source

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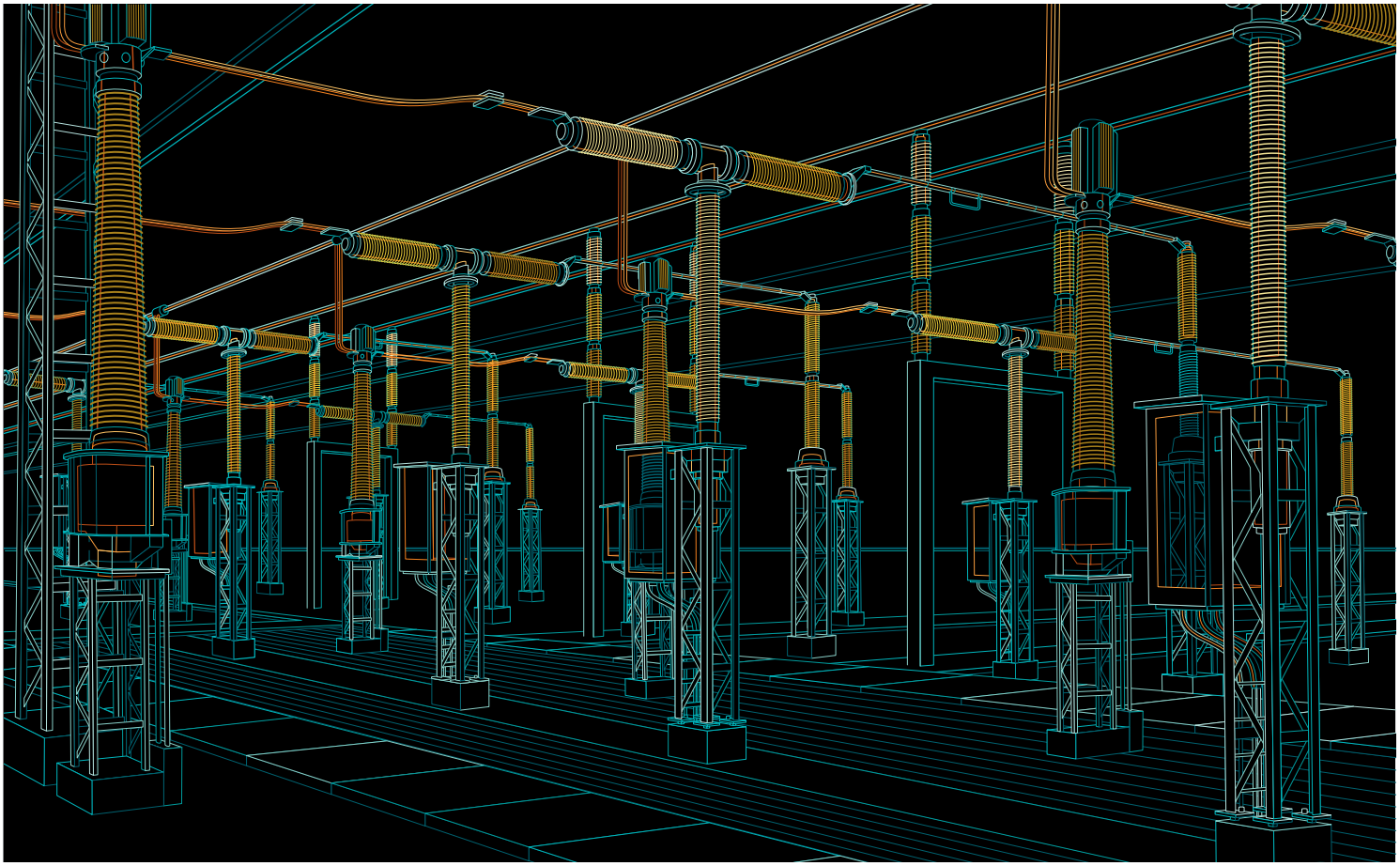
The customer magazine
of the ABB Group
New Zealand



The big picture

source 1|14

Ewan Morris
Managing Director
ABB in New Zealand

I'm pleased to introduce this edition of source, my first as the new Managing Director for ABB in New Zealand.

