SMART, ENERGY-EFFICIENT AND ADAPTIVE PORT TERMINALS

SEA-TERMINALS

Rafael Company
International Congress
ENERGY AND THE ENVIRONMENT 2014,
Opatija, Croatia
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From GREENCRANES to SEA TERMINALS: Facilitating the evolution of port container terminals towards an effective low-carbon emission operative model, integrating smart and energy-efficient technologies through innovative business and environmentally oriented pilots focused on handling machinery and equipment.

- Energy Approach
- Feasibility Investment Models
- Pilots and Demonstrations
  - LNG Terminal Tractor
  - Eco-RTG Retrofitting
  - Eco-Reach Stacker Dual Fuel
  - Partial Energy Monitoring

- Integral Approach (Energy + Operations)
- SEA Concept: Smart, Efficient and Adaptive
- Complete Terminal Monitoring
- Operation at Minimum Cost Point
- Integration of Hybrid Concepts:
  - Hybrid RTG
  - Hybrid Terminal Tractor (Diesel / LNG + Electrical)
  - Hybrid Reach Stacker
Quick Deployment of GREENCRANES Products in the Port Sector

LNG tractors for new Turkish terminal

08 Jul 2014

Netherlands-based Terberg Benschop is to supply 40 LNG tractors for Asyaport’s new container terminal, being built in Turkey on the Marmara Sea.

The YT222 tractors with 170kW Mercedes engines are powerful enough to handle two trailers carrying 20 inch containers.

Asyaport says it chose LNG as a fuel for its environmental properties and the fact that it’s considerably cheaper in Turkey than diesel. There is also an LNG filling station near the terminal, so maintenance is easy.

Terberg’s Turkish distributor Portunus, based in Istanbul, will provide service and support. Delivery will begin in January 2015.

Asyaport’s new deep-water container terminal is strategically located as a transhipment hub for containers destined for the Black Sea via the Bosporus. It will handle vessels carrying up to 18,000 teu and will have an annual capacity of around two million teu.

Investors in the terminal include Terminal Investment Ltd SA (TIL), the terminal operating subsidiary of Mediterranean Shipping Company (MSC), and the Soyu Group in Turkey.

Following this order, Terberg will also supply 28 tractors to TIL’s terminal at Lomé in Togo, West Africa.

Terberg to supply LNG tractors to Turkish terminal

04 Jul 2014 - Terminal Handling

Netherlands-based specialist vehicle manufacturer Terberg Benschop has been chosen to supply 40 LNG-powered tractors for a new, sophisticated container terminal in Turkey.

The Terberg YT222 tractor has a 170kW Mercedes engine, claimed to be powerful enough to handle two trailers carrying 20ft containers.

Servicing and support for the tractors will be provided by Portunus—Terberg Benschop’s Istanbul-based Turkish distributor.

LNG was chosen to power all tractors at the terminal as it eliminates particulate emissions and leads to much lower NOX emissions than diesel. Furthermore, LNG is considerably cheaper in Turkey than diesel and there is an LNG filling station close to the terminal. Delivery of the tractors will commence in January 2015.

To be built by Asyaport on a deep water site, the new terminal will be located around 135km from Istanbul on the Sea of Marmara. The proposed port will be strategically located as a trans-shipment hub for containers destined for the Black Sea via the Bosporus, and will handle 18,000 TEU vessels; it will have an annual capacity of around two million TEU.

For further information on Terberg Benschop, click here
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SEA TERMINALS Consortium and Geographical Scope

Implementing Bodies:

- noatum
- valenciaport
- FV
- Fundación valenciaport
- ampliatel
- ITE
- edae

Global Service Srl
SEA TERMINALS Stakeholders Interest Group

Ports

- LUKA KOPER
  Port of Koper
- Helsingborgs Hamn
  Port of Helsingborg
- Internation container Terminal Services, Inc.
- BCT
  Baltic Container Terminal Gdynia
- MCT
  Container Terminal
- TMGA

European Associations

- NGVA europe
- EUROPHAR

Industry & Energy

- Endesa
- Almazán ingenieros
- Musco Lighting

Equipment Manufacturers

- AVAHLE
- KONE CRANES
- ORBITA INGENIERIA
- CAVOTEC

Smart, Energy-Efficient and Adaptive Port Terminals

SEA Terminals
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SEA TERMINALS: Three Complementary Approaches for European Ports and Terminals

• Smart Energy Management: Integral Monitoring of Container Terminal (Energy + Operations)
  o Design, prototyping and deployment of a Smart, Energy Efficient and Adaptive Management System – SEAMS Platform
  o Integral Monitoring of Port Container Terminal: SEAMS Platform + BlackBox Concept

• Deployment and Demonstration of Last Generation Low/Zero Emission Prototypes
  o Full Electric Terminal Tractor (SEA-eTractor)
  o Hybrid (SEA-HRTG) and Dual-Fuel (SEA-DFRTG) Rubber Tyred Gantry Crane
  o Eco-Efficient Reach Stacker (SEA-EcoRS) and ForkLift (SEA-EcoLIFT)
  o Terminal Dynamic Illumination (SEA-Light)
  o LNG Supply Mobile Module Designed for Port Operations

• Facilitation and Development of an LNG Supply Network for European Ports
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ACTIVITY 1: MODELLING, ENGINEERING AND PROTOTYPING

The main goal of Activity 1 is to improve, adjust and produce the SEA TERMINALS Prototypes, getting them ready for real life deployment at port container terminal scenarios.

