

***Two parallel tracks for the development of the port: efficiency and environment protection***

45° 26' N  
12° 20' E

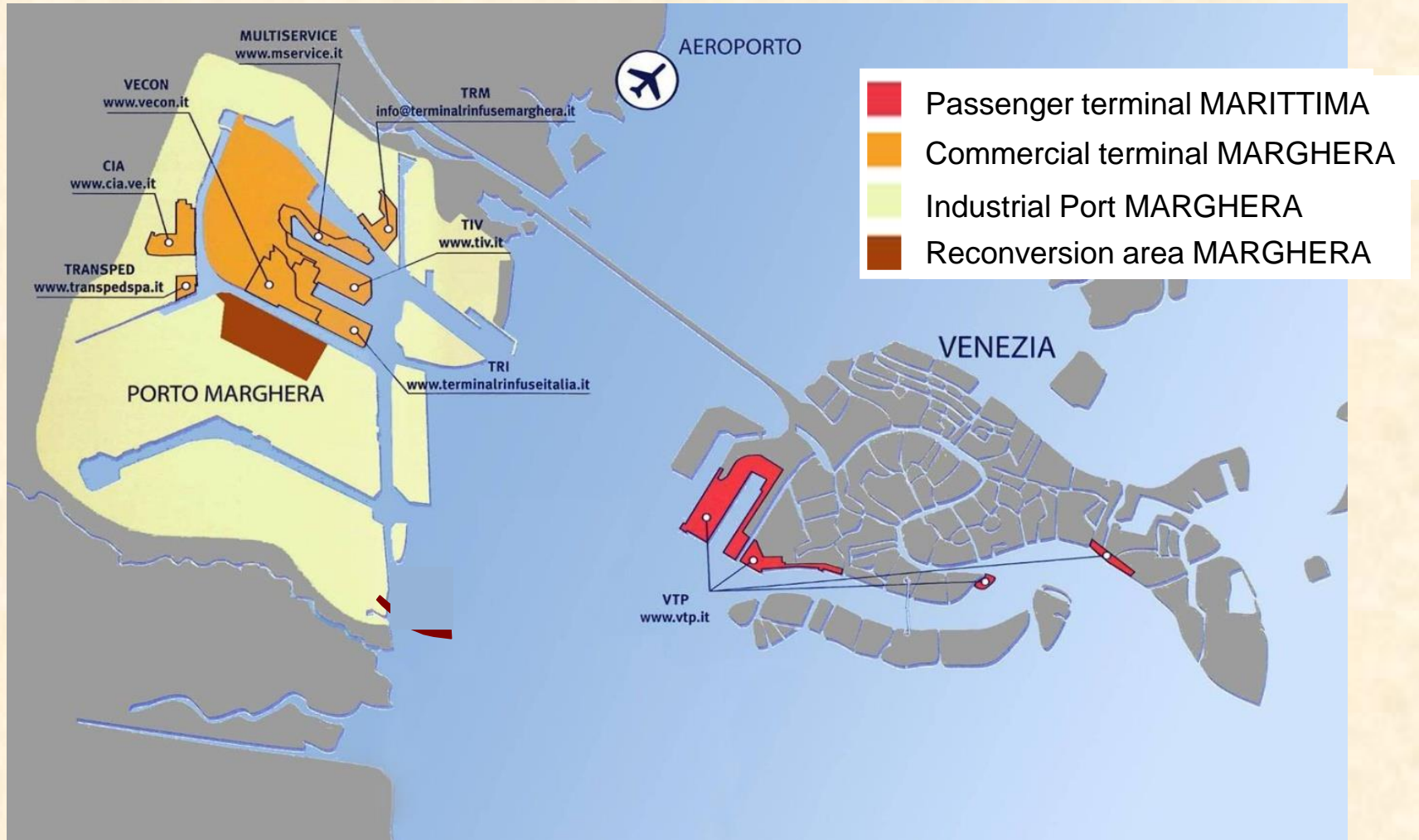
Ing. Nicola Torricella – Technical Manager

