ADVANCING NET ZERO
A net-zero future

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The Quarterly Newsletter of Reliable Controls Corporation

Q4- 2019

OFFICIAL RELEASE

RC RemoteAccess®

3.5

ISO 9001 14001 QUALITY ENVIRONMENTAL ASSURANCE

RoHS 2 COMPLIANT

Member of BACnet International

Reliable controls®

RC-RemoteAccess 3.5

With optional redundant Failover server

Simplify IT management and improve data communications security with RC-RemoteAccess, a flexible BACnet® Virtual Private Network (B/VPN) solution that is scalable and affordable. This easy-to-use software does not require additional routers or controllers to deploy and permits multiple separate VLAN configuration. Save time and money by deploying and managing your own BACnet secure network.

RC-RemoteAccess secures internet connections to Reliable Controls BACnet/IP devices, eliminating the need for BACnet Broadcast Management Devices (BBMDs), static public IP addresses, and forwarding of unencrypted BACnet communications through firewalls. Connecting multiple remote systems into a single BACnet internetwork is greatly simplified and secured using an encrypted B/VPN. The software can be installed on the same server as RC-WebView®, RC-Archive®, and RC-Reporter® or on an independent server. Data communications security is improved with up to 256-bit encryption, 2,048-bit server certificates, and Transport Layer Security protocol.

RC-RemoteAccess benefits

- Supports Domain Name System (DNS) or static IP for server ID.
- Supports Dynamic Host Control Protocol (DHCP) clients.
- Hosts multiple B/VPNs by name, not port number.
- A single inbound port services multiple B/VPNs and minimizes port-forwarding rules while improving security.

New features in RC-RemoteAccess 3.5

1. RC-RemoteAccess is now web-based rather than a desktop application. Installing RC-RemoteAccess configures network settings, installs a website, and creates a shortcut on the desktop to launch the website in your default browser. Configure your B/VPNs and associated settings in the web interface using a standard browser such as Chrome or Windows Explorer.

2. Rather than manually configuring each client, operators can now update the B/VPN settings on connected clients from within RC-RemoteAccess. When a user changes a setting that affects connected clients, a wizard guides them through the client configuration process.

3. Users can change the advanced BACnet settings for each B/VPN device within the web interface in the event of network conflicts. Previously only the BACnet network number was editable. The editable BACnet settings are:

   - BACnet network number.
   - Device ID.
   - ADPU settings (timeout, segment timeout, and retries).

4. A specific External Service TCP port setting allows users to configure and update the external-facing port for B/VPN-connected clients when port forwarding or network address translation is used for the B/VPN connection.

Redundant Failover server

One of the main new features of RC-RemoteAccess 3.5 is the ability for users to configure an optional redundant Failover server to host B/VPNs should the RC-RemoteAccess Primary server go offline.

The Failover server is a separate server instance of RC-RemoteAccess that can be hosted on a separate server, preferably cloud-based, or in a separate location that does not have B/VPN clients. This ensures network resiliency against server maintenance, power loss, or dropped internet connections.