• Sub-Activity 1.1: Prototypes Definition Fine Tuning

SA1.1 will be a pre-engineering task oriented to define the functional requirements of the SEA TERMINALS Prototypes. SA1.1 will serve as a “buffer” for the proposed developments in order to converge as much as possible before the start of the assessment, engineering and prototyping phases. In particular, SA1.1 will:

  o Contribute to defining the baseline concept of each SEA TERMINALS Prototype
  o Establish a collaborative work framework between port equipment manufacturers and port operators.
  o Select the most suitable functional and technical solutions among the available alternatives
  o Adapt the prototypes definition to the real demands of port operators
  o Solve technical questions prior to the start of the engineering and prototyping phases
  o Reduce risks of modifications or no compliances once the prototype is built
ACTIVITY 1: The SEAMS Platform Concept
ACTIVITY 1: MODELLING, ENGINEERING AND PROTOTYPING

- Sub-Activity 1.2: Prototypes Modelling and Assessment

SA1.2 will develop detailed modelling and assessment studies oriented to build the conceptual and operational framework where the SEA TERMINALS Prototypes will be deployed, thus linking each prototype with the real operative scenario. SA1.2 comprises the modelling and assessment of two business cases clearly defined in SEA TERMINALS:

Port of Valencia
SEAMS Platform Assessment

Port of Livorno
LNG Network Assessment

Development of an efficient and cost affordable LNG supply network

- Assessment of LNG Bunkering at the Port of Livorno
- Assessment of LNG Safety and Security Aspects
- Assessment of OLT Offshore Toscana Platform as a Bunkering Facility
- LNG Tank Weathering
ACTIVITY 1: MODELLING, ENGINEERING AND PROTOTYPING

- Sub-Activity 1.3: Engineering and Prototyping

SA1.3 will allow port equipment manufacturers to develop all the necessary actions and works to finally get the SEA TERMINALS prototypes ready for real life operations at the participant port container terminals.
**ACTIVITY 2: REAL LIFE TRIALS**

SEA TERMINALS will perform two integrated real life trials at the ports of Valencia (Spain) and Livorno (Italy). Real life trials will be carried out through the following sub-activities:

- **Sub-Activity 2.1 Design of Real Life Trials and Demonstration Plan**

  SA2.1 will address and prepare the different actions needed to carry out the SEA TERMINALS real life trials. These actions will be based on two approaches:

  - **Smart, Energy-Efficient and Adaptive Operations**: Deployment and test of the SEAMS Platform and BlackBox concepts that will encompass the integration of a new dynamic and real time management framework regarding energy efficiency, consumption reduction and emissions minimization at port container terminals.

  - **Low carbon / Zero Emission Eco-Efficient Prototypes**: Innovative Prototypes including LNG powered equipment, full electric/hybrid machinery as well as last generation eco-efficient container handling equipment with significant capacity to reduce GHG emissions.
ACTIVITY 2: REAL LIFE TRIALS

• Sub-Activity 2.2 Port of Valencia Real Life Trial: SEAMS Platform Integration, Black Box Concept and Low Carbon / Zero Emission Machinery Prototypes
ACTIVITY 2: REAL LIFE TRIALS

• Sub-Activity 2.2 Port of Livorno Real Life Trial: LNG Dual Fuel RTG and LNG Supply Mobile Station

First European prototype of a Dual-Fuel LNG RTG crane

First European prototype of a LNG supply mobile station for refuelling port machinery
ACTIVITY 3: SEA TERMINALS PROTOTYPES MARKET AND BUSINESS PLAN

SEA TERMINALS will produce detailed market and business plans for the presented SEA TERMINALS prototypes and derived pre-commercial outputs in order to define and develop a strategy for the commercial release of the solutions generated within the project. This activity will be a relevant action as one of the main goals of the project is to effectively demonstrate feasibility for the market adoption of eco-efficient prototypes with high development degree and ready for commercialisation.

• Sub-Activity 3.1 Product and Market Analysis

Within SA3.1, different prospects on product and market analysis for each of the SEA TERMINALS prototypes will be carried out:

  o Current status of the port container industrial sector
  o Potential customers
  o Providers and competitors

• Sub-Activity 3.2 SEA TERMINALSS Business and Commercialization Strategies

SEA TERMINALS will define particularised business and commercialisation strategies for the effective market integration of the proposed prototypes.
ACTIVITY 4: MANAGEMENT, COMMUNICATION AND COORDINATION

This activity covers the management, communication and coordination activities of SEA TERMINALS that will be required throughout its duration. The administrative and technical organisation structure, control procedures, quality and risk management, monitoring and auditing aspects of the project will be considered within this activity as well as communication and dissemination actions. Activity 4 is divided into the following sub-activities:

• Sub-Activity 4.1 Administrative Management

• Sub-Activity 4.2 Technical Coordination

• Sub-Activity 4.3 Communication and Dissemination
  o Communication Plan
  o Public Demonstration Days at the ports of Valencia and Livorno
  o Port Equipment Manufacturers Open-Doors Days
  o Cross-Communication between Northern and Southern European Ports (BPO-EUROPHAR)
  o Project Website and Social Networking: LinkedIn Group and Twitter Profile
  o Brochures: 1 Intermediate and 1 Final
PROJECT SCHEDULE
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EXPECTED RESULTS

- Contribution to a progressive and quick decarbonisation of port container activities in Europe, thus reducing GHG and pollutant emissions.

- Demonstration of feasibility (financial, technical and environmental) of mature integrated solutions based on smart energy management, eco-efficient technologies and alternative fuels applied to port machinery and equipment.

- Provision of an innovative and market-sided approach in the way that energy is managed at port terminals, considering it as key driver for improving operations and competitiveness.

- Promotion of a collaborative framework among ports, port operators and equipment manufacturers, thus establishing new relationships not only based on commercial interests but also on common innovation opportunities.

- Transfer of the project outputs to as many as possible stakeholders at European level in order to accelerate the evolution of the port sector towards a low-carbon emission operative model.
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Implementing Bodies: