





# ENERGY EFFICIENCY AWARD CHALLENGE

German Innovation in U.S. Buildings

July 13, 2017 | New York, NY



Supported by:



on the basis of a decision by the German Bundestag

## About our Energy Efficiency Award Challenge

The German American Chamber of Commerce, Inc. is delighted to welcome you to our Energy Efficiency Award Challenge 2017, together with the five energy efficiency solution providers from Germany, who have been selected as today's finalists. Between the site visit in the morning, the project presentations and expert speakers in the afternoon and the award ceremony later in the evening, this unique event is a perfect opportunity to become acquainted with energy efficiency solutions from Germany that are being used to improve energy efficiency and building quality in the United States.

The Award Challenge was created as part of the German Energy Solutions Initiative, sponsored by the German Ministry for Economic Affairs and Energy, to recognize the positive impact German businesses have in the U.S. building sector. It is designed to help German companies strengthen their position in the U.S market and make new connections within the U.S. sustainable building industry. The competition provides participating German companies with the chance to showcase their technologies and services that focus on increasing overall building performance across the U.S. We received many great applications, but there were five companies that especially distinguished themselves: 1100 Architect, Arnold Glas, Kaeser Compressors, Meteoviva and Transsolar. These five will present themselves and their projects today in hopes of winning the coveted Energy Efficiency Award.

Current market trends suggest that building owners and managers will invest \$960 billion between now and 2023 on "greening" their existing building infrastructures. In terms of growth throughout the sustainable building industry, the U.S. is still lagging behind Germany and other European countries that prioritize reducing CO2-emissions. The aforementioned trends towards a more sustainable and energy efficiency-focused method of building, coupled with the exemplary efforts to prioritize developments in this industry throughout Europe, have created increasing market opportunities in the U.S. for German companies in this field.

This Award Challenge is aimed at providing both applicants and attendees with the chance to learn more about energy efficient solutions from German manufacturers, as well as how they are being implemented in the U.S. building sector. We hope you enjoy our event and to the Award Challenge finalists, viel Glück!

## Contact

German American Chamber of Commerce, Inc. Eva Coblenzer *Project Manager, Business Development Consulting* 80 Pine Street, 24th Floor New York, NY 10005 Tel.: (212) 974-8830 Fax: (212) 974-8867 E-Mail: consulting@gaceny.com URL: www.gaceny.com





## Preface



The Energy Efficiency Award Challenge is a celebration of innovative German energy-efficient solutions in buildings across the U.S. It is a great opportunity to promote successful German-U.S. partnerships, which have led to increased building quality, reduced energy costs and lower CO<sub>2</sub> emission levels in the U.S. The five innovative projects, which are being showcased in the framework of the Energy Efficiency Award Challenge, present the U.S. as an attractive location for German companies seeking concrete partnerships and market opportunities.

The advanced technologies, know-how and expertise from the German companies involved in these projects conducted in the U.S. are representative of a wider success story: Germany is a world leader in the field of energy efficiency. Cutting-edge German technology is featured in all energy efficiency market segments, including insulation systems, insulated glazing, heating and cooling technologies, efficient home appliances, smart metering, energy-efficient lighting systems, cogeneration systems, as well as pumps and compressed air systems. German companies generate a turnover of about \$66 billion per year in this industry, and double-digit growth rates are expected in the coming years.

Since 2002, the Federal Ministry for Economic Affairs and Energy has successfully supported German-American partnership via the German Energy Solutions Initiative. The U.S. market has proved to be very open to German suppliers of energy-efficient products, systems and services. Since this initiative was launched in 2002, the German American Chamber of Commerce has been active in creating and hosting successful cooperation platforms such as trade missions, study tours and innovation seminars. This Showcase project is a first for the U.S., and it gives the German Ministry for Economic Affairs and Energy a welcome opportunity to celebrate some great examples of German-American partnership in the building sector.

**Christina Wittek** Head of Division German Energy Solutions Initiative Federal Ministry for Economic Affairs and Energy

## Welcome



#### Brita Wagener Consul General, German Consulate General New York

Before assuming duties as German Consul General in New York, Brita Wagener served as German Ambassador to Iraq (2012 to 2014), as Consul General in Istanbul (2009–2012), as Commissioner for German Personnel in International Organizations at the Federal Foreign Office in Berlin (2006–2009), and as Minister Plenipotentiary/Deputy Head of Mission at the German Embassy in Cairo, Egypt (2003–2006).

Prior to this, Mrs. Wagener held various positions both in the Headquarters of the German Federal Foreign Office in Germany and abroad. Amongst others, she was Counsellor of Economic and Commercial Affairs at the German Embassy in Tel Aviv, Counsellor of Political Affairs at the German Embassy in New Delhi and Second Secretary for Legal and Consular Affairs at the German Embassy in Cairo. Mrs. Wagener studied law at both the University of Bonn and at the University of Hamburg. She has been a fully qualified lawyer since 1983.



