



# SUSTAINABILITY

DESIGN & COMMITMENT

 **IMEG**  
The **FUTURE.** Built Smarter.

# PEOPLE AND THE PLANET

IMEG is passionate about people and engineering, but we are also passionate about the planet. With that in mind, our firm has integrated environmentally-friendly policies and practices into our organization that promote energy, water, and carbon emissions conservation, and waste reduction. We also integrate our sustainable stewardship within our design work, helping clients reduce their environmental impact and risk while maximizing value.

As experts in the field of sustainability, we hold ourselves responsible for sustainable design solutions that provide healthy buildings that are aesthetically pleasing, use less energy, deplete fewer natural resources, generate less waste, provide flexible environments for occupants, and are within the client's budget. Just as sustainability is an important aspect of our design philosophy, we also strive to ensure our internal operations emphasize the importance of inclusion, openness, and science as our commitment to people and the planet grows ever stronger.



# DEMONSTRATING COMMITMENT

DESIGNING BETTER BUILDINGS FROM LEED TO WELL TO NET ZERO

As a nationally recognized leader in sustainability, IMEG's certified experts have designed hundreds of LEED and Net Zero projects and we have several that are WELL certified or seeking certification.

In addition to WELL- and LEED-certified designers, IMEG has accredited experts in ASHRAE-Certified Building Energy Modeling and Building Energy Assessment. We are also a founding member of the Carbon Leadership Forum's newly launched MEP 2040 Challenge, calling on all systems engineers to "advocate for and achieve net zero carbon in their projects: operational carbon by 2030 and embodied carbon by 2040."

Additionally, recently we signed on to be part of the U.S. Department of Energy's Better Buildings Alliance, the AIA 2030 Commitment, the National Academy of Medicine's Action Collaborative on Decarbonizing the U.S. Health Sector (Climate Collaborative), and joined the Structural Engineers 2050 Commitment Program to eliminate embodied carbon in our project designs. However, our commitment goes back decades as demonstrated by our many "firsts" in high-performance design.

- 1st hospital in U.S. served by lake-coupled geothermal system
- One of the first hospitals to reach EnergyStar score of 100 with EUI of 100
- Largest lake-coupled geothermal system serving a hospital in the U.S.
- Largest LEED Platinum office building in the U.S.
- 1st Certified LEED Platinum data center in the U.S.
- 1st Certified LEED Platinum university building in Illinois
- 1st Certified LEED hospital in Wisconsin and Iowa



Top **5**  
100% employee-owned  
**Engineering**  
FIRM in U.S. (BD+C)

DENVER WATER OPERATIONS COMPLEX | DENVER, CO

LEED Platinum, Net-Zero Energy, One Water,  
and LEED Gold multi-building campus  
2021 ACEC Colorado Grand Conceptor Award  
2021 ACEC Grand Conceptor Award



