WELCOME
GUIDING PRINCIPLES
REALITY
CURRENT REALITY
IMPACT
RESULTS AND IMPACT
PROGRESS

APPROACH
PROCESS
PERFORMANCE MODELING
PROJECTS
CULTURE
SUSTAINABLE DESIGN CULTURE

2018
Our promise is to elevate the human experience through design. This inspires our culture of design and fuels the work we do around the world.

The Reality
One of the most pressing challenges in the century is to mitigate climate change caused by greenhouse gas (GHG) emissions from human activities. Our environmental stewardship report for 2018 reflects our progress toward meeting the 2030 Challenge, the architecture industry’s charge to design carbon-neutral buildings and developments. Information in this report has been extracted from the estimated operational energy consumption, energy production, and energy optimization of DLR Group designs in 2018. Beyond these typical metrics of achievement, in 2018 we addressed other areas including exploration of innovative materials, indoor air quality, occupant comfort, wellbeing, and productivity. These areas further expanded our thinking on sustainability and the role it plays within integrated design.

The effects of climate change continue to severely impact lives, communities, wildlife, ecosystems, and economies throughout the world. The latest report from Intergovernmental Panel on Climate Change (IPCC) raises awareness of the risk if global temperatures exceed 1.5°C (2.7°F) between 2030 and 2052, and requires a rapid and far-reaching transition to cleaner and lower emissions from all sectors. As designers of the built environment, in addition to the 2030 Challenge, we are inspired by several frameworks such as The Drawdown Project, AIA Committee on the Environment (COTE) Top Ten Design Measures, and UN Sustainable Development Goals (SDG) and we are beginning to use building design as a catalyst to address a wider set of metrics.

The Impact
DLR Group’s average reduction target of predicted energy use for our high performance designs have consistently exceeded the national peer group average. In 2018, our integrated designs resulted in a 49 percent energy reduction compared to average buildings.* While an improvement over the previous year, we are continuing to set aggressive internal targets and widen our performance design approach to reach our goal of meeting the 2030 Challenge on every new project by 2020. The impact of our designs in 2018 in terms of reducing GHG emissions was multiplied by four times from the previous year. This was largely due to the scale of our projects including a carbon neutral master plan for an entire college district, a deep-energy retrofit of a 400,000 SF high-rise, and over 800,000 SF of energy efficient data centers.

*Reduction determined using The Zero Tool, an Architecture 2030 platform developed for building sector professionals to establish energy reduction baselines and targets, compare a building’s energy performance with similar buildings and its codes, and understand how a building achieved its current energy performance.

The Culture
In 2018, we strengthened our core value of environmental stewardship through a variety of internal initiatives including: development of a “Sustainability Salon” on our intranet which further raised awareness and improved our vocabulary on sustainability topics. We performed a critical evaluation of our integrated design culture and its ability to deliver sustainable design by establishing research initiatives to propel innovative ways to solve design challenges that impact the socio, economic, and environmental sustainability aspects of our projects, and celebrated our success with an AIA COTE Top Ten awarded project – Smithsonian American Art Museum’s Renwick Gallery.

Our 2018 focus on sustainability, driven by an approach to integrated design and propelled by the DLR Group culture, influences our designs in a significant way. We are excited to continue the journey towards designing a restorative, regenerative, and resilient built environment!

Prem Sundharam, AIA, WELL AP
Global Sustainability Leader
DLR Group
GUIDING PRINCIPLES

Environmental Stewardship & 2030 Commitment

1. PRACTICE INTEGRATED DESIGN & SUSTAINABILITY
2. SET ENERGY PERFORMANCE GOALS
3. OPTIMIZE BUILDING DESIGN & PERFORMANCE
4. VERIFY MODELING & TESTING
5. ASSESS RENEWABLE OPPORTUNITIES
6. ENCOURAGE POST OCCUPANCY ENERGY MEASUREMENT & VERIFICATION
7. LIVE SUSTAINABLY IN OUR OFFICE
8. TELL OUR STORY
9. LEAD THIS CHALLENGE
At DLR Group, sustainability is intrinsic to our design culture. In every project, DLR Group aims to inspire, conserve, and promote.

