Development of new planning tools coping with volatile weather conditions

EWEA Technology Workshop, Rotterdam 04.12.2013

Michael Görges

BLG LOGISTICS SOLUTIONS

WINDENERGY LOGISTICS

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Agenda

- Overview BLG
- Offshore supply chain
- SIMTUL a simulative modeling and analysis approach
  - Cause of action
  - Concept of the simulation tool
  - Integration of weather uncertainties
- Further research activities





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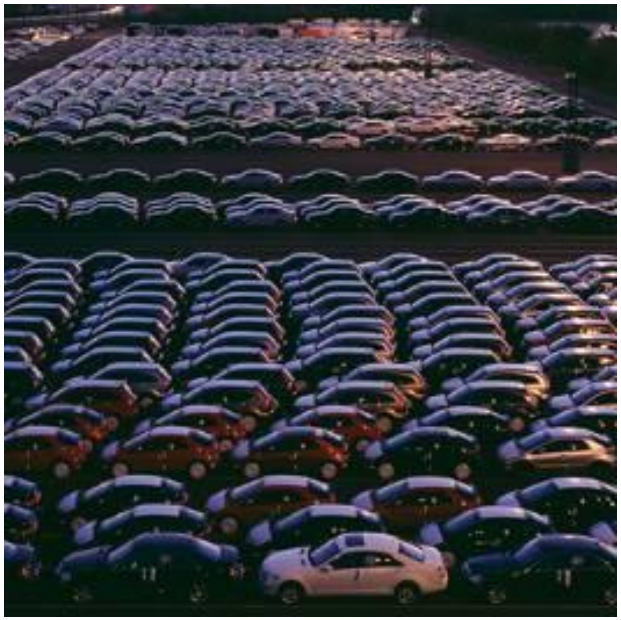


Automobile

Sea and inland terminals
Storage and distribution
Ro/Ro-Terminals
Technical centers
Intermodal transports
Freight forwarding services

Contract

Automotive logistics
Industry and production logistics
Port logistics
WindEnergy Logistics

