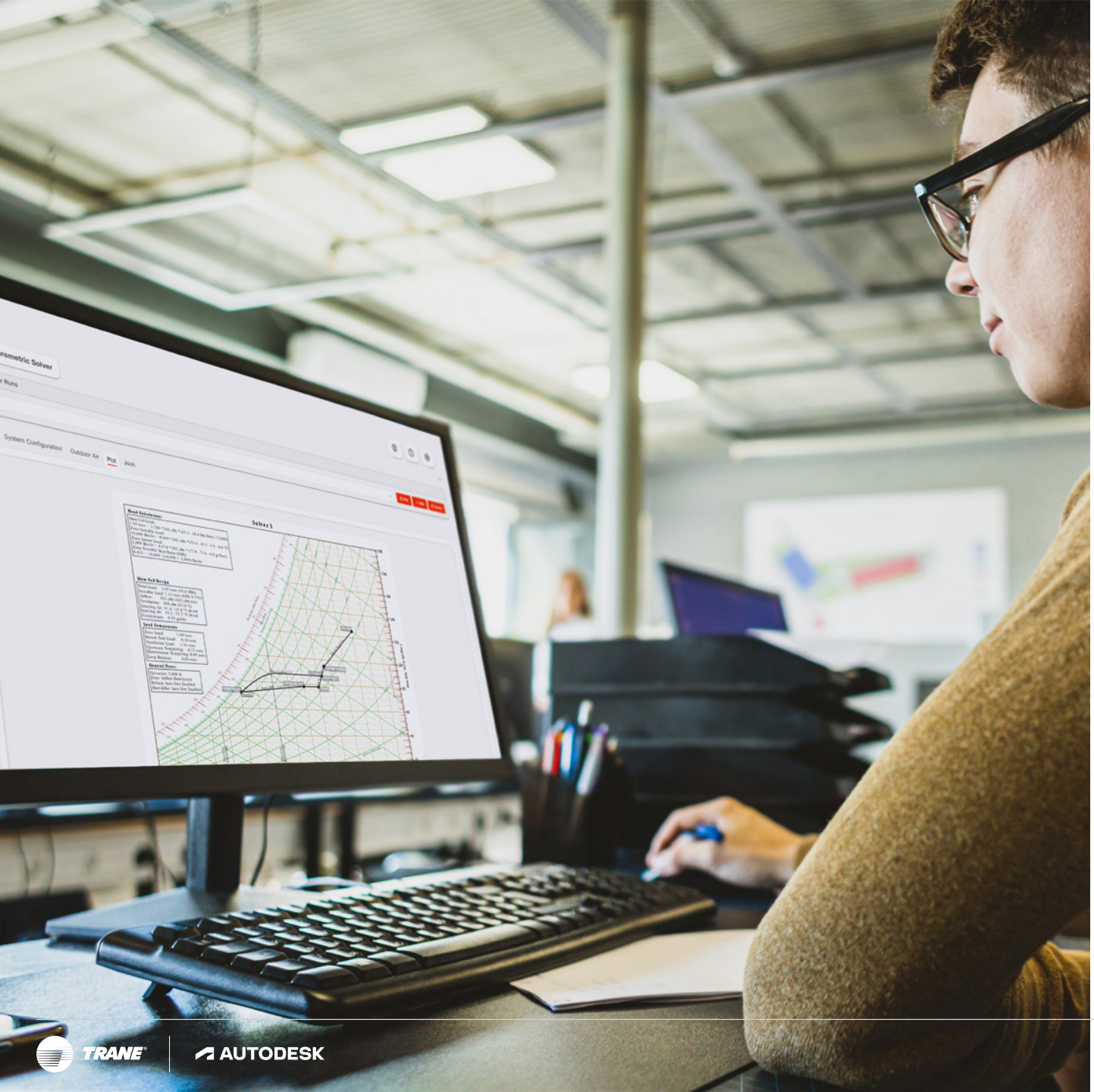
TRACE® Load Design and Energy Modeling in Revit®

A Trane and Autodesk collaboration.

Enhancing building information modeling with energy expertise.





Bringing Great Minds Together

Closer collaboration between architects and MEP engineers can yield amazing results.

The pace of change in building materials and technologies is astounding. Within their own realms, architects and engineers have incredible new choices when it comes to making buildings more sustainable and cost efficient. Understanding how those choices can come together to create better buildings requires close collaboration between professional disciplines.

The TRACE® plug-in for Revit® can make that collaboration a more natural part of the building design process. It means architects and engineers can work within the same software platform to share ideas, apply professional knowledge, test concepts and present more innovative solutions to clients — along with supporting data.

A milestone in sustainable building design.

Economics, building standards and regulations, and personal values are pressing for more sustainable buildings. As a major consumer of buildings' energy use, HVAC systems can provide the best outcomes for owners when they become an important factor in the architectural design process.

The TRACE® plug-in for Revit® supports design discovery to assess carbon impact and operational costs to deliver a better ROI within the same project timeline and budget. It brings natural transparency to iterative processes, saving time and making it easier to merge design visions and technical feasibility into solutions that represent the best of both fields.

Architect's Responsibility

- Building design
- Space planning
- Aesthetics and materials
- Structural layout

Shared Responsibility

- Sustainable design
- Energy efficiency
- Codes and regulations
- Integration of systems

MEP Engineer's Responsibility

- HVAC systems
- Plumbing and water systems
- Electrical design
- Fire protection

With TRACE operating seamlessly within Revit, architects and engineers collaborate more naturally on shared responsibilities.

