world's first use of car batteries as possible back-up power for homes and other commercial uses. We will be installing it on the grid soon to complete the technical evaluation, and this will tell us all what smart grid applications are possible, like back-up power, reducing energy cost, strengthening utilities' distribution systems and storing surplus renewable energy."

ABB's research centre in Raleigh, N.C., conducted the research and development, and ABB's Medium Voltage business unit in Lake Mary, Fla., is managing the proof-of-concept testing, market research and product development. As the world's largest EV fast-charging company and leader in smart grid and energy storage, ABB works with other auto companies, battery manufacturers and utilities to help make electric power and industrial operations more productive and efficient.

GM is focused on assuring battery systems used in future Chevrolet, Buick, GMC and Cadillac vehicles provide environmental and societal benefits beyond their use in the vehicle. Long before a battery is recycled, secondary use provides the opportunity to fully utilise the battery resource.

GM is dedicated to waste reduction throughout its operations, and its worldwide manufacturing facilities combined recycle 90 percent of the waste they generate. Ensuring that batteries are part of reducing the environmental impact of its vehicles and operations is part of the company's roadmap to sustainability.

For more information or multimedia material, visit **www.abb.com**.

General Motors Co. (NYSE:GM, TSX: GMM) and its partners produce vehicles in 30 countries, and the company has leadership positions in the world's largest and fastest-growing automotive markets. GM's brands include Chevrolet and Cadillac, as well as Baojun, Buick, GMC, Holden, Isuzu, Jiefang, Opel, Vauxhall and Wuling. More information on the company and its subsidiaries, including OnStar, a global leader in vehicle safety, security and information services, can be found at **www.gm.com**.

New ABB facility enhances drive support

ABB's energy efficient drives and motors solutions on show

ABB recently introduced its newly upgraded drives facility, which is set to boost the level of variable speed drive (VSD) training for maintenance engineers and electricians in New Zealand and provide a higher level of technical support for troubleshooting VSD installations and servicing drives.

The facility provides state of the art equipment to extend the range of test scenarios. It allows ABB's service technicians to test returned drives with greater precision and verify their performance by simulating operating conditions in real time speed with a torque load up to 800 kW.

The new facility also raises the level of servicing and performance testing of ABB's related products including active power filters, UPSs, intelligent circuit breakers, soft starters and electronic contactors.

Diagnostic training

A renewed training programme will start in the facility next year with two levels of two-day courses held each quarter.

According to John Keir, ABB's Drives business manager, training is a key part of ABB's approach:

"When you buy an ABB product you are buying not just the equipment itself but ABB's commitment to partner with you for the lifetime of the product, which often remains in service longer than the employees responsible for it".

The launch was well attended by a wide range of companies including Watercare, Carter Holt Harvey, AECOM and Todd Energy

The whole system is SIL 2 rated for safety and operates with an HMI and a SCADA system with a PLC to provide a full automation test environment for servicing, testing, evaluation, and in-depth training

Service doubled

ABB's lifetime support approach has seen the installation of ABB drives grow dramatically, with the service team doubling to 14 in the last four years.

Based on global experience, ABB can accurately predict preventative maintenance schedules by drive age and loads to minimise maintenance costs while maintaining performance, reliability and longevity. Packaged single order maintenance kits are available which cost less than buying parts separately.

The modular design of ABB's drives reduces on-site spares inventory because spare modules can be held on site to cover a range of drives. ABB also offers a rental replacement drive service along with a 24/7 service coverage on all drives.

