

Global Energy Management System Implementation: Bci

Chile

Banco Crédito e Inversiones

“To become the first financial institution in Chile to have its own Energy Management System implemented.”

-Orlando Melo, Safety, Central Services and Realtor Manager.



“Bci is an important player in the economic development and a witness of our country’s political and social life, always making a difference through its business culture based on the values of integrity, respect and excellence.”

—Luis Enrique Yarur, CEO

Business Case for Energy Management

Bci is a financial institution which offers a comprehensive range of financial products and services to the community with the highest standards that include efficiency, quality, innovation, risk management and ethical standards, which must be respected by all their employees.

With 80 years of experience, it is the third most important private bank in the country. Bci Corporation has 9 subsidiary companies, more than 10,000 employees, a network of 330 branches from Arica to the Antarctic, a branch office in Miami, representation offices in Mexico City, Lima and Sao Paulo and a business agent in Madrid.

Case Study Snapshot

Industry	Commercial
Product/Service	Financial Services
Location	Chile
Energy Management System (EnMS)	ISO 50001
Energy Performance Improvement Period	One Year
Energy Performance Improvement (%) over improvement period	3%
Total Energy Cost Savings over improvement period	7,640 USD
EnMS Implementation Cost	44,593 USD
Payback Period (of EnMS implementation)	5.8 Years
Total Energy Savings over improvement period	367 GJ
Total CO ₂ -e Emission Reduction over improvement period	25 tonnes CO ₂

Business Benefits Achieved

In its commitment to the environment and sustainability, Bci aims to mitigate the effects of climate change through a number of initiatives including energy efficiency, renewable energy and water efficiency.

In line with this commitment, the corporation set a target to reduce its yearly energy consumption by 10% by the year 2020, taking the year 2012 as a baseline. To date the energy consumption has already been reduced by almost 12% which means the goal was achieved two years earlier than expected. This achievement was thanks to the incorporation of an Energy Management culture, with its systematic approach has allowed, the development and implementation of several energy efficiency measures.

In addition, the Corporation obtained the ISO 50001:2011 "Energy Management Systems" certification for its headquarters building in Santiago, located in El Golf 125, Las Condes. This milestone resulted in Bci being the first national bank to get this certification, becoming a reference for other commercial institutions. The ISO 50001 certification ensures that the energy performance of this facility is constantly monitored and assures a permanent improvement process, with clear objectives, goals and action plans.

Business Benefits (Summary)

Some of the implemented energy efficiency measures were:

- Implementation of the ISO 50001 certification at its headquarters building.
- Implementation of boiler automation systems to obtain efficient control of hot water temperatures.
- Phasing out the fluorescent lighting technology and replacing it with LED technology.
- Controlling the maximum power demand during peak hours in order to reduce the electricity bills.

These projects were financed using the annual budget allocated for energy efficiency, equivalent to 1 million USD. It was also implemented a 23kW photovoltaic system in September 2017 which is going to generate some 31,000 kWh per year. The cost savings from September 2017 to January 2018 reached 1,900 USD and the equivalent CO₂ savings are 5,800 kg. In addition, Bci established an energy management team in 2012, and in 2015 they appointed an Energy Manager who specializes in energy management and whose role is to improve the energy performance of their buildings and branch offices.

In summary, the energy management and the energy efficiency initiatives have achieved the following benefits:

- 12% energy savings, equivalent to 3.1 GWh
- A 975,000 ton reduction of CO₂ emissions

The energy saving of 3.1 GWh is equivalent to the energy use of the Bci headquarters for 1.3 years.

Non-Cash Benefits

The positive results of the implementation of the energy efficiency projects helped Bci to obtain the Gold Energy Efficiency Seal granted by the Ministry of Energy. This award is given to leading national companies who promote energy matters such as culture, responsibility and commitment.



Figure 1: Achievement of the Energy Efficiency Golden Award.

Benefits Demonstration

Figure 2 shows the electricity reduction from 2015 to 2016, which accounts for 3% of energy savings.

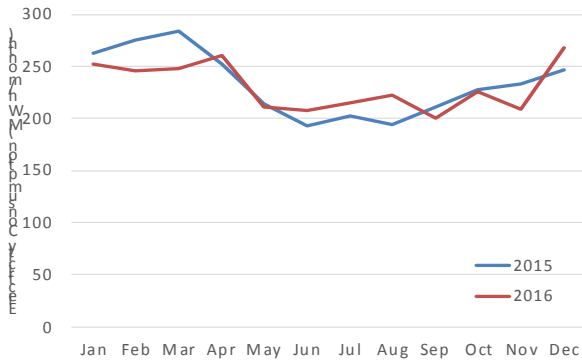


Figure 2: Electricity consumption 2015-2016.