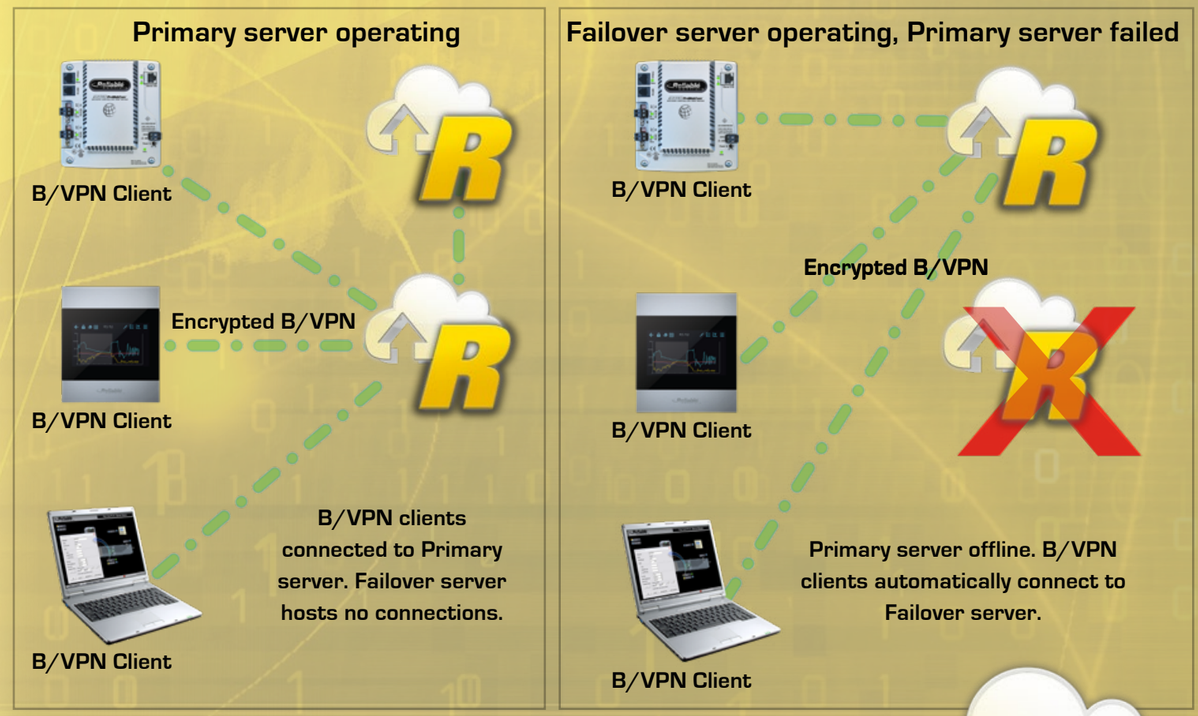
When the Primary server fails, connected clients automatically access Failover server information and initiate a connection. This transition is designed to occur quickly and smoothly, with minimal interruption in service.

Securing your BACnet network from cyber threats has never been easier with RC-RemoteAccess.

The following firmware and software versions support the RC-RemoteAccess Failover server:

- RC-Archive® 3.10.2.1.
- RC-Studio® 3.6.3.
- RC-Toolkit® 3.0.2.1.
- RC-WebView® 3.12.3.
- MACH-Pro(Web)Com/Sys™ 8.26.3.
- MACH-ProView™ 8.26.3 router models.

RC-RemoteAccess not only provides enhanced security but also saves time by minimizing the need for BBMD configuration and broadcast distribution table setup. RC-RemoteAccess from Reliable Controls conveniently provides easily managed changes to client configurations and the ability to host multiple B/VPNs on a single server.



A Failover server mitigates the risk of relying on a single server for secure network communication.

The Failover server feature provides a simple and secure transition from one server to another.

A NET-ZERO FUTURE

The signing of the Paris Agreement in 2015 marked a global call to action to address climate change. The built environment is responsible for an astonishing 30 percent of global energy consumption, 30 percent of greenhouse gas emissions, and 50 percent of emissions in major cities.[1] An increasing effort is underway around the world to make the transition to net-zero energy buildings, an essential step in achieving global energy efficiency and large-scale emissions reduction. In August 2018, the leaders of 19 cities, including Copenhagen, London, Los Angeles, Tokyo, Toronto, and Washington DC, signed the Net Zero Carbon Buildings Declaration and pledged to ensure that all buildings in those cities, new and old, will meet zero-carbon standards by 2050.[2] Even more stringent, in the European Union, the Energy Performance of Buildings Directive requires that all new buildings be nearly net-zero energy by the end of 2020.[3]

WorldGBC and 24 regional Green Building Councils are dedicated to supporting market transformation to 100 percent net-zero carbon buildings in an initiative called the Advancing Net Zero project (see Figure 1). Canada Green Building Council was the first to launch a dedicated Zero Carbon Building Standard in May 2017, making carbon emissions the key indicator for building performance, closely followed by Brazil, Australia, South Africa, the United States, Germany, and the United Kingdom.[4]

Net zero is one aspect of the broader shift toward green buildings, which reduce the overall impact of the built environment on human health and the natural environment by efficiently using energy, water, and other resources; protecting occupational health; and reducing waste, pollution, and environmental degradation. Net zero does not mean a structure produces zero emissions; rather, it generates an amount of energy through solar, wind, and other renewable methods equal to what it consumes from nonrenewable sources. WorldGBC recognizes that constructing or retrofitting buildings to generate 100 percent of their energy needs on-site is not always feasible. Instead it focuses on advancing the development of green buildings that are energy efficient and powered by renewable resources, both on- and off-site.