Introducing the ACS880-01

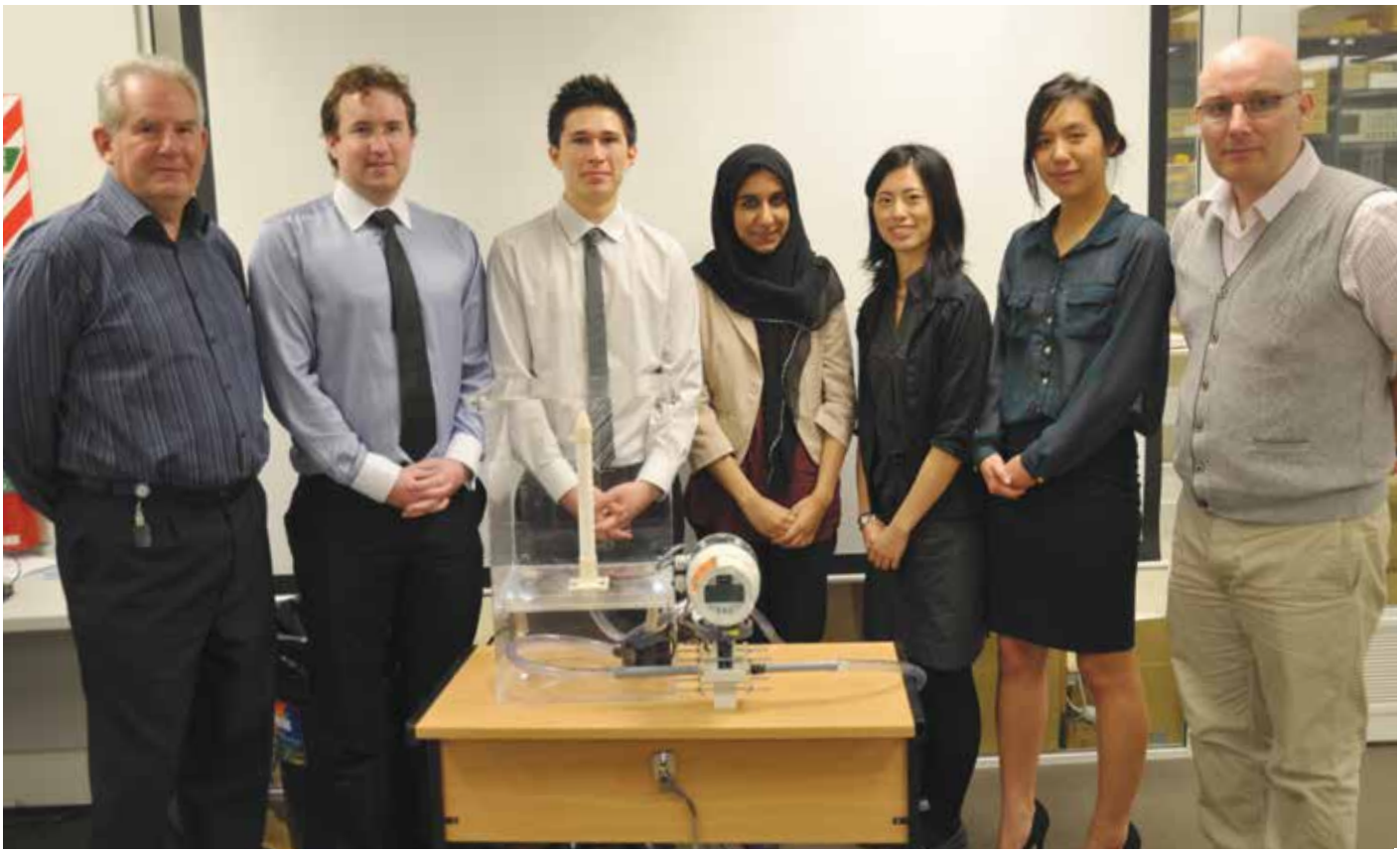
One of the key events of the day was to introduce ABB's new ACS800-01 wall-mounted single drive.

The ACS880-01 is compatible with a wide range of applications in a broad range of industries such as oil and gas, mining, metals, chemicals, cement, power plants, material handling, pulp and paper, sawmills and marine. At the heart of the drive is direct torque control (DTC), ABB's premier motor control technology.

The extensive range of options include EMC filters, encoders, resolvers, du/dt filters, sine filters, chokes and brake resistors, and a remote monitoring tool, as well as application specific software.

Built-in safety features reduce the need for external safety components. Multiple drives can be daisy-chained for synchronised drive to drive communication. The drive offering includes two enclosure ratings, IP21 and IP55, for dusty and wet environments.

Use the QR code on your smartphone to access all the documentation on the new ACS880-01



ABB's Ian Colligan (left) along with Scott Walbran, Andrew Wong, Ayesha Ghani, Queenie Luk, Jade Kwong and Dr Richard Clarke

ABB technology helps students keep project flowing

ABB donated a flow meter and technical expertise to help a team of Auckland University engineering students realise their project success on the creation of a miniature water bell.

The flow meter was a necessary component of the project for their Bioinstrumentation and Design paper according to the team, as flow rate measurements are required to test the fluid properties of the water bell.

A water bell forms when a volume of moving water encounters an object, forming a sheet of water which encloses a mass of air. The team created a miniaturised water bell, based on a new variety of water bell which was discovered in 2001 by Graeme Jameson as a result of firing a vertical jet of fluid onto a large and smooth horizontal plate. A model of this phenomenon was created in a fixed location in Newcastle, Australia in order to study the fluid dynamics of the water bell.