It is important to mention that Bci participates in the Dow Jones Sustainability Index which benchmarks and tracks the stock performance of the world's leading companies in terms of economic, environmental and social criteria. Their current rating allows them to participate in the Chilean and Latin American (MILA) categories. The senior management team has set the goal of being able to participate in the World category, in which four other Latin-American Banks located in Colombia and Brazil currently partake.

EnMS Development and Implementation

“Bci has opted to extend its energy efficiency policy to all its business endeavors.”

—Cristian Báez, Head of Maintenance and Energy Efficiency

Organizational: Bci started the design of the EnMS for its headquarters at the end of 2015, setting as a goal for 2016 the implementation and certification of an EnMS in accordance with the ISO 50001 standard.

The Bank achieved the ISO 50001 certification in December 2016. This was possible due to the commitment of senior management team and the EnMS Team.



Figure 3: ISO 50001 Certification.

Energy Review and Planning:

The headquarters building uses a substantial amount of energy where the main sources are electricity, natural gas and diesel. Figure 4 shows the energy consumption of the headquarters building.

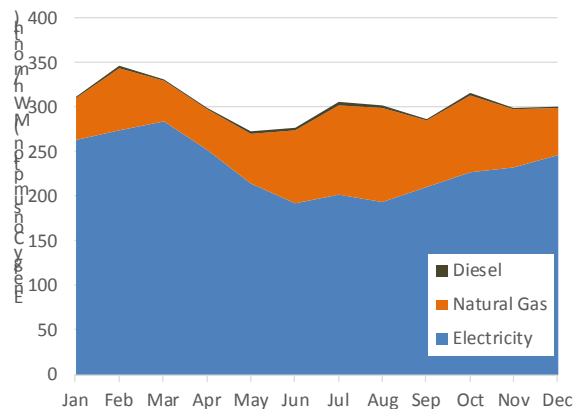


Figure 4: Consumption Distribution Year 2015

Action Plan

Given that the air conditioning and lighting systems are the main energy users, the energy efficiency measures have been aimed at replacing equipment used in these systems. Some of the measures include high efficiency air conditioning units, which are inverter driven, and the use of LED technology for lighting systems. The International Performance Measurement and Verification Protocol (IPMVP) is being used to measure and verify the energy savings achieved.

Baseline

The implementation of the ISO 50001 standard established the year 2015 as the energy baseline, shown in Figure 4. It is possible to notice in Figure 2 an energy reduction during the warmer months of 2016, from January to March and from September to December. The energy savings were calculated using the following equation:

$$\text{Energy savings (kWh)} = \text{Current Energy Use (kWh)} - \text{Baseline Energy Use (kWh)}$$

Performance Indicators

Two energy performance indicators were developed to track the energy performance:

- Energy consumption per square meter (kWh/m²)
- Energy consumption related to the outdoor weather conditions, using the heating and cooling degree days (kWh/DD).

Evaluated Opportunities

The following initiatives have been implemented in buildings and branches:

- Installations of lighting sensors in order switch the lights on and off.
- Control of the maximum power demand during peak hours, which helps to reduce the cost of electricity.
- Installation of a Photovoltaic system to generate electricity.
- The use of the Free Cooling mode on air conditioning equipment.
- Control of the boiler set point temperature.

Financing: Because energy efficiency is part of the core strategy of Bci, the implementation of the EnMS was financed with its own resources. The design and implementation of the EnMS cost 44,593 USD.

Regarding the financing of the energy initiatives, two large projects have already been completed and a third will be implemented during 2018. These are as follows:

System	Use of energy	Savings Opportunities	Estimated investment (USD\$)	Annual savings (USD\$/Año)	Payback
Solar energy	Solar energy generation	Installation of seventy two solar panels of 295 watts each.	USD\$ 41,548	USD\$ 3,822	10.8 Years
Lighting	Lighting equipment	Change of lightning equipment by energy-efficient lighting, decreasing power from 52 watts to 18 watts.	USD\$ 6,125	USD\$ 1,819	3.3 Years
Air Conditioning	Change of absorption chiller by polyvalent chiller	Important points of Chiller: Domestic hot water generation to heat recovery, eliminating the use of two boilers.	USD\$ 440,418	USD\$ 101,839	4.3 Years

Duration: The design of the EnMS took approximately 8 months and the implementation was carried out in 4 months.