Since taking over the role in March, I've been fortunate to meet many of our employees and customers and start to paint a picture of where we are, and where we need to be. I have inherited a great team and I can see a lot of potential for us to introduce new and exciting technology into the market. I discuss some of this potential technology along with an introduction, as part of an interview on page 12.

In this edition we are concentrating on looking at the big picture, both in New Zealand and globally. We are proud to co-sponsor the Annual Electricity Survey with Energy News. This is a survey from the industry, on the industry, and pages 10&11 provide a preview of the latest results. Another big topic globally is energy efficiency.

As you'll read on pages 16&17, ABB has teamed up with the Economist Intelligence Unit (EIU) and Enerdata to produce "Trends in global energy efficiency 2013," which highlights trends and attitudes among countries and industry with regard to energy efficiency. Although New Zealand is not one of the featured countries, we can draw many similarities from the results from other developed countries. The theme that runs through both the survey and the report, and complements our technology, is the importance of using energy more efficiently and the opportunities that exist for industry and utilities.

I look forward to hearing your views on the topics. Enjoy the read.

Kind regards
Ewan

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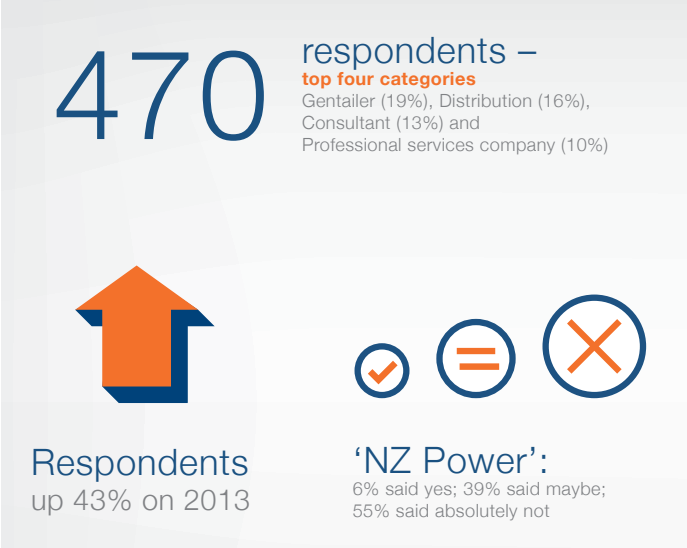

Big picture

Local power technology

Stories in short

Marsden Point

Helping Refining NZ achieve its vision of ‘Fuelling New Zealand’s future’

Photography Refining NZ

ABB’s technology is set to help Refining NZ improve energy efficiency and reduce fuel losses, ultimately enabling the production of more oil products, as part of the replacement of their existing petrol making plant.

Te Mahi Hou Project Overview

The project, named “Te Mahi Hou” (The New Venture), is a $365 million investment in a Continuous Catalyst Regeneration Platformer (the CCR Project). It involves the replacement of Refining NZ’s existing petrol making plant (semi regeneration platformer) that has been in operation for around 50 years, which would otherwise require an investment of approximately NZ$105 million to extend its operational life beyond 2015.

Refining NZ currently supplies the local market with half of its petrol and 80 percent of its diesel needs and, as demands for these fuels increase, so will the demand on the performance of its refinery at Marsden Point. This project has the potential to increase capacity by 3 million barrels of crude a year, improve energy efficiency and reduce fuel losses, (where the crude oil is used in the running of the plant rather than being transformed into saleable product), by 15 percent. Another major benefit for the Company is the expected reduction in CO2 emissions, by around 120,000 tonnes per year.

Refining NZ say the CCR Project is a significant step towards achieving their vision of ‘Fuelling New Zealand’s future!’