The client involved with this project was Dr. Richard Clarke, a senior lecturer in the department of Engineering Science at the University of Auckland.

The flow meter provided the team with low pressure drop, does not require any calibration and gives accurate and reliable readings.

In addition to providing the flow meter, ABB advised the team and helped set the digital flow rate.

Dr. Andrew Taberner, Senior Lecturer, Department of Engineering Science, comments: "The water-bell team did an outstanding job on their project. Thanks to the support of ABB, the team were able to construct and test a working water bell apparatus, and were rewarded with the top mark for their class project."

ABB's measurement products manager Ian Colligan, felt the students showed initiative and tenacity:

"It was a great opportunity for the up and coming generation of engineers to interact with our technology. It was a clever project and we enjoyed playing a part in it."

ABB helps minimise power station's footprint in world-first environmental project

ABB's low harmonic variable speed drives and 800xA control system have combined, in a world-first system, to control the new Wairākei bioreactor, which removes 80% of hydrogen sulphide from the Wairākei power station's cooling water.

Background

Built in the 1950's, the Wairākei power station was the first geothermal station of its kind in the world. Due to the technology available when it was built, the station uses water from the Waikato River for cooling purposes, which allows natural elements in the geothermal steam, such as hydrogen sulphide to mix with the station's cooling water. The cooling water is then returned to the river.

To help improve the water quality in the Waikato River and to ensure the company meets new resource consent requirements, Contact Energy has developed a biological treatment facility, called the bioreactor. The bioreactor uses naturally occurring sulphur oxidising bacteria to remove hydrogen sulphide from the station's cooling water. Used cooling water from the station is pumped through the facility, where the bacterium removes hydrogen sulphide from the water, before goes back into the river.

The bioreactor facility has 378 kilometres of underground pipes which provide an environment where the sulphur oxidising bacteria are encouraged to colonise and grow to form a thin film to remove hydrogen sulphide as the water flows through the facility. With ABB's solution, the cooling water takes about four minutes to travel through the bioreactor at a speed of 13,000 litres per second with over 80 percent of the hydrogen sulphide removed, 10 percent more than is required in the power station's resource consent.

The speed of the pumps needs to be controlled to achieve a low flow rate of water through the pipe network, allowing the bacteria to grow and to treat the cooling water. If the flow is too fast, it would flush the bacteria from the inner walls of the pipes. Once a day each set of pipes is flushed as part of a cleaning cycle, requiring faster flow and greater power requirements from the pumps.

Cooling water from the power station flowing into the biorector facility

Controlling speed variation with ABB's drives

Five of ABB's 400 kW low harmonic variable speed drives control the speed variation of the pumps. The application of variable speed drives in this project was to achieve the speed variation required, as well as to minimise the harmonic distortion created and comply with utility harmonic standards. ABB's solution involved low harmonic drives which include an active (inverter) supply unit to draw a sinusoidal current waveform from the supply. This solution is integrated into a single cabinet, simplifying installation and reducing additional installation and lifecycle costs associated with external filters.

ABB Low harmonic drives produce an extremely low harmonic current with a total current distortion contribution of less than 5.0% (THDi < 5%) at full load.

ABB provided application support and sizing for the variable speed drives, as well as commissioning and power quality monitoring to verify compliance with utility standards.

Centralised control with ABB's 800xA

The overall bioreactor process is controlled and monitored by ABB's 800xA control system, integrated to the main control system at Wairakei Power Station. This allows Contact Energy to have a centralised point of control in addition to a local human machine interface (HMI) panel for local control. The seamless integration of the ABB AC800M PLCs and ABB's drives provides expert control and monitoring of this complex process.

Mathew Staddon, Electical Engineer, from Contact Energy, said, "This project was another example of the seamless integration that was achieved by using ABB products and services."

The new bioreactor was opened in September 2012 at Wairākei, with a blessing from Rev Sonny Garmonsway of Te Pihopatanga o Aotearoa (the Maori Anglican Church) and Ngati Tuwharetoa. The new bioreactor will help Contact Energy better care for the Waikato River and ensures it meets new cooling water discharge resource consent conditions, which came into effect in August 2012.

ABB helps one of the world's largest wind turbine companies connect their wind turbines to the grid

Three 2 MVAr PCS100 STATCOM containers for a 54-megawatt onshore wind farm located in Fakken, in the far north of Norway

Connecting wind turbines to the grid is not as straightforward as many people may think. ABB's Napier R&D team and Vestas have jointly developed a reliable and cost-effective solution, which has been successfully installed at the Fakken wind farm in Norway.