Beyond the goal of net zero, WorldGBC envisions the next step to be zero-carbon buildings, or buildings that rely on both energy efficiency and entirely on-site renewable energy production to reach a balance of energy consumed and energy produced (see Figure 2).

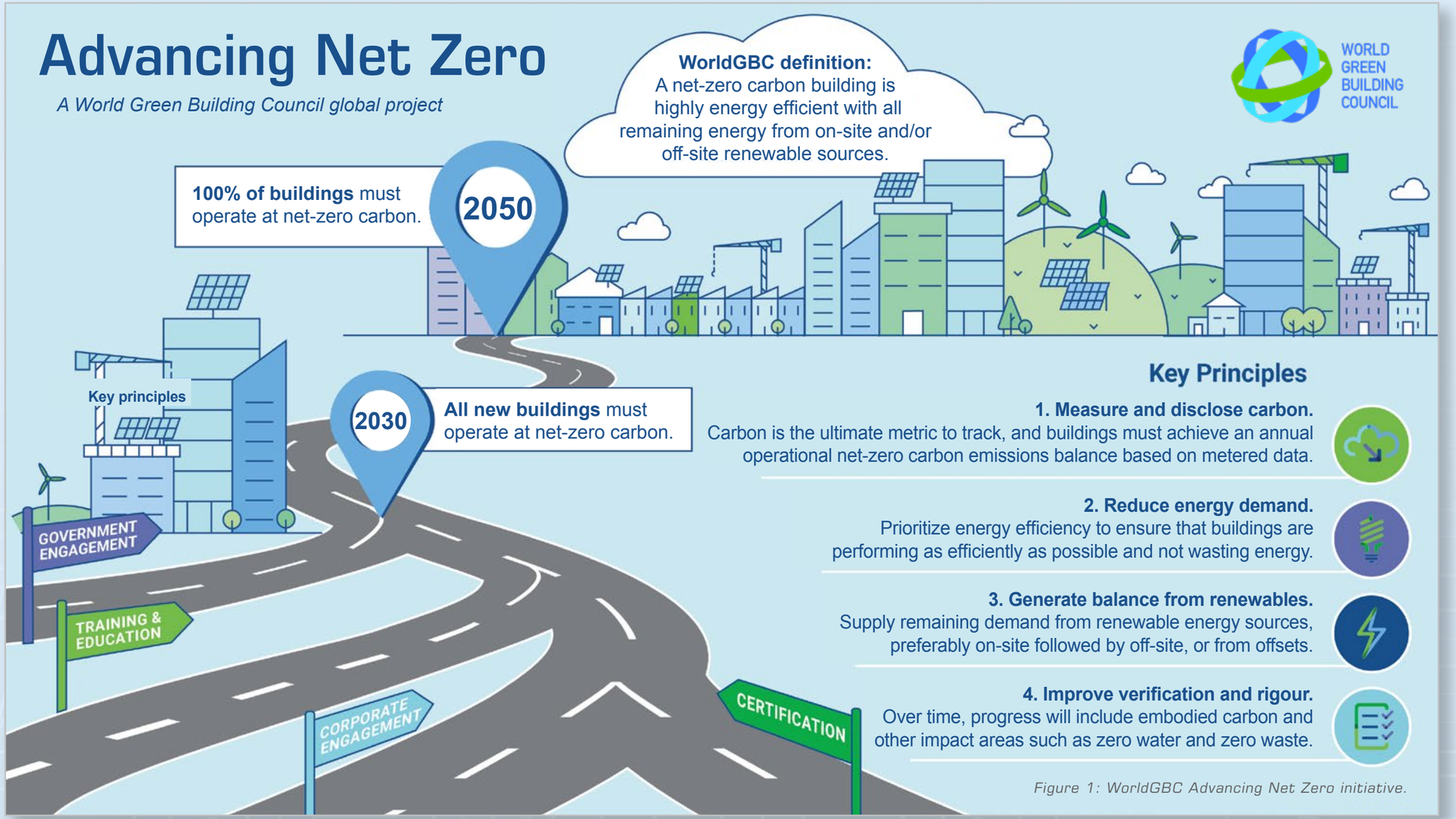


Figure 1: WorldGBC Advancing Net Zero initiative.