**INSPIRE**
Our work should create an emphasis on community by raising awareness of social, ecological, and built systems; being open and honest in our actions and decisions; and honoring existing beauty as we design anew.

**CONSERVE**
In our design process, we search for ways to conserve water and energy in every way possible. We aim to conserve the land. We promise to not only look at the ways that one building can impact a neighborhood, but also the global ecosystem as a whole.

**PROMOTE**
We aim to encourage our building users, as well as the surrounding community, to be their best in productivity, wellbeing, health, and fitness through our sustainable design choices.

- community
- awareness
- honesty
- beauty
- land
- water
- eco-system
- energy
- wellbeing
- productivity
- health
- fitness
Climate change is considered one of the greatest challenges of our time. As designers of the built environment, it is our responsibility to balance operational efficiency with design goals.
In 2018, atmospheric carbon dioxide (CO₂) levels have consistently stayed above 400 parts per million (ppm) peaking at 412 ppm. For centuries, the atmospheric CO₂ levels have never been above 300 ppm. Such high concentration of CO₂ levels results in changing weather patterns causing a significant impact to economies and communities worldwide. In 2018, we experienced the shift in conversation from reducing the operating inefficiencies of buildings to risk mitigation, climate adaptation and resiliency.

Energy use within buildings and cities continue to be at the center of climate change mitigation conversations as they contribute to GHG emissions to a large extent. However, the latest report from U.S. Energy Information Administration on the reduction of U.S. building sector’s CO₂ emissions by 20.2 percent below 2005 levels, is a healthy encouragement for designing high performance buildings. Our design challenge is now expanded to address more interconnected challenges such as the impact of materials and related land use; food and lifestyle choices; transportation, mobility and artificial intelligence; and diversity and equity. Our holistic design solutions continue to evolve by taking into account more than energy use metrics.

Global temperature change relative to 1850-1900 °C

With a holistic approach to sustainability, we continue to refine a set of metrics to evaluate our design impact and evolve our practice.
In 2018, DLR Group tracked 8,148,634 SF against the 2030 challenge goals. We measure our design impact in three parts addressing the full life-cycle of buildings: Reduce, Produce, Optimize. We begin with reducing the need for energy use within buildings through high performance design strategies on new buildings and renovations. Then, we support the resiliency of the built environment through renewable energy integration. We close the loop with optimizing existing buildings and fine tuning new buildings to improve their operational efficiencies.

This resulted in 334,000 metric tons of GHG* avoided

The impact of design choices for 2018 can be quantified in these tangible ways:

- The amount of water used in U.S. Olympic-size swimming pools: 619
- Removing 71,000 passenger vehicles from the road
- The amount of carbon sequestered by acres of forest: 393,000
- The amount of energy consumed by homes in a year: 36,000

*GHG emissions are estimated using national average fuel ratio for energy use in buildings and EPA’s Power Profiler Tool.
DLR Group aims to design to 2030 Challenge metrics for all projects by 2020.
**RENEWABLE ENERGY SYSTEMS INSTALLED**

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**RENEWABLE ENERGY SYSTEMS DESIGNED**

- **Optimized** projects firm-wide in 2018
  - Produced 42 GWh
  - Based on solar architecture projects firm-wide in 2018

- **Produced** based on energy optimization projects firm-wide in 2018
  - 39 MILLION kBtu
  - 49% Annual energy reduction over average building
PROJECTED ENERGY SAVINGS

2030 GOAL
70% 2030 GOAL FOR 2018
PROJECTED ENERGY SAVINGS

2018 projected energy savings percentage by market sector

DLR Group goals by 2020

DESIGN IMPACT

Participation and key performance indicators

2030 COMMITMENT

DESIGNING TO 2030 AS A PERCENTAGE OF PROJECT AREA WITH PERFORMANCE ANALYSIS
PERFORMANCE ANALYSIS AS A PERCENTAGE OF PARTICIPATING PROJECT AREA (GSF)
PARTICIPATION AS A PERCENT OF TOTAL PROJECT AREA (GSF)
The key to success is our systematic approach, process, and strategies for designing high performance buildings.
PROCESS

DLR Group is an integrated design firm.

