Civil Engineering and Marine Works (CEM) Offshore Branch Office
Content

A Overview of HOCHTIEF International
B CEM Offshore Activity
C Marine Civil Engineering
D Plant and Equipment
E HGO InfraSea Solutions
F HOCHTIEF Offshore Services
HOCHTIEF AG Key Figures 2010

New Orders: 29,63 billion Euro +31.8 percent
Work Completed: 23,23 billion Euro +13.0 percent
Orders in Hand: 47,49 billion Euro +34.2 percent
Net Profit: 288,0 million Euro +50.3 percent
EBT: 756,6 million Euro +26.8 percent

Employees: 70,678 +6.7 percent

Shareholder Structure (11/2011)

- Freely Traded Trust 36.60%
- ACS incl. 4.44 %
- HOCHTIEF F treasury stock 53.40%
- Quatar Holding LLC, Doha 10.00%
**HOCHTIEF AG structure**

HOCHTIEF Solutions AG, Management company of the Division HOCHTIEF Europe

### HOCHTIEF Corporate Headquarters

#### HOCHTIEF Americas
- Turner #1 US general builder
- Flatiron: top 10 US transportation infrastructure contractor
- E.E. Cruz: civil & foundation in NJ/NY

#### HOCHTIEF Asia Pacific
- Leighton Holdings:
  - Civil engineering
  - Contract mining
  - Building construction
  - Property development
  - Services

#### HOCHTIEF Concessions
- Industrial infrastructure investor and operator; manager of concessions
  - Airports
  - Roads
  - Social infrastructure
  - Infrastructure ventures
  - NPV (end 2010): EUR 1.68bn

#### HOCHTIEF Europe
- Integrated Solutions:
  - Service
  - Real Estate
  - Energy & Infrastructure
  - International Projects
  - Classic
  - Engineering

<table>
<thead>
<tr>
<th>HOCHTIEF Americas</th>
<th>HOCHTIEF Asia Pacific</th>
<th>HOCHTIEF Concessions</th>
<th>HOCHTIEF Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>US, Canada</td>
<td>Australia, Asia, Gulf region</td>
<td>World-wide</td>
<td>Europe, selected other countries</td>
</tr>
</tbody>
</table>

**EBT (EUR m):**

- **H1 11: 85.8 (FY 10: 126.5)**
- **H1 11: -598.2 (FY 10: 512.7)**
- **H1 11: 64.0 (FY 10: 84.3)**
- **H1 11: 41.3 (FY 10: 82.5)**

---

1) The net present value (NPV) is based on our applied discount rate and other assumptions.
HOCHTIEF Solutions AG
Branch of Civil Engineering and Marine Works

Competence Centre concentrating on all projects in and around the water

The business unit of CEM offers a strong partner for planning, financing and construction of your project.

Our fields of activity

• Offshore-facilities
• Ports (also turnkey)
• Locks, ship lifts
• Submerged tunnels
• Weirs, flood protection walls
• Foundations in the water
• Caissons
• Shipyards, industrial construction
• Tunnels
• Bridges

Our colleagues for your successful project.

More than 290 experienced employees in department, providing innovative maritime solutions.
Department houses a technical and work preparation department, employing more than 75 people.
B Offshore Activity
Civil Engineering and Marine Works
Offshore Branch Office
Current Activities

- Design of offshore structures
- Soil investigations
- Construction and installation of wind energy converter (WEC) and foundations:
  - tripods
  - monopiles
  - tripiles
  - gravity base foundations
  - jackets
- Offshore logistics
- Operation and Maintenance Services
Civil Engineering and Marine Works
Offshore Branch Office
Completed Projects

- Offshore Wind Farm Lillgrund, Sweden (2007)
- Offshore Wind Farm alpha ventus (2008)
- Met Mast Hornsea (2011)
- Met Mast Amrumbank (2005)
Met Mast Amrumbank

Client: Amrumbank West GmbH

Execution planning:
Technical Department, Business Unit
Civil Engineering and Marine Works

Construction execution:
HOCHTIEF Construction AG
Civil Engineering and Marine Works
technical leading in joint venture

Installation: March/April 2005

Project data:
Total height: 135 m
Foundation depth in seabed: 23 m
Total weight: 381 t
Length monopile: 63 m
Weight monopile: 285 t

Contract value: 4 m EUR

Special feature:
• Installation of a met mast with monopile
• Foundation (steel pipe), measuring cabin and latticed steel mast, approx. 90 m above sea level
• Installation within five days, 35 km North of Helgoland Island
Offshore Wind Farm Lillgrund, Sweden

**Client:**
Vattenfall AB Nordic Countries

**Execution planning:**
NIRAS

**Construction execution:**
HOCHTIEF Construction AG Business Unit
Civil Engineering and Marine Works
in joint venture

**Construction period:**
December 2006 - March 2007

**Project:**
Foundations for 49 WEC’s with 2.3 MW capacity (total 110 MW)

**Project data:**
- Concrete: 26 000 m³
- Formwork: 42 000 m²
- Reinforcement: 4 450 t
- Excavation: 75 000 m³
- Stone material: 80 000 m³

**Contract value:** 49 m EUR
Offshore Wind Farm alpha ventus

Client:
DOTI GmbH (Deutsche Offshore-Testfeld und Infrastruktur GmbH & Co. KG)

Execution planning:
IMS, Plant Planning: Technical Department, Business Unit Civil Engineering and Marine Works

Construction execution:
HOCHTIEF Construction AG
Civil Engineering and Marine Works in joint venture

Construction period:
Installation: September 2008

Project:
Design and construction of the offshore transformer station for the first German offshore wind farm in the North Sea.