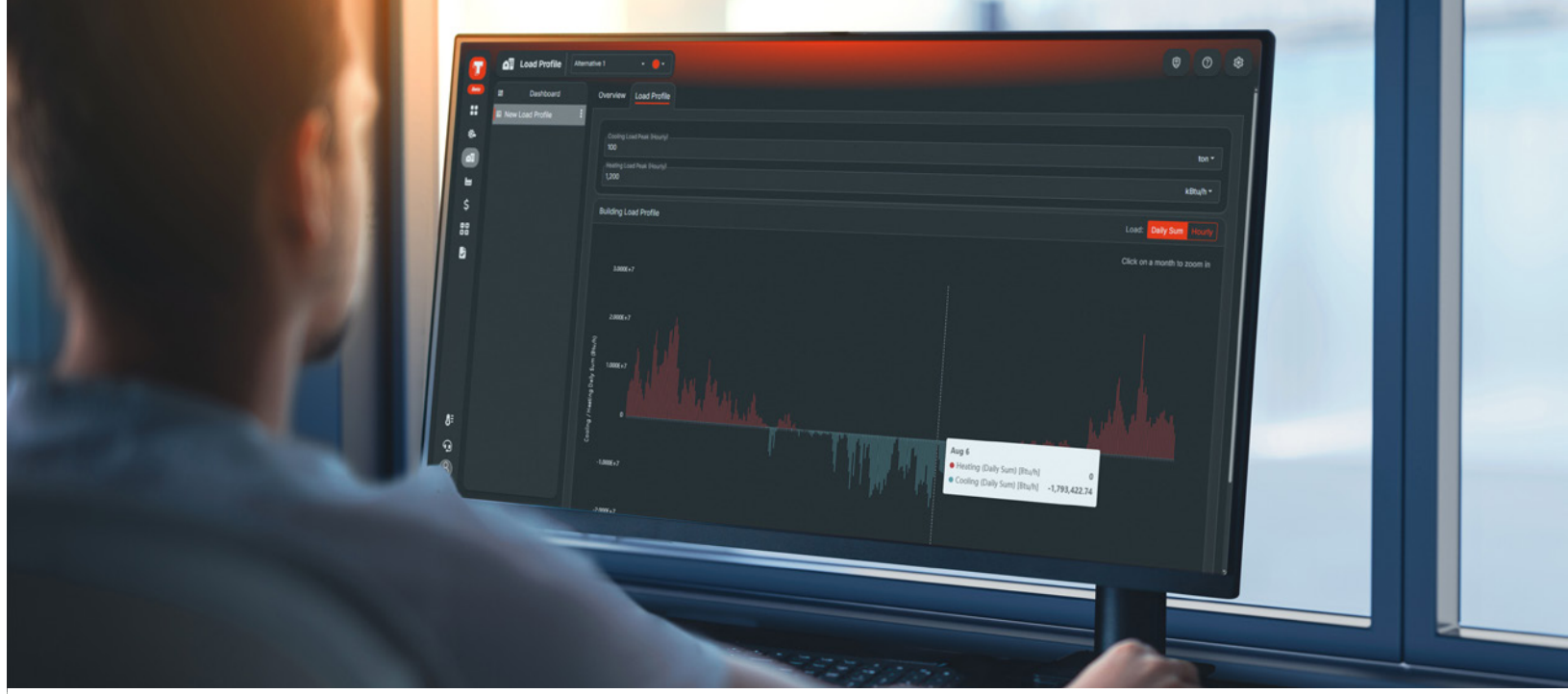
Thrive through adversity.

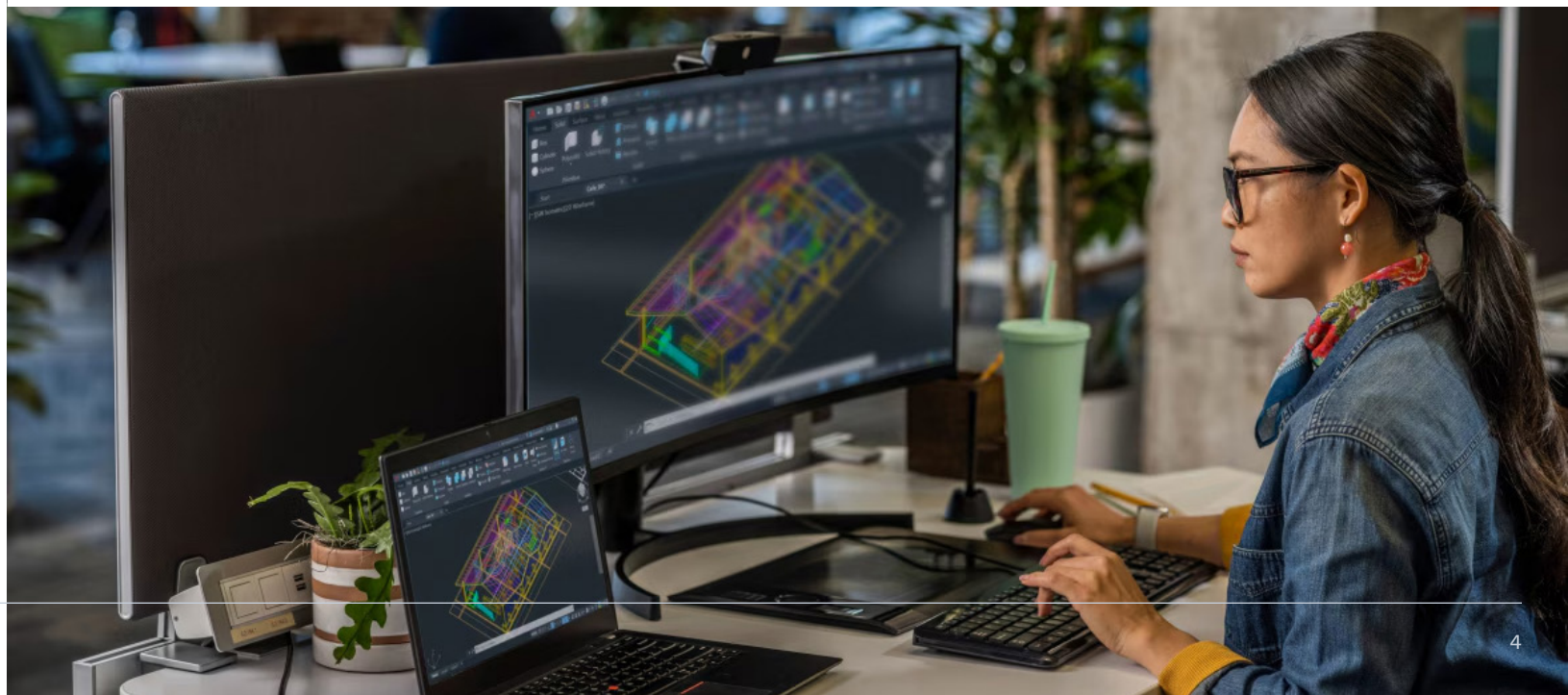
The AECO industry is facing some real challenges, and this may not seem like the right time to reach a little higher. In fact, the opposite is true. The ease and efficiencies gained through integrated TRACE and Revit technologies can empower firms to stand out while others struggle with rising costs, a shrinking labor pool and accelerated project timelines.