## Agenda

## Speakers & Moderator

## **Energy Efficiency Presentation Event**

3:00 pm	Words of Welcome & Introduction Brita Wagener, Consul General, German Consulate General New York Dietmar Rieg, President & CEO, German American Chamber of Commerce New York, Inc. Energy Efficiency in the U.S. with focus on New York Bruce S. Fowle, FAIA, LEED AP, Founding Principal, FXFOWLE Architects	
3:05 pm		
3:35 pm	<b>Showcase 1 – Riverside Health Center, NY</b> Juergen Riehm, FAIA, BDA, Founding Principal, 1100 Architect	
3:50 pm	<b>Showcase 2 – Vassar College Integrated Science Center, NY</b> Stefan Marshall-Goebel, General Manager, Arnold Glas, Corp.	Site Visit - Energy Efficiency: Made in Germany 12:15 pm Departure 1:00 pm Harlem Passive House Guided tour of a Harlem Passive House • Cramer Silkworth, Chief Engine Baukraft Engineering PLLC
4:05 pm	Short Break	
4:15 pm	<b>Showcase 3 – UniFirst Industrial Laundry</b> <b>Distribution Center, KY</b> Michael Camber, Marketing Services Manager, Kaeser Compressors, Inc.	
4:30 pm	Showcase 4 – American University, McKinley Building, Washington DC Jean-Marie Bergeal, Vice President North America, Meteoviva	
4:45 pm	<b>Showcase 5 - Loyola University Chicago Campus, IL</b> Pratik Raval, Associate Director, Transsolar, Inc.	
5:00 pm	<b>Energy Efficiency in Germany</b> Oliver Baumann, President, Baumann Consulting	Brace Enterprises, LLC
		Harlem Passive House

New York, NY 10035

2:15 pm Depart for the Award

Challenge

## **Energy Efficiency Award Ceremony & Evening Reception**

5:45 pm	Networking	
6:15 pm	<b>Energy Efficiency Award Presentation</b>	
6:25 pm	Celebration of the Award Winner & Networking	
7:30 pm	End of the Event	

#### **Oliver Baumann** President, Baumann Consulting

In 2006, German-native Oliver Baumann relocated to the United States to establish Baumann Consulting, successfully growing the business from a one-man operation to a multimillion dollar firm with a staff of 20 located in four offices across two continents. Oliver has two decades of experience in design, commissioning, and measurement & verification for high-performance buildings. After joining the EB-Group in Munich in 1996, he went on to establish the Building Simulation Group and later served as Project Manager for integrated building design and low-energy projects and Head of the International Projects Group. Oliver earned his Master's in Mechanical Engineering from the Technical University of Munich in 1997. Building on his experiences in Germany, Oliver's expertise covers the entire lifecycle of commercial, institutional and industrial buildings and facilities, from developing innovative energy concepts to the evaluation of building performance and operation. One of the top engineering executives in the industry, Oliver earned the prestigious distinction of being named to Consulting-Specifying Engineer magazine's 40 Under 40 list in 2009.



## **Bruce S. Fowle** FAIA, LEED AP, Founding Principal, FXFOWLE Architects

Since co-founding FXFOWLE Architects 39 years ago, Bruce Fowle has guided the firm to international recognition for excellence in design and pioneering socially and environmentally responsible architecture and planning. His work has earned numerous national and regional design awards. He was the lead designer of the Country's first green skyscraper, the Conde Nast Building at 4 Times Square, completed in 1998. Bruce's most recent project is the revitalization and greening of New York's Jacob K. Javits Convention Center - including the largest green roof within any urban area in the U.S. Bruce's dedication and contributions to the architectural industry have been recognized with many honors. Most prominently, in 2004, he won the AIA/New York Chapter's President's Award, the organization's highest honor. In 2008 his firm received the New York State AIA's Firm of the Year Award and in 2016, Bruce was awarded the State's Prestigious President's Award for outstanding contributions to the profession. Following the September 11 attacks on the World Trade Center, Bruce helped found and mobilize New York New Visions, a coalition of 21 civic and professional organizations formed to help shape the planning and design response to the destruction of downtown Manhattan.



# **Dietmar Rieg**

Mr. Rieg has served as President and CEO of the German American Chamber of Commerce (GACC) in New York since July 2013. Prior to joining the GACC New York, Mr. Rieg held various banking positions for Bayern LB starting in 1991. Since 1993, he served in multiple senior roles in Corporate Banking and Project Finance in New York. From 2006 to 2008, he re-located to the bank's headquarters in Munich, where he was responsible for the corporate banking business in multiple industries, including energy, manufacturing, and telecommunications. He returned to New York in mid-2008 to take the position of General Manager of Bayern LB's Branch office which he held until June 2013. Mr. Rieg is an economist with a degree from the University of Tuebingen, Germany and holds an M.B.A. from the Stern School of Business at New York University.