Electrical balance of plant

A major part of this CCR project is the electrical balance of plant used to power the site. ABB is supplying both 33 and 6.6 kV air insulated switchgear, along with a 25 MVA power transformer, distribution transformers and drives for the new plant.

ABB’s switchgear solutions provided Refining NZ with increased health and safety benefits through its arc ducting channel to direct hazardous gasses away from operators and surrounding equipment in a system fault event. ABB’s 6.6 kV motor soft starter solution also provided compactness and allowed multi-starter configuration.

ABB’s power and distribution transformers were well-suited to Refining NZ’s stringent petroleum process application needs.

The Te Mahi Hou project is due for commissioning late 2015.

ABB and Solar Impulse form technology alliance

ABB's heritage of technology innovation in renewables, sustainable transportation and energy efficiency makes it an ideal partner for Solar Impulse, which is attempting the first round-the-world flight powered by the sun.

ABB has announced it will support Bertrand Piccard and André Borschberg in their attempt to fly around the world in a solar powered airplane in 2015.

The first-ever flight through the night with a solar airplane as well as record-breaking missions across Europe, the Mediterranean Sea and the United States brought worldwide attention to Bertrand Piccard and André Borschberg with their Solar Impulse endeavour, demonstrating the enormous potential of clean technologies and showing how a pioneering spirit can achieve the impossible.

Now the Solar Impulse team is preparing for the ultimate technological challenge: to circumnavigate the globe in a plane powered only by the sun's energy. On April 9, the team unveiled a new airplane, which will be used to attempt the round-the-world flight in 2015.

"This partnership brings together two Swiss-based global leaders that are passionate about pushing the boundaries of technology and innovation to achieve a better world," said ABB CEO Ulrich Spiesshofer. "We believe in Bertrand's vision, and we are convinced that by pioneering innovative technologies we will be able to decouple economic growth from energy consumption and environmental impact. Today, ABB is a global leader for solutions to enable energy efficiency, sustainable transportation and renewables and like Solar Impulse we are always challenging the boundaries of what is technologically possible."

"It was my dream to have ABB as technology partner of Solar Impulse," said Bertrand Piccard, initiator and chairman of Solar Impulse. "We have the same goal of improving the world by using energy more efficiently and conserving natural resources."

"Solar Impulse and ABB are technology innovators and pioneers," said Andre Borschberg, Co-Founder and CEO of Solar Impulse. "We both want to motivate people to use clean technologies; ABB and Solar Impulse will work together on key technologies like power electronics for our mutual benefit."

Switzerland-based ABB is a global leader in renewables, sustainable transportation and energy efficiency. The company is the world's second-largest supplier of solar inverters and one of the largest suppliers to the wind-power industry. It is also a leader in integrating renewables efficiently and reliably into power grids. The breakthrough innovation of a high-voltage direct current circuit breaker in 2012 will enable the grid of the future. In March 2014, ABB announced that it would be building the world's largest network of new-generation, fast chargers for electric cars in China. ABB improves energy efficiency across the entire value chain from exploration to consumption. Its installed base of drives for motors alone saved around 400 TWh in electricity in 2013, equivalent to the annual power consumption of 100 million European households.

ABB invested more than $1.5 billion in research and development in 2013 and has 8,500 technologists worldwide.

About Solar Impulse

Swiss pioneers Bertrand Piccard (Chairman) and André Borschberg (CEO) are the founders, pilots and the driving force behind Solar Impulse, the first airplane that can fly day and night without fuel or polluting emissions. Solar Impulse is a unique adventure that aims to bring emotions back at the heart of scientific exploration, a flying laboratory to find innovative technological solutions for today's challenges and a vision to inspire each of us to be pioneers in our everyday lives.

This revolutionary carbon fibre airplane has the wingspan of a Boeing 747 (63.4m / 208 ft) and the weight of a small car (1,600kg / 3,527 lb). It is the result of seven years of intense work, calculations, simulations and tests by a team of about 80 people and 100 partners and advisors. A plane so big and light has never been built before. The 12,000 solar cells built into the wing provide four 10HP electric motors with renewable energy. By day the solar cells recharge the 400kg / 881 lb lithium batteries which allow the plane to fly at night.