CLICK ON IMAGES TO LEARN MORE

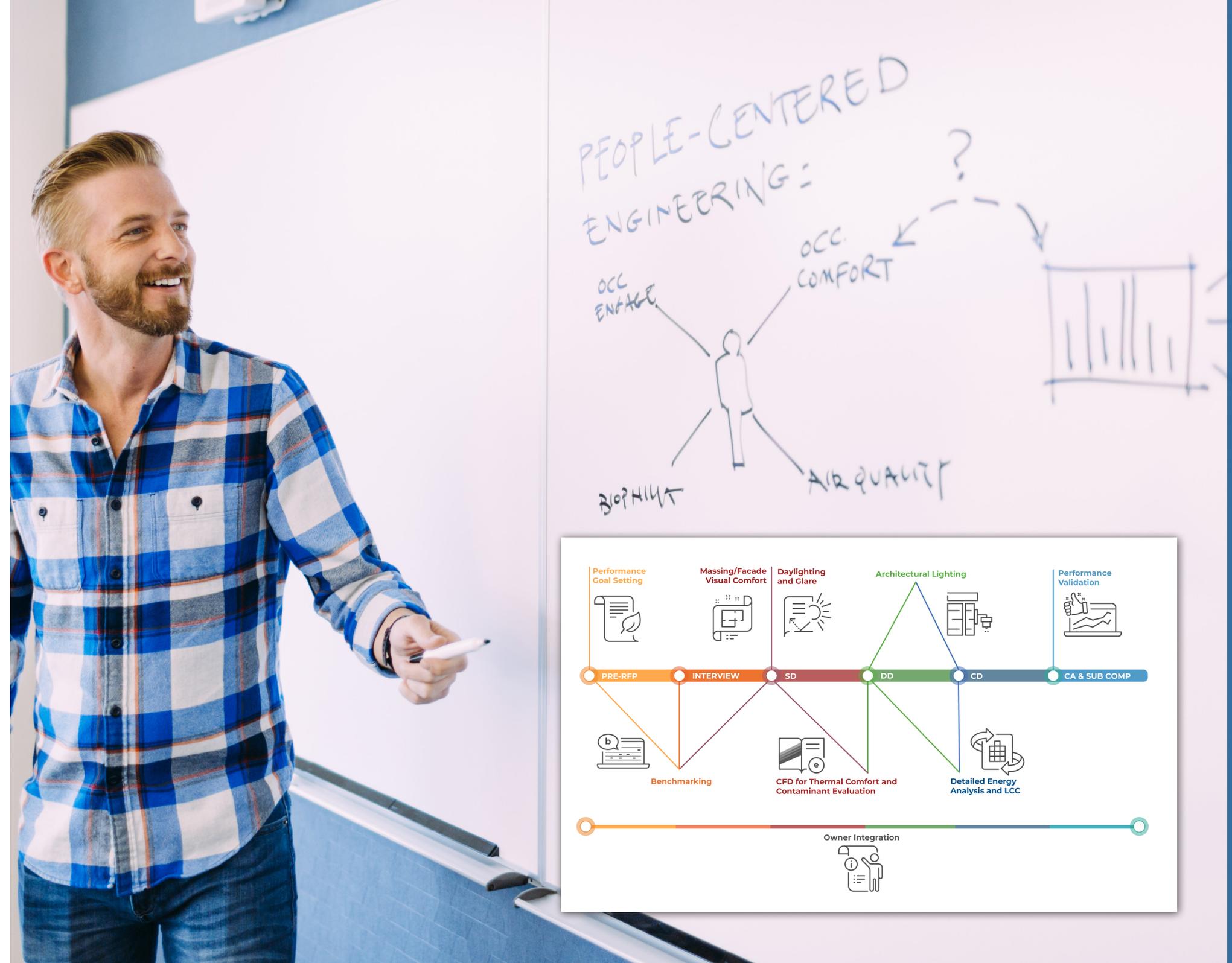
# OUR APPROACH

## DELIVER AN INFORMED, HEALTHY, EFFICIENT BUILDING

IMEG has built a global reputation for engineering services of high-performance buildings that maximize efficiency and flexibility with forward-thinking design solutions. We believe that the performance and energy goals laid out during the concept design phase should be achieved during operations and we work diligently with our clients to see tangible results. This approach maximizes value while reducing environmental impact and carbon emissions.

Our building performance analysts assist owners and designers in optimizing building energy consumption, occupant comfort, and wellness. This provides valuable cost-benefit information to assist decision makers in their capital investment planning while also making the building comfortable and healthy for its occupants. IMEG's goal is to be your collaborator from concept to consumption as a design partner and owner advocate.

We believe that a high-performance building prioritizes the health and wellness of its occupants along with energy efficiency and clean energy generation.



# RAPID PERFORMANCE MODELING

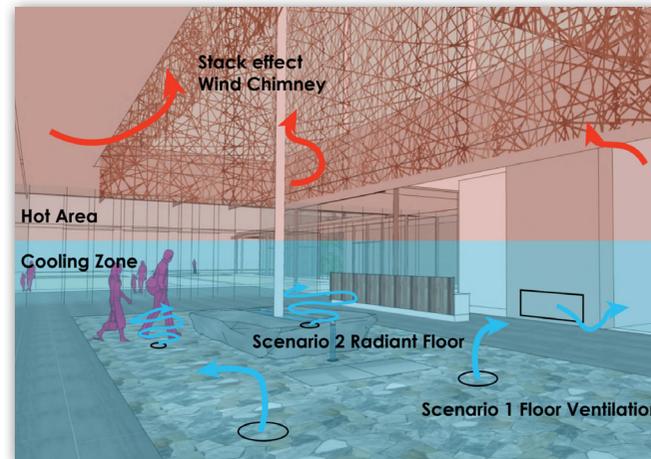
## EARLY, COST-EFFECTIVE BUILDING SYSTEM ANALYSIS

IMEG's **Rapid Performance Modeling (RPM)** provides early, quick, and optimal design decision-making for clients, providing the best solutions and most cost-effective implementation for MEP and other key building systems.