Better together.

Trane® and Autodesk®

The capabilities of the new TRACE® engine make load design and energy modeling through Revit® more powerful than ever. Joining Autodesk's broad BIM expertise with Trane's robust HVAC system design and energy analysis, and improved load and psychrometric design capabilities, enables a fundamental shift in the way architects and engineers can use design technologies to achieve more sustainable buildings.





Autodesk

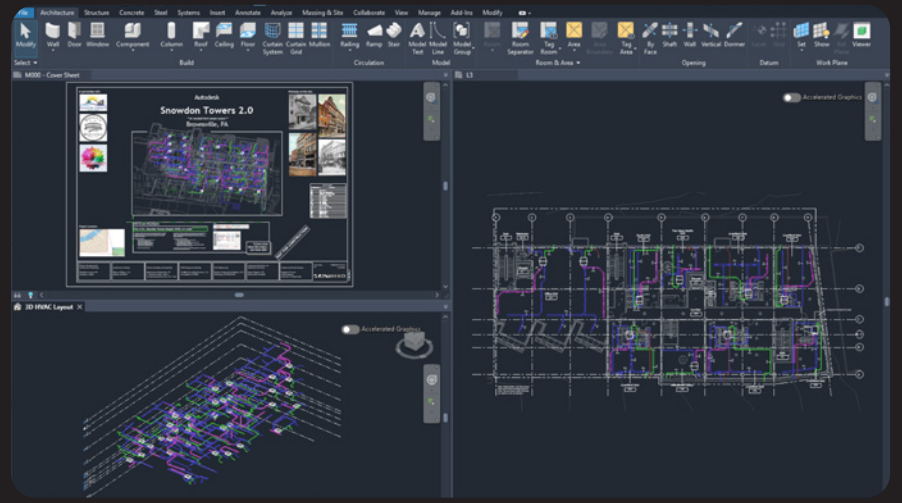
Autodesk is a leader in 3D design, engineering and entertainment software. The company empowers innovators everywhere to solve important challenges through technology. Autodesk technology spans architecture, engineering and construction; product design and manufacturing; and media and entertainment.

Autodesk Revit® for Building Design, Analysis and Visualization

Autodesk Revit is a building information modeling (BIM) solution, a digital tool for creating and managing 3D building models. Revit is a very broad solution that includes multidisciplinary tools spanning architecture, structure and MEP design in one software environment.

Key features include:

- Parametric 3D modeling capabilities for design, detailing and visualization.
- The ability to design complex MEP systems, including undertaking system analysis.
- Plans, sections and schedules are easily developed from the model and dynamically updated, ensuring designs are always current.
- Easily identify conflicts early in design to reduce rework (clash detection) and avoid issues later in construction, potentially reducing RFI on projects.
- Quickly and easily convert design-intent models into detailed fabrication models for pre-construction planning.



Building Information Modeling (BIM): A Collaborative Process

BIM is more than a 3D modeling and 2D documentation tool. It is a collaborative, 3D digital process for designing, creating and managing building data throughout a project's lifecycle. BIM enables multiple professional disciplines to view and share information in the same format at the time. Its analytical tools simulate building conditions so engineers and architects can analyze behaviors and help improve energy efficiency early in the project. Value engineering support helps contractors choose cost-effective construction methods before preparing detailed documents.

