

**First half 2013 Status Report for DMF**  
**Period: 1<sup>st</sup> February, 2013 - 31<sup>st</sup> July, 2013**

**Project: Global Wind Energy Shipping and Logistics**  
**– Project no. 2012-97**

**Partners: Aalborg University**

Status report will elaborate on the following:

- Project summary
- Project organization
- Project status compared to milestone plan
- Actual costs compared to project budget and deviations explained
- Project risk analysis
- Signatures and dates

**Project summary**

Referring to the application (dated 17<sup>th</sup> August 2012 + 24<sup>th</sup> January, 2013), the project has the following aim, scope and deliverables:

- *Type of research project: A 4-year Ph.d. research project jointly funded by Den Danske Maritime Fond and Aalborg University commencing on February 1, 2013 and to be completed 31st January, 2017*
- *Research objective: To understand the global wind energy shipping and logistics market up to 2050 with an aim towards mapping out the revenue potential for different shipping and logistics entrants as well as determine capabilities required to gain leadership in this market*
- *Research angle: How the Danish maritime sector and supporting industries used to have the undisputed leading edge and how they can prevent losing this vantage position completely to other emerging global players*
- *Geography: Global project scope including Denmark, Europe, China, Asia, USA, the Americas, and the rest of the world. With Denmark being “the cradle” of the global wind industry and China being the largest market in the world at this time from all perspectives, a special focus will be put on these two countries.*
- *Output: 4 conference/journal articles, 1 Ph.d. thesis, and 4 industry reports*

The project is planned with the following content / main tasks to be completed:

- A. *Wind energy market sizing and outlook: Market development in phases up to 2020, 2030, and 2050 including technological development*
- B. *Wind energy supply chains: Configurations, set-up, and structure*

- C. *End-to-end wind energy supply chain costs: Break-down and quantification of costs and revenue potential for shipping / logistics services*
- D. *Requirements for companies to participate in wind energy shipping and logistics tasks*
- E. *The Blue Denmark: How to regain a leadership position in the global wind energy shipping and logistics market place?*

### **Project organization**

Project is per end of July, 2013 organized as follows, see table below.

<b>Project sponsors</b>	Den Danske Maritime Fond Aalborg University, Department of Mechanical and Manufacturing Engineering
<b>Advisory board</b>	Inaugural members are: Danish Shipowners' Association, DONG Energy, Siemens Wind Power, Port of Esbjerg, Blue Water Shipping, J Poulsen Shipping, BTM part of Navigant
<b>Project leader and Ph.D advisor</b>	Niels Rytter, Associate Professor, Ph.d., AAU
<b>Project administrator</b>	AAU, Department of Mechanical and Manufacturing Engineering administration
<b>Project team</b>	<b>Thomas Poulsen, Research Assistant, MBA, AAU (full time)</b> Gang Chen, Assistant Professor, Ph.D, AAU (part time)

During the first half year the following organizational issues have been settled

- Thomas Poulsen (TP) commenced 1<sup>st</sup> February the project in a position as research assistant, and the project was kicked gradually off.
- TP will during 2013 as planned complete a number of courses to gain minimum additional 30 ECTS points to his CV and thereby be formally qualified (120 master degree ECTS points) to switch to a Ph.D. position. TP has already per end of July gained 25 ECTS points through completing 4 courses at AAU and CBS (1. Systems Engineering - Analysis and Optimal Design, 2. Strategy, Operations and Business Improvement, 3. Public-Private Partnerships, 4. Advanced Statistics), and expect to complete 10 points more (5. Manufacturing and service system design, 6. Product and Service Design) before end of year. In total this should lead to gathering of not only 30, but 35 ECTS points by end of year after which TP submits the formal application for the Ph.D position which should be advertised during November 2013.
- TP is planning to set up an advisory board for the project by conducting an inaugural meeting to be held on August 28, 2013 with above mentioned members as well as DMF/AAU representatives.

### **Project status compared to project milestone plan**

The project plan consists of 5 areas or phases to be dealt with over the 4 year period (see activity and time plans enclosed this document). Table below presents an overview of recent progress and predicted next steps for not only the five areas, but also project and stakeholder management activities and a status on progress towards completion of promised final deliverables.

