

**Status Report for DMF**  
**Period: 1<sup>st</sup> August, 2013 - 31<sup>st</sup> January, 2014**

**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

Effective 1<sup>st</sup> February, 2014, the project is organized as per the table below.

<b>Project sponsors</b>	Den Danske Maritime Fond Aalborg University, Department of Mechanical and Manufacturing Engineering
<b>Reference Group</b>	Inaugural members are: Danish Shipowners' Association, DONG Energy, Siemens Wind Power, Port of Esbjerg, DHL, J Poulsen Shipping, BTM part of Navigant, offshoreenergy.dk
<b>Project leader and Ph.D advisors</b>	Niels Rytter, Associate Professor, Ph.d., AAU Lars Bo Henriksen, 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:

- By end of period, TP had completed an additional 35 ECTS points of courses to become formally qualified on a Master degree level and he was thus able to apply for a project Ph.D. fellow position instead of current position as research assistant.
- The project Ph.D. position was announced November 2013, and TP and a number of other candidates applied for it by mid December same year. Early February 2014 (briefly after this reporting period), it was announced that TP was offered the position.
- Some few changes was made to the project Reference Group as the group was both expanded and a member changed for another one in the same part of the business.

### 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. The 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 as well as a status on progress towards completion of promised final deliverables.

Project phase	Completed tasks	Next steps
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/ area		
<b>Project and Stakeholder Management</b>	<p>Advisory Board/Reference Group was gathered on 28<sup>th</sup> August at AAU for first session.</p> <p>Collaboration was progressed with researchers (Ph.D students) from other institutions in DK working on similar projects, particularly the ReCoE project of SDU</p> <p>TP and NR participated in the ReCoE project kick off meeting at SDU 27<sup>th</sup>-28<sup>th</sup> January</p> <p>TP participated in the EU sponsored project about ECOWindS</p> <p>TP participated in the OWIB initiative in Esbjerg along with the Danish Trade Council from the Danish Embassy in Beijing with a special focus on offshore wind China</p>	<p>2<sup>nd</sup> Advisory Board / Reference Group meeting to take place at DONG Energy on 20<sup>th</sup> March 2014 including a subsequent “go-home” meeting</p> <p>Project steering to be continued</p> <p>Ph.D. project 2 month plan to be drafted in detail and approved by AAU doctoral school</p> <p>Scientific focus and research questions, main theoretical models and research design to be developed and documented in more detail</p> <p>M.Sc student project to start February with Blue Water Shipping Esbjerg on topic of port management with focus on wind turbines</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>	<p>1<sup>st</sup> Europe case study (Anholt) done providing empirical evidence on this</p>	<p>2<sup>nd</sup> European case study (DanTysk) to be prepared</p>
<b>Wind Energy Supply Chain Costs</b>	<p>Work on the cost model continued</p>	<p>-</p>
<b>Required Wind Energy Logistics and Shipping Capabilities</b>	<p>Further mapping of wind supply chain constituencies took place</p>	<p>-</p>
<b>Future role and Capabilities of the Blue DK</b>	<p>Dialogue with DDMF, DSA, and BTM part of Navigant as well as other industry stakeholders</p> <p>TP to peruse BTM Navigant consulting report made for DSA and sponsored by DDMF as this report forms a good basis for the shipping part of the Blue Denmark</p>	
<b>Case studies</b>	<p>1<sup>st</sup> Europe case study done - Anholt offshore wind farm. Initial preparation of subsequent European case study done.</p>	<p>2 trips to China and South Korea planned for Winter and Spring 2014 to prepare for and execute 2 Asia case studies.</p>

	Initial preparation for CN case study started	
<b>Publications</b>	12 page Conference paper for LOGMS 2013, Singapore presented September 2013.	First year industry report to be developed (10 pages)
	5 page Conference paper for EAWW Wind Ph.d. Seminar in Sweden presented September 2013.	Singapore and Sweden conference papers to be converted into peer-reviewed journal papers or book chapters.
		Conference abstracts and papers to be prepared for several conferences.

Referring to the original project plan including 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 12 months of 2013-2014.