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.

Celebrating 100 years of ABB Review

2014 is a very special year for ABB Review as we mark 100 years since the first publication of our direct predecessor journal, BBC Review.

ABB Review is a technical journal that is published quarterly in five languages.

The latest issues of ABB Review are available for download on the website www.abb.com/abbreview or on our new ABB Review app available on a range of app stores.

ABB at EEA 2014

19 & 20th June 2014 – Sky City Centre "Invest for tomorrow – people, plant & process"

ABB is proud to have been a part of the electrical industry in New Zealand for more than 80 years, and looks forward to being part of development of a long-lasting future grid. In addition to our usual stand, ABB has two speakers as part of the programme:

- Martin Magnusson will present a paper on the development of technology for disconnecting circuit breakers. This will highlight developing advantages in safety, reliability and footprint. It will also tackle the development of air insulated technologies in this area with consideration to the environment.

- The second paper will discuss the development of technology for dry-type transformers. This will follow on the ability to build dry-type transformers up to the 72.5 kV voltage class and look at the benefits this technology can offer, particularly as space becomes a premium in inner city areas, industrial plants and application in the oil and gas industry.

ABB will be highlighting these products on our stand, and, as always, will be supplying the best coffee in town!

Fostering talent – ABB's regional graduate engineering programme

Our five fresh-faced new graduates (from left to right) Amy Pitt, Max Gessler, Emily Franklin, Nish Patel and Leo Chae

In February ABB welcomed five fresh faces into the team as part of the inaugural ABB South Asia regional engineering graduate programme; Max Gessler and Emily Franklin from the University of Canterbury, and Amy Pitt, Nish Patel and Leo Chae from the University of Auckland.

The programme is part of ABB's regional initiative to meet present and future engineering talent need. The graduate programme runs for 18 months and allows insight into three different areas of business within ABB. The three rotations are for six months each, and include an international posting within the South Asia region.

The engineering programme is run in addition to on-going employment of graduates engaged in engineering and non-engineering roles across ABB, and in addition to other apprentice programmes.

As part of their induction process, the graduates along with their mentors, took part in a charity "build a bike" team building exercise.

Annual NZ Electricity Survey results highlights

470 respondents –

top four categories

Gentailer (19%), Distribution (16%), Consultant (13%) and Professional services company (10%)

Respondents

up 43% on 2013

‘NZ Power’:

6% said yes; 39% said maybe; 55% said absolutely not

65% of respondents

saw the industry playing some role in addressing energy poverty

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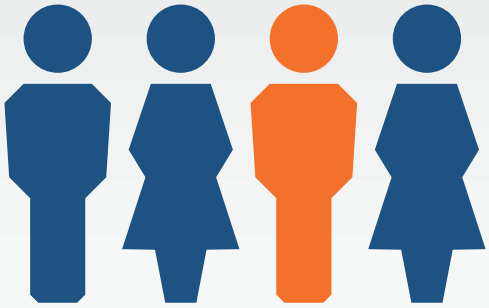
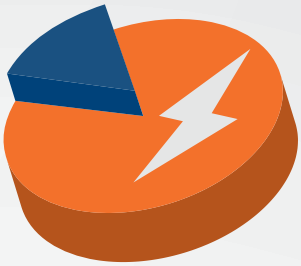


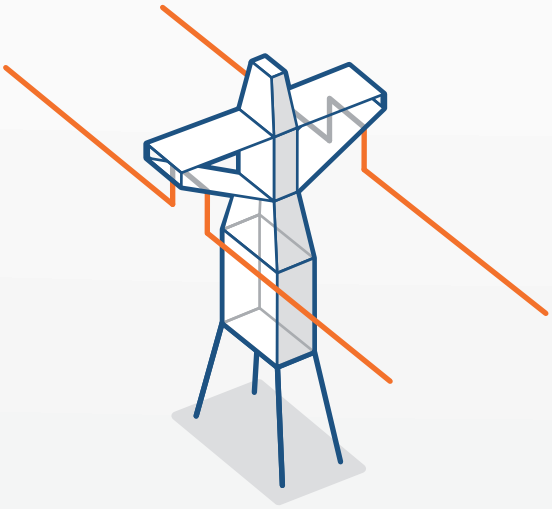


1 in 4

respondents thought
Tiwai will be shut in 2017

Some 85%

of respondents see New Zealand returning to peak demand growth in five years or less