RPM occurs during concept and/or schematic design phases and pairs quick modeling studies with timely design guidance for such key features as building insulation and mass, glazing and shading, passive strategies, and HVAC and lighting systems. This early analysis enables implementation and integration of the best opportunities and strategies that might not otherwise be feasible (or would add cost due to change orders) were the decisions deferred until later (as often happens).

RPM helps owners understand “the big moves” that will define their building’s performance,

establishing early agreement on goals and project approach, and is easily integrated into presentation decks, reports, and submittals – all at a lower cost compared to detailed modeling.



In this project example, a displacement ventilation design allows natural stratification of the space. This improves occupant comfort by treating the lower level occupant needs while exhausting hot air from the top. This specific lantern design also captures heat and releases it before it ever reaches the occupants, saving 20-30% in cooling energy.

## RPM SERVICES INCLUDE:

- Setting a target for energy use intensity (EUI)
- Daylight modeling
- Schematic energy model
- Schematic HVAC system comparison
- Computational fluid dynamics (CFD)
- Renewable energy assessment
- Schematic life cycle cost analysis
- Water conservation and re-use
- Carbon emissions analysis
- Participation in design meetings
- Schematic design report
- 2030 Commitment documentation



MISSOURI BOTANICAL GARDEN | ST. LOUIS, MO  
91,700-sf New Visitor Center - Pursuing LEED Gold

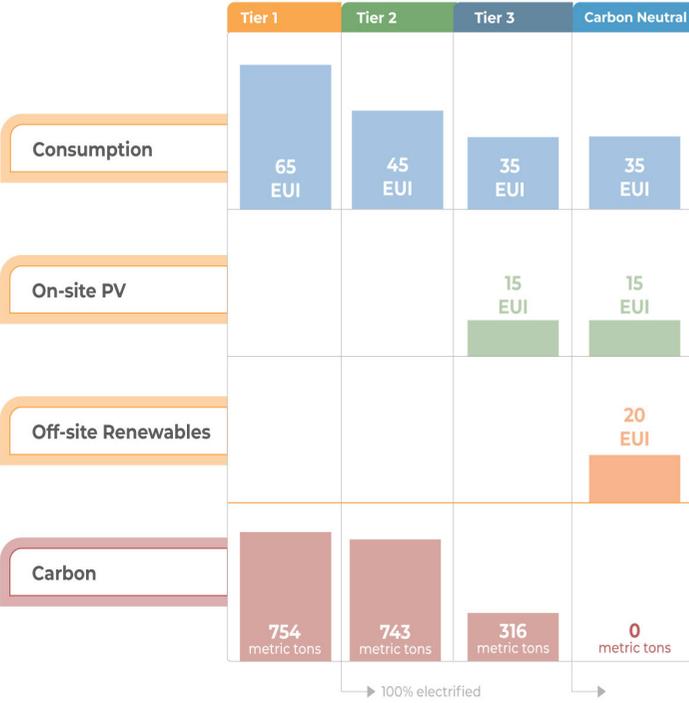


# PATH TO CARBON NEUTRAL

## REDUCING OPERATIONAL CARBON IN BUILDINGS

IMEG can assess both the energy use and carbon impact of moving from business-as-usual practices to charting a path to carbon neutral.

Our approach explores building efficiency as well as on-site and off-site renewable energy options. This improves a client's understanding of the options to reach a zero carbon footprint while also providing the landscape for other solutions that align with project goals and budget.



CLICK ON IMAGES TO LEARN MORE



In this project example, Cross-Laminated Timber (CLT) roof panels and large glulam beams accentuate the sloped roof exterior and provide a clean aesthetic to the perimeter galleries, corridors, and open lobby. CLT greatly reduces the embodied carbon of the structure. This project is in line with the SE2050 Embodied Carbon Commitment that IMEG joined on April 20, 2021.