#### President & CEO, German American Chamber of Commerce, Inc.

## The Jury



A huge thanks to all the Energy Efficiency Award Challenge submissions. The high standard of applications, made it difficult to determine our five finalists and ultimately our Energy Efficiency Award Winner. Thankfully, we are beeing supported with this difficult task by our expert panel of judges consisting of energy efficiency and green buildings professional in the New York area. The Award Challenge culminates today with the showcases in front of our jury and an award ceremony at our evening reception where the Energy Efficiency Award Winner will be announced.

Meet our 2017 Energy Efficiency Award Challenge judges:



#### Wolfgang Werner President & CEO, Urban Fabrick, Inc.

Wolfgang Werner, AIA, LEED AP BD+C, USGBC Faculty, is the President & CEO of Urban Fabrick, Inc. and heads up the recently established New York City branch of the San Francisco based firm. Wolfgang has more than 18 years of experience in building sustainability, architectural design, construction administration, and building investigation, including general building sustainability concepts, strategies, and technologies, building codes, policy, standards, regulations, and life cycle assessment. Wolfgang is an active part of New York City's green building community and currently serves on the Urban Green Council's Monthly Programs Committee. He holds a Dipl.-Ing. degree in architecture from the Technische Universität, Berlin, Germany and a master's degree in architecture from Pratt Institute, Brooklyn, New York.

## Bruce Fowle FAIA, LEED AP, Founding Principal, FXFOWLE Architects

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## Enrica Oliva Partner & COO, Werner Sobek New York

Enrica's experience in the Construction Industry includes 9 years of design and project management at Thornton Tomasetti, Inc. in New York, as well as the subsequent role of Director of Structures at Werner Sobek New York, taken on in 2016. Amongst many other projects, she has been involved in the Design of the Barclays Center Arena (2007-11) and has been Project Manager of the 146 E 126th Street Tower in Harlem, NY by BIG Architects (2013-15), a 12-story concrete and steel residential tower partially built over an existing commercial 3-story building. At Werner Sobek New York, Enrica is currently managing a luxury penthouse-only residential project in Chelsea, New York, as well as prestigious Academic projects in the New York City, Chicago and Boston areas. In addition to leading the Structures Group, she holds the role of Partner and COO at the Company.



## Yetsuh Frank Managing Director, St

Yetsuh Frank is an architect, writer and educator with nearly 20 years experience in green building and sustainability. As Managing Director, Strategy & Programs for the non-profit Building Energy Exchange, Yetsuh has been instrumental in the creation of their energy and lighting efficiency resource center in Manhattan and guides the focus of their education, research and exhibit programs. He is also Adjunct Associate Professor at New York University in the Urban Design & Architecture program. Yetsuh's diverse background working in both the private and non-profit sectors allows him to balance both the visionary and practical considerations of advancing sustainability in the built environment

## Pat Sapinsley Managing Director of Cleantech Initiatives, Urban Future Lab/ACRE, NYU's Tandon School of Engineering

Pat Sapinsley is the Managing Director of Cleantech Initiatives at Urban Future Lab/ACRE at NYU's Tandon School of Engineering. A LEED AP architect, Pat holds a M.Arch from the Harvard GSD. She is past Co-Chair of the Committee on the Environment of the AIANY, a member of the Board of Building Energy Exchange and a frequent lecturer and industry panelist. Prior to joining UFL/ACRE, Pat worked in venture capital at Good Energies and was a Visiting Scholar at Harvard's Wyss Institute. She was CEO of Watt Not, an LED lighting consultancy, and Build Efficiently, LLC.

#### Managing Director, Strategy & Programs, Building Energy Exchange

#### Short Project Description

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1100 Architect's renovation and expansion of the Riverside Health Center transformed what had been a grossly inefficient mid-century clinic into a vibrant community anchor and exemplar of energy efficiency. A public facility managed by the New York City Department of Health and Mental Hygiene, Riverside Health Center supports the department's mission of providing community-based health services.

#### **Reference Project Address** Riverside Health Center. 160 W 100th Street. New York, NY 10025

#### **Energy Efficiency Achieved**

1100 Architect took a holistic approach to minimizing Riverside Health Center's environmental footprint, considering energy consumption, water conservation, material selection, and healthy living. The Riverside Health Center uses over 50% recycled materials and sourced 45% from regional producers. Additionally, over 85% of construction waste was diverted from the landfill. To reduce the amount of water diverted to the sewer system in times of intense rainfall, a water retention system was installed as well as a green roof to further mitigate water runoff.