Cost-Benefit Analysis: The EnMS has generated several tangible and intangible benefits.

Regarding the intangible benefits, it has permitted the standardization of processes and greater control over the air conditioning and electrical contractors. This allows the constant monitoring of the energy sources at the headquarters building.

Another important benefit of the EnMS is that the energy efficiency criteria is incorporated in the early stages of design in new projects and when purchasing new equipment.

Approach Used to Validate Results

Implementing the first ISO 50001 at the Bci headquarters was a real challenge, because one of the main goals was to get the employees involved in the initiative. The results were positive as the employees started to provide suggestions and contribute to different aspects relating to the efficient use of energy.

One of the actions taken to support the EnMS was to recruit an Energy Manager. His tasks are to verify the energy savings, conduct a monthly analysis of the energy bills, track energy performance indexes, issue monthly energy reports, take the lead on energy efficiency projects and to follow up on the results of previously implemented projects.

In order to verify the energy savings results, he uses the IPMVP protocol. The IPMVP defines standard terms and suggests best practices for quantifying the results of water and energy efficiency investments, demand management and renewable energy projects.

Steps Taken to Maintain Operational Control and Sustain Energy Performance Improvement

The methodology used to carry out the operational control of the energy use is as follows:

- Monitor energy bills (electricity, natural gas and diesel) for each premises, a task carried out by the Energy Manager.
- Increase the number of electricity meters within each premises to register the energy consumption in different areas.
- Control the temperature in hallways, meeting rooms and work areas.
- Provide adequate training for maintenance personnel including the operational control of the main energy systems.
- Switch on and off the electric and air conditioning equipment in accordance with the service required during working hours.

“Sustainability is a permanent challenge that we must continue to face with creativity and innovation”

-Eugenio Von Chrismar, General Manager.

Development and Use of Professional Expertise, Training and Communications

Bci created the EnMS team which is led by the Head of the Maintenance and Infrastructure Department. The team is composed of the Electrical Maintenance Manager, Air Conditioning Manager, Real Estate Management Architect, Corporate Building Manager, Project Management Engineer, Purchasing Manager, Sustainability Manager and Financial Control Manager.

The EnMS team has also developed, with the support of communication agencies, an annual dissemination plan focused on developing awareness campaigns, in which the team provides information to employees regarding the improvement in energy performance.



Figure 5: Publicity slogan

Tools and Resources

The Bci headquarters building has the following:

- Building Management Software, I-VU Carrier, which controls the air conditioning and lighting systems.
- 22 electricity meters.
- Monthly energy performance report.
- 23.48 kW photovoltaic system which consists of 72 panels (295 Watts each).

At a National level Bci has the following:

- Energy management software in all its buildings and branches. This system allows them to have 100% coverage of the energy consumption within the organization.
- 78 online energy meters , covering 23.6% of the national Bci premises.

Lessons Learned

In summary, what stands out with regards to the energy management is as follows:

- The existence of an internal team specialized in energy management is essential, together with the support of energy advisors that incorporate technical and management expertise and help to achieve even better results.

- Upon review of the energy efficiency measures and the savings achieved, Bci learned that savings can be achieved not only through high investment but also through behavioral changes. Such is the case of turning on and off equipment turn like lighting sensors and chiller controls.
- Incorporation of all company employees to commit to the environment and thus promote a culture of energy efficiency.
- Work in a systematic way to improve the energy performance and maintain the energy management in order to avoid reductions in energy performance.

Keys to Success

- The commitment of Senior Management.
- Collaborative work between the different areas involved in the implementation of the EnMS.
- Using providers committed to supporting energy performance improvement.
- Take into account all the variables that affect the energy performance.

Implement an effective awareness campaign that will increase the support and collaboration of all the employees.

Through the Energy Management Working Group (EMWG), government officials worldwide share best practices and leverage their collective knowledge and experience to create high-impact national programs that accelerate the use of energy management systems in industry and commercial buildings. The EMWG was launched in 2010 by the Clean Energy Ministerial (CEM) and International Partnership for Energy Efficiency Cooperation (IPEEC).

For more information, please visit www.cleanenergyministerial.org/energymanagement.