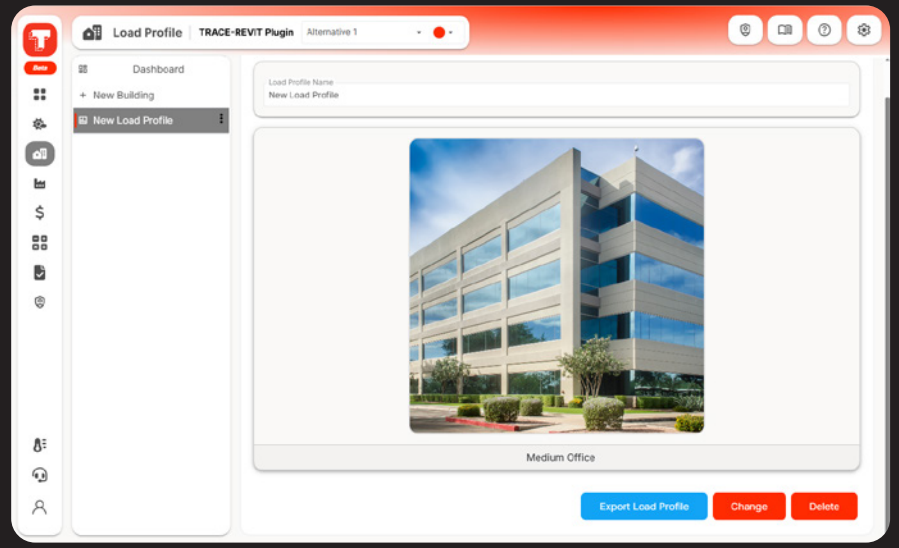
Trane

Contributes to comfortable, energy-efficient indoor environments as part of Trane Technologies, a world leader in sustainable environments that put the planet first.

TRACE® HVAC Design Software

Trane's TRACE HVAC design software helps MEP engineers calculate building thermal load, find opportunities to improve energy efficiency, align to industry standards and make informed decisions about equipment and design options. It applies Trane's extensive expertise to help engineers analyze their options through a cloud-based, intuitive interface that streamlines navigation and model building. TRACE software is not limited to Trane-branded equipment. It allows engineers to model, compare and analyze a wide range of HVAC system types and equipment from multiple manufacturers. Trane adheres to confidentiality policies, and we do not use our customer's data for the purpose of training AI models.

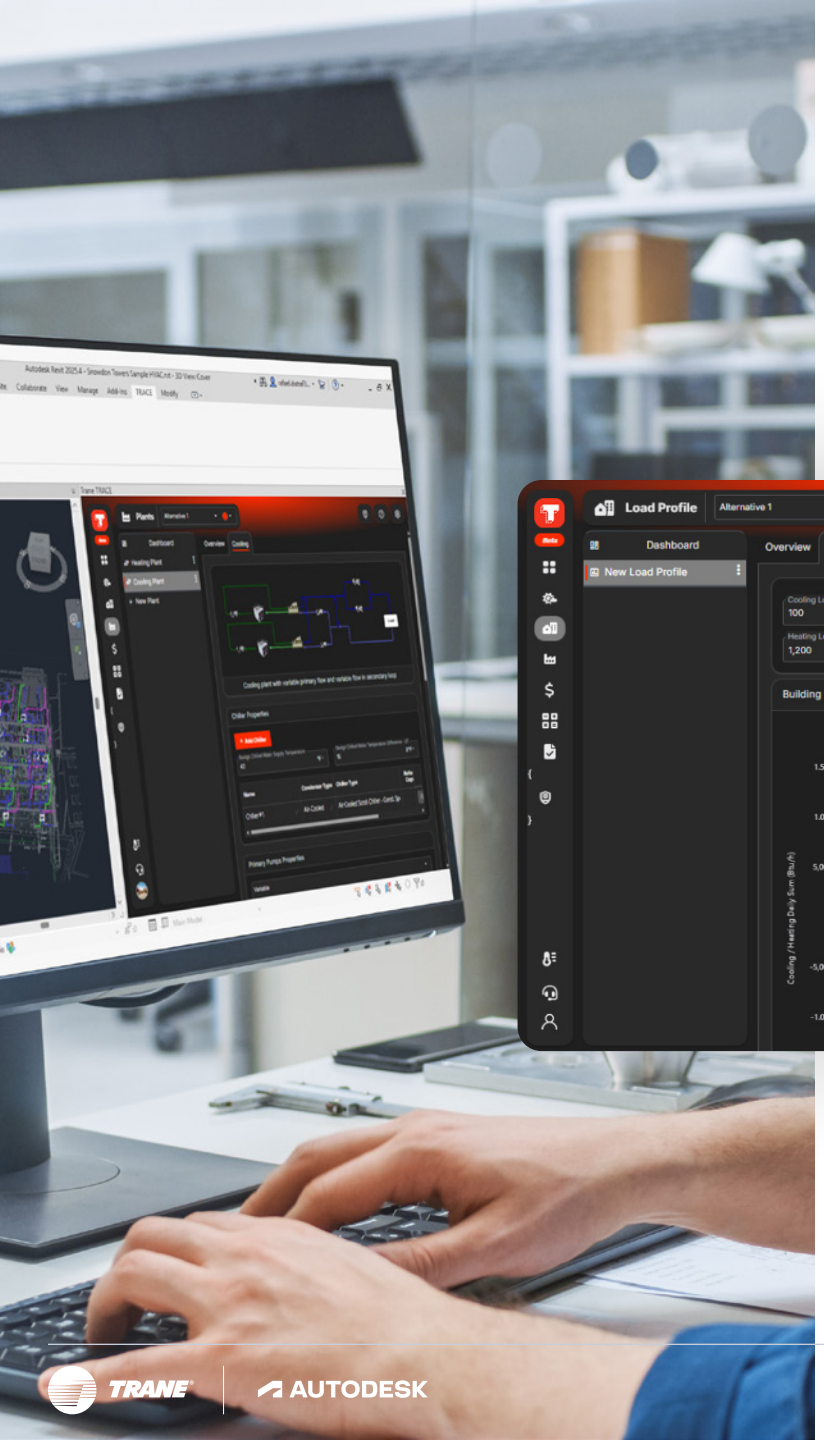
- Thermal load calculations
- Energy modeling
- Design guidance
- Analysis of various HVAC systems and equipment choices