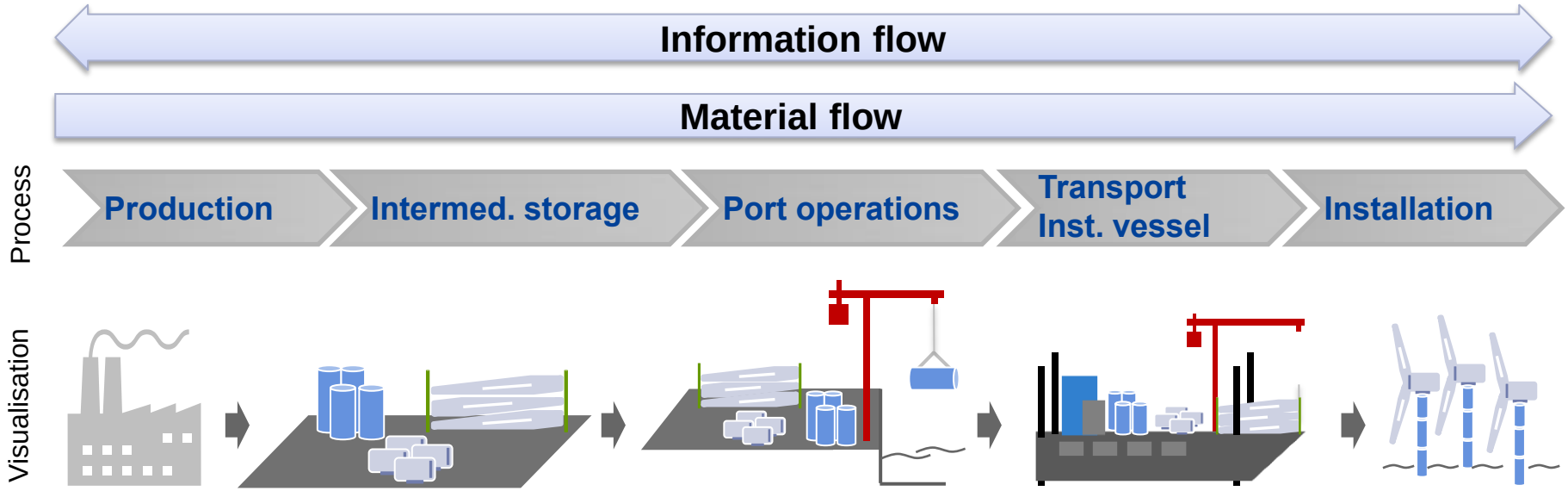
Container

Sea and inland terminals
Intermodal transports
Logistics services
Maintenance and repair
Container-depots

EUROGATE

Offshore Supply Chain

Material and information flows



Challenges material flow

- Technical feasibility
- Organisation / resource planning
- …

Challenges information flow

- Exchange of information
- Planning and restrictions
- …

Source: based on Industrie Management 27 (2011)

SIMTUL

Using discrete event simulation for improving the supply chain

SIMTUL

Motivation

- Improving resources utilization
- Idle time of resources
- Improving plan accuracy
- Increasing throughput of the supply chain

Objectives

- Identification of influencing factors
- Operationalisation of influencing factors
- Modeling of offshore transport processes
- Generation of a simulation model
- Evaluation and validation of results

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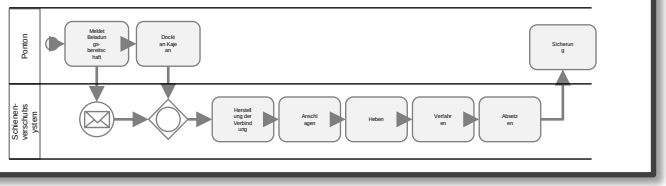
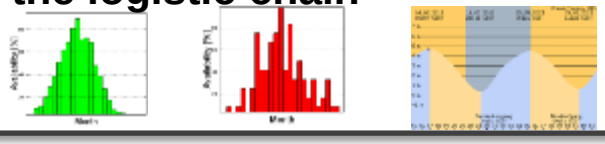
SIMTUL

Course of action

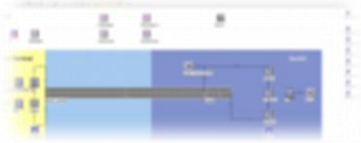
Analysis of the logistic chain



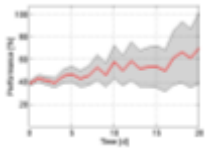
Identification of parameters of the logistic chain