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											
Case B - full supply chain analysis research questions 1, 2, 3, and 4 (PRC)						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
Industry interviews and site visits as relevant	x	x	x	x	x	x	x	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	x	x	x	x	x	x
Publication of 4 articles for academic conferences / journals													x	x						x
4 industry reports for Den Danske Maritim Fond					x	x							x	x						x
Stay abroad at foreign academic institution					x	x														
Ph.d thesis finalization																				x

Activities related to phase 1 have been launched according to plan, and regarding the planned 3 case study regions during the whole project period, not only a first European case study is now done, but a second is also being planned and 1 or 2 more Asian studies have been planned through connections to various companies and organizations in particular China (and South Korea). Regarding publications targets for end of this first year, these were met with the LogMS2013 and EAWW Wind Ph.d. conference papers submitted and presented. The “steering committee” was inaugurated and a first Reference Group meeting was established August 28, 2013. Finally, TP acquired sufficient ECTS credits to apply for the project Ph.d. position which he was offered early February 2014. The project leader (NR) judges that project team, first of all TP, and next GC, during the first 12 project months with a dedicated and professional work

effort, have provided the project with a promising start. Going forward, professor Lars Bo Henriksen has been assigned as a secondary project advisor, supporting Niels G M Rytter.

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

All project related costs (salary, accommodation costs etc.) except travel related expenses are during the first year covered by AAU according to original application. Short after this status report, the project team will also submit the following documents:

1. A small separate status report with overview of realized travel costs compared to the original travel budget for year 1.
2. A separate updated project plan and budget for the remaining 3 project years, still respecting the agreement between AAU and DDMF with the contracted support grant for the project. The updated plan and budget will be crafted along with the mandatory university 2-month plan and will reflect the exact salary level TP will receive when he - according to plan - switches into the Ph.d position by February 1, 2014 and will also include an updated and more realistic estimate of required travelling and related costs for the remaining project years.

As mentioned October, 2013<sup>1</sup> the project can already now see a need for additional funding for travels in order to complete especially the Asian case study work. It is the intention of the project consortium to apply for additional funding to cover higher than first expected traveling budget. Additional funding applications will target DDMF and/or alternative funding sources.

### 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, particularly TP who has been selected for the Ph.D Fellow position.	TP is considered the most critical team member for project success, and results depend much on his availability as a resource. TP formally enters into a Ph.d. Fellow position by 1 <sup>st</sup> February, 2014 and it is critical that he stays in this position and continues to do his job well there. AAU, M-tech should offer and ensure TP a Ph.d. salary level in line with original budgets (matching qualifications obtained through previous work experience) to increase likelihood of TP accepting the upcoming Ph.d. position.
Some project team members also have other assignments / obligations - do they drag	During the first year of the project, there has been little pre-scheduled time for NR and GC to engage

<sup>1</sup> Meeting between Carsten Melchior and Thomas Poulsen to follow-up on the August 28, 2013 Reference Group meeting conducted at DDMF premises on October 11, 2013

attention, time and resources away from the project?	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, inclusive to the recently added Ph.d supervisor, 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 monthly basis and DDMF 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 debated and agreed a further sub-scoping of the project. Finally, the project team tries - on an ongoing basis - to manage balance between the project's practical and academic deliverables. For the next 3 years, the academic deliverables with increasingly get attention from the team.
Access to companies and empirical evidence not available ?	TP is in close dialogue with relevant companies and 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
Project team members have different aims and interests and these can potentially develop in to conflicts between team members, e.g. also between supervisors and Ph.d. fellow.	This is a risk in any project where several persons form up a project team or have to collaborate on tasks. The risk is mitigated through clarifying tasks roles and responsibilities upfront and ensuring an ongoing constructive dialogue among team members about project aims and personal interests in the project. AAU has assigned a second advisor (Lars Bo Henriksen) to the Ph.d project which ensures a broader set of perceptions of potential conflicting matters.
Strategy changes or major reorganizations in partner companies	Reference Group most critical, however, members can be exchanged (was just done). 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, March 19, 2014**

Project leader, Niels Rytter, Associate Professor, Ph.D, Aalborg University

Thomas Poulsen, Ph.D fellow, MBA, Aalborg University

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