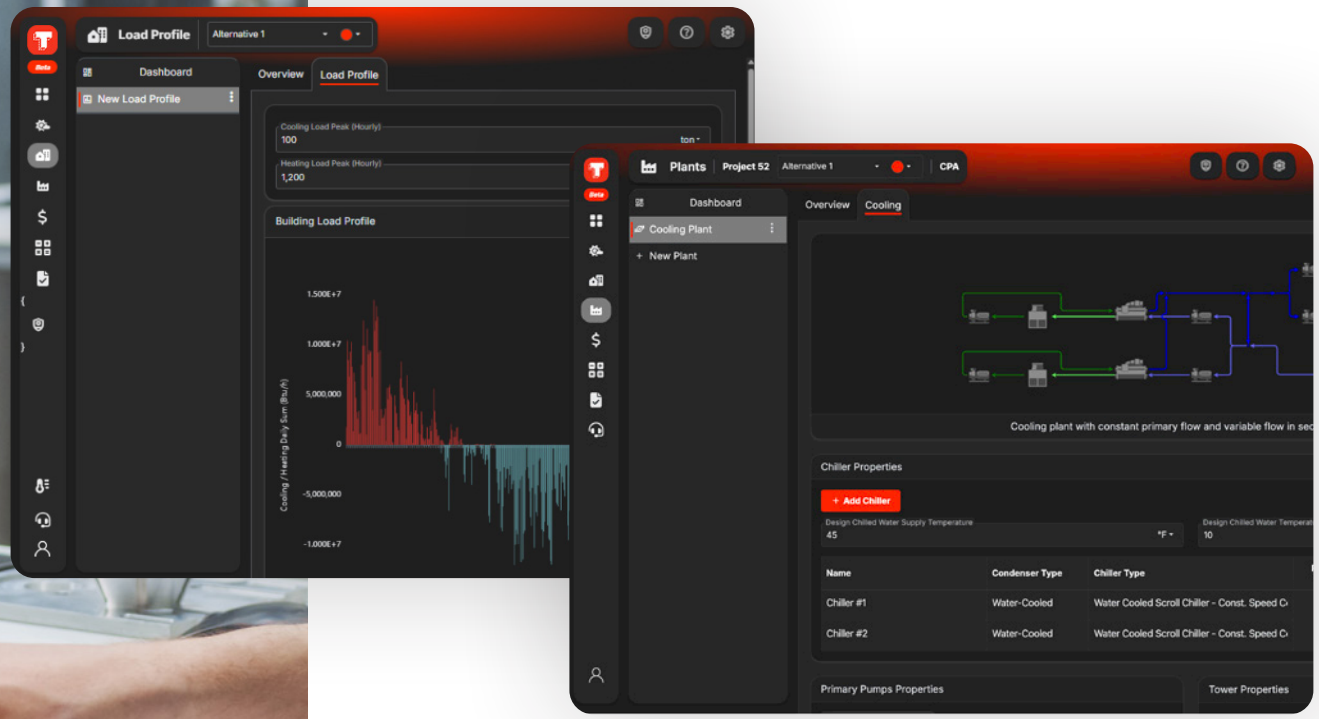


HVAC systems have been evolving rapidly. TRACE gives engineers a way to experiment and test new and unfamiliar equipment types, from any brand, without commitment — and build a stronger bench of sustainable solutions.

Improved workflow efficiency.

The combined solution can help architects and engineers deliver more sustainable, low-carbon building designs through more robust systems analysis within BIM. With the TRACE® plug-in, Revit® becomes a single, more comprehensive tool for building design, system modeling and documentation.





TRACE integration:

- Slashes design time by eliminating work repetition — no more constructing building geometries in both Revit and TRACE
- Elevates project quality by giving architects and engineers a single platform to share knowledge equally and simultaneously
- Allows sustainability concepts to be pre-tested, fine-tuned, data-driven and documented

How Technology is Shaping the Industry Today

Annually, Autodesk conducts a global longitudinal study for leaders who design and make places, objects and experiences. The 2025 edition highlights some of the ways digital technologies are transforming industries, including architecture, engineering, construction and operations (AECO). Here are a few highlights.

As a sustainability enabler

Technology has solidified itself as a sustainability enabler for Design and Make industries, with **39% of leaders saying they use AI to be more sustainable,** more than any other action; this is up from 34% in 2024 and 26% in 2023.*

As a business differentiator

At data-effective organizations — those at which leaders said they are “very effective” at leveraging data — **45% of leaders are using AI to enable sustainability** compared to 38% of other organizations.* These numbers could highlight an AI implementation gap that could ultimately lead to competitive advantages for data-centric organizations.

As a means to greater resiliency

Some **84% of the most data-effective organizations feel prepared to handle unforeseen changes,** compared to 47% of less digitally mature organizations.*

As a talent acquisition and retention advantage

Within Design and Make industries 61% of organizations say they have difficulty finding skilled talent. Meanwhile, **27% of digitally mature companies report improved talent acquisition and retention** as a benefit of digital transformation, compared to only 18% of less digitally mature companies.*