# **IIOO:** ARCHITECT

1100 Architect PC 475 10th Avenue, 10th Floor New York, New York 10018 T: (212) 645-1011 F: (212) 645-4670 contact@1100architect.com

## **Riverside Health Center**

#### **Project Description**

Riverside Health Center, part of NYC Department of Design and Construction Design Excellence Program, received LEED Gold Certification. The result of 1100 Architect's design is a community building that improves both the health of individual stakeholders and the Bloomingdale neighborhood in aggregate.

1100 Architect regularly uses the principles of passivhaus and applied this expertise at Riverside Health Center. By keeping most of the new interior spaces near the building facade they were able to optimize use of the operable windows for passive cooling, increase daylight to the interior, and reduce the volume for HVAC units.

In addition to upgrading systems and improving material performance such as added insulation and high-performance glazing, the team was tasked with reprogramming the space for the five agencies occupying the three-story building. The interior layout was reconfigured to maximize spatial efficiency and adapt to the needs of the various agencies over time.

The building was originally designed with front and rear yards which are essential to preserving the scale of the Health Center contextual to the buildings around it. Maintaining the morphology of these spaces also provides opportunities for outdoor passive cooling by creating microclimates between buildings. Improvements to these areas encourage use of outdoor spaces and integrate the inclusive character of the building into the urban fabric.

#### **Energy Efficiency achieved**

A central HVAC system was installed that replaced the outdated window units; these units blocked sunlight and views to the park. The centralized system provides more square feet of fenestration, exposure to natural light, and greater visual connection to the exterior. Beyond the benefits of freeing up the windows, the ventilation system of the building pulls in fresh air from the outside

instead of recirculating interior air through the HVAC systems. All of the systems have been upgraded to meet Local Law 86 requirements reducing the overall energy costs by at least 20%. Riverside Health Center's Total Site EUI is 52kBtu/ft2/yr.

Additional energy conservation strategies included occupancy sensors and LED lights. Sixty-nine percent of regularly occupied spaces at Riverside Health Center have access to daylight, helping to reduce electricity loads.

#### **Degree of Innovation**

1100 Architect's efforts to provide building that is not only responsible to the environment but also actively makes the lives of its occupants better sets Riverside Health Center apart. 1100 Architect partnered with the NYC Department of Cultural Affairs Percent for Art Program to commission artist Richard Artschwager to design orange terra cotta tiles that wrapped the main circulation core. This art piece serves a dual function: it incentivizes users to engage with the stairs instead of the elevator and it gives the community a sense of stewardship and pride in their community amenities. This design decision culminated in the development of a new LEED Innovation Credit for Active Design. The credit was awarded for the building's encouragement of physical activity that quantifiably provides health and environmental benefits primarily through the use of stairs in lieu of the elevator. These strategies ultimately became part of NYC's Active Design Guidelines.

# of the Project

As architects, 1100 Architect recognizes the value of rehabilitating an existing structure as opposed to building from scratch. Their

#### **Overall environmental Impact**

1100 Architect took a holistic approach to minimizing Riverside Health Center's environmental footprint, considering energy consumption, water conservation, material selection, and healthy living.



approach to materials was twofold: First, to retain as much building mass as was appropriate. Second, to source new materials that are made from recycled content and, wherever possible, from regional sources. The Riverside Health Center uses over 50% recycled materials and sourced 45% from regional producers, including much of the flooring and steel structure for the expansion of the third floor. Additionally, over 85% of construction waste was diverted from the landfill.

The flooring throughout the building is made from a unique 100% recycled end-grain wood which is both sustainable and durable. All the millwork in the building was done in bamboo, a renewable material, and the doors of all the offices used a bamboo veneer. All additional steel used on the project was made from 70% recycled material.

To reduce the amount of water diverted to the sewer system in times of intense rainfall, a water retention system was installed. The installation of a green roof had an additional benefit of lessening impervious surfaces and reducing localized heat gains in the summer months. Other parts of the roof were painted with a reflective coating and the paving was changed to a light hue to reduce the urban heat island effects caused by the building.



# ARNOLDGLAS

Arnold Glas, Corp. 48 Spinnev Path, #2 Nahant, MA 01908, USA Tel: +1 (857) 294 7768

Stefan Marshall-Goebel **General Manager** stefan.marshall-goebel@arnold-glas.com www.arnold-glas.com

Short Project Description With ORNILUX, Arnold Glas has developed an environmental product that serves more than a single function. ORNILUX provides excellent thermal performance and bird window collision protection. It has expanded the green building industry focus to include wildlife

conservation.