Venice, 13th December 2013



AUTORITÀ PORTUALE  
DI VENEZIA

# VENICE 2 PORTS: MARITTIMA AND MARGHERA



## COMMERCIAL PORT MARGHERA

- 26.000.000 tons
- 26 TERMINALS  
commercial, industrial and oil  
terminal
- 30 Km docks
- 163 berths
- 205 km railways
- 2.050 hectares

## MARITTIMA PASSENGER TERMINAL

- 2.300.000 passengers
- 8 berths
- 200 mega yachts/year
- First Mediterranean cruise  
home port
- Value: € 500 million
- VPA investments  
(since 1997 to 2013): more  
than € 70 mil

**40.000 direct employees**

## Port activities Impact evaluation matrix

PRESSURE	IMPACTS	QUANTIFICATION OF IMPACTS	MITIGATING ACTIONS
<b>Waves</b>	Walk-ways and submerged structures	Studies and Analysis: Cruise ships produce wakes indistinguishable from background noise. The increases in speed of the currents of water are of the same order of magnitude as a tidal flow.	No mitigation needed
<b>Vibrations</b>	Buildings	Studies and Analysis: The passage of ferries and cruise ships does not induce vibrations that cause damage to structures or disturbance to the people who occupy the building. The levels are below the effects produced by walking on the floors.	No mitigation needed
<b>Noise</b>	Subjects exposed	Studies and Analysis: Ships in transit and at berth observe the noise limits imposed by the Municipality of Venice.	Berthing Plane
<b>Radar</b>	Subjects exposed	Studies and Analysis: Ships use radar in transit; this technical equipment is validated and can not be turned off for safety in navigation. APV has realized a study to quantify the possible effects with Padua University	No mitigation needed
<b>Air Pollutants</b>	Subjects exposed	Studies and Analysis: Between 2007 and 2009 there was a progressive reduction in emissions from cruise ships. The contribution of big ships to the levels of particulates (PM <sub>2,5</sub> ) can be estimated at 5%, while for sulfur dioxide it is 28%. A.P.V. together with Harbour Master and Custom Office laboratory verify effectively the compliance of legislation analyzing fuels samples taken on board.	The application of the Venice Blue Flag voluntary agreement and the Consolidated Environmental Act on the use of fuels with a low sulfur content represents the solution over the short and medium term (apice project result) Over the long term evaluations for the best technical/economical solutions are ongoing (off onboard generator with the electrification of the docks to power ships, use of scrubbers, use of LNG / alternative fuels).

# PORT AIR QUALITY ACTIONS: SHIP EMISSIONS MEASUREMENT

**27/04/2007** - With the signature of the **first “Venice Blu Flag”**, VPA, Harbour Master, Venice Municipality and cruise and ferry companies had **voluntary agreed on using fuel with increasing lower level of sulphur** and engine rules during mooring in Venice Port.

Through collaboration with IDPA-CNR and Ca’ Foscari University of Venice, VPA studied in 2007, 2008 and 2009 the agreement effects in Venice historical city, in particular estimating ship emission contribution to:

- **PM 2.5,**
- **PM10,**
- **PAH,**
- **heavy metals (2007),**
- **NO<sub>2</sub> – SO<sub>2</sub>**

