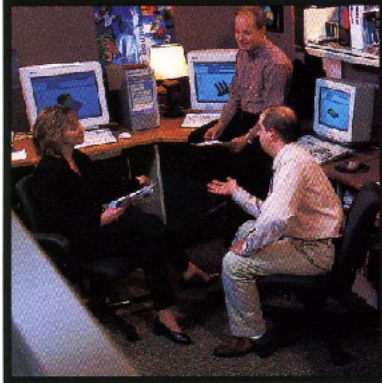


One challenge facing the power generation industry in the twenty-first century is to develop technologies that utilize renewable energy sources. Eastern Generation, a United Kingdom-based power producing company, is committed to generate at least ten percent of its power — using renewable energy sources — by 2010. Eastern covers some of the windiest areas in Europe, so the company recently decided to purchase a one-megawatt, wind-harnessing turbine, installed by Renewable Energy Systems (RES).

The working environment at ANSYS, Inc. is open and flexible. This philosophy is reflected in the open architecture built into ANSYS, Inc. products, which enables key development partnerships.



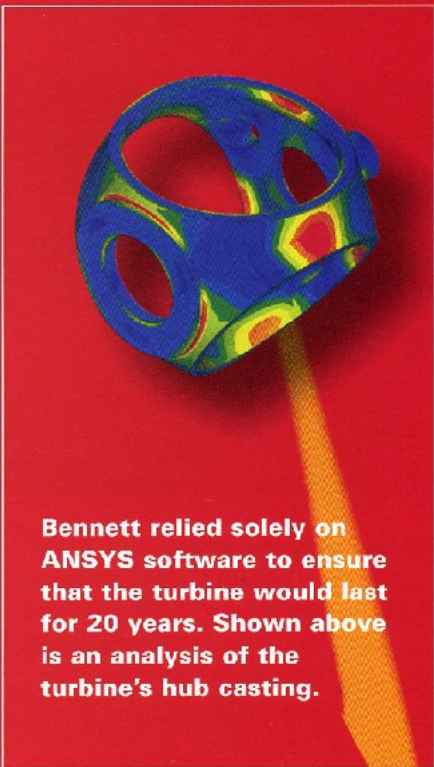
Engineering the turbine presented numerous problems. Not only must a large turbine efficiently convert wind power to electricity, but also it must withstand irregular loads and relentless, potentially destructive vibration. Additionally, it must have a sufficiently lengthy service life to justify the investment. The target minimum life for this turbine is 20 years. Complicating matters, such a large turbine — 52 meters (170 feet) in diameter — could not be prototyped. Engineers had only one opportunity to get it right.

ANSYS, Inc. played a crucial role in the project. Using ANSYS/Multiphysics™ software,

RES's team of consulting engineers from U.K.-based Bennett Associates was able to simplify its calculations on static loading and fatigue life of the turbine. The team was then confident about the design's ability to stand up to the severe challenges of metal fatigue and other loads caused by the wind's potentially damaging swift movement over and around the structure.

Currently the turbine, which sits atop a 49-meter (160-foot) tower, generates one megawatt from its location in Co Antrim, Ireland. It meets the power requirements of 625 homes, eliminating approximately 2,300 tonnes (2,535 English tons) of toxic, global warming gases that annually would be poured into the atmosphere if the same power were generated using fossil fuels.

## HARNESSING THE WIND TO ENGINEER CLEANER AIR



Bennett relied solely on ANSYS software to ensure that the turbine would last for 20 years. Shown above is an analysis of the turbine's hub casting.