Development simulation model

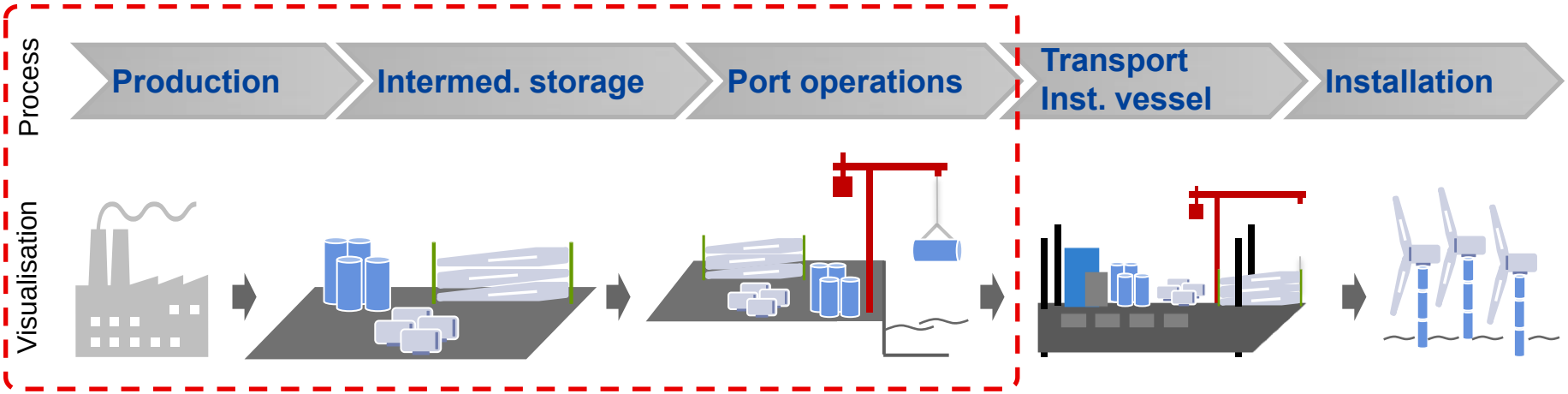


Experiments and validation



Offshore Supply Chain

Material and information flows



(1)

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Currently, SIMTUL addresses the near-shore logistics supply chain

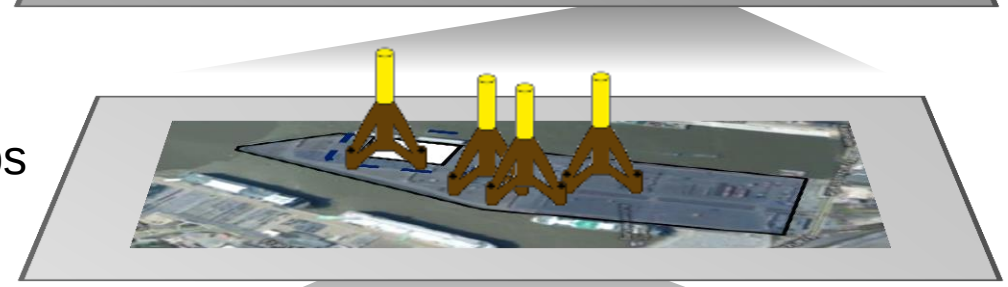
Source: based on Industrie Management 27 (2011)

