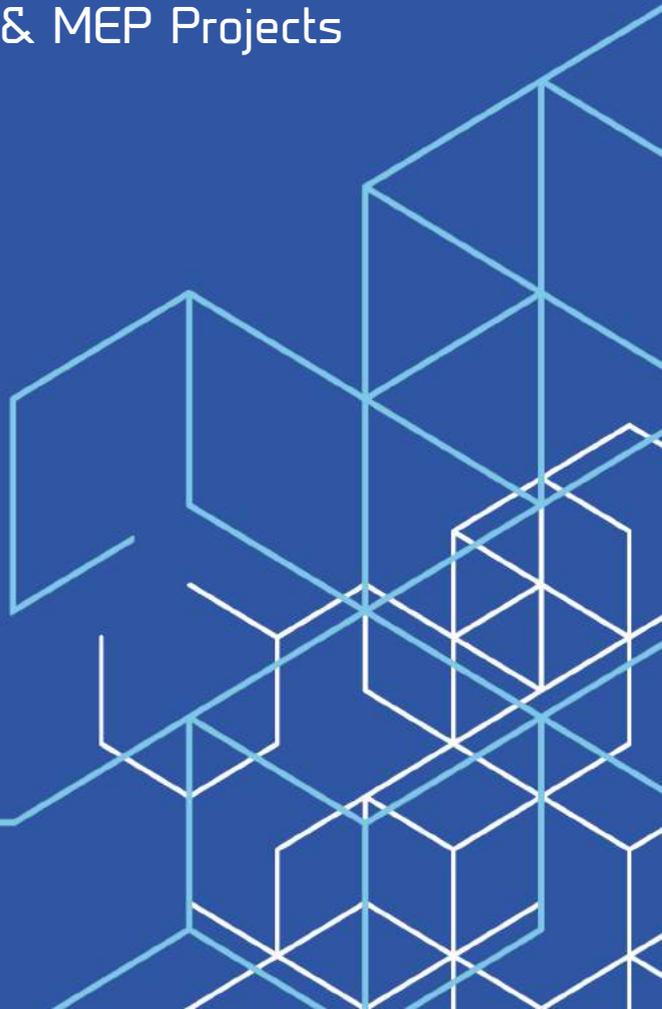


3D Energy Modeling Capability Statement for Architectural & MEP Projects



“AEC has successfully developed the programming linking the newest software and technologies together to develop and create the most accurate 3D Energy Modeling and Architectural Modeling Designs”

AEC has been established since 2006 in Dubai, UAE and we offer a wide range of services for our esteemed clients’ that includes Transportation Planning, Highways and Bridges Design, Utilities and Networks Design, Contracts and Cost Consultancy, Construction and Program Management, Architectural Modeling and MEP 3D Energy Modeling, aiming to cater for all our client’s needs to be provided in one integrated offer.

“Approved Authority Consultant”

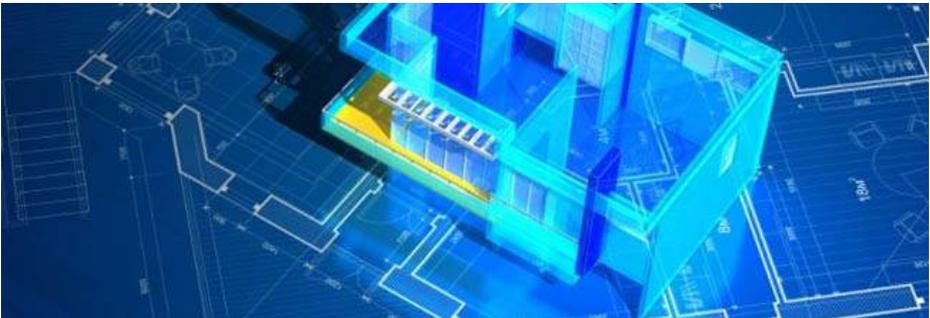
AEC are approved by all Government Authorities and over the many years have become well accustomed and experienced with the process and requirements to obtain the necessary NOC approvals for our clients.

“A one-stop shop for your 3D Energy Building Design projects”

Our team are experienced in the Architectural and MEP fields, and in the development of 3D Energy modelling that will provide valuable information in regards to your projects. 3D energy modeling helps understand the Architectural and MEP elements better. It also helps with sustainability, energy efficiency, and reduce costs in selecting the right materials as part of your construction process.

“We Can Deliver”

AEC has a proven track record in working closely with our clients and Authorities in order to achieve an optimized and accelerated delivery schedule to fulfil all our clients’ goals.



What is 3D Energy Modeling?