While wind power is increasing its share in the energy mix, several issues need to be addressed when connecting wind turbines to the grid. For consumers of electrical power it is important that the power is available with a stable voltage and frequency. To make sure that this is the case, grid operators issue requirements for connecting power generating equipment to the grid. Collectively these requirements are known as the grid code, and equipment that meets these requirements is called grid compliant.

A typical requirement by the grid operators is that generators should be able to vary their reactive power output dependent on the grid voltage level. This and other requirements necessitate the deployment of devices that can control reactive power. A static var compensator (SVC) is such a device. The term var is derived from the unit of measurement for reactive power, VAr or volt-ampere reactive.

An SVC can be implemented in different ways. The implementation employed at Fakken is a hybrid solution that makes use of classical reactive power compensation and of dynamic reactive power compensation that is based on voltage source inverter technology. The latter type of SVC is usually referred to in the industry as STATCOM (static compensator). Compared with other technologies the STATCOM has a number of benefits: a smaller footprint, a smaller parallel capacitor bank, faster dynamic performance, active filtering of harmonic currents, and more.

At the Fakken onshore wind farm in the far north of Norway, ABB has installed three PCS100 STATCOMs. These are low voltage STATCOMs each with a rating of 2 megavolt-amperes reactive (MVAr), and two ABBACUS metal enclosed mechanically switched capacitor banks (MSC), each with a rating of 2.5 MVAr. The wind farm consists of 18 wind turbines with a rating of 3 megawatt (MW) each. The ABB installation helps Vestas, the world's leading wind turbine manufacturer, to comply with the Norwegian grid code.

The entire project is a joint effort by the R&D teams of ABB and Vestas. The Fakken wind farm is used as a qualification of the PCS100 STATCOM.

The qualification includes extensive verification testing and standardizing of interfaces and controls. A similar qualification was carried out last year for the PCS 6000 STATCOM, a medium voltage STATCOM, which means that ABB has both a low voltage and a medium voltage solution depending on the size of the wind park.

Once the qualification has been completed the Vestas plant control group can do all their system modeling with ABB's STATCOMs, so becoming a preferred solution for Vestas.

Vestas chose ABB for this project because one of the salient characteristics of the PCS100 STATCOM is its modular construction, which makes the platform very reliable: If one of the power modules fails, the system will not trip, but will continue to operate at reduced capacity. Because the granularity is small, the customer can get full redundancy at very small cost by adding one more module to the system. This level of reliability at such low cost is unique in the industry.

The project also involved the integration of ABB's control system for the PCS 100 and Vestas' Power Plant Controller. Freddie Andreasen, Vestas Technology R&D Director stated, "For the first time VestasOnline™ Power Plant Controller has an ABB STATCOM in the loop via an advanced and standardized communication scheme. We have experienced a very successful and professional cooperation with ABB on this controller integration project." The result is a fast and dynamic response where the STATCOM acts as reactive power source controlled in parallel with the wind turbine generators by the Vestas Power Plant Controller.

A crane positioning one of the PCS100 STATCOM containers into place

An overview of Fakken wind farm in Norway

ABB's PCS100 STATCOM technology ranges from 100 kilovolt-amperes reactive (kVAr) to 10 MVAr and offers power factor control, voltage regulation and high- and low-voltage ride through support. The STATCOM system has overload up to 260 percent for three seconds, and higher overload requirements can be met by adding extra modules while having advanced capability of flicker mitigation.

The turnkey solution means the STATCOM is easy to relocate as the container incorporates a power converter, switchgear and a standard-type transformer with no special windings or specification for reduced maintenance requirements.

Vestas Wind Systems A/S is a Danish manufacturer, seller, installer, and servicer of wind power plants. The company operates manufacturing plants in Denmark, Germany, India, Italy, Romania, Britain, Spain, Sweden, Norway, Australia, China, and the United States, and employs more than 20,000 people globally.

Fakken wind farm will generate 135 gigawatt-hours (GWh) per year. To make this possible ABB will supply Vestas with a full reactive power plant consisting of medium-voltage (MV) switchgear and all related services in addition to the STATCOM containers and MSC.

ABB innovation saves costs and reduces pollution at a shipyard in Bahrain.