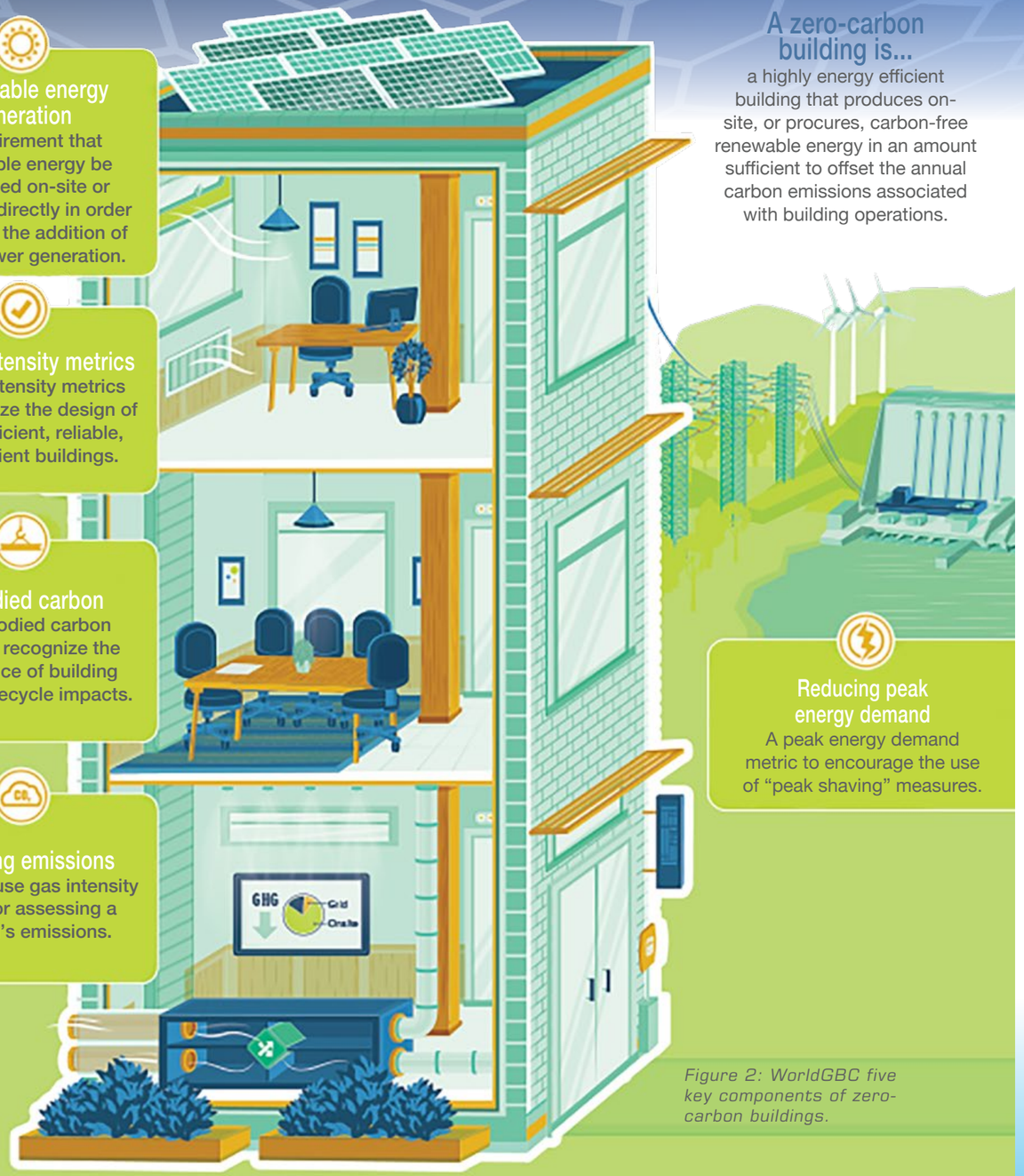
Five key components of zero-carbon buildings

Renewable energy generation
A requirement that renewable energy be generated on-site or procured directly in order to ensure the addition of clean power generation.