All ‘future trends’

hold near-term potential for NZ

Electric vehicles 17%;
Distributed generation 27%;
Dynamic smart grid 17%;
Residential demand response 16%;
In-home energy management 23%

Energy News and ABB
Annual New Zealand Electricity Survey

The full results document is available on **www.energynews.co.nz** and **www.abb.co.nz.** The survey is held annually in April and is run by both Energy News and ABB Limited.

Q&A with Ewan Morris, ABB's new Managing Director in New Zealand

Ewan Morris talks about coming home, New Zealand industry and his priorities

You have worked for ABB for many years outside New Zealand (NZ). How does it feel to be back home?
It feels great. I have been with ABB for 25 years, starting in NZ as a commissioning and service engineer. In 1992 I got an opportunity to work for ABB in Sweden and I left NZ for two years. Twenty two years later, I have returned – better late than never!

That's quite some time spent with the company. You must be passionate about ABB.
I am fortunate to work for a company that provides tremendous learning and development experiences in New Zealand and around the globe. I've held a number of positions in service management, project management and marketing and sales management in New Zealand, Sweden, Australia, Malaysia and Switzerland. During the last 15 years, I have worked in global roles, most recently as Global Marketing and Sales Manager for ABB's Power Conversion business, based in Switzerland. So, although 25 years sounds like a long stretch, different roles, countries, new cultural and business challenges have kept things exciting and fresh.

What have you noticed has changed in the NZ business scene since you've been away?
Probably one of the biggest changes has been the liberalisation of the electricity market and the associated structural changes. The whole electricity environment seems to have become more complex. I notice that many companies and customers have rebranded themselves and I have to admit that it's a bit of a challenge to correctly associate the new names with the respective sites and infrastructure.

Other notable developments have been the growth of the dairy industry, the decline in the manufacturing sector and the strengthening of the NZ dollar, all of which present opportunities and challenges for ABB.

What are your priorities in your new role?
Engaging with customers is a key priority for me. I look forward to meeting customers, taking time to listen to their feedback, gaining a deeper understanding of their businesses, and determining how ABB can improve its level of service and add value.

Another priority is to ensure that we keep customers informed about global market trends and technological developments that might have relevance in their sectors and for their businesses. This is something that we are well positioned to do, being part of a leading global supplier of power and automation technology.

Does NZ have an opportunity to adopt these trends and developments, or are we too small?
There are several important technological developments and trends taking place in the energy sector around the globe. While the relevance to us in New Zealand might not be immediately obvious, it's important to be aware of these so that we can help customers derive the benefits and plan for the impact. The two areas which come to mind immediately are electric vehicles and photovoltaic solar energy.

There is a huge amount of development taking place globally around electric vehicles (EVs) and charging infrastructure for EVs. Many car OEMs are in the process of bringing fully electric EVs to the market and this will require charging infrastructure which will place demands on electrical networks.

ABB has collaborated with some of the major car OEMs and has developed a complete range of DC fast chargers for EVs, which allows an EV to be charged in 15 to 30 minutes instead of six to eight hours as required with slow AC charging – that is fast by any measure. ABB is already supplying large quantities of fast chargers for charging networks across Europe. And, in addition to Europe, China is making large scale investments in EV development, with EVs being one of China's seven emerging strategic industries. ABB has been selected to supply fast charging solutions for the new DENZA electric vehicle project, which will form part of the largest EV fast charger network in the world.