#### **Reference Project Address**

Vassar College Integrated Science Center, 124 Raymond Ave, Poughkeepsie, NY 12604

#### Energy Efficiency Achieved

This energy efficient insulating glass offers a reduced energy loss of 1.1W/m<sup>2</sup>/K and thereby reduces the heat loss and saves energy on heating in winter. While transmitting 75% visible light, the solar heat gain is reduced to 55% and thereby reduces the energy used by cooling the inside of the building with air conditioning units in the summer.

## Vassar College Integrated Science Center

#### **Project Description**

Installed product: Insulating glass units, featuring bird protection and thermal insulation in architectural buildings. Installed technology: Bird protection glass **ORNILUX** including low-Emissivity coating for significant thermal insulation, optimized lighting characteristics, and bird window collision protection.

With ORNILUX, Arnold Glas has developed an environmental product that serves more than a single function. ORNILUX provides excellent thermal performance and bird window collision protection. It has expanded the green building industry focus to include wildlife conservation.

#### **Energy Efficiency achieved**

Amount of glass used: approx. 10,000 sq ft This energy efficient insulating glass offers a reduced energy loss of 1.1W/m<sup>2</sup>/K and thereby reduces the heat loss and saves energy on heating in winter. While transmitting 75% visible light, the solar heat gain is reduced to 55% and thereby reduces the energy used by cooling the inside of the building with air conditioning units in the summer.

#### **Degree of Innovation**

**Biomimicry - Intelligent Technology** The inspiration for ORNILUX bird protection glass came from connecting the knowledge that birds see light in the UV spectrum, and a theory of how spiders might use UV reflective strands of silk in their webs. The proposal that was the moment of insight was that birds, sharing the same space as spiders, would see the web because of the UV reflecting strands and thus be able to avoid a collision. This is an advantage for the spider as it would preserve the spider's ability to capture prey.

With the understanding that birds are able to see light in the ultraviolet spectrum, birdfriendly glass innovator, ARNOLD GLAS developed ORNILUX Bird Protection Glass. The glass has a patterned, UV reflective coating making it visible to birds while remaining virtually transparent to the human eve.

of the Project conditions for birds.

made visible to birds.

The environmental impact of ORNILUX is one of avian conservation by helping to reduce the number of bird window collisions as well as offering high thermal performance with a secondary low-E or solar control coating. The UV reflective, patterned ORNILUX coating offers a visual marker to alert birds to the presence of the glass while maintaining a high level of transparency to the human eye.

the energy savings.

#### **Overall environmental Impact**

The Problem of Bird Window Collisions: Researchers estimate that hundreds of millions of birds are killed each year in North America due to collisions with glass on human-built structures, making bird collisions one of the most significant causes of avian mortality globally. The bird window collisions present a global challenge as more and more glass is being utilized in architecture, especially with green building practices that focus on energy efficiency through the use of natural light. This translates to an increasing use of glass in design and therefore more dangerous

It is the reflective and transparent characteristics of glass that create the danger for birds, as they cannot see it as a barrier. They fly to sky and trees reflected by or on the other side of a window or railing and collide fatally with the glass. To prevent these collisions, glass must somehow be

Given the unique nature of the ORNILUX product, our perspective on "investment" is that it is an environmental investment which does not necessarily translate to a traditional "financial return on investment." The investment goal with ORNILUX was avian conservation, to reduce the numbers of bird collision kills. Additionally, ORNILUX is paired with a low-E coating which increases the environmental investment because of







Built for a lifetime."

Kaeser Compressors, Inc. **US** Headquarters PO Box 946 Fredericksburg, VA 22404 us.kaeser.com

#### Short Project Description

The technology used in this solution includes Kaeser's Sigma Air Manager (SAM) 4.0 which is designed for Industry 4.0 / IIoT communications. This compressed air master controller continually monitors the compressed air system and selects the most efficient combination of compressors to meet the changing plant demand, offering significant ongoing energy savings. Additionally, SAM 4.0 conducts a continual compressed air audit.

**Reference Project Address** UniFirst Corporation, 2801 Unifirst Drive, Owensboro, KY 4230

#### **Energy Efficiency Achieved**

After implementing Kaeser's recommended solution. UniFirst reduced their Total Energy Consumption from 223,093 kWh/ vr to 120,461 kWhr/vr. Energy costs were cut from \$16,732 annually to \$9,035. This is especially significant since UniFirst's demand for compressed air actually increased after installing the new equipment. Additionally, the KPI of specific performance (kW/100 cfm) was reduced from 40.98 kW/100 cfm to 21.56 kW/100 cfm.