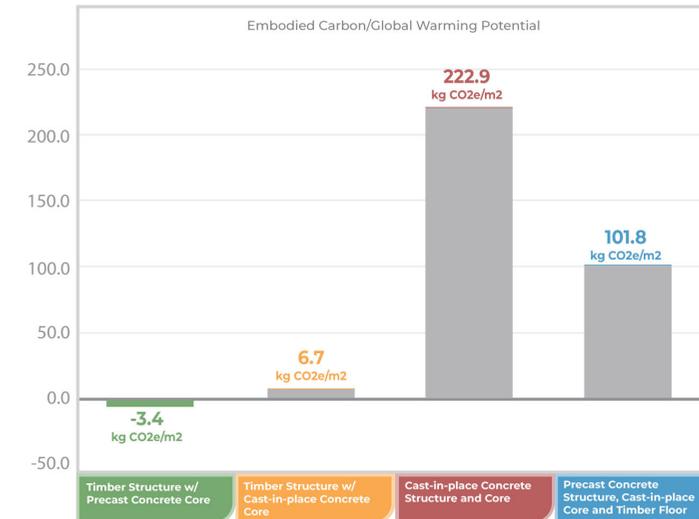
# MINIMIZING EMBODIED CARBON

## CONSIDER THE CARBON IT TAKES TO CONSTRUCT

The embodied carbon emissions of building products and construction, such as concrete, iron, and steel, represent a significant portion of global emissions. In fact, embodied carbon emissions from the building sector produce 11% of annual global greenhouse gas emissions.\*

IMEG's structural and sustainability experts help clients understand, reduce, and ultimately eliminate embodied carbon in their projects.

SYSTEM BOUNDARY A-D



The assessment of the embodied carbon in structure, building shell, or interior products should be conducted in early design to maximize the results and assist in the decision-making process.

\*Source: 2018 2030, Inc. / Architecture 2030

# INTEGRATING RENEWABLE ENERGY

ANALYSIS TO REDUCE FIRST COSTS & PUT ENERGY GOALS IN REACH

Renewable energy planning is best done at the initial concept phase. Systems need to integrate with the building and surrounding site and can impact all trades.

Our real-time analytics capabilities provide IMEG experts the ability to quickly assess size and scale for early consideration. This assists planning and helps put carbon and energy goals within reach.





**Building size (sf)**  
433400

**Electric EUI**  
36  
kWh offset 4,572,802

**Gas EUI**  
29  
kWh offset 1,274,658

**Electricity cost**  
0.143

**Solar Generation (kWh/kW)**  
1350

**On-Site Solar**

Roof/site area (sf)  
60000

\$/W  
2.00

**\$1,846,154**

923 kW  
1,246,154 kWh  
\$178,200 kWh value  
10.4 payback (yrs)

**21% Net Zero**

**Community Solar**

Array size (kW)  
1000

\$/W  
\$1.50

**\$1,500,000**

1,350,000 kWh  
\$193,050 kWh value  
7.8 payback (yrs)

**23% Net Zero**

**Virtual PPA**

Contract term (yrs)  
20

\$/kWh  
\$0.030

**\$1,950,784**

Balance for NZE  
3,251,306 kWh  
No payback

**56% Net Zero**

Meet balance with VPPA

**100%**  
Total % Net Zero

**\$3,346,154**  
First Cost

**\$97,539**  
Annual Cost Premium

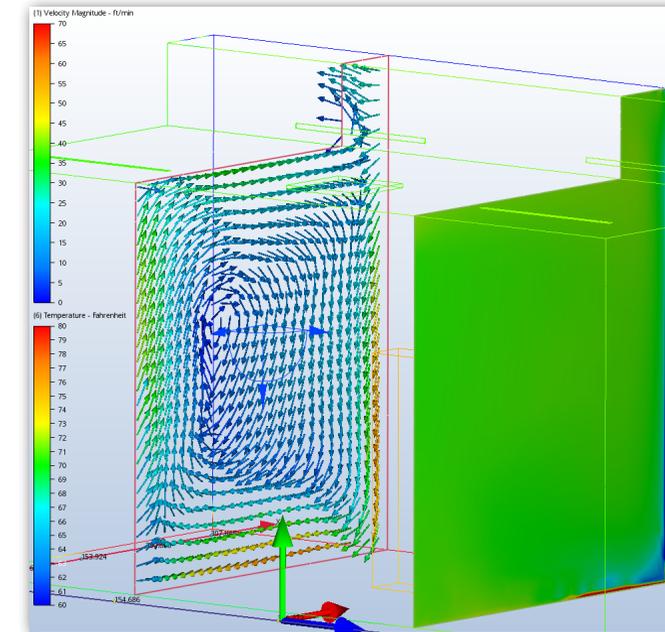
ARIZONA STATE UNIVERSITY | TEMPE, AZ  
Campus-wide Energy Savings Performance Contract