* Source: 2025 State of Design & Make, Autodesk, 2025

Learn more



TRACE® Analysis Tools

Where Architectural Design Meets Engineering Insights

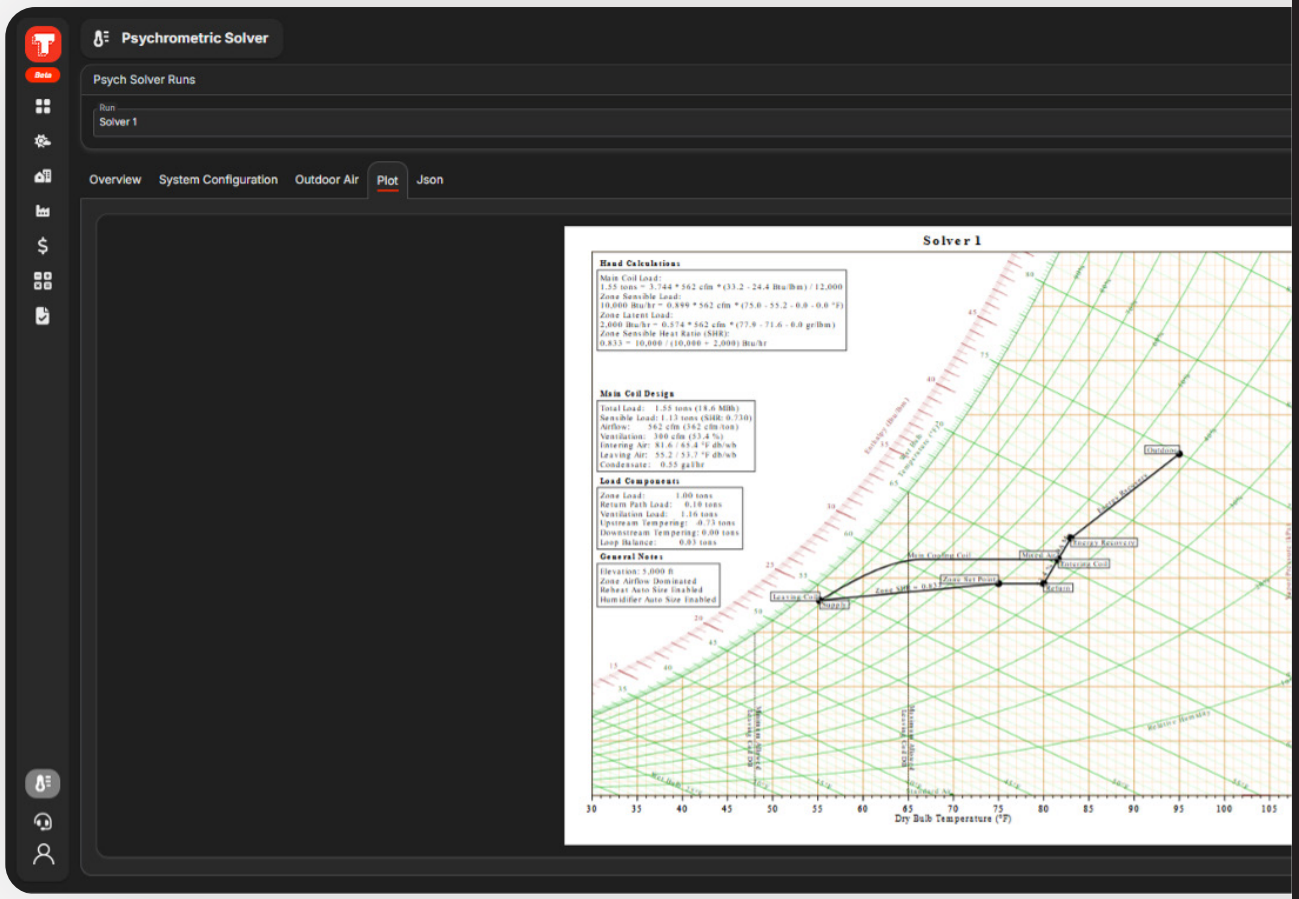
Using TRACE within Revit® makes it easier to strengthen the correlations between architectural features and mechanical system design. Architects and engineers can use data from various TRACE features to make strategic decisions, collaboratively and earlier in the design process, to help them ensure their designs satisfy owner objectives for sustainability, comfort and cost. Front-end analysis in TRACE saves time-consuming rework in Revit later.

Psychrometric Solver

Psychrometrics is the study of air properties and their impact on comfort and efficiency. The art of finding the right solution is referred to as “closing the psychrometric loop.” Trane’s PsychSolver™ in TRACE® uses an advanced analytical engine to specifically recommend how to close the psychrometric loop under a wide range of scenarios and conditions, including:

- Positive and negative zone sensible loads (cooling and heating)
- Positive and negative zone latent loads (dehumidification and humidification)
- Ventilation constraints
- Minimum airflow constraints
- Airside energy recovery
- And more

By simplifying psychrometric analysis, engineers and architects can anticipate cooling, heating and humidity requirements without waiting for late-stage mechanical design input. The result is fewer late-stage redesigns, less rework in Revit, closer coordination between engineers and architects, and buildings that perform as intended.



Custom Load Profiles

While TRACE® includes pre-calculated heating and cooling loads from DOE prototype building models, the Custom Load Profile tool allows users to override them with their own expected or known hourly load data. The result is improved model or retrofit analysis and more customized plant energy consumption calculations.