Approach in SIMTUL

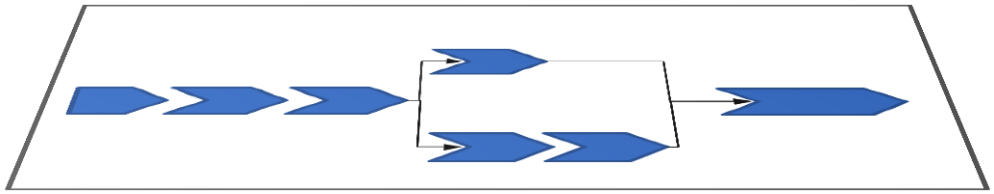
Modeling in three layers

Global transport network

Port and groups of ports



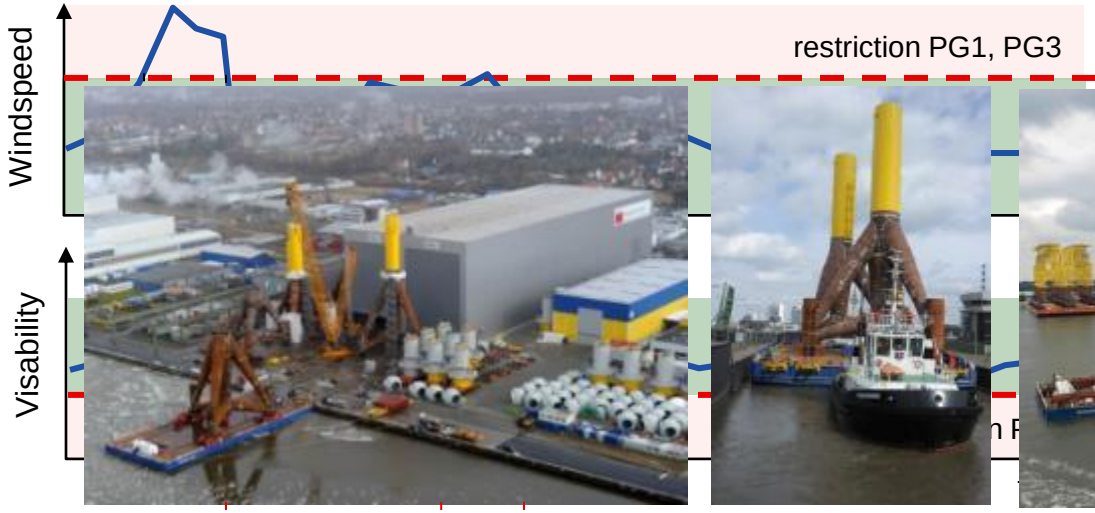
Processes and restrictions



- Modular approach→ integration of further locations
- Weather and tidal data for specific locations
- Ports, Yards, Ressources (SPMT, Forklifter)
- Description of processes and their properties
- Mapping of restrictions to processes and resources

Modeling of Processes

Weather restrictions – influence on process performance



Process restrictions

- General criteria:

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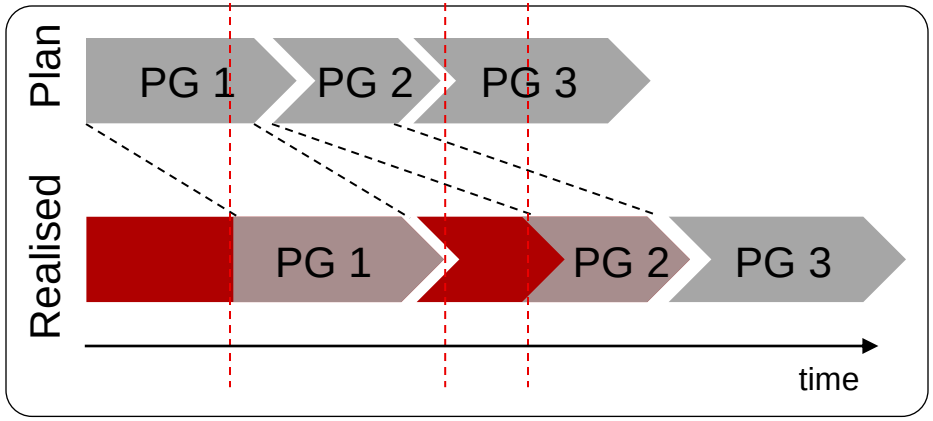
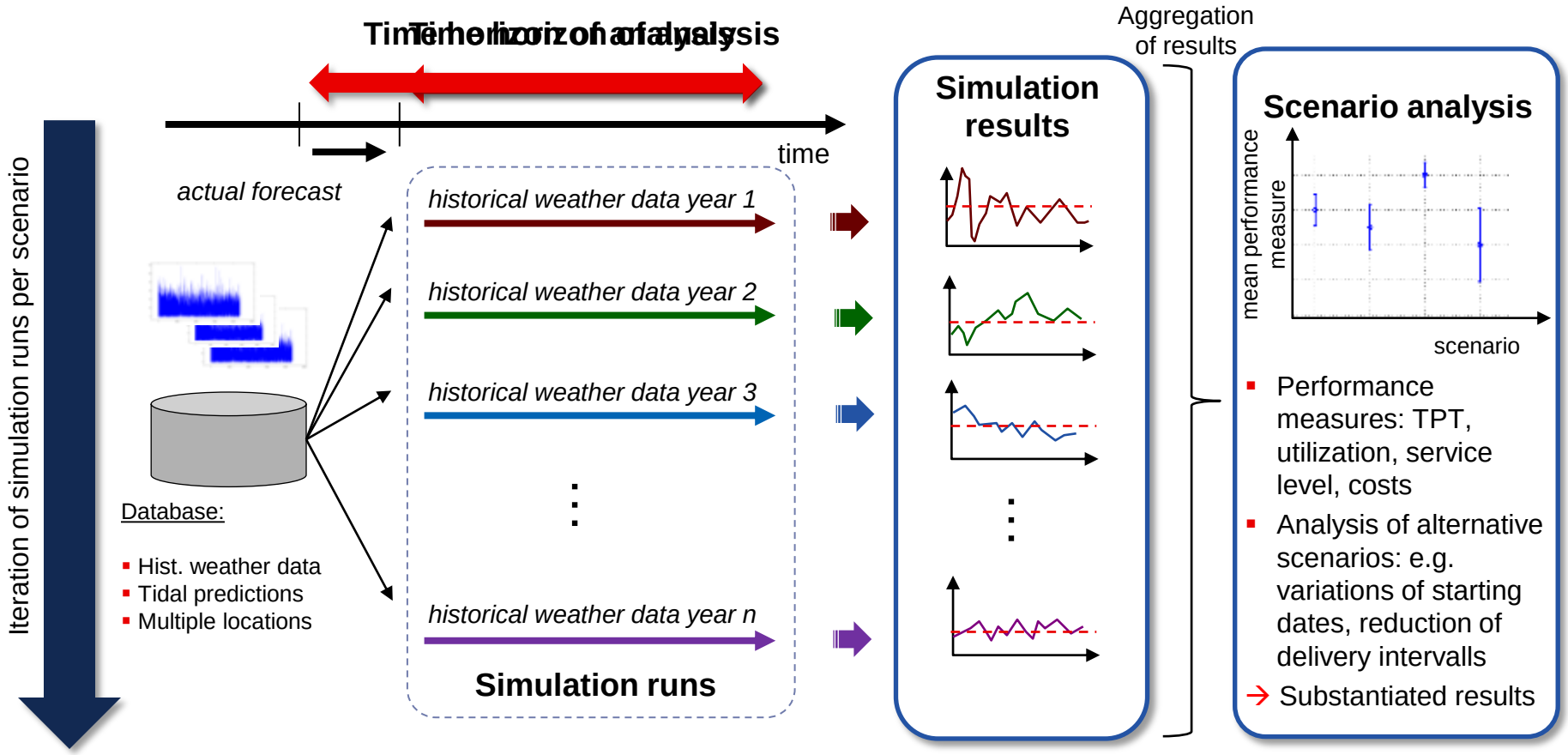