Energy intensity metrics
Energy intensity metrics to incentivize the design of highly efficient, reliable, and resilient buildings.

Embodied carbon
An embodied carbon metric to recognize the importance of building material lifecycle impacts.

Lowering emissions
A greenhouse gas intensity metric for assessing a building's emissions.



A zero-carbon building is...
a highly energy efficient building that produces on-site, or procures, carbon-free renewable energy in an amount sufficient to offset the annual carbon emissions associated with building operations.

Reducing peak energy demand
A peak energy demand metric to encourage the use of "peak shaving" measures.

Figure 2: WorldGBC five key components of zero-carbon buildings.

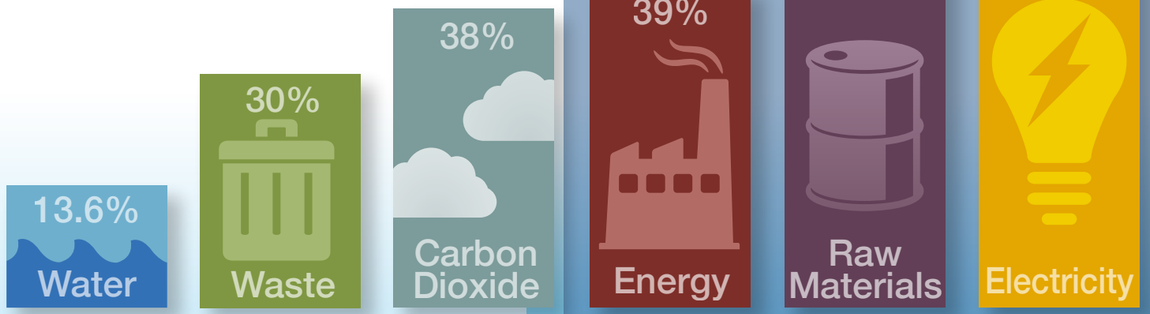
The way forward

The development of net-zero buildings has become possible largely through advancements in technology, design, and operational practices. Any office, school, hospital, or other building can be built or converted to be highly energy efficient, with operational energy use from on- or off-site renewable resources, to achieve net-zero carbon emissions.

To reach this ambitious target and transform the building and construction sector, a coordinated effort between business, government, and nongovernmental organizations is required. Ten regional Green Building Councils around the world are already working to adopt four guiding principles as set out by WorldGBC:[5]

To optimize building efficiency and address energy conservation, building operators and designers can look at internal components as a factor of sustainability. In commercial and institutional buildings in Canada, energy is consumed primarily for space heating, followed by auxiliary equipment, lighting, water heating, and space cooling (see Figure 3).[6] These systems are optimal areas for energy analysis and reduction measures. Innovative building automation systems provide an effective means to measure, analyze, and improve a building's operational efficiency.

Figure 3: Percentages of the total resources consumed and outputs emitted in North America by commercial buildings.



A key component to achieving net-zero emissions is accurate, actionable energy data and flexible control. Reliable Controls offers a suite of products to assist architects and engineers to improve building efficiency and reduce harmful emissions.

- Reliable Controls products provide a simple connection to BACnet and Modbus interfaces This includes building energy and water meters, and major mechanical and electrical components. Reliable Controls provides operators with the data they need to pinpoint and resolve sources of energy waste.
- The MACH-ProLight™ BACnet building controller is ideal for sustainable lighting applications and allows users to implement advanced control strategies such as daylight harvesting, vacancy, low-voltage peripherals, and customizable scheduling.
- RC-Archive and RC-Reporter software products allow facility managers to measure and extract intelligence from their building data to determine exactly when and where energy is being wasted.
- RC-WebView software provides a simple web interface to empower operators to monitor their buildings from anywhere at any time. The Enterprise Schedules feature allows operators to easily schedule building zones that are unoccupied, with all nonessential equipment turned off.
- Reliable Controls also provides integrated real-time fault detection and diagnostics (IFDD), empowering building operators to diagnose and resolve issues before they happen—so facilities can run at peak efficiency over the long term.

Reliable Controls LEED Platinum headquarters in Victoria, Canada.

