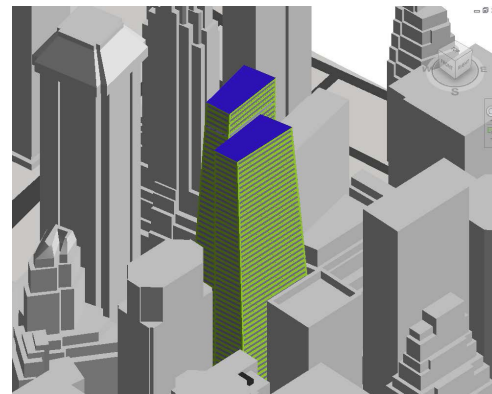# Scaling energy assessments with REM for existing buildings

Asset managers can now quickly screen a building portfolio to identify the best candidates for retrofits, remotely

Fast and easy to perform, REM informs decisions on the highest value steps to take when tackling an energy efficiency upgrade for a single or group of buildings.

Highlights

Performs virtual building energy and carbon assessments
Calculates EUI[1] range with minimal building data input
Identifies energy conservation measures (ECMs)
Usable by non-experts and design consultants alike

Benefits

Quickly determine retrofit priorities, without site visits
Predict electricity use to within 20% of actual
Discover which strategies to investigate for best return
Complete capture-to-report in less than an hour

A tall order:
Retrofit the built environment

Energy efficiency retrofits are the only measure that building owners can take to simultaneously lower operating costs, raise asset values, and achieve critical energy reduction goals. Recognizing this, every major government around the world has set disclosure or retrofit mandates for public buildings, and commercial building owners in many markets are now required to report their annual energy use publicly.

Although the benefits seem clear, deciding where and how to invest resources for upgrades is a complex challenge that can leave owners exposed to considerable financial risks. A building's energy use depends on a number of interrelated factors including its location (local weather), orientation, building geometry and construction, internal systems, and operational uses. Traditional methods of energy assessments are expensive,

labor-intensive and require high technical expertise. In short, these methods are not scalable. To avoid that cost and time, owners often do nothing or resort to a quick statistical benchmarking that is not grounded in building science and doesn't account for the building's shape and construction. This often leads to faulty conclusions and courses of action that do not necessarily offer a good return on investment.

Introducing Rapid Energy Modeling – a big win for the environment, and the bottom line

Rapid Energy Modeling (REM) from Autodesk is a streamlined method for energy analysis that provides quick, useful results using building data that can be collected remotely and a simplified simulation process that a non-expert can perform.
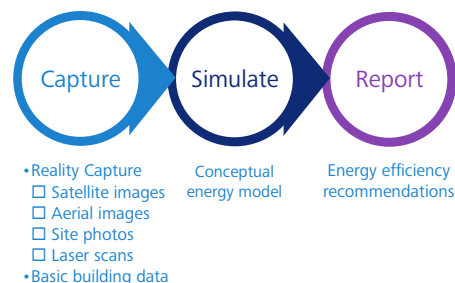
REM is not meant to replace investment-grade audits but rather to make better use of audit dollars by identifying and directing efforts toward those buildings with the highest potential for energy savings. Using only photographs or satellite

Get in touch.

Contact your Autodesk Sustainability Solutions team today.

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imagery and Autodesk software's built-in energy simulator and climatic data, within a couple hours one can see the energy and carbon footprint of the building, peak loads, and potential for energy conservation measures. The results point to the highest-

- •Reality Capture
  - ☐ Satellite images
  - ☐ Aerial images
  - ☐ Site photos
  - ☐ Laser scans
- •Basic building data

Conceptual energy model

Energy efficiency recommendations

A basic REM analysis can be accomplished in Autodesk Vasari, a free, easy-to-use tool. The same model can also be brought into Autodesk Revit and Green Building Studio for a more detailed analysis.

