

AALBORG ENERGIE TECHNIK DESIGNS BIOMASS PLANTS FASTER WITH BIM



The firm uses BIM to improve the way it designs environmentally-friendly biomass plants.

“Among the things that appeal to us is the possibility to construct, visualize, and simulate our models in Plant 3D. Because of this, serious errors can be avoided to the greatest possible extent when constructing the plants in the real world.”

– Claus Bach Nielson, Engineering Manager, Aalborg Energie Teknik

Introduction

Founded in 1996 and headquartered in Denmark, Aalborg Energie Teknik (AET) supplies and services biomass power generation boilers and plants.

AET’s biomass boilers generate energy using residual products from forestry and agriculture, such as wood chips, sawdust, and bark. AET can even design plants that run on chicken droppings, corn stalks, and olive shells. Compared to conventional types of fuel, production of energy using biomass is CO₂-neutral.

This fact appeals to many utility companies throughout Europe, which is AET’s primary market. For example,

in the United Kingdom, AET has established the best functioning biomass plant in the country, which has made it quite a success. The company uses Autodesk solutions, including Inventor, Plant 3D, and Navisworks Manage software, to help it design its groundbreaking biomass plants. Autodesk solutions are helping the company to:

- Enhance the quality of its designs
- Use a more integrated design process
- Reduce the risk of design errors and interferences
- Model and visualize entire plants before construction

The challenge

AET's engineers have used Autodesk Inventor to design AET's proprietary biomass plant components for some time. Autodesk Inventor helps the company create digital prototypes of its innovative plant components. Until recently, the company used AutoCAD software along with a third-party add-on to design the piping and other components that connect to the biomass boiler.

The third-party software presented three challenges to the company. AET wanted more seamless integration between the third-party application and Inventor. Upgrading the software in conjunction with upgrades to AutoCAD took too long. And the third-party software did not allow the company to get the most out of its computing hardware. These drawbacks inspired AET to move to Plant 3D software.

"We formerly used another plant application as an addition to AutoCAD; however, updating the application to the most recent version of AutoCAD was often a slow affair," says Claus Bach Nielson, an engineering manager with AET. "The application was also unable to run in 64-bit mode. This is why we did not hesitate when deciding to use Autodesk's 3D application for plant design."

The solution

AET chose NTI CADcenter, an Autodesk Gold Partner, to help its engineering team implement Plant 3D. NTI CADcenter supplied support and training during the process.

According to Jørgen Larsen, chief consultant at NTI CADcenter, the fact that Plant 3D software is built on the AutoCAD interface helped accelerate the move to Plant 3D for AET.

"The considerable user-friendliness of Plant 3D allowed AET to create layouts and piping in the biomass plants with only a few training days," says Larsen. "A great advantage is that Plant 3D is based on familiar AutoCAD technology and can provide AutoCAD users with a sensation of being at home in the application."