<b>Project phase / area</b>	<b>Completed tasks</b>	<b>Next steps</b>
<b>Project and Stakeholder Management</b>	<p>Project kicked off, and administrative, practical and organizational issues settled</p> <p>Roll up prepared and project presented by TP in DMF researchers day 28<sup>th</sup> May</p> <p>Advisory Board/Reference Group to be gathered on 28<sup>th</sup> August</p> <p>Collaboration initiated with other researchers (Ph.D students) from other institutions in DK working on similar projects (e.g. SDU)</p>	<p>TP is expected to switch from position as research assistant into Ph.D position</p> <p>Project steering to be continued</p> <p>August Advisory board meeting to be held, and next Advisory board meeting is to be planned for March, 2014 most likely in Esbjerg</p> <p>Progress collaboration with SDU researchers and others, maybe initiate joint articles / book writing</p>
<b>Wind Energy Market Sizing and Outlook</b>	<p>Industry consulted on future WTG output in MW.</p> <p>Work on outlook for the wind market and developments within R+D initiated – including quantitative model building</p>	<p>Work to be continued on this part of the project</p>
<b>Wind Energy Supply Chain Configurations</b>	-	-
<b>Wind Energy Supply Chain Costs</b>	-	-
<b>Required Wind Energy Logistics and Shipping Capabilities</b>	-	-
<b>Future role and Capabilities of the Blue DK</b>	<p>Dialogue with DMF, DSA, and BTM part of Navigant</p>	<p>TP to peruse BTM Navigant consulting report made for DSA and sponsored by DDMF</p>
<b>Case studies</b>	<p>Europe case study started (Anholt offshore wind farm), site visit + interviews done</p> <p>Initial preparation for subsequent case studies started</p>	<p>European case study to proceed gradually as planned</p> <p>Trip to China planned for September to do soft start on Asia case study and follow up activities expected</p>
<b>Publications</b>	<p>12 page Conference paper for LOGMS 2013, Singapore in September submitted.</p> <p>5 page Conference paper for EAWC Wind Ph.d. Seminar in Sweden in September submitted.</p>	<p>Singapore and Sweden conference papers to be presented in Singapore and Sweden at conferences and next converted into peer-reviewed journal papers.</p> <p>Conference abstracts and papers to be prepared for IAME and EWEA 2014 conferences.</p>

Referring to the original project plan included milestones displayed below, it is our estimate that the project scope remains intact by now and is well on track compared to planned progress after the initial 7 months of 2013.

Activity	Year/Quarter																							
	2013				2014				2015				2016				2017							
	M3	M6	M9	M12	M15	M18	M21	M24	M27	M30	M33	M36	M39	M42	M45	M48	M51	M54	M57	M60				
Project management, administration and reporting to DMF	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
Research assistant, +30 more ECTS points completed and Ph.d. scholarship preparation	x	x	x	x																				
Formal Ph.d training/education, dissemination/lecturing at university					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
Preparation, get in place, launch of project, and setup of Reference Group	x	x																						
<b>Phase 1 - market sizing and outlook</b>																								
Work with available market data to quantify wind market size 2020, 2030, 2050		x	x																					
Work with OEM's, utilities, and available market data and technology/R+D			x	x																				
<b>Phase 2 - wind energy supply chains</b>																								
Current supply chain designs, strategies and business models						x	x																	
Future supply chains							x	x																
<b>Phase 3 - end-to-end wind energy supply chain costs</b>																								
Generic supply chain cost estimates based on averages						x	x																	
Detailed supply chain cost component analysis for sub-processes							x	x																
<b>Phase 4 - requirements for market participation</b>																								
Types of players involved in the shipping and logistics tasks							x	x																
Definitions of supply chain tasks, roles, and responsibilities now and future								x	x															
<b>Case studies throughout phases 1 through 4</b>																								
Case A - full supply chain analysis research questions 1, 2, 3, and 4 (DK)		x	x		x	x	x	x	x	x	x	x												
Case B - full supply chain analysis research questions 1, 2, 3, and 4 (PRC)					x	x	x	x	x	x	x	x												
Cross case analysis/conclusions and mit-term seminar											x	x												
<b>Phase 5 - how The Blue Denmark can maintain or regain leadership</b>																								
Blue Denmark survey										x	x	x	x	x										
Wrap-up of Blue Denmark study work and matching to cross case analysis														x	x	x								
Final seminar																				x				
Attendance of conferences, industry fora, and events	x	x	x		x	x	x		x	x	x		x	x			x	x						
Industry interviews and site visits as relevant	x	x	x		x	x	x		x	x	x		x	x			x	x						
Workshops, seminars, and speeches at conferences					x	x	x		x	x	x		x	x			x	x						
Publication of 4 articles for academic conferences / journals																								
4 industry reports for Den Danske Maritme Fond		x	x						x	x			x	x										
Stay abroad at foreign academic institution																								
Ph.d thesis finalization																				x				