As the volume of EVs scales up, the economics of EVs will change and they will become more competitive. I foresee EVs becoming more mainstream, including in New Zealand. Given the predominance of renewable power generation locally, declining electricity consumption, and our relatively high level of greenhouse gas emissions (mainly from livestock), we have an environment that's suitable for reaping benefits from EVs.

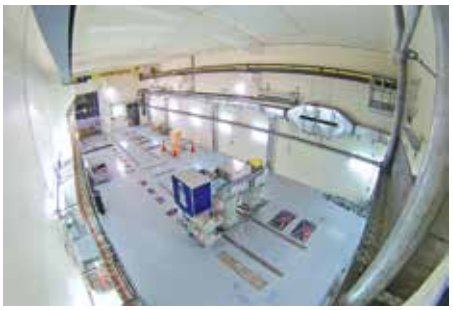
Another example is in the area of photovoltaic (PV) solar energy, where lower cost technologies are driving changes in the global energy sector. As a leading global supplier of PV Solar Inverters, we see that increasingly competitive distributed PV Solar, combined with higher functional integration in Inverters, and more cost effective battery energy storage solutions are creating demand for grid connected, micro-grid and off-grid solutions. I expect this will be of interest to some customers in New Zealand.

Finally, what should we expect to see from ABB in NZ under your leadership?
The most important goal is that we are a responsive, reliable and trusted partner for customers. A partner which understands its customers' business imperatives, has the necessary domain and application expertise to add value, and a partner which delivers on its commitments and satisfies its customers.

Having reviewed our business in New Zealand and having met most of our team, I believe we have a strong foundation, nevertheless, we need to be continuously on the lookout for ways in which we can improve. That's why feedback from customers is so important and why we initiated a customer satisfaction survey (NPS). We really appreciate that customers take the time to give us feedback via the survey, as it highlights areas for improvement and drives change. My commitment is that we follow up on every single piece of feedback in order to determine where we can improve our performance, so that we can become a better partner for customers.

Switchgear supply for substation

ABB 110 kV gas insulated primary switchgear (GIS) was utilised by Vector as part of the redeveloped substation at Hobson Street in central Auckland City, designed to reinforce power supply to the Auckland CBD.



Officially opened in late 2013, the redeveloped substation project by Vector and Transpower was part of Transpower's wider North Auckland and Northland project (Naan). The Hobson Street substation will connect to a new underground electricity cable link between Pakuranga and Albany.

The main components of this project were the construction of a new architecturally designed substation at the Hobson street site and the installation of a grid exit point to create increased power supply to the Auckland CBD.

ABB's installed 12 GIS bays in Hobson Street site. They are suited for this project as they are designed for extremely low space requirements and for densely populated areas like Auckland City.

ABB pioneered high-voltage gas-insulated switchgears in the mid-1960s and continues to drive innovation today with a product portfolio that includes voltage levels from 72.5 kV to 1,100 kV.

Ministerial visit

Our team in Napier played host to Minister for Economic Development/Minister of Science and Innovation, Hon Steven Joyce in April.

In addition to a quick tour of the factory, Mr Joyce interacted with the team during a Q&A session.

The team took the opportunity to discuss local transport issues around the Napier/Gisborne rail line as well as discussing R&D funding.

This is not the first time Napier has played host to high-level politicians. The Prime Minister and representatives from the Labour Party caucus visited in 2013.

ABB Ventyx in New Zealand

Ventyx, an ABB company, is the world's leading supplier of enterprise software and services for essential industries – such as energy, mining, public infrastructure and transportation.

Ventyx offerings include a broad range of IT solutions as well as leadership in Enterprise Asset Management (EAM) and Enterprise Resource Planning (ERP) software. These solutions are designed to minimise risk, optimise operations to enhance financial performance and help industrial customers operate in a smarter way.

To develop and grow Ventyx in the New Zealand market, Ross Anuzis recently joined ABB and is based in Auckland.

Prior to joining ABB, Ross worked in the IT industry for over 25 years holding various senior sales and marketing roles, for IT companies such as Microsoft and Oracle, both in New Zealand and the UK.

