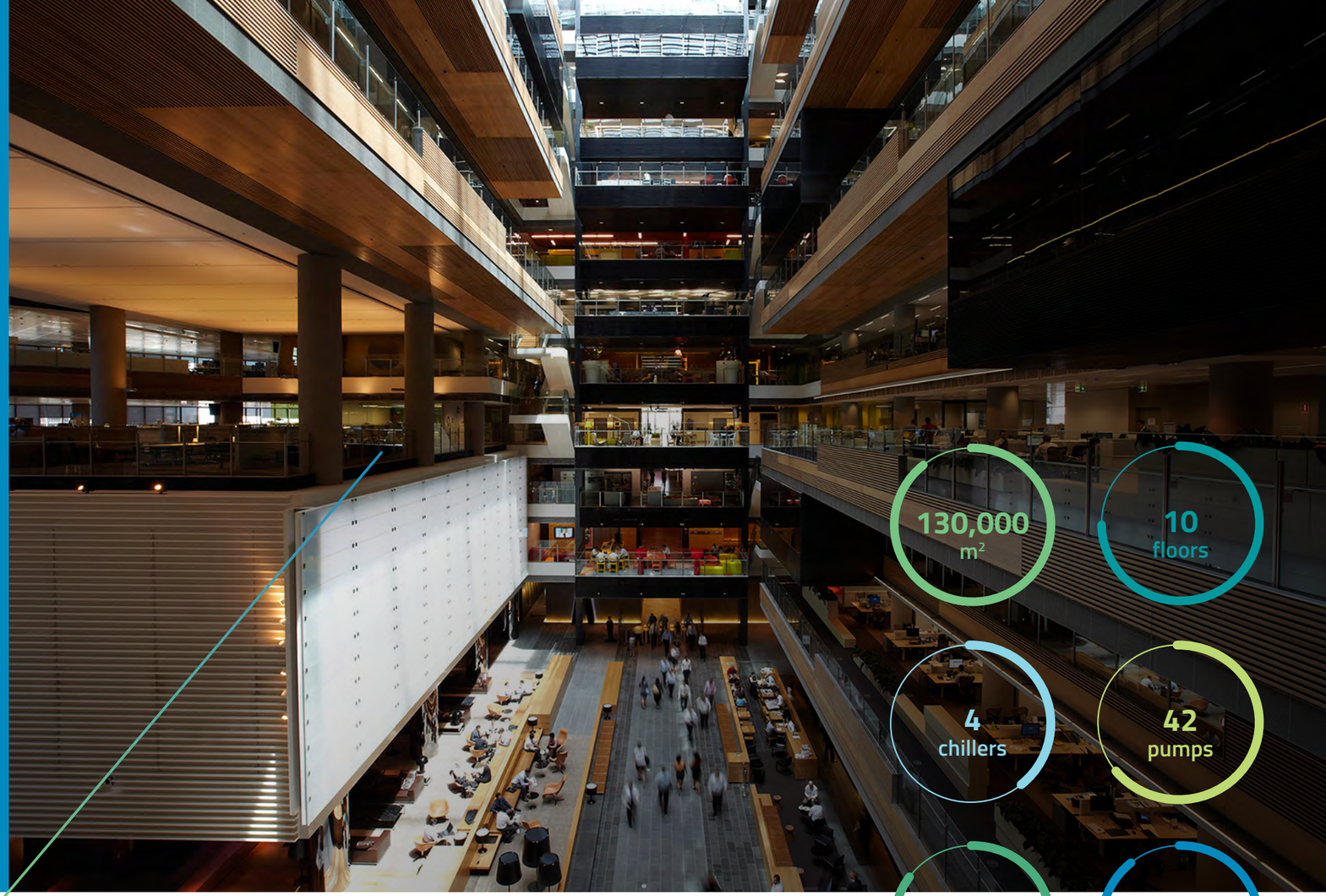
AZZO
technology comes together®

POWER QUALITY
CASE STUDY

AUSTRALIA & NEW ZEALAND BANK (ANZ)

ANZ bank headquarters is the largest office complex in Australia. Completed in 2010, the mixed-use facility consists of 10 floors and over 130,000 square meters.

Energy is supplied from a combination of utility power and a number of distributed energy resouces (DERs) including generators, cogeneration plants and solar.



The challenge

ANZ Bank's modern headquarters have several large loads, including 4 chillers, and approximately 200 variable speed drives (VSDs) for 42 chiller/AHU pumps, 150 air conditioners and other loads. The varied loads have contributed to severely distorting the AC voltage through rectification. The resulting power quality issues, mainly harmonics, put a strain on the site infrastructure, specifically the cogeneration units, which lead to outages.

The combined impacts of large horsepower motor operation, and the electrical transformation from AC to DC and back to AC as a part of the operation of a VSD, in combination with the power supplies found in LED lighting and computers conspired together to distort the power quality within the facility. The distortion was so significant that it caused the cogeneration units to fail and go offline.

