

## SEA TERMINALS

### Smart, Energy Efficient and Adaptive Port Terminals



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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.





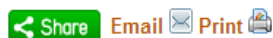
## Quick Deployment of GREENCRANES Products in the Port Sector



insight for senior port executives

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### 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 Bosphorus. 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 Soyuer Group in Turkey.

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



Terberg will supply 40 LNG tractors for Asyaport's new container terminal





## GREENCRANES RESULTS

- First LNG Terminal Tractor prototype, already on the market



- New re-motorization policy for RTG cranes at Noatum



- First dual fuel LNG/Diesel Reach Stacker



- Participation in international congresses



- Collaboration with other reference projects in Europe



- Continuation of the work with SEA TERMINALS



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## SEA TERMINALS Consortium and Geographical Scope



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Implementing Bodies:





## SEA TERMINALS Stakeholders Interest Group

### Ports



### Puertos del Estado



### European Associations



### Industry & Energy



### Equipment Manufacturers



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

- **Smart Energy Management: Integral Monitoring of Container Terminal (Energy + Operations)**
  - Design, prototyping and deployment of a Smart, Energy Efficient and Adaptive Management System – SEAMS Platform
  - Integral Monitoring of Port Container Terminal: SEAMS Platform + BlackBox Concept
- **Deployment and Demonstration of Last Generation Low/Zero Emission Prototypes**
  - Full Electric Terminal Tractor (SEA-eTractor)
  - Low Carbon (SEA-EcoRTG) and Dual-Fuel (SEA-DFRTG) Rubber Tyred Gantry Crane
  - Eco-Efficient Reach Stacker (SEA-EcoRS) and ForkLift (SEA-EcoLIFT)
  - Terminal Dynamic Illumination (SEA-Light)
  - LNG Supply Mobile Module Designed for Port Operations
- **Use of Alternative Fuels and Eco-Efficient Technologies in Port Equipment**





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## ACTIVITY 1: MODELLING, ENGINEERING AND PROTOTYPING

- **Sub-Activity 1.1: Prototypes Definition Fine Tuning**



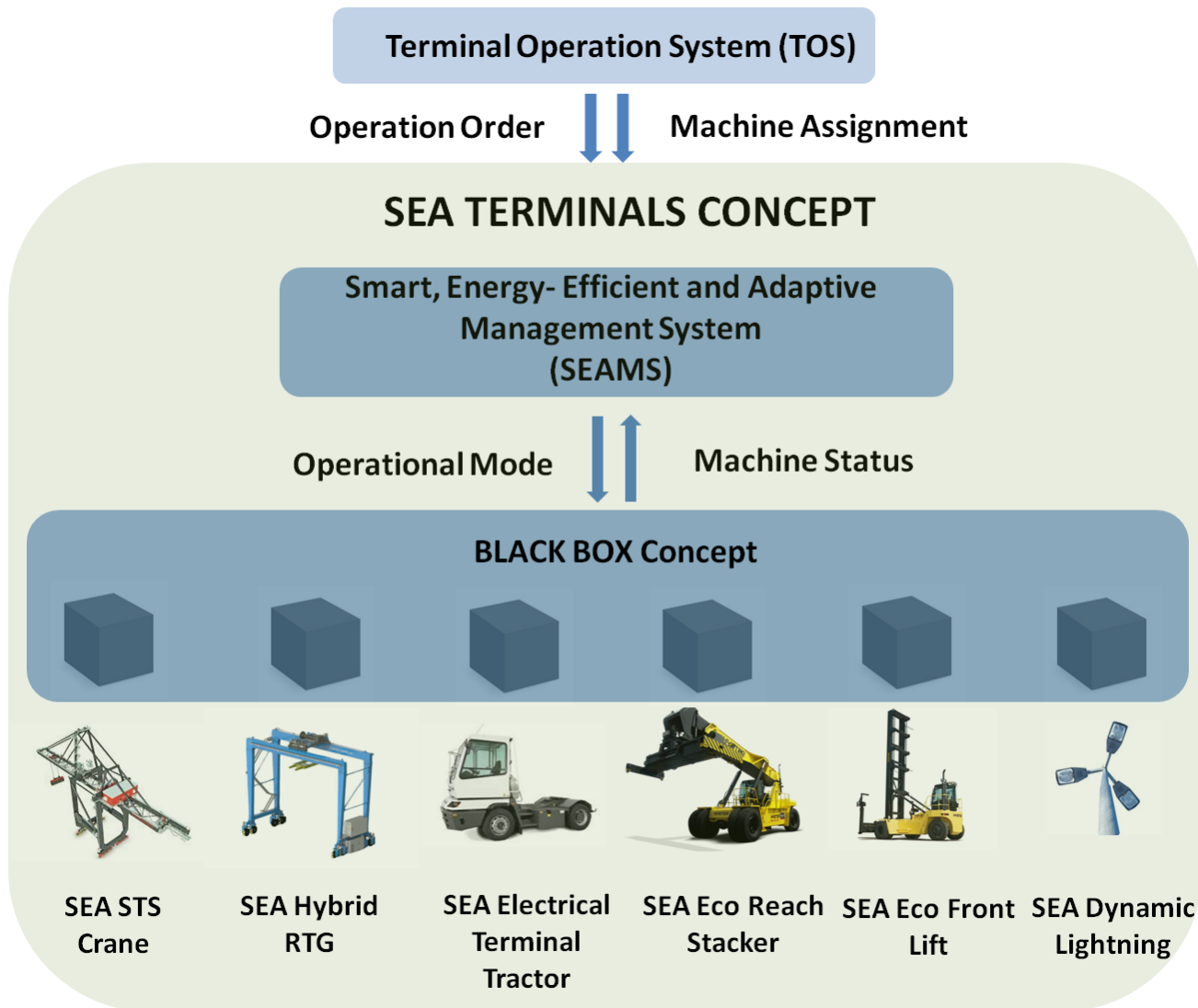
- **Sub-Activity 1.2: Prototypes Modelling and Assessment**