"I'm looking forward to engaging with ABB's customers to share our vision of how the convergence of IT and operational technologies can enable improvements in business processes. ABB Ventyx is leading the industry in this area and with continued R&D investment, aims to maintain this leadership role," Ross says.

For more information on Ventyx, visit www.ventyx.com or contact Ross on ross.anuzis@ventyx.abb.com, or 09 362 1230.

Sustainable opportunities in energy efficiency

ABB's newly published report "Trends in global energy efficiency 2013" presents attitudes and trends among countries and industry with regard to energy efficiency. ABB first published the report in 2011 to help raise awareness about the importance of using energy more efficiently, and the opportunities that exist for industry and power utilities.

The 2013 report comprises several parts provided by two independent organisations, the Economist Intelligence Unit (EIU) and Enerdata. It features energy efficiency information and published on an external microsite and ABB's energy efficiency external portal.

Over the last 20 years, significant progress has been recorded in terms of energy efficiency, where a continuing reduction in world energy consumption compared to national production has been a trend. Industry and power generation accounted for almost half of that reduction (about 30 percent and 15 percent, respectively).

Many of these energy intensive industries have focused on energy efficiency for a number of years. But a whole new class of industries, from automotive to food and beverage and discrete manufacturing, are now gaining appreciation for its importance. And more and more businesses are viewing energy efficiency as part of their sustainability performance, alongside a growing level of customer interest.

Nevertheless, a great deal still remains to be done, as shown by the significant energy savings potentials identified in ABB's 2013 report. In the power sector, the improvement of power generation efficiency could reduce fossil fuel consumption for power generation by 30 percent, and power grid efficiency improvements could reduce global electricity consumption by four percent. In industry, the energy efficiency improvement potential is 40 percent in the case of steel, 20 percent for cement and 15 percent for aluminium; potentials in the chemical and paper industries are also high.

The Paris-based International Energy Agency (IEA) says industry can cut its energy costs by $3.3 trillion by 2035 by implementing currently available technologies and practices in manufacturing.

To view the full report, visit the interactive website: www.abb-energyefficiency.com

ABB's Napier technology helps save 20 percent fuel on ships

ABB has supplied two 875 kVA PCS100 Static Frequency Converters (SFCs), designed in Napier, New Zealand, to provide voltage and frequency stabilisation on Corona Seaways and Hafnia Seaways, two RO/RO (roll on/roll off) vessels. The vessels transport large volumes of cargo between Denmark and the Baltic countries, and consume vast amounts of fuel oil. Thanks to MAN Diesel and Turbo's technology in partnership with ABB, saving on fuel costs by 20 percent can now be achieved.

Technology in action

The shipping industry is continually faced with the challenge of finding new ways to lower the consumption of fuel. This is due to environmental restrictions and high bunker oil prices. With these challenges in mind, MAN Diesel and Turbo worked in partnership with ABB to investigate whether it was possible to reduce the fuel consumption by lowering the engine speed of the ship, without compromising boat speed. When the propeller speed was reduced, this also reduced the RPM of the shaft generator, leading to a lower AC Bus voltage and a lower AC Bus frequency. This, in turn, resulted in significantly lower fuel consumption.

MAN Diesel's Sales Manager, Christian Wollerup Sørensen, says that a 20 percent saving on fuel consumption is a major advantage within the shipping industry, "There is a lot of money at stake when vessels are bunkering fuel oil, so a saving in the region of 20 percent makes a huge difference."

The technology behind this result was MAN Diesel and Turbo's highly efficient Alpha Kappel propeller design, combined with flow optimising Rudder Bulbs and ABB's PCS100 Static Frequency Converter (SFC). The ship's electrical equipment operates on a 50 Hz grid with a voltage of 400 V. In order to maintain the voltage and frequency when the speed of the shaft generators is lowered to 1500-1260 RPM, ABB's PCS100 SFC regulates the voltage and frequency to 50 Hz with a voltage of 400 V. With ABB's technology in place, this enables the ship's electrical system to carry on working at the same frequency without having to consume additional fuel.