Project data:
- Weight without driven piles: 800 t
- Elevation from seabed: 57 m
- Contact area jacket: approx. 30 m x 30 m
- Driven piles: weight approx. 100 t/each
  - length: 41 m
- Embedding into seabed: 31 m
- Contract value: 19 m EUR
Met Mast Hornsea

Client: 
SMart Wind Ltd.

Execution planning: 
Technical Department Business Unit 
Civil Engineering and Marine Works

Construction execution: 
HOCHTIEF Solutions AG 
Civil Engineering and Marine Works

Construction period: 2011

Project data: 
Construction of the met mast foundation using a Twisted-Jacket-foundation in the Zone Hornsea (UK)

Contract value: 8 m EUR

Special features: 
The design of this structure had already resisted the Hurricane Katrina [2005]. Compared with more traditional foundation structures, the twisted jacket also uses significantly less steel in its manufacture.
Civil Engineering and Marine Works
Offshore Branch Office
Current Projects

Offshore Wind Farm
Global Tech I
2012 - 2013

Offshore Wind Farm
BARD 1
2010 - 2012

Offshore Wind Farm
Global Tech I
2012 - 2013

Offshore Wind Farm
Baltic 2
2012 - 2013
Offshore Wind Farm BARD 1

Client:
BARD Logistik GmbH

Execution planning:
Plant and Equipment Management, Business Unit
Civil Engineering and Marine Works

Construction execution:
HOCHTIEF Solutions AG
Civil Engineering and Marine Works
for Equipment Chartering

In time charter: May 2010 - May 2012

Project: Chartering the construction vessel THOR
for a successfully installation of about 80 WEC’s.

Project data:
Project area: about 60 km²
Project position: about 90 km in the northwest of the island Borkum
Total capacity: 400 MW
Power requirement: for more than 400.000 households
Water depth: average of 40 m

Special features:
With BARD Offshore 1 we are building the first and currently largest
commercial offshore wind farm in the North Sea, Germany.
Offshore Wind Farm Global Tech I

Client:
Global Tech I Offshore Wind GmbH

Execution planning:
Technical Department Business Unit Civil Engineering and Marine Works

Construction execution:
HOCHTIEF Solutions AG Civil Engineering and Marine Works

Construction period:
Installation: July 2012 - July 2013

Project:
• Preparation of a “Project Installation Manual” for all transport- and installation works
• Supply of defined installation vessels incl. tripod seafastening and seafastening of all tripod installation equipment
• Loading and transportation of foundation elements from baseport to offshore site
• Installation of 80 tripods at offshore site
• Transport of WEC-elements: fabrication port - Bremerhaven - Offshore
• Installation of 80 WEC’s
Offshore Wind Farm Global Tech I

Project data:
• 80 WEC’s with tripod foundation (post-piling)
• WEC type: AREVA Multibrid M5000
• Each WEC 5.0 MW
• 400 MW actual power output
• Located in the North Sea, app. 50 km north of island Borkum, Germany
• Water depth: 39 - 41 m

Soil Conditions:
• Fine Sand 0-9m
• Medium Sand 5-45m
• Course Sand 40-45m
• Pile driving possible according to available site investigation results.

Contract value:
175 m EUR
Offshore Wind Farm Baltic 2

Client:
EnBW Baltic 2 GmbH

Execution planning:
Technical Department Business Unit
Civil Engineering and Marine Works

Construction execution:
HOCHTIEF Solutions AG
Civil Engineering and Marine Works in
joint venture

Construction period:
Installation: September 2012 - July 2014

Project:
Design, planning, transport and logistics,
installation (foundations and WEC's)
Offshore Wind Farm Baltic 2

Project data:
- 80 WEC’s (39 with monopile and 41 with jacket foundations)
- WEC type: Siemens SWT-3.6-120
- Each WEC 3.6 MW
- 288 MW actual power output
- Located in the Baltic Sea, app. 30 km north of island Rügen, Germany
- Water depth: 23 - 44 m

Soil Conditions:
- Upper & lower boulder clay layers, semi-solid to solid within the entire project area
- Soft to stiff basin clay as top layer
- Chalkstone basis (high bearing capacity)
- Sands (loose to very dense) in the inner project domain

Contract value:
382 m EUR
Civil Engineering and Marine Works
**Further Project Involvement**
3rd Round UK, Zone Hornsea

- Development of the 4GW Hornsea Zone
- Nominated as preferred supplier for the foundations
- Installation of the first UK Met Mast round Three, 2011.
Civil Engineering and Marine Works
Selected Research & Development Projects