Initially, to solve this problem, ANZ had Active Harmonic Filters (AHF) installed. However, due to multiple hardware issues, those units failed after a few years resulting in site downtime and lost productivity. Furthermore the AHF units were not connected to any software for continuous monitoring which affected prompt and active diagnosis.

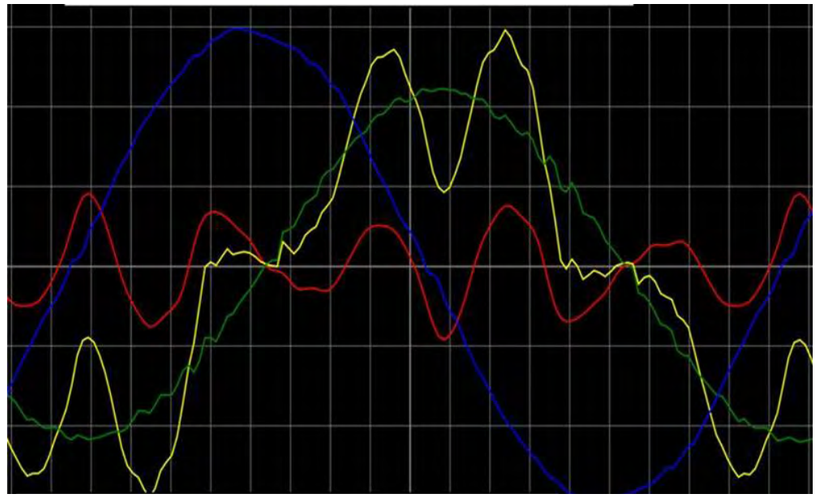
As a result of the failures, all the AHF units were turned off, which meant that the cogeneration units were unable to run due to high harmonic levels, thereby compromising ANZ's aim to reduce CO2 emissions since 2019.

The solution

The AZZO team brought their interdisciplinary skills and teams in to engage with ANZ and understand the full scope of the challenge. All four of our core competencies of energy management, power automation, electrical engineering and digital systems were put to use in providing a solution.

The first step we took was to deploy 10 EnergyX Portable units to understand the nature of the power quality issues across the entire facility. During the tendering process, we were actively analysing the data from the meters and discussing all of this with the consultant. We also focused on building partnerships with the BMS Provider, electrical contractor, the original consultant and ANZ, resulting in a level of trust in our combined capabilities. Our approach differed significantly from others who were tendering, such as distributors and suppliers.

Based on the power quality audit results from the EnergyX Portables, we proposed a complete solution, consisting of an EcoStruxure architecture built around 21 Accusine AHF units, connected to software and accompanied by 16 ION power quality meters at strategic locations in the building. We also proposed advisory services including fleet management. Because we were able to show the value of having a complete system and intelligent, communicating active harmonic filters, the customer accepted our proposal.



Voltage sinewave

Current sinewave before correction

Injected current harmonics from AccuSine

Corrected current sinewave

The results

AFTER OUR SOLUTION WAS DEPLOYED, HARMONICS RETURNED TO MORE THAN ACCEPTABLE LEVELS. ANZ WAS THEN ABLE TO ACTIVATE THE COGEN UNITS ENSURING MONTHLY SUSTAINABILITY TARGETS WERE MET.

There has been no further site failures resulting in lost productivity and downtime and the facility team is now able to have confidence in the electrical network with regular live daily insights into the facility.

The ANZ project won Schneider Electric's Digital Power 2020 Project of the Year, acknowledging the impactful business results achieved for the customer and the technical solutions provided by AZZO.

As one of ANZ Bank's key Project Delivery partners, Downer was tasked with identifying the source of a number of historical, ongoing failures of the site's Active Harmonic Filters. We engaged AZZO in early 2019 to carry out a power quality investigation and analysis on-site to assist us with this. We were pleased with the quick turnaround of the EnergyX portable meters, the ease at which they could be installed, as well as the detailed analysis, reporting and recommendations that followed.

Downer was then able to partner with AZZO over the following months, to rollout a new Active Harmonic Filter system on site. Alongside AZZO, Downer worked with Nilsen for the on-site installation, AE Smith for the design and construction of purpose built environmentally controlled enclosures, Siemens for BMS management and control as well as with JLL and Airmaster for operational and site management .

The solution not only resolved the site's power quality issues, but also gave ANZ an unprecedented insight into the real-time status of the site's power quality, which was not available before. The successful delivery of this project has ensured that 833 Collins Street will be in a great position for a sustainable future."

LEROY D'SOUZA
Lead Project Engineer / Project Manager
Critical Infrastructure Management
Downer Group

Contact us to see what we can do together

AZZO (USA)
330 Changebridge Road
Suite 101, Pine Brook
NJ 07058
USA

+1 973 575 5032

AZZO (AUSTRALIA)
B22, 6 MAB Eastern Promenade
Tonsley
SA 5042
Australia

+61 1300 00 2996

solutions@azzo.com
azzo.com