At the core of an integrated design practice are collaborative, integrated, and productive teams composed of project life-cycle stakeholders. Our practice embraces a research-based and results-oriented approach at each phase of the design process. Deeply embedded in our practice is our performance design team.

A robust team of performance designers across the firm analyze critical aspects of our designs against performance metrics established by our clients.

A key focus area within our integrated design is our commitment to the carbon neutrality goals of the 2030 Challenge. Our designers are uniquely poised to service the full life-cycle of a building from energy optimization to energy reduction and energy production.

Our approach to systematically evaluate design strategies that achieve carbon neutrality.

AIA 2030 Net Zero Energy Definition
A highly energy efficient building that produces on-site, or procures, enough carbon-free renewable energy to meet building operations energy consumption annually.
Measuring and validating design goals and building performance is key to our approach.

DLR Group is able to generate a representative model of the building for the purpose of detailed energy and utility cost benefit analysis.

At DLR Group we take a holistic and long-term approach to sustainability from initial planning and strategy to design and construction and through occupancy and operations. In this report we use the AIA COTE Top Ten Design Measures to give more detail to our sustainable design story on the following pages.
Our design highlights in 2018 and the estimated annual impact on climate change.
WEST-MEC
SOUTHWEST
ENERGY CAMPUS
Buckeye, Ariz.

K-12 Education
Size: Phase 4-18,022 SF

83% REDUCTION in pEUI
THE PORTLAND BUILDING RECONSTRUCTION

Portland, Ore.

JUSTICE+CIVIC

Size: 400,000 SF

76% REDUCTION

25 pEUI
CANYON VIEW HIGH SCHOOL
Avondale, Ariz.

K-12 Education
Size: 231,000 SF

75% REDUCTION 25 pEUI
T3 WEST MIDTOWN
Atlanta, Ga.

Workplace
Size: 263,173 SF

72% REDUCTION 27 pEUI
DES MOINES AREA COMMUNITY COLLEGE
AUTOMOTIVE TECHNOLOGY CENTER
Ankeny, Iowa

Higher Education
Size: 60,556 SF

70% REDUCTION
30 pEUI
SACRAMENTO COMMUNITY CENTER THEATER

Sacramento, Calif.

Culture+Performing Arts
Size: 92,750 SF

70% REDUCTION 40 pEUI
CULTURE+PERFORMING ARTS

Size: 88,787 SF

64% REDUCTION
47 pEUI
TULARE COUNTY SEQUOIA FIELD PROGRAMMING FACILITY

Visalia, Calif.

Justice+Civic
Size: 53,929 SF

53% REDUCTION
42 pEUI
LONG BEACH COMMUNITY COLLEGE DISTRICT INTEGRATED ENERGY MASTER PLAN

Long Beach, Calif.

Higher Education
Size: 112 Acres

Beyond 2030 Challenge Metrics
Provides a road map and a set of design recommendations to achieve Zero Net Energy (ZNE) as a scalable, beyond the building, multiple campus, district-wide initiative.
SMITHSONIAN AMERICAN ART MUSEUM’S RENWICK GALLERY
Washington, D.C.

Beyond 2030 Challenge Metrics

Major renovation of this national historic landmark included modernizing infrastructure and systems with state-of-the-art sustainable and energy-efficient technologies for this 2018 AIA COTE Top Ten awarded project.
OMAHA’S HENRY DOORLY ZOO & AQUARIUM
ROBERT B. DAUGHERTY EDUCATION CENTER

Omaha, Neb.

K-12 Education
Size: 42,400 SF

Beyond 2030 Challenge Metrics

Inspired by patterns of nature, DLR Group’s innovative biophilic design presents a strong indoor/outdoor connection.
VALENCIA COLLEGE PONCIANA CAMPUS
Ponciana, Fla.