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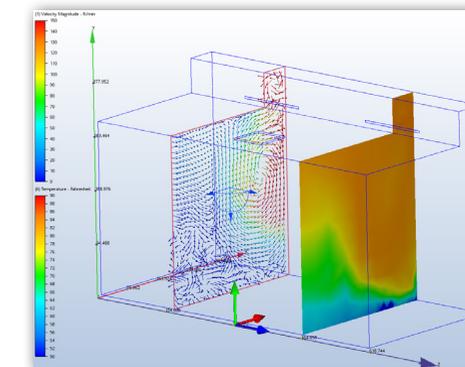
Our CFD capabilities help improve understanding of the indoor environment. Integrated systems have a unique opportunity to maximize comfort while increasing efficiency, and the savings gained from reducing mechanical system size can be leveraged to improve other areas of the building.

# IMPROVING THERMAL COMFORT

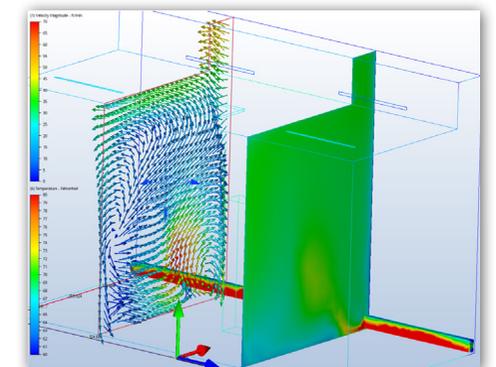
REDUCE MECHANICAL EQUIPMENT COSTS WITH CFD ANALYSIS



RADIANT FLOOR



OVERHEAD SUPPLY

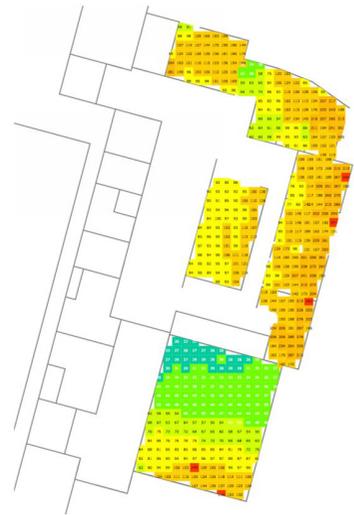


BASEBOARD

# TRANSFORMING VISUAL COMFORT

DAYLIGHT MODELING IMPROVES COMFORT & INCREASES PRODUCTIVITY

The building facade helps bring the outdoors into the building – connecting us to the natural environment. Comfortable temperatures, access to daylight, and absence of glare will be noticed and appreciated by all who utilize a space.



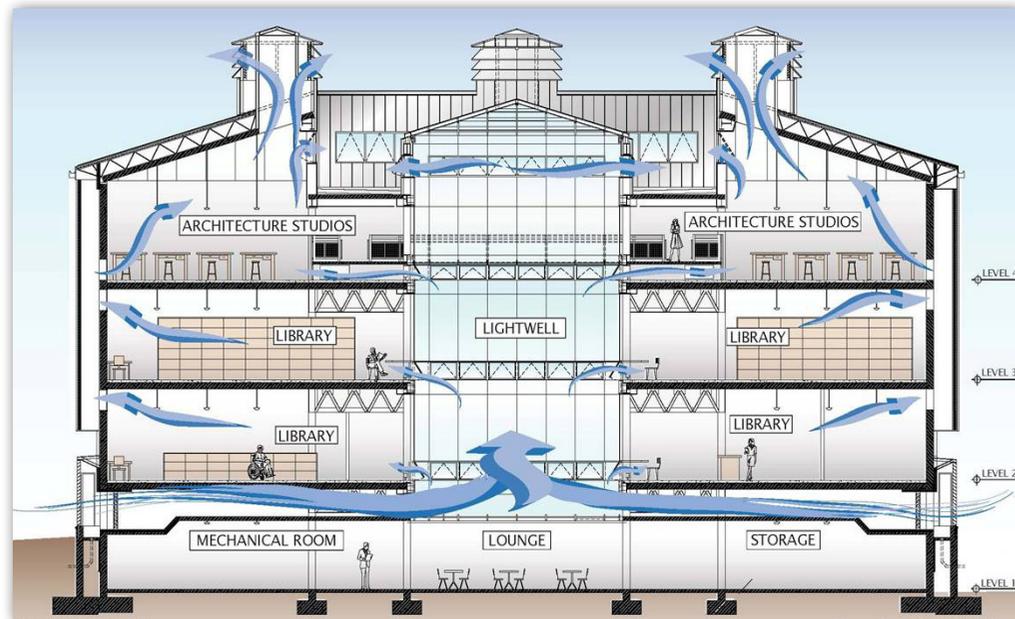
SSM HEALTH SAINT LOUIS UNIVERSITY HOSPITAL | ST. LOUIS, MO  
822,125-sf New Hospital & Ambulatory Care Center - 65-acre site