Modeling weather restriction

Using historical data and actual forecasts

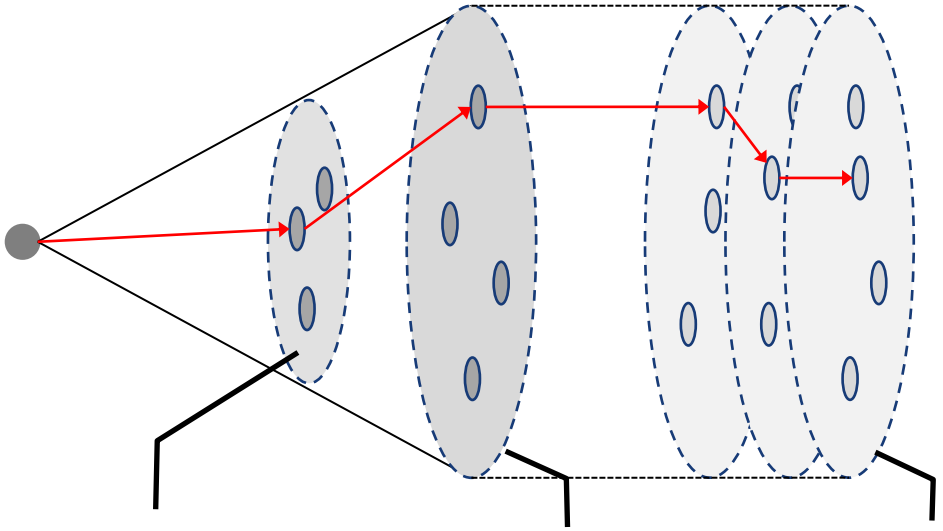
Mode 1 – Analysis of planning scenarios
→ Under development / Validation