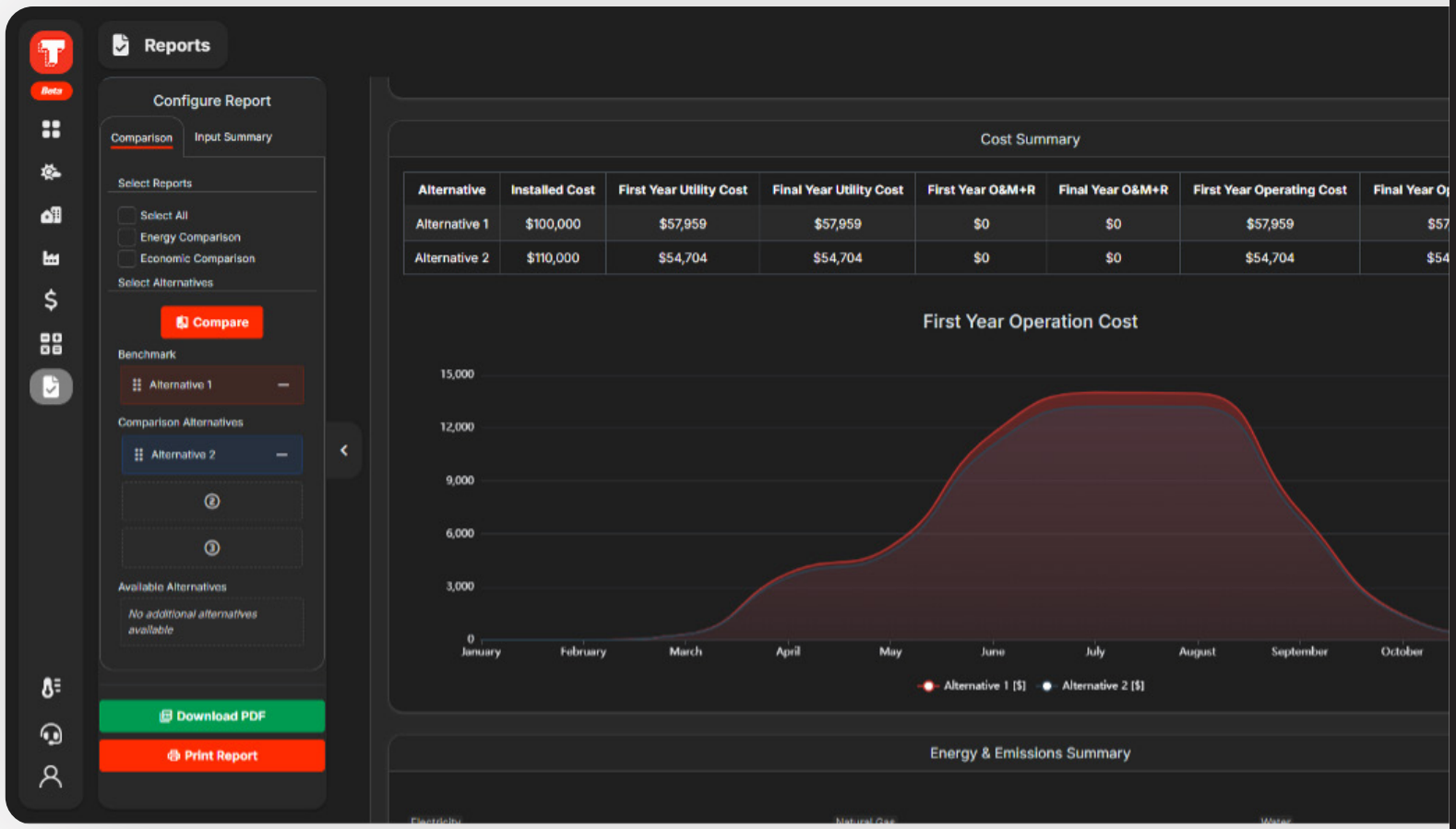
Users can export their building data into a load profile consumed by TRACE for further energy modeling. By integrating accurate thermal load calculations within building models, TRACE supports more sustainable design practices by helping architects and engineers find opportunities to reduce the building's energy consumption.



Create Alternatives and View Reports

This TRACE® feature allows engineers and architects to assess the energy and cost impacts of building design choices, beginning with central plant comparisons. As more features are included in TRACE, users will be able to evaluate HVAC system types, building envelope options and more — factoring in considerations like local utility rates and weather.