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# PROTECTING HEALTH AND WELLNESS

## AIRFLOW ANALYSIS INFORMS DESIGN & PLANNING

Great design prioritizes the health and well-being of occupants. Airflow control and pollutant management are key considerations for both the indoor and outdoor environments. We employ airflow analysis techniques to inform the design and space planning approach.



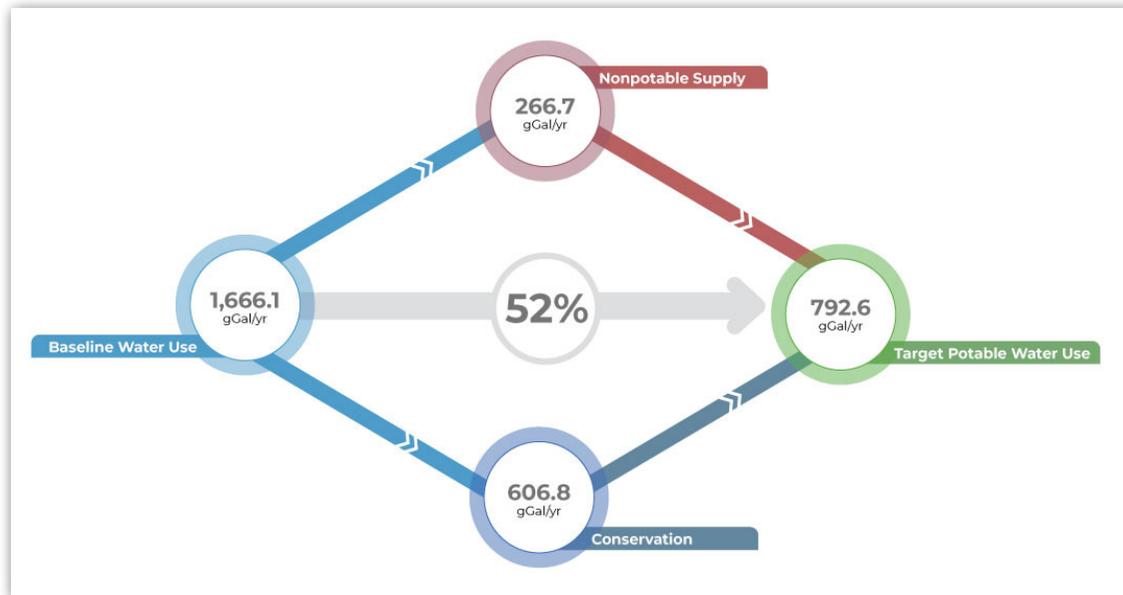
JUDSON UNIVERSITY | ELGIN, IL  
88,000-sf New Academic Library & School of Architecture - LEED Gold

# PRIORITIZING WATER CONSERVATION

DESIGN TO CONSERVE, CAPTURE, AND RE-USE

IMEG prioritizes water conservation and works with clients to implement capture and re-use techniques. We understand that systems need to integrate with the building and the surrounding site and can have an impact – both positively and negatively.

From low-flow fixtures in the building to integrated rainwater capture systems, we will assess project scale and site characteristics, considering all opportunities to meet project goals. This can help reduce first costs while preserving this valuable resource.



Rainwater is collected from the roof using siphonic roof drains and distributed to two underground cisterns located in the park area in the center of the u-shaped building. The collected rainwater is used for irrigation and flushing purposes to decrease the use of potable water at this facility, providing a 55% reduction in water usage.