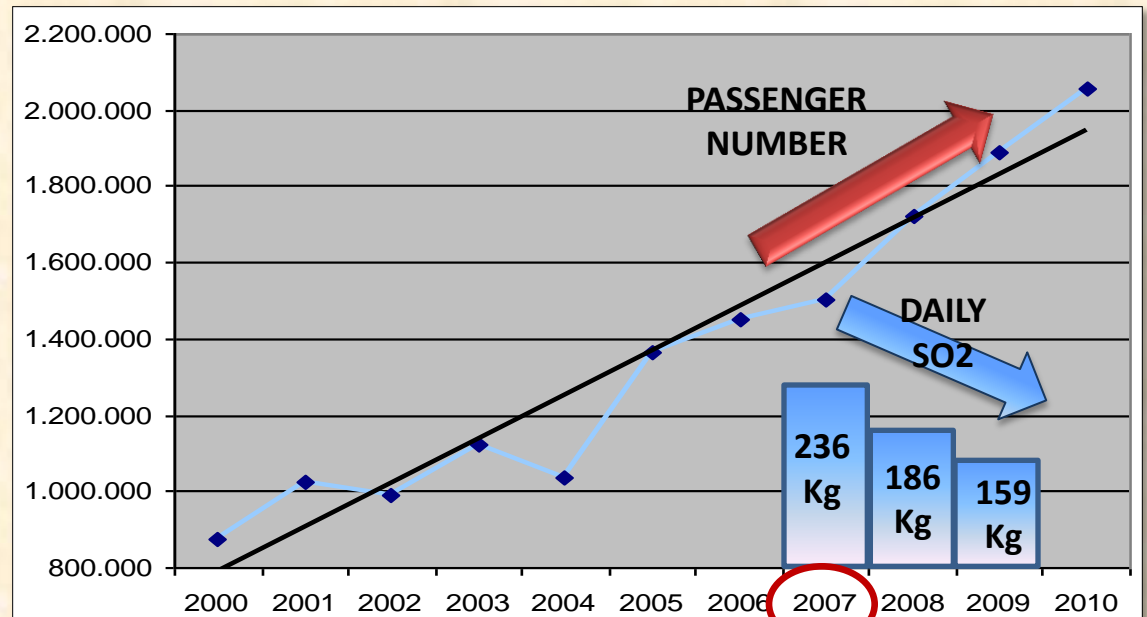


# PORT AIR QUALITY ACTIONS: SHIP EMISSIONS MEASUREMENT



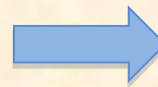
*No significant correlation between PM 2.5 concentration and tonnage (peaks detected even in absence of cruise ships in port)*

*Decreasing SO<sub>2</sub> .... But increasing passengers trend in from 73 thousand in 2000 to over 2 million*



**BLUE FLAG**

- *Decreasing SO<sub>2</sub> in mass/day*
- *Decreasing SO<sub>2</sub>/NO<sub>2</sub> ratio*



*Index of using a better fuel  
Effectiveness of Venice Blue Flag*



## VENICE BLUE FLAG II (2013 CRUISE SEASON)



Thanks to **Venice Blue Flag** voluntary agreement and the measurement campaigns carried out to assess the influence of the ships' transit on the air quality in the urban area of Venice, the emissions of SO<sub>2</sub> were strongly reduced from 2007 to 2009.

Over the short and medium term, on 20<sup>th</sup> of May 2013 VPA subscribed - together with Harbor Master, Venice Terminal Passenger and the Municipality of Venice and shipping companies - a new voluntary agreement (**Venice Blue Flag 2013**) for the use of fuel with lower level of sulphur (0.1%) within the Port of Venice.

This limit (well below the regulatory level 3.5 %) permit a further reduction of SO<sub>2</sub> emissions and a consequent improvement of air quality