- Offshore Foundation Drilling (OFD®-Technic)
- Noise Mitigation (cooperation in ESRA-Project)
- Tension Legged Platforms
- Wave power plant
- Gravity Base Foundations (Gravitas/ Tagu)
Technology Department
Technical Skills and Expertise
Engineering and Consulting

- Design support structures for WEC's, met masts, offshore substations
- Transportation and installation concepts
- Geotechnical services and soil investigations
- Approval planning
- Offshore Engineering
- Materials
Work Preparation
Analysis via 4D-visualisations

Loadcase

WEC Installation
Work Preparation
Deck layout
Our Plant & Equipment
Overview of our plants and equipment

Working pontoons  Odin  Thor  Vidar  Innovation*

* available by HGO InfraSea Solutions
The suitable basis for all offshore-transports

Technical data:
Class: DnV
Class notation: DnV 1A1,
Barge for deck cargo

Main dimensions:
Length: 90.00 m
Width: 32.00 m
Side height: 6.68 m
Max. draft: 5.00 m
Freeboard: 1.68 m
Max. load bearing capacity: 10,000 t
Deck load: 15.00 t/m²
Load in the intersection points of the bulkheads: 300.00 t
Load in the longitudinal direction of the bulkheads: 50.00 t/m
Ballast tank capacity: 9,800 m³

Equipment:
Ballast system
Electrical pre-equipping for decks generator

In operation from April 2012.
Jack-up Platform ODIN

Jack-up platform Odin installing the Offshore-Wind Farm alpha ventus.
Jack-up Platform THOR
Jack-up Platforms ODIN and THOR

**ODIN**
- Hull: 46.10 x 30.00 x 4.60 m
- Leg length: 60.00 m / 2.00 x 2.00 m
- Operation depth: 35.00 m
- Payload: 900 t (subject to SSA)
- Crane capacity: 300 t@15.00 m
- In operation: since 11/2004

**THOR**
- Hull: 70.00 x 40.00 x 6.00 m
- Leg length: 82.00 m / Ø 3.70 m
- Operation depth: 50.00 m
- Payload: 2,500 t (subject to SSA)
- Crane capacity: 500 t@15.00 m
- In operation: since 05/2010
Jack-up Vessel Vidar

Technical Data:
Classification DNV + 1A1 Self Elevating
Wind Turbine and Crane Unit, Dynpos-Autr.
HELDEK, E0, Opp-F, SPS

Main dimensions hull:
- Length: 136.50 m
- Width: 41.00 m
- Height: 9.50 m
- Open deck area: 3,400 m²

Leg dimensions:
- Length: 90.00 m
- Diameter: 4.80 m
- Spudcans: Ø 12.00 m
Jack-up Vessel Vidar

**Operational conditions:**
- Draft: 6.30 m
- Operating depth: 50 m
- Payload: 6,000 t (subject to SSA)
- Deck load: 15.00 t/m²
- Hoisting capacity: 24,000 t
- Hoisting speed: up to 1.00 m/min
- 2 Moon Pools: Øi 0.90 m

**Cranage:**
- Offshore crane CAL 45000-1200 Litronic
- Crane capacity: 1200 t/32.50 m
- Offshore crane BOS 4200-50 Litronic
- Crane capacity: 50 t/46.00 m

**Power supply:**
- Diesel/electric
- Total output: 19,000 kW
- Emergency generator: 700 kW

**Transit:**
- 10 knot

**Accommodation:**
- 90 persons
HGO InfraSea Solutions
Jack-Up Vessel „Innovation“

Vessel specifications:

- Length overall hull: 147.50 m
- Breadth hull: 42.00 m
- Depth hull: 11.00 m
- Max. operating draft: 7.00 m
- Accommodation up to 120 persons
- Self-sustaining
- Self-propelled
- DP2 capability
- 8.000 t cargo load capacity
- Feeding is not necessary
- In operation from 2012

Joint venture:
50% HOCHTIEF Solutions
50% GeoSea (DEME Group)
HGO InfraSea Solutions
Jacket installation process

- Crane around the leg
- 1,500 t SWL
- 2 jackets up to 1,000 t
- 4 jackets up to 600 t
- 7 monopiles up to 500 t
HGO InfraSea Solutions
Turbine installation process

- Safe operation of crane activities
- up to 50 m water depth
- 600 t nacelle weight @120 m
- up to 7 WEC/5 MW+
- up to 12 WEC/3.6 MW
HOCHTIEF Offshore Services

Consulting – Operation – Maintenance

Foundations
Substations
Wind turbines
Sea cables
HOCHTIEF Offshore Services
One solution – Maintenance packages and offshore logistics

- Inspection and maintenance of offshore windparks, seacables, substation
- Experienced and certified service crews
- Service and supply vessels with workshops, accommodations, cran, personal transfer system, sonar and ROV
- Meet the specific HSE requirements
- Areas: North Sea, Baltic Sea, Irish Sea
- Start of operation: August 2012
THANK YOU on behalf of Civil Engineering and Marine Works (CEM) Offshore Branch Office Hamburg
David.craft@hochtief.de