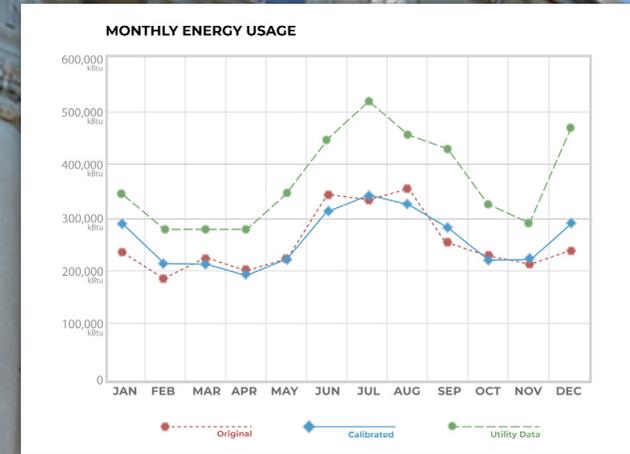
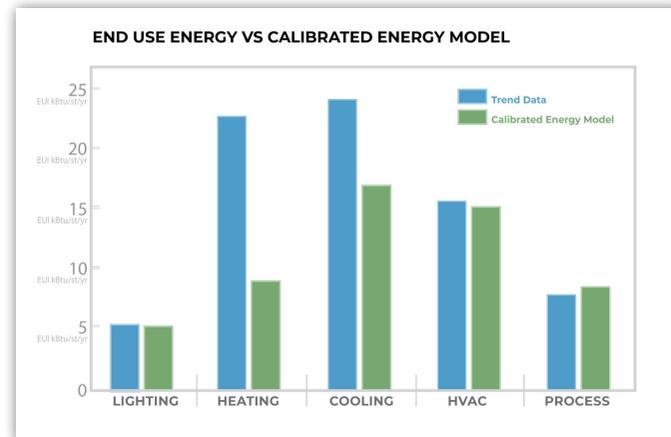
**WELLMARK BLUE SHIELD | DES MOINES, IA**  
650,000-sf New Corporate Headquarters LEED Platinum  
ASHRAE Regional Technology Award and National Honorable Mention (2012)

# DELIVERING PERFORMANCE

## OUTCOME-BASED APPROACH FROM CONCEPT TO CONSUMPTION

It's an unfortunate reality that efficiently designed buildings often use more energy than they were intended to use – sometimes substantially more. Subpar building performance can occur for numerous reasons and can be set in motion at any point from day one of planning all the way through design, construction, and operation. Failure to establish an energy goal, an absence of commissioning, an unprepared facility staff, faulty equipment, incorrect installation, a lack of measurement and verification – all of these pitfalls and more can lead to systems operating inefficiently, difficult-to-trace issues, and, ultimately, added energy costs.

IMEG's holistic project oversight method protects an efficiently designed building from the many shortcomings that can lead to poor performance – thereby reducing the financial risk for owners who invest in high-performance design.



IMEG completed post-occupancy performance evaluation after a major renovation of a higher education engineering building. The project had replaced legacy systems with a chilled beam/DOAS system. After monitoring showed higher-than-expected energy use every month of the year post renovation, system-level analysis revealed that heating and cooling were not operating as expected. Further evaluation revealed a DOAS heating valve was incorrectly commanded 100% open (without causing noticeable comfort issues). This was quickly and easily corrected at no cost to the owner. A simple, zero-cost heating valve correction saved the owner \$24,000 per year in energy costs.



IOWA STATE UNIVERSITY | AMES, IA  
65,000-sf College of Engineering Renovation - LEED Gold

CLICK ON IMAGES TO LEARN MORE

# WE ARE IMEG

## PUTTING PEOPLE AND PLANET FIRST

Our story is one that began organically and has evolved strategically through multiple firms coming together with a common goal of high-performance design and a shared passion for people-centered engineering.

We specialize in high-performing building systems, infrastructure, program management, and construction-related services, and our secret to success is found in our deep bench of 1,600+ team members. For us, people-centered engineering is about more than the people we serve — it's representative of the engaged employee culture we've worked hard to create and the planet we work passionately to protect.

After all, that's the whole reason we're drawn to people-centered engineering: Everyone wins!

IMEG plants a tree in select national forests for each new team member who joins our firm through acquisition. We plan to expand this and celebrate all new team members soon.





The **FUTURE.** Built **Smarter.**

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