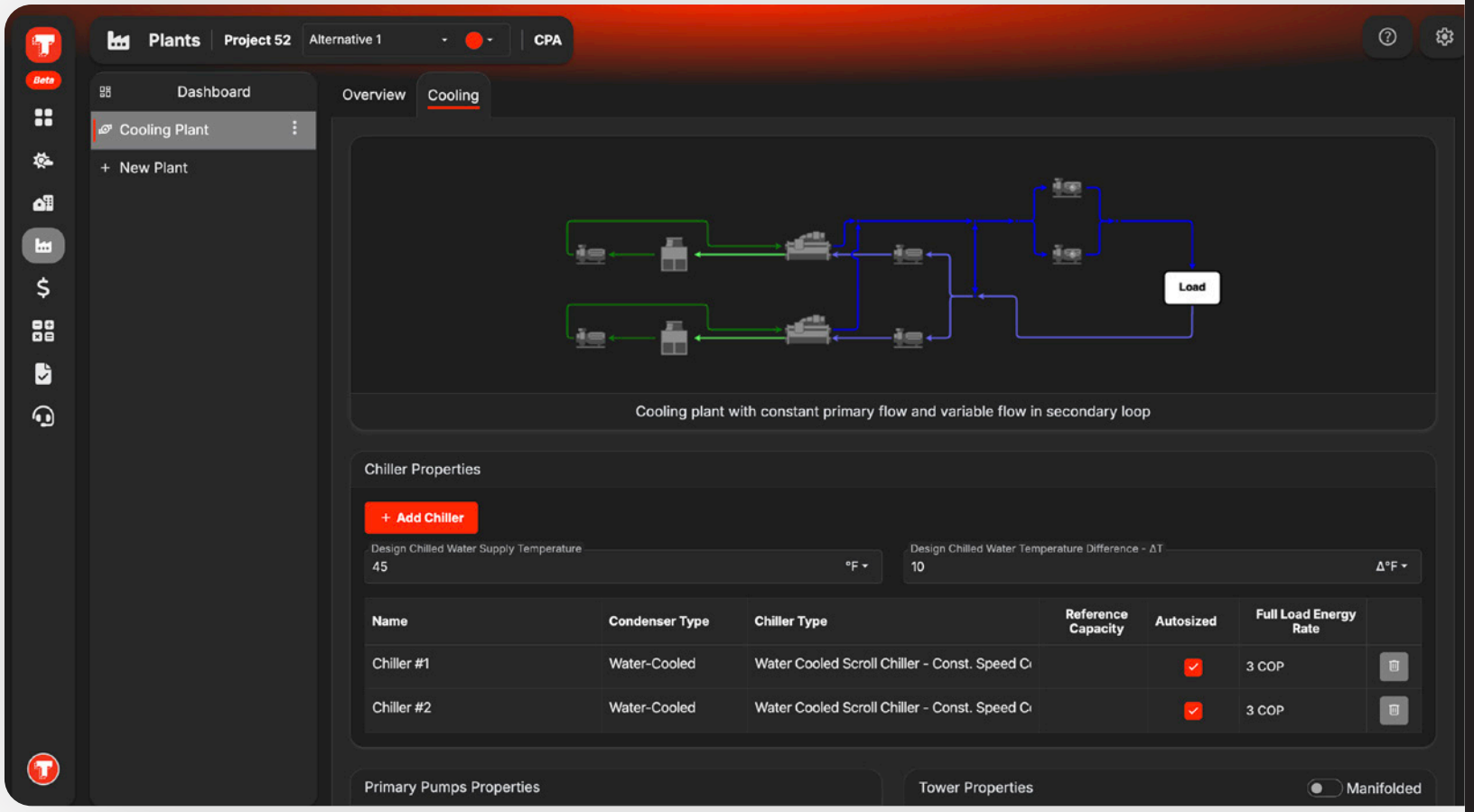
The information gives architects working in Revit performance comparisons that help shape the biggest energy drivers early in the design process, including building massing and orientation, window-to-wall ratio and glazing type, shading devices and daylight vs. energy tradeoffs — before HVAC systems are finalized.



Create Plants

Simulate and compare central plant heating and cooling options in TRACE®. Compare air-cooled chillers vs. water-cooled chillers; single large chiller vs. multiple smaller chillers; gas boiler vs. electric heating; boilers vs. heat pumps; electrification and hybrid strategies; and more.

When used collaboratively, architects and engineers can work together to determine how well various options align to owner objectives. For example, is an all-electric building viable in this case? Does a water-cooled plant justify the space and water use? Data from TRACE can guide the building's decarbonization narrative and help manage owner expectations concerning sustainability vs. cost.



Better outcomes for buildings — and businesses.

The TRACE® plug-in for Revit® can support engineers and architects in their quest for better buildings and stronger firms.

Elevate Design Excellence

TRACE interfacing directly with Autodesk Revit software enables enhanced analysis and valuable data-driven insights. Comprehensive reports and outputs facilitate informed decision making. By grouping data in meaningful contexts, TRACE will provide users with the tools they need to innovate and refine their designs.

Work Faster With Embedded AI Tools

Outpace your competition and get to bid faster. Revit's built-in chatbot saves hours of time by providing AI-driven access to vital set-up information, data and documentation — right within the software. Access climate data, TRACE help documentation and more, without leaving the project file.

Analyze Earlier and More Thoroughly

Integrated functionality allows architects and engineers to review options for achieving local and industry regulatory compliance and owner-defined objectives for carbon and energy earlier in the project. Once preliminary drawings are available in Revit, engineers can leverage the same files for energy analysis in TRACE — eliminating file replication in TRACE that burns time and limits experimentation.

Keep Moving Forward With Limited Information

TRACE allows you to focus on each project stage as it emerges. For example, TRACE Central Plant Analyzer enables energy modeling for central plants with a simplified load profile description. TRACE System Analyzer allows you to skip detailed room-by-room properties definitions to simplify energy modeling for both airside and waterside HVAC modeling. Simplified load design allows early-stage load calculations even before the building geometry is fully defined. Detailed load design then captures all relevant information from Revit to enable thermal building load calculation with much greater detail.

Start Collaboration Sooner

Architecture and engineering can be completed virtually in sync. Early collaboration helps to ensure architectural design features work from an engineering standpoint, too — in time to make adjustments before they cause costly delays and rework.

Stretch Billable Hours

Labor shortages and shrinking budgets require firms to assign more responsibilities to people already on the payroll. Design technicians building BIM models in Revit with TRACE energy analysis can take a bigger role in the project by responding to changes that are made by both engineers and architects.

Avoid Errors and Omissions

Automated data updates and open sharing prevent costly errors caused by incomplete communication between professional disciplines. For example, when architects forget to tell engineers about design changes, or when design technicians don't have accurate equipment dimensions and space requirements.

TRACE® Project Stages

TRACE allows you to focus on each project stage as it emerges.

Central Plant Analyzer

Uses streamlined load profiles	→	Delivers fast, early central plant energy modeling

System Analyzer

Skip room-by-room details	→	Speeds up airside and waterside system evaluations

Space Loads

Runs load calculations before building geometry is finalized	→	Helps teams make early sizing decisions and maintain project momentum

Load Design

Pulls complete building information directly from Revit	→	Produces high-detail thermal load calculations for final design







Visit Trane or Autodesk for more information.

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