Higher Education
Size: 80,000 SF

Beyond 2030 Challenge Metrics
Inspired by the poinciana tree, the design achieves high performance through an innovative shading strategy.
Beyond 2030 Challenge Metrics

Sustainability was paramount in responsible site design with a focus on tree preservation.
Sustainability is intrinsic to the DLR Group design culture. How our own offices handle waste, monitoring our own indoor air quality, and how we design buildings, sustainability is at the forefront of our work environment.

DLR Group’s Sustainability Salon was formed by a group of passionate employee-owners who proactively promote sustainable concepts within DLR Group. This team, led by Kami Lemke discusses trends, resources and developments as well as plans sustainability-focused office events and knowledge shares with DLR Group employee-owners. Clients benefit from a deeper bench and the outcome is a high performance design for a sustainable future.
These ideas and conversations have encouraged sustainable thinking and skills development throughout the firm. Sustainability Salon members generated their own content based on their dual passion for design and environmental stewardship.

Low Carbon Structural Design and the Truth about Structural Steel
By Natalie Georgieff, PE
Structural Engineer
Discussion about sustainable structural materials has been an increasingly pertinent conversation over the last several years. The recent release of the ASCE-SEI technical report, "Structural Materials and Global Climate - A Primer on Carbon Emissions for Structural Engineers" in 2017 and its mention in a Structure Magazine article in early 2018 sparked my interest in creating this post about the topic. This topic is important to the conversation because it outlines some big-impact changes we implement in our current and future building designs in terms of materials to greatly reduce our carbon footprint and help us achieve our firm-wide commitment to the 2030 Challenge.

Performance Mechanical Engineering – An Integrated Design Story
By Steve Reigh, PE, HBDP
Mechanical Engineer
My excitement about this topic came from my experiences of working together as a fully integrated team to solve the serious issues of budget constraints, all while keeping the sustainability of the building and the desires of the entire team fully in mind. This is important to the ethos of DLR Group as a whole being an integrated design firm, signatory 2030 firm, and stewards of the environment. So often, the sustainable systems get value engineered out of projects, and having a full team dedicated to bending wherever possible to save these systems was a success across the board.

Tools – Mindful Materials
By Jill Maltby, WELL AP
Designer
This topic became important because there is an urgency about decreasing our energy consumption footprint as an industry. However, we also need to balance carbon-conscious materials with ingredient safety beyond chasing certification logos. I wanted to highlight and recognize the manufacturers who are meeting the call for transparency with action by understanding a product’s composition and supply-chain demand. This kind of knowledge means we can actively practice hazard avoidance to improve indoor air quality and occupant health by supporting product specifications with the lowest GWP and distance to the site. We had 4,385 product specifications in our Mindful Materials library. Six months later, it has risen to 6,986.

When Good Intentions Aren’t Enough – Design for Equity
By Elizabeth Bixenman
Interior Designer
I was interested in writing the article because social sustainability is less understood and often left out of the dialogue when we talk about sustainability. I have always been passionate about the way that place plays a large factor in shaping our social identity and feel passionate about exploring and understanding how my role as a professional of the built environment can best be used to facilitate sustainable communities and bring unheard voices to the table. This is important in offering a thoughtful understanding about the issues we hope to solve in our communities. Only then can we start weaving these outcomes into the design process to deliver on these promises in the fight for social sustainability.

The Sustainability Salon is the perfect way to be the thought provokers of sustainability discussion within the firm and keep moving the needle towards/ beyond the AIA 2030 Challenge.

Sustainability Salon posts are a great platform to keep us engaged in innovative sustainable solutions... it helps keep our design conversations fresh and diverse.

Performance Design Start to Finish
By Sam Margolis
Mechanical Designer
My interest has always been in the areas where sustainability and mechanical engineering come together. High performance design is an excellent example of that crossover. Maximizing the impact that energy modeling and performance analysis has on the engineering and design of a project is my passion. This topic of integrating these efforts with performance modeling is important to good design. And it is essential to reducing the environmental footprint of our industry. When the product of our work accounts for 39% of global CO2 emissions, we are responsible to do better for the planet and its occupants who work, live, and play in the buildings we design.

The insights from the Sustainability Salon contributors are always inspirational and enlightening... I believe this helps shape our culture of sustainability and the value it adds to our own projects.