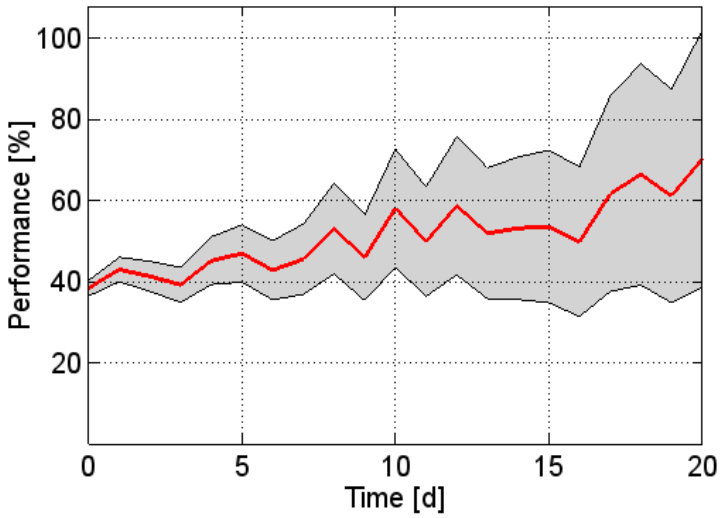
Mode 2 – Analysis of operative scenarios
→ Possible extension



SIMTUL

Scenario based approach – Analysis with SIMTUL





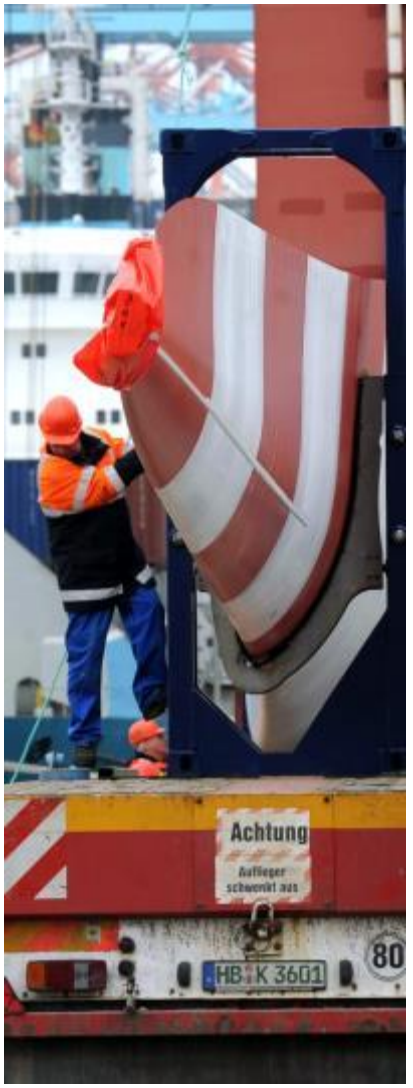
Scenarios and Influencing factors → Simulation → Evaluation

Summary and next steps of development

Research and Development

- SIMTUL provides a simulation based planning tool including restrictive factors (e.g., weather conditions)
- SIMTUL uses data from different sources
- Modular approach allows to extend the model:
  - Further Location (onshore and offshore)
  - Additional processes
  - Further restrictions
  - Usage of additional data sources

- Validation using existing data about transports
- Integrated Modeling approach for the offshore supply-chain
- Standards as an instrument for dissemination



Thank you for your kind attention!

Michael Görges
WindEnergy Logistics – Project Manager R&D

BLG Logistics Solutions GmbH & Co. KG
Präsident-Kennedy-Platz 1
28203 Bremen
Germany

Tel.: + 49 421 398 3458
Mail: mgoerges@blg.de
Web: www.blg.de