Reliable Controls takes the art of building sustainability seriously. The organization is a member of the US and Canada Green Building Councils and is committed to the goal of net-zero emissions by 2050. Reliable Controls is proud to have obtained Leadership in Energy and Environmental Design (LEED) Platinum certification for its corporate head office in 2013. In addition, over 30 percent of the LEED Platinum–certified commercial facilities in British Columbia depend on Reliable Controls.

In practice, Reliable Controls has observed firsthand the benefits of an efficient building automation system—not only in terms of economic and environmental interests but also social gains. Occupants at the Victoria headquarters reported a 93 percent overall comfort and well-being level in a recent satisfaction survey. Natural fresh air enters the building through trickle vents and is circulated through offices and workstations, then through an open atrium before being exhausted through a wind tower. Trickle vent technology and radiant floor hydronic heating provide continuous comfort based on time of year, and personal space preferences can be set by each occupant using the myControl application. Individual lights are controlled and comfort settings initiated when an employee uses their access card to enter the building.

The green roofs at Reliable Controls help preserve the natural landscape and reduce the building's cooling requirements. Each year a number of improvements are planned that will continue the downward trend in energy consumption. The flexibility of the Reliable Controls MACH-System means changes are easy to implement and performance is easy to monitor.

The Reliable Controls south annex has natural lighting and ventilation, and is temperature and air-quality controlled to optimize building efficiency.

Many city and industry leaders are working to address climate change and reduce carbon emissions from commercial buildings.

This year, ASHRAE, creator of the BACnet standard announced plans to renovate its world headquarters in Atlanta, Georgia, with the intent of net-zero energy efficiency.[7]

In Australia, buildings that have achieved Green Star certification emit a whopping 62 percent less greenhouse gas than the average Australian building. Buildings certified by the Indian Green Building Council have seen energy savings of up to 50 percent. LEED-certified buildings in the United States and elsewhere consume 25 percent less energy than their nongreen counterparts.[8]

Canada's green building industry generated more than $23 billion in GDP and represented nearly 300,000 full-time jobs in 2014.[9] In the United States, green building accounted for nearly 3.3 million jobs in 2018.[10] Owners of green buildings report a 10 percent increase in asset value over traditional buildings.[11] Working toward net-zero buildings makes good economic sense.

The City of Lancaster, California, has a program that enables residents and businesses to install solar energy systems at a subsidized cost. All single-family homes built in Lancaster since January 1, 2014, are required to have a minimum number of solar photovoltaic collectors. Additional installations in facilities around the city are estimated to generate revenue of $20 million over the life of the project.[12]

To achieve the goal of 100 percent of buildings operating at zero carbon by 2050, WorldGBC believes there must be a rapid change to the building and construction sector. This will involve the retrofit of existing buildings and the construction of all new buildings to net-zero or zero-carbon standards. Thirty-one businesses and organizations, 26 cities, and six states and regions are signatories to the WorldGBC Net Zero Carbon Buildings Commitment.[13]

Is your city on the path to reach net-zero operating emissions by 2050? How can Reliable Controls Authorized Dealers help you optimize energy efficiency in your projects? Together we can empower one another to stand at the helm of sustainability.

1. https://www.worldgbc.org/sites/default/files/From%20Thousands%20To%20Billions%20WorldGBC%20report_FINAL%20issue%20310517.compressed.pdf
2. https://www.c40.org/press_releases/global-cities-commit-to-make-new-buildings-net-zero-carbon-by-2030
3. https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-performance-of-buildings/nearly-zero-energy-buildings
4. https://www.worldgbc.org/advancing-net-zero/what-net-zero
5. https://www.worldgbc.org/sites/default/files/From%20Thousands%20To%20Billions%20WorldGBC%20report_FINAL%20issue%20310517.compressed.pdf
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7. https://www.ashrae.org/about/news/2019/ashrae-to-begin-renovation-to-create-new-net-zero-world-hq-building
8. https://www.worldgbc.org/benefits-green-buildings
9. https://www.cagbc.org/News/EN/2016/20160210_News_Release.aspx
10. https://www.usgbc.org/articles/new-study-finds-green-construction-major-us-economic-driver
11. https://new.usgbc.org/press/benefits-of-green-building
12. https://www.cbsnews.com/news/powering-the-future-small-city-has-big-solar-goals/
13. https://www.worldgbc.org/thecommitment

people & technology
you can rely on™

ASHRAE president visits Reliable Controls

On November 1, 2019, ASHRAE President Darryl Boyce toured the Reliable Controls headquaters and manufacturing facility in Victoria accompanied by our president, Tom Zaban, P. Eng.