AUTODESK

REM produces useful results quickly and affordably, even without a detailed building model or information traditionally gathered during an on-site audit.
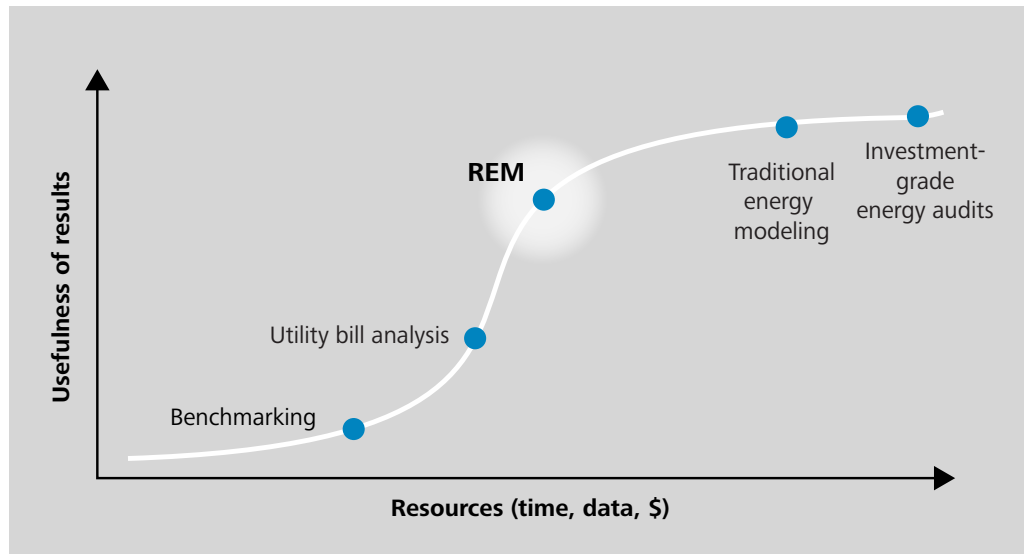
Rapid Energy Modeling delivers results on:

- Energy use intensity (EUI[1])
- Life cycle energy use and cost
- Energy-saving strategies
- Renewable energy potential – PV and wind
- Annual carbon emissions
- Annual energy use and cost
- Fuel energy use – HVAC and hot water breakdown
- Electric energy use – HVAC, lighting & equipment breakdown
- Heating and cooling load by month
- Fuel and electricity consumption by month
- Peak demand by month
- Wind speed and frequency by year and by month

value, highest-impact measures to take for the building in question. Conversely, and perhaps just as importantly, these methods also help identify which measures may not be worthy of investment because of the building's unique physical and/or operational characteristics.

A case in point: U.S. DoD

The U.S. Department of Defense engaged Autodesk Consulting to estimate energy usage and identify potential energy savings for multiple DoD building types using REM. Creating energy reports with REM was found to take 90% less time than an average ASHRAE level 2 audit. The ease of the process allows owners and asset managers to create the models and reports, thereby saving the time and cost to outsource the work.

Ready. Set. Go. Getting up to speed

If needed, Autodesk Consulting can engage with the customer to define the optimal workflow based on the type of data available to capture existing building conditions and the level of detail required as output from the model and analysis. Also, REM is just part of a larger Autodesk
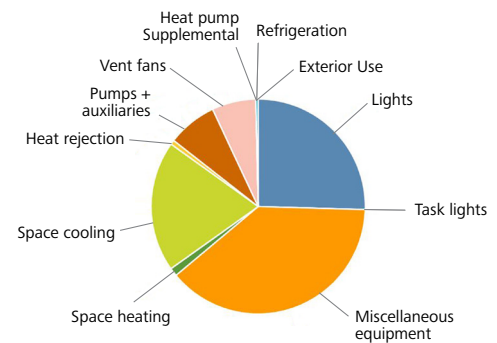
An energy use breakdown as visualized using REM tools.

Sustainability Solutions portfolio which includes BIM-based workflows such as High Performance Building Design, Green Building Product Selection, and Data Center Energy Efficiency.

For more information about Autodesk Sustainability Solutions, contact: sustainability.solutions@autodesk.com

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