Meanwhile, the Alpha Kappel propellers weigh in at 10 tons and have a diameter of five metres. They are designed to be similar to an aircraft wing tip and have a bend of almost 90 degrees. Due to this feature, there is reduced turbulence around the propeller tip, lowering the flow separation from the pressure side to the suction side of the propeller.

In addition to supplying the PCS100 SFC, ABB was also responsible for the shipyard installation work, which included the expansion of the main switch board with three 1600 A breakers and installing cabling into the confined spaces.

An effective technology partnership

MAN Diesel's Promotional Manager, Brian Grusgaard, is confident that in the future ABB and MAN Diesel will be able to continue their relationship and produce effective solutions for existing and future customers. "The longer we can drive down the power to the propeller shaft, the higher efficiency and saving of fuel we can achieve. At the same time, there is less wear and tear as a side-effect, because of fewer revolutions. And we have seen that throughout the ship the gearbox, propeller shafts and propeller blades can be optimised to save fuel. The savings are very palpable, and proved by the pay-back period."

New products

Robotics

IRB 6700

7th generation of large industrial robots

With the unveiling of the ABB's seventh generation of large robots – the IRB 6700 family – not only have accuracy, payload and speed been increased, but power consumption has been lowered by 15 percent and service has been simplified.

Every robot in the 6700 family has been designed to accommodate Lean ID – a new Integrated Dressing (ID) solution meant to achieve a balance between cost and durability by integrating the most exposed parts of the dress pack into the robot. Equipping an IRB 6700 with Lean ID makes it easier to programme and simulate with predictable cable movements, creates a more compact footprint, and lengthens service intervals due to lessened wear and tear.

Advantages

- Multiple variants: Payloads from 150 to 300 kg and reaches from 2.6 to 3.2 metres
- Robust yet precise: Collision resistant with moment of inertia capabilities
- Simplified maintenance: Longer service intervals, highly accessible components and optimised service routines
- Lowest Total Cost of Ownership: Key improvements combined with better energy efficiency add up to a 20% lower TCO

Further info: www.abb.com/robotics

Power protection

PCS100 MV UPS

ABB's PCS100 Medium Voltage UPS – Complete power protection

The new PCS100 MV UPS is a medium voltage UPS that offers complete power protection for your business. Because it complements the existing range of ABB's power protection products, you can simply add the PCS100 MV UPS to your existing solution.

Power ratings starting from 2 MVA up to 6 MVA, allow you to choose the solution that best suits your application. A wide range in retrofit possibilities means you can custom design the PCS100 MV UPS for any high powered industry. With an efficiency well in excess of 99 percent and a wide range of energy storage options, the PCS100 MV UPS is the ideal solution for your power protection needs.

Advantages

- Highest energy efficient configuration: Installing the UPS protection at the MV level provides the most energy efficient configuration as the lower currents at this voltage result in lower losses.
- Lowest total cost of ownership: The unparalleled efficiency of the PCS100 MV UPS, its maintenance costs and small system footprint minimise ownership costs. The fact that the energy storage and converter is at the LV level also greatly simplifies maintenance and reduces system cost.
- Retrofit possibilities allow custom designs that suit applications in plants that are currently unprotected or where traditional rotary UPS solutions require replacement.

Further info: powerquality.nz@nz.abb.com

Every standard, every schedule, every time.
Every. Thing. Controlled.

In most dairy companies, the trend is towards faster turnaround and closer integration of production scheduling with logistics. Yet the production engineer must maintain tight control over every part of the process to deliver consistent quality products, and comply with the strictest food safety standards. Usually under pressure to reduce costs at the same time. ABB's tireless commitment to process innovation can offer major performance improvements. Whether you choose to talk directly to us, or to one of our ABB Authorized Value providers, you can rest assured that everything is controlled. Every input, every sample, every standard, every schedule, every time. www.abb.com/dairy

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