Activities related to phase 1 have been launched according to plan, and regarding the planned 3 case studies during the whole project period, not only the European case study part is now initiated, but also travels to Asia visiting various companies and organizations of interest (Beijing, Shanghai, Hong Kong, Singapore) is planned to take place during September and this will mean a soft start on the Asian case study, earlier than planned. Regarding publications targets for end of this year, these have already been met with the LOGMS2013 and EAW Wind conference papers completed. Finally, with the strong turn-out expected for the first Reference Group meeting on August 28, the inauguration of the steering committee is also ahead of plan. The project leader (NR) judges that project team, fist of all TP, and next GC during the first 6 project months with a dedicated and professional work effort, have provided the project with a promising start.

### Actual costs compared to project budget and deviations explained

All project related costs (salary, travel, accommodation costs etc.) are during the first year covered by AAU according to original application, and there are thus no comments to this aspect by now except to mention two small things: (1) AAU needs to determine the exact salary level TP will receive when he according to plan applies for and hopefully switches into a Ph.D position early 2014 (in the initial year, some challenges arose in this respect); (2) based on this

decision, it will then be possible for AAU to develop an updated and likely more accurate budget for the remaining 3 project years, still respecting the between AAU and DMF now contracted support grant for the project .

### Project Risk analysis

Below is an overview of main factors posing a risk to the project not meeting its deliverables for the rest of project period as well as current strategies for their mitigation.

Potential Main Risks	Strategy of Mitigation
Loss of key resources / persons from project team due to unforeseen circumstances, particular TP who is expected to be the preferred candidate for the Ph.D position to be posted later this year	TP is considered the most critical team member for project success, and results depend much on his availability as a resource. It remains critical for project success that TP formally enters into a Ph.d. position by latest 1 <sup>st</sup> February 2014. However this should be realistic and is expected, as TP is well on track regarding gathering sufficient ECTS points to meet formal qualifications for this position. Also AAU, M-tech should offer TP a Ph.D. salary level in line with original budgets to increase likelihood of TP accepting the upcoming Ph.D position.
Some project team members also have other assignments / obligations - do they drag attention, time and resources away from the project?	During the first year of the project, there has been little pre-scheduled time for NR and GC to engage in the project and a good part of their effort has been done as over time work. For the next years, AAU should according to plan allocate more hours for own team members and make sure the project is prioritized internally in competition with other tasks, and this through managing own "home" organization requirements.
Lack of project steering	Project steering meetings between all team members are held at AAU on a biweekly basis and DMF is updated on progress on an ongoing basis.
Wind Energy loses strategic importance as an energy source across the world	This can potentially be a risk, but more in the long term and project ambition is to assist the industry in reducing levelized cost of energy to make wind more competitive.
Scope too wide or unrealistic ?	Project team will on an ongoing basis try to ensure that scope is well managed and narrowed if required to be able to meet project end deliverables. Also, project team will use Advisory Board input in this respect. First Reference Group meeting already scheduled to debate further sub-scoping of the project. Finally project team on an ongoing basis try to manage balance between the project's practical and academic deliverables.
Access to companies and empirical evidence not	TP is in close dialogue with relevant companies and

available ?	market intelligence businesses to get access to data. Also use of generic modeling and averages will ease access to data and information from companies along with use of NDA's, confidentiality agreements, etc.
Individual project parts / phases are not sufficiently linked, and synergies lacking across work efforts ?	At all project steering meetings and on an ongoing basis, we strive for tight coordination across project parts
Strategy changes or major reorganizations in partner companies	Reference Group most critical, however, members can be exchanged. Case study member organizations will also be critical for research at tactical level going forward.
Lack of backup of relevant stakeholders	Project is broken down into major steps and deliverables are both short and long term. Significant effort is done to develop good presentation materials (PPTs) and reach out to important stakeholders in the appropriate sequence as the project progresses with visible results and when found relevant.

**Signatures and dates  
Copenhagen, September 27, 2013**

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Thomas Poulsen, Research Assistant, MBA, Aalborg University

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