ACCORDO VOLONTARIO PER VENEZIA

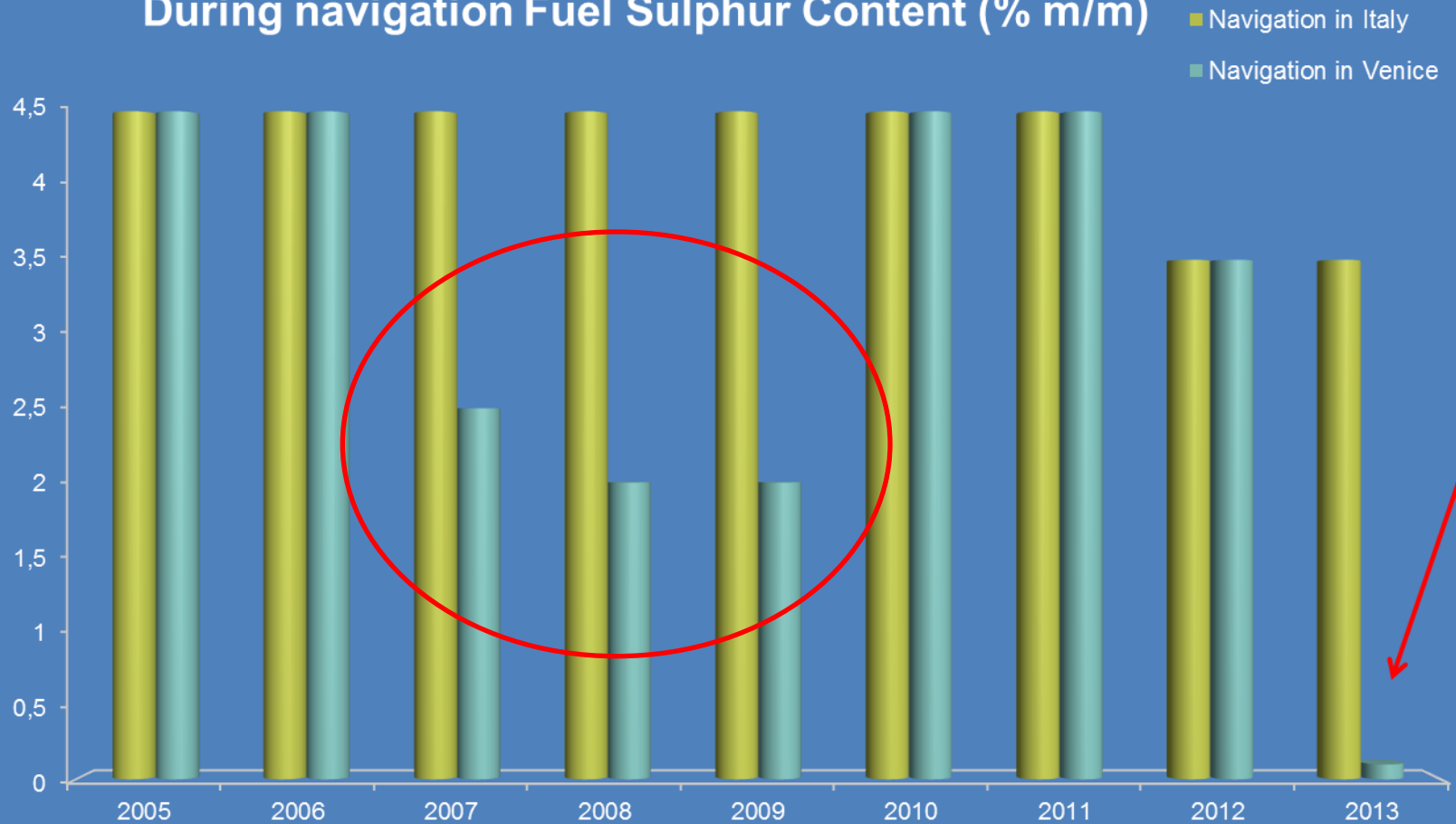
**“VENICE BLUE  
FLAG”  
2013**

Venezia 20 maggio 2013

# EFFECTIVENESS OF VENICE BLUE FLAG during navigation



## During navigation Fuel Sulphur Content (% m/m)






# AGREEMENT ON CONTROLS



In order to verify the compliance to legislation, in 2012 and again in 2013 VPA, Harbor Master and Custom Office laboratory signed up a voluntary agreement to define some clear procedures to analyze fuels samples taken on board.

Laboratory analysis on bunker samples join standard on board inspections carried out by Harbor Master on “bunker delivery notes”.

Checkup are carried out to verify, from an analytical point of view fuel sulphur content, in relation to bunker delivery notes declaration.



