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How to Promote sustainable transport in the context of climate change: the case of port of Venice

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“How to Promote sustainable transport in the context of climate change “

• Sustainable transport can be promoted with a two layers strategy:

- “Greening "the whole logistic chain developing new transport multimodal routes" with less impact on CO2 emission to achieve the environmental goals in the white paper on transport – *F.I. the Baltic Adriatic Axis*

- “Greening” maritime transport & port activities, entailing both cutting the GHG emissions and adaptation strategies – *F.i. Port activities, environmental protection of the Lagoon and Heritage safeguard in Venice*
Greening Logistic Chain: coping with Commercial Flows And Maritime Transportation

TRANS-ATLANTIC
Est.2009 size 5.2 m TEU

ASIA-EUROPE
Est.2009 size 16.0 m TEU

LATIN-AMERICA
Est.2009 size 11.9 m TEU

INTRA-ASIA
Est.2009 size 56.2 m TEU

TRANS-PACIFIC
Est.2009 size 17.3 m TEU

Source: Neptune Orient Lines (2009)

CONTAINER TRAFFIC VIA SUEZ CANAL, 2000-2008 (MLN/TEU)
Source: Suez Canal Authority; Drewry Shipping Consultants
Greening the Logistic chain: serving European markets from Asia through the Mediterranean and its main gateways.
Greening the logistic chain: lowering the emissions

Shipping a container, transported by ship and railway, from Suez to Prague via VENICE, rather than via HAMBOURG, allows for a reduction of 124 kg/Teu of CO2 emissions.

Emissions estimate on Suez-all Europe routes and railway transportation

Emissions estimate on Suez-Venice route and railway transportation
Greening the logistic chain: Focus on the Baltic Adriatic

• Connecting Baltic and Adriatic ports
• Shifting part of the Baltic Asian and Mediterranean Trade flows which are passing through Northern Sea Ports reducing CO2 Emission

Things to be done:
• Improving railway infrastructure and multimodal terminals to enable a quick and fast forward of the products
• Increasing the handling capacity and last mile connections of NAPA ports

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Greening maritime transport & port activities
Greening Port Activities: Port of Venice main Environmental and Climate Change Issue

Unique ecosystem, to be preserved by:
- Soil contamination
- Water contamination, wastewater
- Exhaust gas emissions
- Waste production
- Sediment contamination

Interface city and port
- Noise
- Dust (PM)
- Ships waves

Port and City Sustainability Actions:
- Preserving water and improving sediment quality
- Respect air quality standard
- Heritage conservation
- Energy Efficiency
Port of Venice main Environmental and Climate Change Issue: main initiatives

1) MOSE Dams system & dredging channels for the protection of Venice Lagoon from High Waters / rising level of the sea

2) Reduction of CO2 and others GHG emissions:
   – Evaluation of biomass for energy and heat in port Area (Algae plant).
   – Design a photovoltaic park using port roofs and lagoon Island
   – “Cold Ironing” for the Use of energy on shore

3) Mitigation & other measures
The MOSE System to protect Venice and the Lagoon from High Waters & coping with port activities.
Protecting Venice lagoon from high waters
Eviction of Oils from the lagoon & container offshore terminal

The proposal contained in Law 798 dd. 29/11/84 is now extended to all types of goods. The terminal will be designed for oil traffic to be expelled from the lagoon (ex Article 3 of the above Law), not using anymore San Leonardo for oil traffic purposes.

Oil: eviction from the lagoon and connection to the refineries in Marghera and Mantua (3 million tons/year in Mantua, 4 million in Marghera)

Container: from 1.500.000 to 3.000.000 per year, of which 500.000 for Po River transport through Chioggia and Porto Levante
The Offshore Terminal is designed to allow, inside the breakwater, a modular construction of facilities dedicated to port operations, both in relation to the types of goods to be moved and to the vessels to be accommodated.
Greening Port Activities: Energy Saving Investments

- Best practise energy saving solutions
- Change methane heating system to biofuel in all buildings
- Cogenaration for methane heating buildings + more efficient heating system for not continuous use buildings
- Tri-generators for existing centralized heating/conditioning buildings + cogenaration for...
- Photo voltaic plant on the Venice Port Authority and cruise terminal (VTP) buildings

% CO2 saved

On going actions

Planned actions
WHAT IS SHORE SIDE ELECTRICITY GRID SUPPLY?

- Ships can shut down engines while berthed and plug in to an onshore power source
  - The ship’s power load is transferred to the shore side power supply without disruption to onboard services
  - GHGs Emissions Avoided. (- 80% CO2)
**Microalgae Power Plant**

**POWER PLANT FEATURES:**
* Location: Tresse Island
* Facility Surface: 20 He (TBE)
* Nominal Power: 40-50 MW
* Expected Cost: 200.000.000 Euros
* Construction Time: 2 years

**TECHNOLOGY (BFS)**
* Bio Fuel System
* Microalgae: Diatomee
* 2 Units: - Breeding PhotoBio Reactors - Conversion Unit
* 80% Biomass for Bio fuels Production
* 20% High Value Added substances

**ADVANTAGES:**
* Zero emissions
* In Situ production
* Maximize space and efficiency
Greening Port Activities: Pilot Plant Venice Port

- **Lab and research unit** for project and management of large project in Port of Venice
- Bioreactor have to be tested in local condition for discovering potential and weak points for the Venice Lagoon
- Lab and research unit will develop by product innovative extraction processes
- 0.5 Mw generating plant in Pellestrina Island
Mitigation Actions of dredging the lagoon and canals: the “Moranzani Agreement”

- Action is focused on hazardous and not hazardous contaminated sediment dredging: 1.65 M m³ removal from the port and industrial channel.
- Navigation dredging coincides with Environmental Dredging.
- This action is part of a wider project that will take the total requalification of suburban area close to industrial port facilities. Dredging will be combine with roadway and hydraulic improvement, energy plant grounding, park and relocation of oil tank area.
- One third of the cost will cover environmental compensation (old landfill safe action, grounding power plants...).
- Action will reduce contaminant reservoirs: polluted sediments.
- Financial amount for VPA will be about 51 M€ on 260M€ funds available (Moranzani Cost 478 M€).
MORANZANI AGREEMENT - ACTIONS

- Treatment Plants and Final Disposal for hazardous sediment
- Confined Disposal Facility for non-hazardous sediment
Greening port activities: other initiatives

- **Preserving water and improving sediment quality** through works on the channels banks and rehabilitation of industrial polluted areas
- **Respect air quality standard through the “Venice Blu Flag”**, that provides on sulphur reduction and engine rules during mooring in Venice Port
- **Heritage conservation from erosion generated by waves**: ship waves measurement through stereometric investigation (Hydra system) to control the respect of the navigation protocol whithin Venice.
Thank for your attention!

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