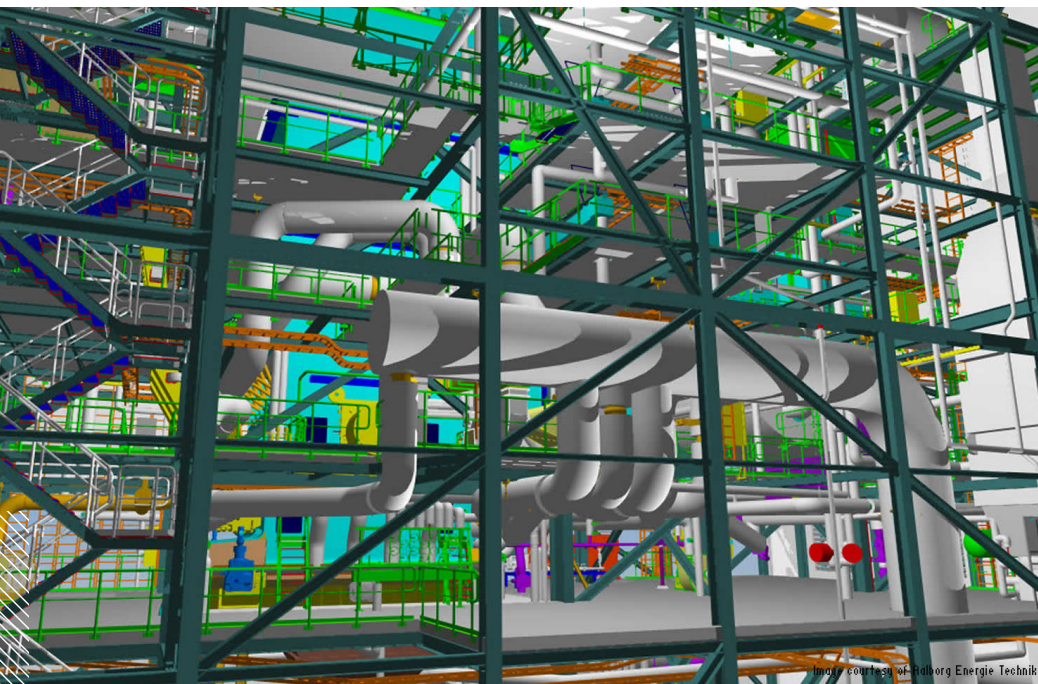
A 3D workflow

The overall responsibility for the actual design of AET's new plants lies with the engineering department. Plant dimensions depend on the size of the boiler and other factors, such as fuel quantity and quality as well as specific heat and steam requirements. As a first

stage in the design process, AET computes the boiler size. The engineering team then works closely with the construction department to design the plant, and proprietary components support the boiler. Often AET's customers will design the plant façade and concrete foundation.

The proprietary boiler components are modeled in Inventor, but AET sources other plant components, such as piping, from secondary suppliers. AET models the layout of these plant components in Plant 3D.

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3D,” says Bach Nielson. “Because of this, serious errors can be avoided to the greatest possible extent when constructing the plants in the real world.”

He adds that having a 3D model makes it easier to design an effective plant: “Due to the complexity of the plants, a considerable number of peepholes, access paths, gauges, valves, motors, and cameras are required in various locations, and these need to be physically accessible. We therefore create so-called gallery plans with Plant 3D, which provide us with a complete overview of the installation before assembling the whole setup. This is a considerable advantage, and it also increases the quality of our product.”

Improving the bottom line

In addition to Plant 3D, AET has added Navisworks Manage software to its workflow. Navisworks helps the company improve the way it collaborates with both its customers and suppliers. The software allows the company to aggregate design files in a variety of formats into a single model. This model makes it easier for AET to identify interferences and coordinate construction.

“In parallel with Plant 3D, we also use Navisworks for ongoing construction reviews,” explains Bach Nielsen. “This system is easy to use and helps us spot any errors during the development, construction, and engineering phases. In addition, it also helps us to see where holes must be drilled in the steel structure in order to mount the components. This helps the installation work happen as quickly and smoothly as possible, which can have a positive effect on our bottom line, so naturally we are always seeking to optimize this.”

The result

As the importance of green energy grows, interest in AET’s biomass plants is increasing.

“The company was founded in 1996, and it did take us three years to sell our first biomass plant,” says Hans Erik Askou, chief executive officer of AET. “However, the pace has been blistering since then, and today we are one of the European leaders in the sector. In 2010 alone, we have hired 20 new employees, and this is generally a sign of significant awareness when it comes to energy-efficient combustion plants capable of lower CO₂ emissions.”

Bach Nielson notes that Plant 3D enables the company to use 3D plant models to help it meet the expectations of AET’s rapidly expanding customer base: “By definition, our plants are mission critical, since thousands of people in one town often depend on our plants to deliver heat and energy. Having a 3D tool at our disposal helps to provide us with a complete overview from start to finish, which is crucial. Otherwise, we cannot work with sufficient precision.”

Learn more about Plant 3D and the other tools in the AEC Collection.

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