AGENZIA DELLE DOGANE  
E DEI MONOPOLI

**RAPPORTO DI PROVA**  
ASI N. 363923

Autorità Portuale di Venezia  
Protocollo generale: ENTRATA  
0005686 05/04/2013  
Classificazione: 2013 - 9.6.0  
20130005686 UOR: Servizio archivio  
Istico

Prot. Lab. N. 883/2013 Denominazione della merce: MGO Categoria Mercologica: 17 - PROFOTTI PETROLIFERI E DENATURANTI, SLOPS, FONDAMI DI SERBATOIO, MISCELE ACCIDENTALI Prodotto: OLI DA GAS TRAZIONE - Prelevatore: AUTORITA PORTUALE DI VENEZIA Prelevato il: 02/04/2013 Pervenuto il: 02/04/2013	Cliente: AUTORITA PORTUALE DI VENEZIA Indirizzo: SANTA MARTA FABBRICATO 13, VENEZIA (VE), Riferimenti indicati dal cliente Identificativo Campione: CONVENZIONE del: 27/06/2012 Campione riferito a: Ditta / persona: AUTORITA' PORTUALE DI VENEZIA SANTA MARTA FABBRICATO 13-VENEZIA (VE)
--	---

**Descrizione del campione**  
LIQUIDO GIALLO SCURO IN BOTTIGLIA CON INDICATO NAVE MSC DIVINA DATE OF DELIVERY 13-03-13, CHIUSA CON SIGILLO 0051251.

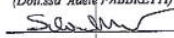
  


Codice tariffario	Determinazione	Metodo/Anno	Risultato di prova	Incertezza	Unità di misura
9000400003	ZOLFO	UNI EN ISO 9754:2005	0,066	± 0,012	% m/m


  

I risultati dell'incertezza di misura riportati per le prove sopra elencate sono stimati con un fattore di copertura k=2 corrispondente ad una probabilità di circa il 95%.  
Il presente rapporto di prova riguarda solo il campione sottoposto a prova, e non può essere riprodotto parzialmente, salvo approvazione scritta del Laboratorio.

Data Inizio Prove: 03/04/2013  
 Data Fine Prove: 03/04/2013  
 Il Responsabile del Laboratorio  
 (Dott.ssa Adele FABBRETTI)  
  
 Data: 03/04/2013



Il Chimico  
 (Dott.ssa Francesca OSELLO)  


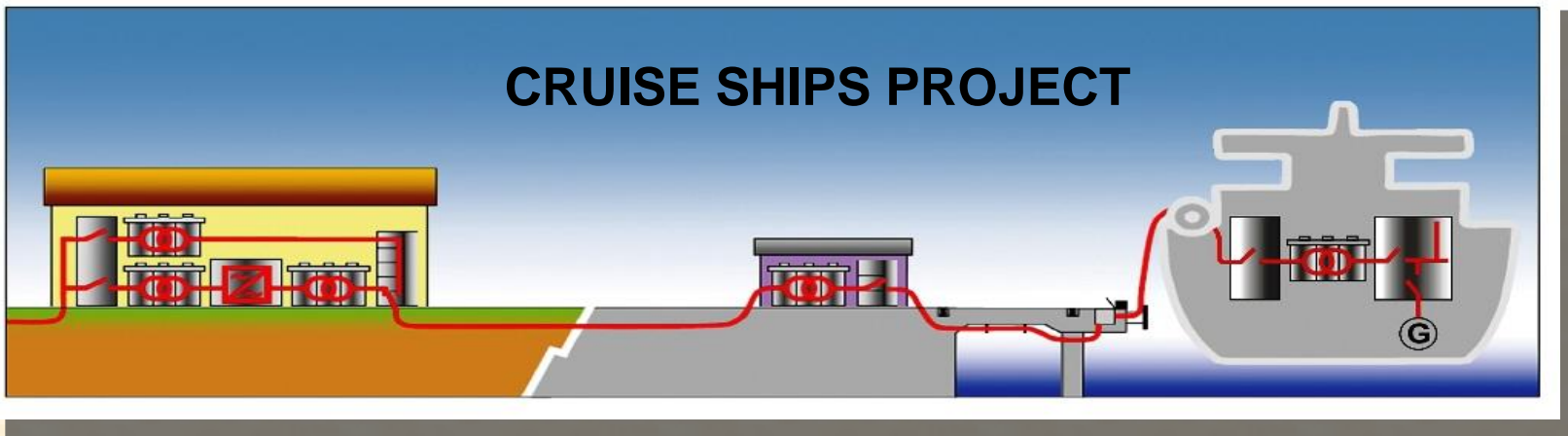
DIREZIONE INTERREGIONALE PER IL VENETO E IL FRIULI VENEZIA GIULIA  
 Laboratori e Servizi Chimici - Laboratorio Chimico di Venezia  
 Via dell'Elemia n. 19 - 30175 Venezia - Minghera  
 Telefono: +39 0415221179 - Fax: +39 0412527154 - e-mail: did.veneto\_fvg.lab.venezias@agenziadogane.it