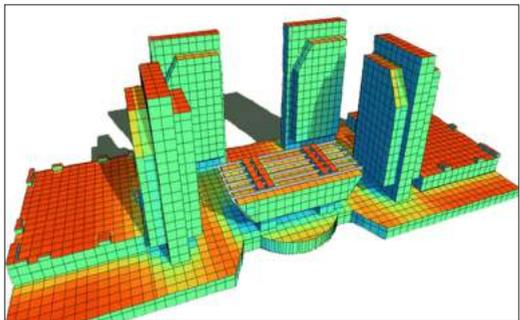
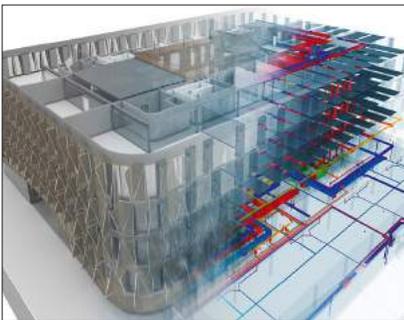
Sustainability and Energy Saving is an increasingly important aspect of building design.

Building Information Modeling (BIM) helps us see in third dimension our creations and engineering before it becomes a reality by using computers to create a virtual replica of a building or a structure. Along with the advances in BIM, now we can create Energy-models and simulations to help us understand more about energy efficiency and sustainability.

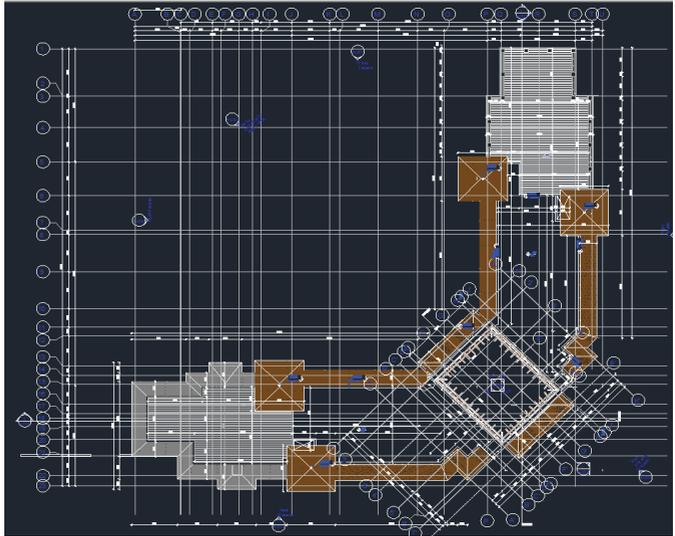
Energy modelling is a virtual, computerized simulation of a building or structure that focuses on energy consumption and life cycle costs of various energy related items such as HVAC, lights, and hot water. Energy models simulate the consumption process of energy by all users in a building.

3D Energy-modeling that is adopted for your project will provide the following:

- Predict the monthly energy consumption and bills.
- Predict the U-value and R-value.
- Energy efficiency of the materials used.
- Predict the annual energy cost.
- Annual CO2 emissions.
- Compare and contrast different efficiency options.
- Determine life cycle payback on various options.
- Analyze different technological ways to save energy and other energy solutions.
- Determine the Energy needed to operate a building thus can predict entire cities.
- Predict points of loses and where the energy is being consumed.
- Provide an energy chart and ratings.
- Help create conclusions for how energy can be saved.
- Help us optimize the design and materials used in a building or a structure to save energy.



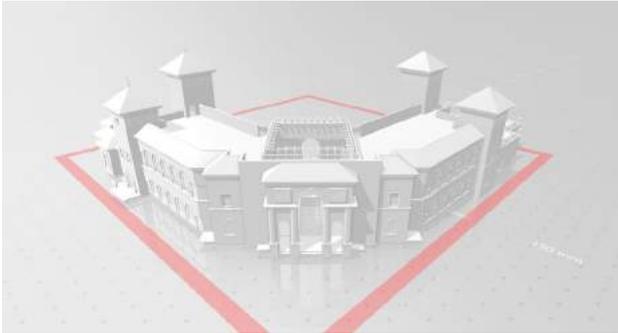
SPORTS CITY LEISURE CLUB 3D ENERGY MODELING PROGRESS



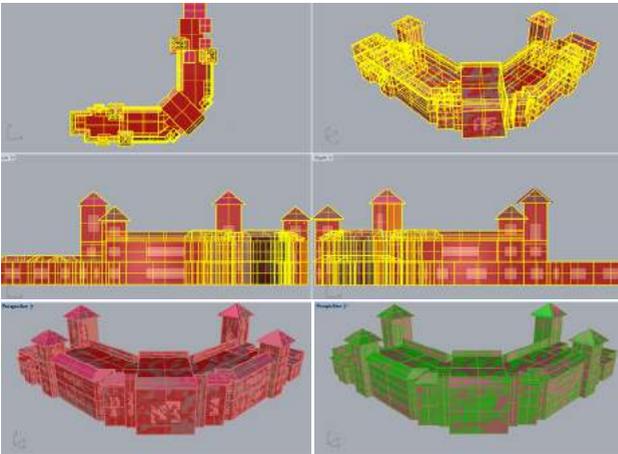
STEP 1. 2D ARCHITECTURAL AND MEP DESIGN ANALYSIS AND IMPLEMENTATION.



STEP 2. CREATING THE 3D ARCHITECTURAL BIM AND INSERTING THE MEP DESIGNS INTO THE 3D MODEL.



STEP 3. CONVERTING THE 3D BIM TO A 3D PRINTING MODELS TO ANALYZE AND DETERMINE THE ENERGY ZONES, AND ENERGY LOSES LOCATIONS.



ENERGY CONSUMPTION BEFORE AEC ANALYSIS BASED ON TYPICAL DESIGN

ENERGY CONSUMPTION AFTER AEC ANALYSIS BASED ON OPTIMIZED DESIGN PARAMETERS.

STEP 4. CREATING THE 3D MODELING AND SIMULATIONS THROUGH THE COMBINATION OF MANY SOFTWARES AND PROGRAMMING TOOLS THAT AEC HAS DEVELOPED.

LEISURE CLUB 3D ENERGY MODELING ANALYSIS RESULTS		
ITEM	RANGE	
ENERGY SAVINGS / BUILDING AND CONSTRUCTION MATERIALS	9%	12%
ENERGY CONSUMPTION SAVINGS / MEP EQUIPMENT	8%	11%
ENERGY SAVINGS / VALUE ENGINEERING	6%	9%
ENERGY SAVINGS TOTAL	23%	32%
ENERGY SAVINGS UTILIZING INNOVATIONS & SOLAR POWER		
ITEM	RANGE	
ENERGY SAVINGS / NEW INNOVATIONS & SOLAR INSTALLATIONS	16%	19%
ENERGY SAVINGS TOTAL	39%	51%

1

2D ARCHITECTURAL AND MEP DESIGN ANALYSIS AND IMPLEMENTATION.

2

CREATING THE 3D ARCHITECTURAL BIM AND INSERTING THE MEP DESIGN INTO 3D MODEL.

3

CONVERTING THE 3D BIM TO A 3D PRINTING MODELS TO ANALYZE AND DETERMINE THE ENERGY ZONES, AND ENERGY LOSES LOCATIONS.

4

CREATING THE 3D MODELING AND SIMULATIONS THROUGH THE COMBINATION OF MANY SOFTWARES AND PROGRAMMING TOOLS THAT AEC HAS DEVELOPED.

The Process of Creating a 3D Energy Model

1. 2D Architectural and MEP design analysis and implementation.
2. After obtaining the architectural BIM Model or creating it. MEP elements are installed in the 3D Modeling software.
3. The BIM file is later converted to a 3D printable version and a smaller scale structure to analyze and determine the energy zones and energy losses locations.
4. Various softwares are used to analyze the MEP services, building dimensions, materials, and all the available technologies and innovations to save energy and optimize the design.
5. After obtaining the results, all the simulations are compiled for value engineering and an environmental analysis is conducted to determine the rating or the efficiency of the building or structure.
6. The improvements are suggested in the final step and value engineering is provided for the design or the replacement of the equipment and the materials used, for a better sustainable and energy efficient project.

Who benefits from 3D Energy Modeling?

What are the benefits of undertaking a 3D Modelling assessment for any project? There are numerous benefits for all those involved from planning to building to the end-user.

Governments

Help boost the economy and save resources.

Engineers

No more giant spreadsheets, calculations, and can quantify and elucidate how they can save energy, predict the future, and help create theorems from the theories of design.

Manufacturers

Quantitatively prove that your product saves money in a given amount of time.

Building Owners

Get the most out of the money spent.

Building Tenants

Lower monthly bills and more appealing for those who wish to buy or rent.

The Environment

One can determine the options that use the least amount of energy, have the least emissions, help save energy, understand the ways we can be more sustainable, and to create a more efficient system. more GREEN future.

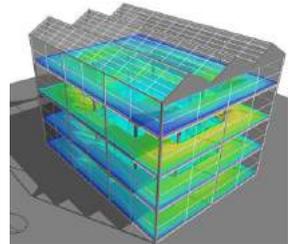
How AEC can deliver your project needs?

AEC is a multi-discipline organization that has a team of engineers that can deliver a **3D Modelling project** to our clients.

Energy modeling is critical to your building design. By relying on an energy modeler early in the process, your whole project can be more **energy efficient** and **save you money**. Cascading effects from the number of windows to the orientation of the building all bring valuable insight to your total building efficiency.

Working with our design team early in the project can help a project team explore an array of design parameters and alternatives that might not otherwise be considered, including passive design elements such as:

- Building orientation,
- Size of facility,
- Function of the design,
- Geometry/shape,
- Building envelope materiality,
- Window-to-wall ratio,
- Shading and daylighting, among other elements,
- Materials used for the interiors and exteriors,
- MEP equipment used,
- Energy saving innovations.



Incorporating these features, as well as heating, ventilating and air conditioning (HVAC) strategies, into an early-stage design energy model can optimize whole-building performance and aid in meeting project energy goals. This approach can also reduce redesign time and costs that could otherwise arise when incorporating energy modeling later in the project.

What are the benefits in Preliminary Design energy modeling for a project team?

- Energy efficiency and certification goals are achieved more easily, due to more-informed design decisions.
- Risks, delays and setbacks are mitigated through the elimination of redesign later in the project.
- Different components and systems can be compared in order to choose those that will optimize energy efficiency and meet performance targets.
- Energy modeling in the pre-design phase can allow a project to achieve significant savings for the project compared to a baseline building.



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