ASHRAE is the brains behind the BACnet protocol and the BACnet Testing Laboratory.

In 1996, Reliable Controls founder Roland Laird wisely choose BACnet as the company's open protocol. That decision has had wide-reaching positive implications for the company and the industry to this day.

With the BACnet protocol, building systems can mix and match which devices are used to meet controls requirements. At Reliable Controls headquarters there are currently 181 devices networked together into a single, seamless BACnet internetwork, using eight different vendors.

Michael Osborne, Reliable Controls Firmware Manager, is the current chair of BACnet, and Roland Laird was inducted into the BACnet Hall of Fame in January this year.

Darryl Boyce was in Victoria to attend a chapter meeting luncheon, and we were honored to show him around our beautiful LEED Platinum building afterward.

This positive experience felt more like a reunion than a tour because of the long partnership between ASHRAE and Reliable Controls.

Darryl Boyce, President of ASHRAE (left) and Tom Zaban, President of Reliable Controls Corporation.

Thank you, ASHRAE, for your continued support.

Welcome to our

New Reliable Controls Authorized Dealers

plug smart™ intelligent energy solutions

Plug Smart—NW Ohio
Toledo, Ohio, USA
www.plugsmart.com

ECS

Essential Connected Solutions
Subang Jaya, Selangor Darul Ehsan, Malaysia
www.ecs-sea.com

SCHMITT ELECTRIC, INC.

Schmitt Electric, Inc.
Wenatchee, Washington, USA
www.schmittelectric.com

ACS

Automated Control Systems
Albuquerque, New Mexico, USA
www.acsionline.com

浙江瑞亚能源 Zhejiang Rhea Energy

Zhejiang Rhea Technology Co. Ltd.
Hangzhou, Zhejiang 310051, China

LR®

JuYan Intelligent Technologies Company
Shanghai, China

Reliable Controls sales, installation, service, and support are performed by a growing network of independent factory-trained Authorized Dealers. Each dealer is committed to the green building controls industry and to providing total customer satisfaction.

Reliable® controls Authorized Dealer

Broadway Tower

Portland, OR, USA

Corporate

Overview

Broadway Tower is a 19-story, 430,000 square foot, mixed use high-rise building in the heart of Portland, Oregon. The building is within walking distance of the city's best restaurants, shops, museums, parks, and art galleries. The ground floor combines retail space and world-class restaurant and bar facilities. A Radisson RED Hotel occupies the second through eighth floors and includes 186 hotel rooms. The ninth through nineteenth floors house office space.

Project Details

Reliable Controls Authorized Dealer Sunbelt Controls Inc. successfully completed the LEED Gold–certified construction of the Broadway Tower skyscraper in downtown Portland.

Broadway Tower has a mixed use mechanical system. On the office-occupied floors, self-contained vertical units with water-side economizers use a condenser water loop controlled by wet-bulb outside air temperature to maximize efficiency. Fan-powered and variable air volume boxes with reheat complete the office system. The ground floor and hotel mechanical system is comprised of fan coil units with electric reheat and hydronic cooling. The hydronic system uses boilers, an air-cooled chiller, heat exchangers, pumps, and cooling towers. Other third-party integration includes a chiller, dedicated outdoor air system, rooftop unit, ABB variable frequency drives for the pumps and fans, hydronic flow meters, and CO/NO_2 garage exhaust.

Sunbelt Controls Inc. is very proud to have played such an integral role in the construction of this new energy-efficient building, which opened in November 2018.

To learn more about projects using Reliable Controls visit
www.reliablecontrols.com/projects/overview

Project type
New construction

Installation type
Boiler, chiller, fan coil unit, heat pump, HVAC, VAV, CO/NO_2 monitoring

Total area
39,948.3 m^2 (430,000 ft^2)

Network
EIA-485, Ethernet

Protocol
BACnet

Total system points
2,970 points

Equipment installed
237 MACH-ProAir™ controllers
12 MACH-ProCom™ controllers
4 MACH-ProSys™ Smoke controllers
1 MACH-ProWebCom™ controller
72 MACH-ProZone™ controllers

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