Over the long term, VPA has started up a number of projects aimed at cutting dangerous emissions and ensuring a higher **energy** sustainability of port activities by:

- ❖ designing a Cold Ironing system for the Passenger terminal (4 berths, 80MW);
- ❖ using retrofitting technologies: scrubbers (hotelling and manouvering);
- ❖ using alternative fuel (LNG)
- ❖ Using LED for new lighting system.

# REDUCING AIR POLLUTION: COLD IRONING TECHNOLOGY



Main incoming substation RES	Power cables	Shore-side substation	Berth terminal	Onboard installation
---------------------------------	--------------	--------------------------	----------------	----------------------

### ⇒ **PROJECT [ *Marittima* ]**

- Installation of 4 berths [20 < MW each]
- Economic Investment: furniture 55.000.000 Euros
- Target : cruise vessels docked in Marittima quays

### ⇒ **MAIN BENEFITS**

- Improve air quality: less pollutants, noise and vibrations
- Better onboard comfort while in port
- Meeting local and international environmental regulations
- Green Profiling for ship owners and customer

# SAN BASILIO: COLD IRONING mega – yachts

VTP realized a Cold Ironing, for mega-yachts, already operating since 2010

✓3 OPS

✓220 – 400 V

✓50 Hz

✓0,5 MW each

✓*Banchina Tagliamento*



## GREEN ENERGY USE: LED Lighting Technology



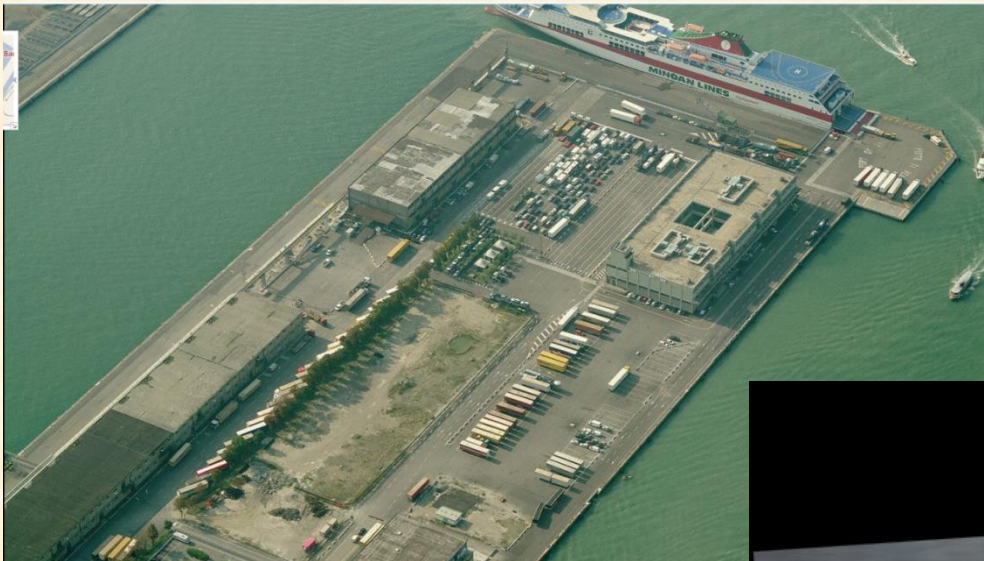
In Autumn 2010 the VPA started using LED technology to illuminate Passenger Port (*Molo di Ponente* - 14 ha surface)

