

GE Energy required a highly tailored web application to streamline knowledge capture, retention, and communication for wind farm site suitability analysis.

*"EASA enabled us to reduce the IT effort and accelerate the deployment of the Wind ITO (Inquiry to Order) system.*

*Consequently, we have reduced the number of hours per project, enhanced accuracy by reducing manual operations, increased our ability to try 'what if' scenarios, and empowered non-experts".*

Julia Martinez  
GE Wind Energy.



*GE Energy is one of the world's leading wind turbine suppliers, with over 8,400 wind turbine installations.*

*The Wind ITO (Inquiry to Order) application, created with EASA, is now used by 130 people on 3 continents. Wind ITO is a custom web-application which integrates Oracle® with analysis tools such as MATLAB®, Excel®, and several proprietary algorithms.*

**Problem: How do you automate and streamline the complex processes associated with major projects?**

Site feasibility studies for a wind farm project are complex and time-consuming, and must address a host of issues such as integration with the power grid, optimization of wind farm layout, load analyses, regulation, and the local environment and topography.

Historically, the process involved unstructured email, and multiple teleconferences and meetings. It was a highly manual process.

Various stages of the suitability analysis were performed by experts in their localized environments, often spread across multiple geographic locations. Though the multiple analysis results were always manually integrated to produce the final evaluation, it was difficult to avoid inconsistent methods, human errors and the loss of technical and process knowledge.

**Solution: Use EASA to create a custom web-application, tailored to your specific requirements.**

To reduce turn-around time of analysis and to build consistent global processes, a web-based system called *Wind ITO (Inquiry to Order)* was conceived. In order to dramatically reduce the time taken to create and deliver the Wind ITO application, GE selected EASA.

EASA is a patented software product which enables ultra-rapid creation of custom web-based applications which leverage existing assets such as spreadsheets, databases, web-services, and legacy applications.

The Wind ITO system has resulted in an error-proof process that provides consistent and reproducible results, a knowledge base that allows validation and verification of past analyses, enhanced productivity and a quicker turn-around on complex analyses.

Specific features of the application include:

- Ability to define wind farm layouts and wind turbine configurations;
- Storage of project information, customer files, analysis information, versions used for each analysis, as well as analysis results;
- Ability to perform a daily load of latest projects from the Sales Opportunity system;
- Capture the results of all analyses to a knowledge bank, so that results from any past analysis can be recreated at any time;
- Communication of generated knowledge in the form of technical report generation, performance scorecards and process management reports.

The Wind ITO application leverages internally created algorithms and models (Excel and MATLAB) in combination with commercial off-the-shelf (COTS) tools such as Oracle. EASA allowed for rapid user interface development, automated queuing and seamless connectivity to compute servers.

Custom algorithms were developed to enhance the interpretation of output, and to facilitate workflow management.

Finally, the system has automated the generation of analysis reports for customers, and the calculation and distribution of metrics for project management and work load balancing.

Future work aims at enriching the knowledge base with wind farm layout knowledge and the possibility of employing Artificial Intelligence techniques for automated knowledge generation.

**User Roles**

User Full Name
1. Brian Benvenuti
2. Brian Benvenuti
3. Brian Benvenuti
4. Carsten Jung
5. Carsten Jung
6. Dario Carillo
7. Dario Carillo
8. Dario Carillo
9. David R. Nordman
10. Edward Boudreau
11. Edward Boudreau
12. Edward Boudreau
13. Edward Boudreau
14. Edward Boudreau
15. Edward Boudreau
16. Edward Boudreau

**Status**

Selected Project: CMS # 13FSCK : Project Greenery : Opportunity WF Sarbagard : Type Frame Agreement (FA)

**Schedule**

CMS Dates (Display only)

CMS #	Activity Status	Yield/Status
1. 4HW-E7	Active	Not yet Rate
2. 700016	Active	Not yet Rate
3. 1-EPBGK	Active	N/A
4. 13CKWB9	Active	Manufacturing
5. 1-FK0YY	Active	Manufacturing
6. 13FSCK	Active	Manufacturing

**System-generated E-mails**

From: ENERGY WFC (GE Infra, Energy)  
 Sent: Thursday, May 22, 2008 4:28 PM  
 To: Kornfein, Mark M (GE, Research); rjk@research.ge.com  
 Subject: WFC: M000083 : Big wind farm opportunity : Sample Wind Project: New Project

**Project Metrics**

Country	CMS #	Project Name
Vind	USA	70608 Orlando
Vind	USA	70607 Tampa
Pago	USA	706123 Miami
Kardles	China	706126 Beijing
Vind	USA	706124 Dallas
Vind	USA	706125 Chicago
Carsten	Spain	706112 Barcelona
Carsten	Spain	706119 Girona
Vind	USA	706121 Ohio
Vind	USA	70626 Calgary
Vind	USA	70624 Boston
Pago	Germany	704830 North
Pago	India	704830 Bangalore

**Customer Reports**

MECHANICAL LOADS ANALYSIS

ORLANDO PROJECT / USA