## **UniFirst Industrial Laundry Distribution Center**

#### **Project Description**

The equipment added to this UniFirst site includes: three (3) AIRCENTERS (rotary screw compressor packages including tank, dryer, and drain) and Sigma Air Manager (SAM) 4.0 (compressed air system master controller). Further, Kaeser conducted an Air Demand Analysis (ADA), which is a proprietary compressed air audit to baseline the existing system and determine the most energy efficient system solution for UniFirst. These products are designed, engineered, and manufactured by Kaeser in their headquarters located in Coburg, Germany.

#### **Energy Efficiency achieved**

After implementing Kaeser's recommended solution, UniFirst reduced their Total Energy Consumption from 223,093 kWh/yr to 120,461 kWhr/yr. Energy costs were cut from \$16,732 annually to \$9,035. This is especially significant since UniFirst's demand for compressed air actually increased after installing the new equipment. Additionally, the KPI of specific performance (kW/100 cfm) was reduced from 40.98 kW/100 cfm to 21.56 kW/100 cfm.

#### **Degree of Innovation**

The technology used in this solution includes Kaeser's Sigma Air Manager (SAM) 4.0 which is designed for Industry 4.0 / HoT communications. This compressed air master controller continually monitors the compressed air system and selects the most efficient combination of compressors to meet the changing plant demand, offering significant ongoing energy savings. Additionally, SAM 4.0 conducts a continual compressed air audit so UniFirst can easily see what their energy costs, compressed air consumption, and trends are.

#### **Overall environmental Impact** of the Project

The maximum power consumption, annual energy consumption, annual energy costs, and specific power have all been reduced.

up valuable plant floor space.

The total annual energy savings are \$7,697--a 46% savings. UniFirst will also have savings from reduced maintenance. Their previous system was not properly controlled and was oversized, causing the compressors to needlessly cycle on and off. This cycling puts additional wear and tear on the motors and valves, increasing maintenance intervals and costs. Other areas of savings will be from: more stable system pressure, reduced scrap rate, equipment uptime-which are all results from installing the Sigma Air Manager 4.0.

ongoing energy savings.

Additionally, AIRCENTER packages feature a space-saving design so the overall system footprint was reduced. UniFirst was able to locate the system on a mezzanine, freeing

Compressed air is vital to manufacturing processes, yet it is costly to produce. The US Department of Energy estimates that half of all compressed air generated is wasted. By beginning their system redesign with a comprehensive compressed air audit, UniFirst was able to see their actual plant demand and better understand their system's dynamics. This facilitated designing a system that would best meet their needs, improve uptime, and deliver





#### Short Project Description

American University (AU) received a full installation of MeteoViva Climate for their McKinley building. MeteoViva Climate connects to the AU BMS and incorporates all climate relevant equipment in the building. It assesses the thermodynamics of the building, knows its usage patterns and internal loads, understands the effects of external temperature, sun and wind on the indoor climate and knows what the weather will be for the next three days. With this information MeteoViva Climate calculates the optimal control data for the HVAC equipment. MeteoViva installed the MeteoViva Climate connector and did the thermodynamical modeling of the McKinley Building.

#### **Reference Project Address**

McKinley Building, 4400 Massachusetts Ave. NW, Washington, DC 20016

#### **Energy Efficiency Achieved**

Within the evaluation period of the last 12 months, MVC reduced energy costs for heating, ventilation and air conditioning (HVAC) from \$ 133,271 to \$ 85,025, representing savings of \$ 48,245, or 36%.

Furthermore, MeteoViva Climate helped detect significant malfunctions in the HVAC operation. These were addressed by AU's Building Automation and Energy Management Staff. In addition, the linked reduction in carbon dioxide emissions helps AU in achieving its Climate Plan goal of carbon neutrality by 2020.

# O MeteoViva\*

#### MeteoViva® Inc.

1424 K Street NW, Suite 500 Washington, D.C. 20005 www.meteoviva.com

Jean-Marie Bergeal, Vice President, North America Jean-Marie.Bergeal@meteoviva.com Tel: +1 (646) 535 1615

## American University, McKinley Building

#### **Project Description**

American University (AU) received a full installation of MeteoViva Climate for their McKinley building. MeteoViva Climate connects to the AU BMS and incorporates all climate relevant equipment in the building. It assesses the thermodynamics of the building, knows its usage patterns and internal loads, understands the effects of external temperature, sun and wind on the indoor climate and knows what the weather will be for the next three days. With this information MeteoViva Climate calculates the optimal control data for the HVAC equipment. Always one step ahead, 24hours a day, 7 days a week. The user simply sets the desired indoor climate through an intuitive internet portal and the system takes care of the rest. An intelligent alarm system uses expected versus log data to monitor the HVAC equipment and sends early signals for maintenance and repair. AU did the programming changes of the Building Management System (BMS) in-house. MeteoViva installed the MeteoViva Climate connector and did the thermodynamical modeling of the McKinley Building.