- **Sub-Activity 1.3: Engineering and Prototyping**



## ACTIVITY 1: The SEAMS Platform Concept (Port of Valencia)





## ACTIVITY 1: LNG Infrastructure Development (Port of Livorno)

### PORTS AND VESSELS



### TOSCANA LNG REGASIFICATION PLANT



## 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 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:

- Current status of the port container industrial sector
- Potential customers
- 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.



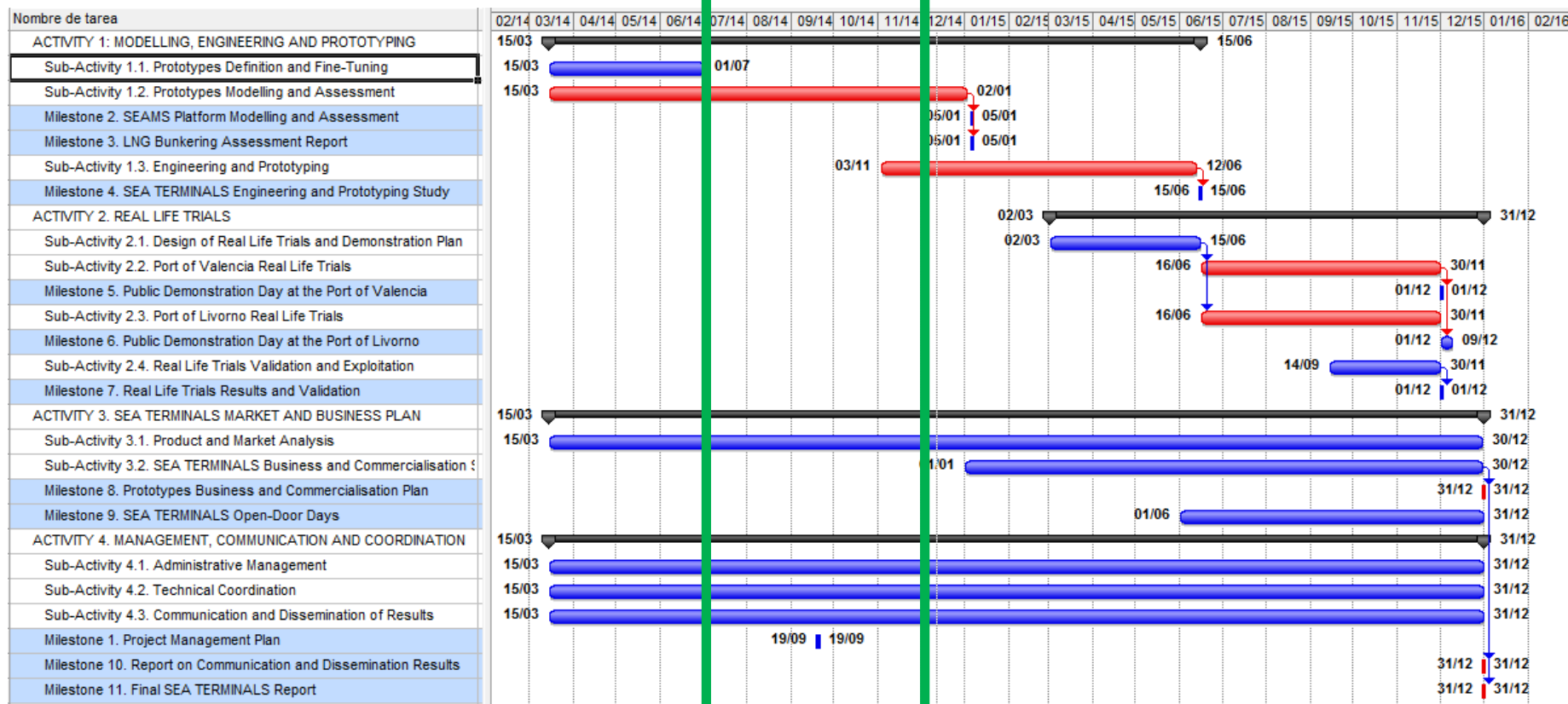
## ACTIVITY 4: MANAGEMENT, COMMUNICATION AND COORDINATION

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**
  - Communication Plan
  - Public Demonstration Days at the ports of Valencia and Livorno
  - Port Equipment Manufacturers Open-Doors Days
  - Cross-Communication between Northern and Southern European Ports (BPO-EUROPHAR)
  - Project Website and Social Networking: LinkedIn Group and Twitter Profile
  - Brochures: 1 Intermediate and 1 Final



## PROJECT SCHEDULE



INEA co-funding approval

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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.

# THANK YOU!

## Smart, Energy Efficient and Adaptive Port Terminals

