

Net Zero Energy Building and Its Analysis Using Primavera Software

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Abstract: This thesis is based on analysis of Net zero energy building taking case study of a residential building (G+1). In this thesis an effort is made to explain in detail and to analyze the Net zero energy building. Major elements used are solar panels and wind turbines for the production of electricity for the building. The planning is done as per requirements and the various activities involved in the construction of this structure are considered. The study is carried out using Primavera P6 software which is a project management program.

Keywords: Net zero energy building, Primavera P6 software, Project Management, solar panels, wind turbines

I. Introduction

A zero energy buildings, also called as zero net energy buildings, net zero energy buildings (NZEB) or net zero buildings is a building with zero net energy consumption, which means gross sum of utilized energy by the expanding on a yearly premise is roughly equal to the measure of renewable energy generated on that place itself or nearby place. Energy is typically created on that place itself by energy creating advancements such as wind turbines and sunlight based solar, while lessening the general utilization of energy with profoundly effective lighting and HVAC innovations. The goals of ZEB are becoming more practical now a days as the one main reason for this is the cost of alternate energy is increasing.

In present days for the successful administration and management of construction projects a systematic method is needed to be adopted, with the guide of procedure to control the activities inside the time span at a specific cost.

This system is ordinarily known as the critical path method. Utilizing the critical path method manually is troublesome because of increment of complexities in project. To defeat this trouble a CPM based scheduling software is utilized.

II. History

It is very difficult to say any particular building as the first net zero energy building the one of the main reason could be that this is not a new concept but just has given an another name. From the times before for house warming and lightening people used wood straw, candles and domestic animals for their houses. In the end of seventies and beginning of eighties some articles has established in which the phrases has been used as “zero energy home”, “neutral energy autonomous house” or “energy independent house”. That was the time when the shortage and soon getting over of the petroleum product were detected and the energy utilization begun to be talked about.

III. Scope and Objectives

Planning and scheduling the diverse exercises required in the Project.

- Estimating the aggregate cost required for the project as for schedule, length and number of total critical activities in the project.
- Developing the fluctuation and records identified with the cost and schedule of the project keeping in mind the end goal to track the project.
- Developing the change and lists identified with the cost and calendar of the project so as to gauge the project.

- Measuring the project execution at current stage a, total execution till date and anticipating the future execution in view of EVM investigation.

IV. Main Elements of NZE Building

- Solar Panels
- Wind Turbine
- Rectifier
- Power Inverter
- Batteries

V. Methodology

- Enterprise Project Structure (EPS): EPS is used to perform top down budgeting, manage multiple projects, implement coding standards, and maintain security throughout the enterprise.
- Organizational breakdown structure (OBS) overview: The OBS is a global hierarchy that represents the managers responsible for the projects in your enterprise.
- Calendars: Calendars can create and assign to each resource, each project, and each activity. For each calendars, you can define the following:
 - Available work hours in each calendar day
 - Default hours per time period settings that are used as conversion factors when Entering or displaying units in time increments other than hours
 - National holidays
 - Your organization's holidays
 - Project-specific work/ non workdays
 - Resource vacation days.
- Work Breakdown Structure (WBS): The total project has broken down into number of elements which contains the activities to contribute the total work completion.
- Activities: Activities window is used to add, view, edit, and delete activities for the open projects. You can divide the activities window into top and bottom layout views, and you can customize these layouts and how activities are displayed.
- Resources: Resources window is used to maintain both your organization's resource hierarchy and individual resource information. You can assign resources to activities and roles in any project. If resources security is enabled, you can only view resources you have access to. See Introduction to resource Security.
- Roles: Use the roles dialog box to add, edit, and delete roles. You can also use the roles dialog box to assign roles to resources, define up to five price/unit rates for each roles, and specify roles availability over time.

VI. Results and Discussions

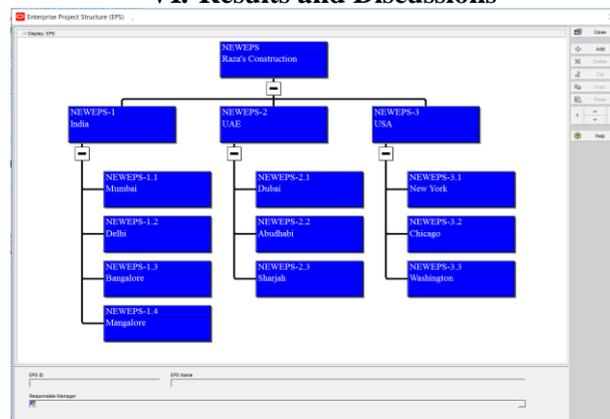


Fig1: Enterprise Project Structure

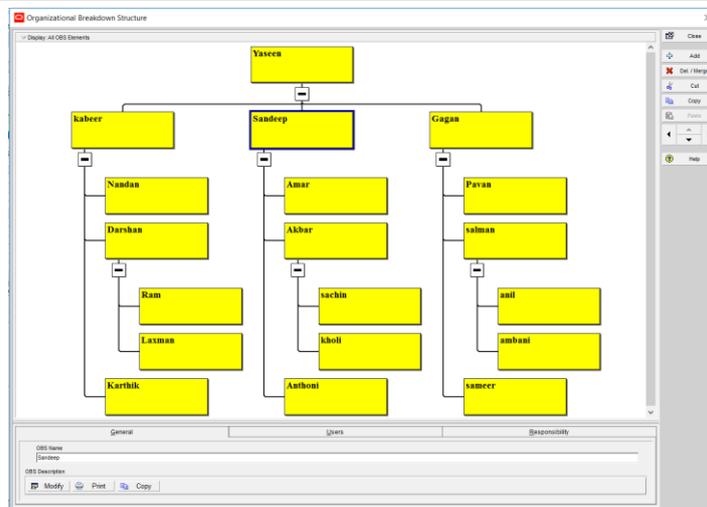


Fig 2: Organizational Breakdown Structure

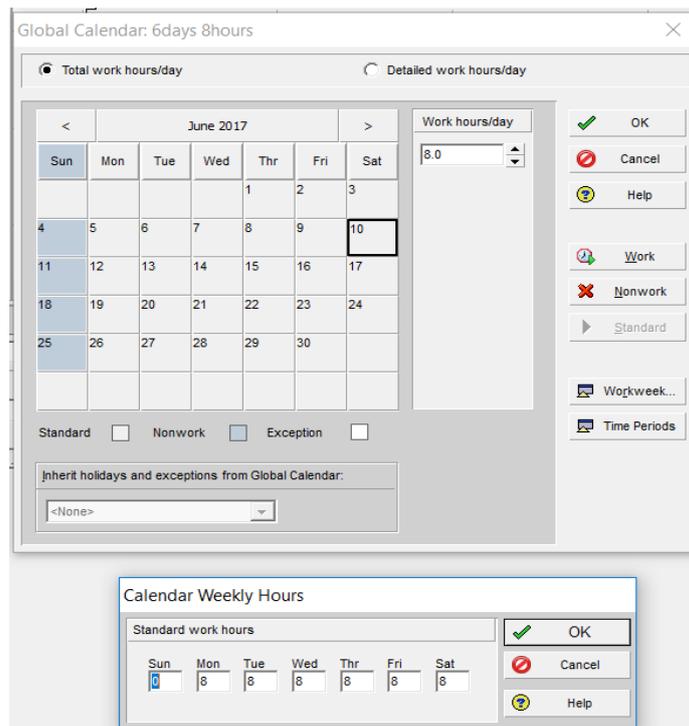


Fig 3: Calendars

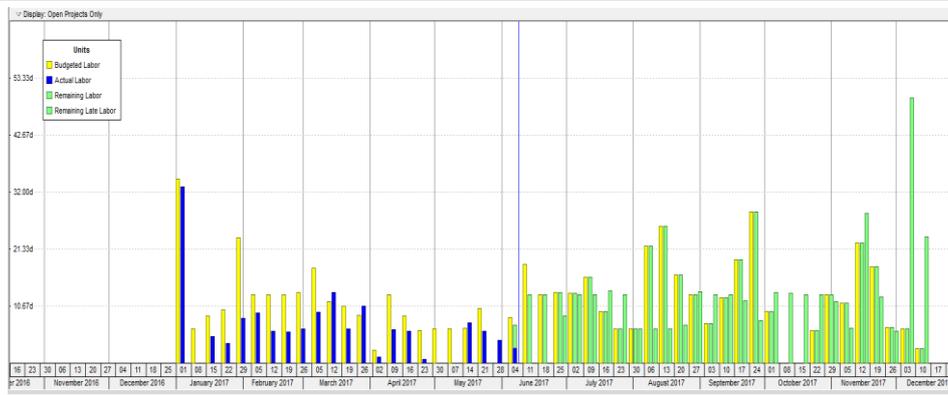


Fig 7: Activity Usage Profile For NZE Building

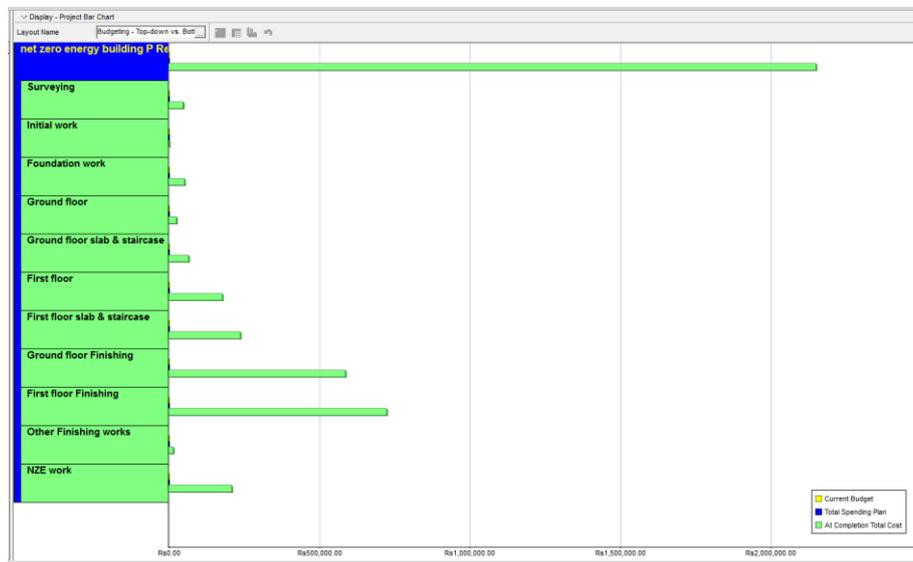


Fig 8: Tracking For Of The Project

VII. Conclusions

The main purpose of the study is to include the detail examination of the elements of net zero energy building. The study concluded as follows:

Net zero energy buildings are the future with the advancement in renewable technology. Many nations have framed zero energy building laws. Some governments are also providing subsidies to individuals and organizations for creating zero energy buildings. But the goal of zero energy building would not be fulfilled till the time all the people do not understand their responsibility and contribute towards reducing energy consumption.

- ZEBs are most practical
- Implemented in the field economically
- Substantial reduction in environmental issues
- Eco- friendly buildings can be achieved
- Solar and wind energy will be the major contributor of renewable energy for ZEB's owing to their wide spread availability.
- No major maintenance is required so almost maintenance free
- It is the point where energy needs of a building has no impact
- Zero energy building is the crossover point between a building that consumes a resource and one that produces the resource.

- Each approach has merits and as well as demerits
- Reduce demand first then supply second
- Planning and scheduling of construction work in primavera will give very ease in handling of the project.

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