#### **Energy Efficiency achieved**

MeteoViva Climate (MVC) first started running in the McKinley building on March 4th 2016. A bi-weekly alternating schedule (with the existing control strategy) was used during the first 16 weeks. The results were such that on June 24th 2016, Management decided to run MeteoViva continuously. Within the evaluation period of the last 12 months, MVC reduced energy costs for heating, ventilation and air conditioning (HVAC) from \$ 133,271 to \$ 85,025, representing savings of \$ 48,245, or 36%. Furthermore, MeteoViva Climate helped detect significant malfunctions in the HVAC operation. These were addressed by AU's Building Automation and Energy Management Staff. In addition, the linked reduction in carbon dioxide emissions helps AU in achieving its Climate Plan goal of carbon neutrality by 2020.

#### **Degree of Innovation**

MeteoViva optimizes energy consumption of large buildings through a patented software. The software is own intellectual property but is based on standard software (MatLab simuling). Unlike the competition MeteoViva is the only forward looking simulation algorithm that takes all influencing factors for the indoor climate of the building into account and uses an existing HVAC to control the heating, cooling and ventilation equipment without adding additional hardware to the building. MeteoViva Climate saves between 15-40% of energy. Their fees are solely based on the success of their clients, i.e. we charge 1/3 of the energy savings as monthly subscription.

based on these factors.

#### **Overall environmental Impact** of the Project

The reduced energy costs for heating, cooling and ventilation of \$ 48,117245, or 36% are also linked to a reduction in carbon dioxide emissions. MeteoViva has requested the energy mix of AU to precisely define the effect on CO<sub>2</sub> emissions. Based on the data of the 65 buildings currently managed by MeteoViva, they estimate the carbon emission reduction to be around 30% for this building.

MeteoViva Climate uses a thermo dynamical model of the specific building. All future aspects, which influence the room climate of that building, are considered in this model. The model uses local weather forecasts, internal load info, building masses building usage information (e.g. business hours) to calculate the necessary heating or cooling needed to create the desired room climate at the lowest possible costs. No other system is currently available on the market that is







#### **Short Project Description**

In the last years Transsolar collaborated with SCB to design six new campus buildings that fulfill the client's ambitious sustainability goals. By carefully taking into consideration the different site factors, programmatic requirements and energy targets Transsolar developed climate and energy concepts for each building to ensure highly comfortable environments and low energy consumption. Passive strategies such as natural cross ventilation driven by stack-effect in a central atrium or double facade which act as insulating layer in winter were integrated in the concepts. Furthermore Transsolar performed daylight and advanced thermal simulations to analyze, validate and optimize the performance of the developed concepts.

#### **Reference Project Address**

Loyola University 1032 W Sheridan Rd, Chicago, IL 60660

#### **Energy Efficiency Achieved**

All six buildings already achieved or are targeted for a LEED Silver or Gold certification; two are ready for a net-zero operation. The implemented technologies and concepts reduce the energy consumption of the buildings by 33-61% compared to the then valid ASHRAE energy code.

Transsolar KlimaEngineering

Transsolar Inc. 220 E. 23rd St. Suite 403 New York, NY 10010

www.transsolar.com

# Loyola University Chicago Campus

#### **Project Description**

In the last years Transsolar collaborated with SCB to design six new campus buildings that fulfill the client's ambitious sustainability goals. By carefully taking into consideration the different site factors, programmatic requirements and energy targets Transsolar developed climate and energy concepts for each building to ensure highly comfortable environments and low energy consumption. Passive strategies such as natural cross ventilation driven by stackeffect in a central atrium or double facade which act as insulating layer in winter were integrated in the concepts. Furthermore Transsolar performed daylight and advanced thermal simulations to analyze, validate and optimize the performance of the developed concepts. Please see the attachment for a detailed description of the individual concepts for each of the six buildings.

#### **Energy Efficiency achieved**

All six buildings already achieved or are targeted for a LEED Silver or Gold certification; two are ready for a net-zero operation.

The implemented technologies and concepts reduce the energy consumption of the buildings by 33-61% compared to the then valid ASHRAE energy code.