ASRY shipyard in Bahrain

ABB's power electronics team in Napier has installed three PCS100 SFCs (Static Frequency Convertors) at a shipyard in Bahrain to help the facility become more environmentally friendly and reduce maintenance costs.

ABB's grid connection technology enables commercial ships calling at ports to turn off their diesel engines and tap into cleaner onshore energy sources and save fuel. Having successfully delivered the world's first shore-to-ship power connection to the port of Gothenburg, Sweden in 2000, ABB has the experience required to make the complete connection, onboard and onshore. Unique features, such as a high efficiency rate of 95 percent whilst having precise control of frequency and voltage, create a clean power supply to isolate an unstable grid from a critical load.

In the shipping industry, harbours have been identified as a prime area in which emissions can be significantly reduced. With this in mind, port authorities, ship-owners, industry suppliers and regulators are now focusing on the decade old technology known as shore-to-ship power, for which universal electrical standards are on the verge of being ratified by IEEE, ISO and the IEC. ASRY was among the first shipyards in the world to receive ISO certifications for Quality, Management, Environment and Health & Safety Systems in addition to the ISPS code for Port Security. By adopting ABB's PCS100 SFC, a large ship can cut fuel consumption by up to 20 metric tons and reduce CO2 emissions by 60 metric tons during a 10-hour stay in port. ASRY, a leading Middle Eastern ship building and repair company, had been using rotary frequency converters for two years. These rotary converters were not very environmentally friendly due to nitrogen dioxide gas emissions and low efficiency. Therefore, to adopt a clean energy system, ABB's grid connection technology was implemented. Internationally, many ships are designed to operate on a 60 Hz power supply, however in the Middle East, the standard power supply is only 50 Hz. Therefore, an SFC (Static Frequency Converter) is used to feed the power supply to ships at ASRY in order to make them compatible with the 50 Hz requirement. Also, to adhere to ASRY's requirments, the three 1250 kVA SFCs were de-rated to 882 kVA to suit the high ambient temperature of Bahrain.

Promising outcome

Since installing the PCS100 SFCs, there is no longer any rotating equipment in the system and therefore no need for mechanical maintenance. As a result, efficiency is drastically improved and the operating and maintenance cost of the equipment over time is reduced. Due to less maintenance issues the solution provides high reliability and greater availability of the equipment.

For a rotary system, efficiency is generally around 75 percent and in addition, pollution, relibility and availability of the equipment is an issue. But the efficiency of the PCS100 SFCs is much higher – up to 95 percent. ABB is the market leader for SFC technology and thanks to acknowledged technological leadership secured the order from ASRY.

Saad Shetiwi, Head of Yard Operations at ASRY, says, "With ABB's pioneering technology coupled with local support capabilities, we will reap the benefits."

Auckland University Engineering field trip to Henderson plant

The students walked around in small groups to encourage greater interaction

Around 30 Auckland University Engineering students, a mix of electrical, mechanical and mechatronics, took advantage of a field trip to ABB's switchgear facility in Henderson, Auckland. The trip was jointly organised by ABB and the IEEE Auckland student branch, of which ABB is proud to be the principal sponsor.

The students were taken on a tour of the plant by one of the key engineering or design managers, and were given the opportunity to ask questions on the tour, or during a networking lunch.

ABB has been designing and manufacturing medium voltage secondary switchgear for over 30 years, and celebrated the production of 25,000 units earlier this year. The Henderson plant currently produces the SafeLink switchgear product for a local and international market, including Australia, Netherlands and Jordan.

The first of the two student groups to take the tour

ABB website

Visit www.abb.com to get a sneak peak of what is to come for ABB's local NZ website www.abb.co.nz in 2013.

The change is just the first phase of a new navigation scheme to provide users with faster access to content from the front page.

The new web look and feel is a vast improvement, and the site includes much more interactivity with blogs and videos.

ABB on social media

Don't forget to like ABB in New Zealand on facebook for the latest news and information.

ABB is also on Twitter, LinkedIn and has a channel on YouTube.

Electric cars: 15 minutes charging, 200 km driving?

Having to wait eight hours to fully recharge an electric car is the main reason for not buying one. But things have changed: With ABB's direct current (DC) chargers charging time has been slashed to as little as 15 to 30 minutes. No wonder the Estonian government is relying on ABB to build Europe's largest electric vehicle fast-charging network. By the end of the year the Estonian main roads will have fast chargers every 50 km. Once accomplished the goal to significantly reduce CO2 emissions by 2020 moves a lot closer. **www.abb.com/betterworld**

Certainly.

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