Six sustainable new buildings for the Loyola University Chicago campus:

- Richard J. Klarchek Information Commons Year of implementation: 2008 Annual Energy demand: 84 kBtu / sf / year – a 52% reduction compared to ASHRAE 90.1-1999
- Cuneo Hall Year of implementation: 2012 Annual Energy demand: 30 kBtu / sf / year
- Marcella Niehoff School of Nursing Year of implementation: 2012 Annual Energy demand: 43 kBtu / sf / vear – a 38% reduction compared to ASHRAE 90.1-2007

- 90.1-2007
- ASHRAE 90.1-2007
- Education ASHRAE 90.1-2010

**Degree of Innovation** 

 Institute of Environmental Sustainability Year of implementation: 2013 Annual Energy demand: 52 kBtu / sf / year - a 49% reduction compared to ASHRAE

• John and Kathy Schreiber Center -**Quinlan School of Business** Year of implementation: 2015 Annual Energy demand: 28 kBtu / sf /year - a 61% reduction compared to

Center for Translational Research and

Year of implementation: 2016 Annual Energy demand: 247 kBtu / sf / year – a 33% reduction compared to

Beginning with the Klarchek Information Commons, each project builds on lessons learned from the previous projects. In this way novel approaches such as hybrid ventilation, radiant heating and cooling, exterior automated operable shading, solar chimneys, interconnected airflow paths

between spaces, central atriums integrated in a performance concept, and prioritizing daylight in all occupied spaces have become standard practice at Lovola, without need for extensive discussion and acceptance of implementation on each project. This is a major contributor to Loyola's reputation as a leader in sustainable campus development and operations.

#### **Overall environmental Impact** of the Project

All six buildings combined have a GFA (= gross floor area) of 765 500 sf. By developing and implementing the proposed energy and climate concepts the combined annual energy demand of the buildings has been reduced by approximately 54 million kBtu - resulting in CO2 emission savings roughly equivalent to taking off 1,800 cars off the road or the energy use of 900 American homes.

In addition, the six project are an important contributor to Loyola's overall reduction of carbon emissions by 38% from their 2008 baseline.



Courtesy of Solomon Cordwell Buenz and Steinkamp Photography

## Passive House Retrofit in Harlem, NY

During the site visit, a work-in-progress, residential Passive House retrofit, was toured in the Harlem neighborhood of the Manhattan borough. By applying Passive House principles, a complete renovation and transformation of a circa-1900 masonry row house into a modern, comfortable, and efficient two-family building is being performed.

While retaining its historic charm, the building is being prepared for another century of life by utilizing air barriers, superinsulated assemblies and highly efficient heating, cooling, hot water and heat recovery ventilation systems.

Occupants will enjoy consistently comfortable temperatures, humidity, and air quality free of allergens and pollutants while reducing their energy bills by up to 75-90%.

Renovation work by Brace Enterprises, LLC is several months into the project timeline, just enough for you to appreciate the extent of the demolition, yet far enough for you to appreciate the Passive House design coming to life!



Passive House: 16 E 126th Street, New York, NY 10035



## About the German Energy Solutions Initiative

With energy prices on the rise and fossil fuel resources becoming scarce, both economic prosperity and competitiveness increasingly depend on our ability to use new energy sources and energy efficiency solutions. This applies to all countries worldwide. The use of innovative energy solutions offers enormous potential for energy conservation in all fields.

The promotion of smart and sustainable energy solutions in Germany has resulted in the establishment of an industry which offers some of the world's leading technologies. This

industry encompasses several thousand small and medium-sized enterprises specialised in the development, design and production of renewable energy systems, energy efficiency solutions, smartgrids and storage technologies. Also new energy technologies like Power-to-Gas and fuel cells are the basis for cutting-edge energy solutions.

The transfer of energy expertise, the promotion of foreign trade and the facilitation of international development cooperation are part of the German Energy Solutions Initiative. We offer:

- - capacity building



networking and business opportunities both in your country and in Germany showcasing of reference projects

Coordinated and financed by the German Federal Ministry for Economic Affairs and Energy (BMWi), the initiative is implemented

in cooperation with partners such as German bilateral chambers of commerce (the AHKs), the German Energy Agency (dena) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

For more information, please visit: www.german-energy-solutions.de



# German American Chamber of Commerce, Inc.



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Comprised of a highly qualified team of professionals, the GACC NY supports companies by facilitating the following: market entry & business development; legal services, intern visas; recruitment and startup guidance.

Founded in 1947 the GACC NY also comprises branch offices in Philadelphia and California. The GACC New York offers a wide range of services to the Northeastern and Western states. Benefiting from being close to Silicon Valley the California branch mainly supports trendsetting industry sectors such as IT, biotechnology, renewable energies, semi-conductors and nanotechnology.

The organization is an integral part of the German Chambers of Commerce Abroad network with over 130 offices in 90



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GACC New Yorks territory covers 24 US states: Arizona, California, Connecticut, Delaware, Hawaii, Idaho, Maine, Maryland, Massachusetts, Montana, Nevada, New Hampshire, New Jersey, New Mexico, New

York, Oregon, Pennsylvania, Rhode Island, Utah, Vermont, Virginia, Washington, West Virginia and Wyoming. With over 900 members, GACC New York enables its members to socialize and build important business relationships throughout its network.

Find out more about our membership and services at www.gaccny.com @GACCNewYork



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