- innovative, high efficiency lighting system
- takes into account the R.L. 17/09 about light pollution
- compared with the conventional systems, the new 23 metre **spotlights enabled the port to save 70% more energy**

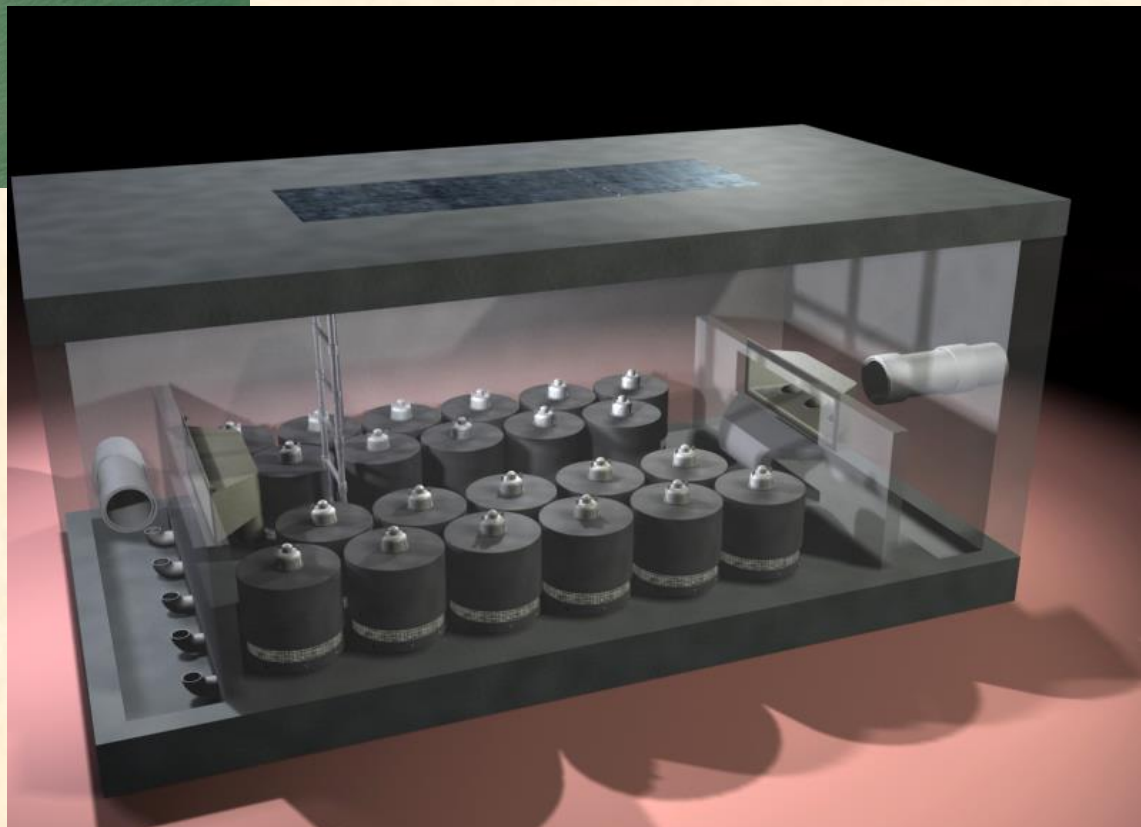
- **The same system has been implemented in**
- **Marittima gate area and in Marghera new gate area**



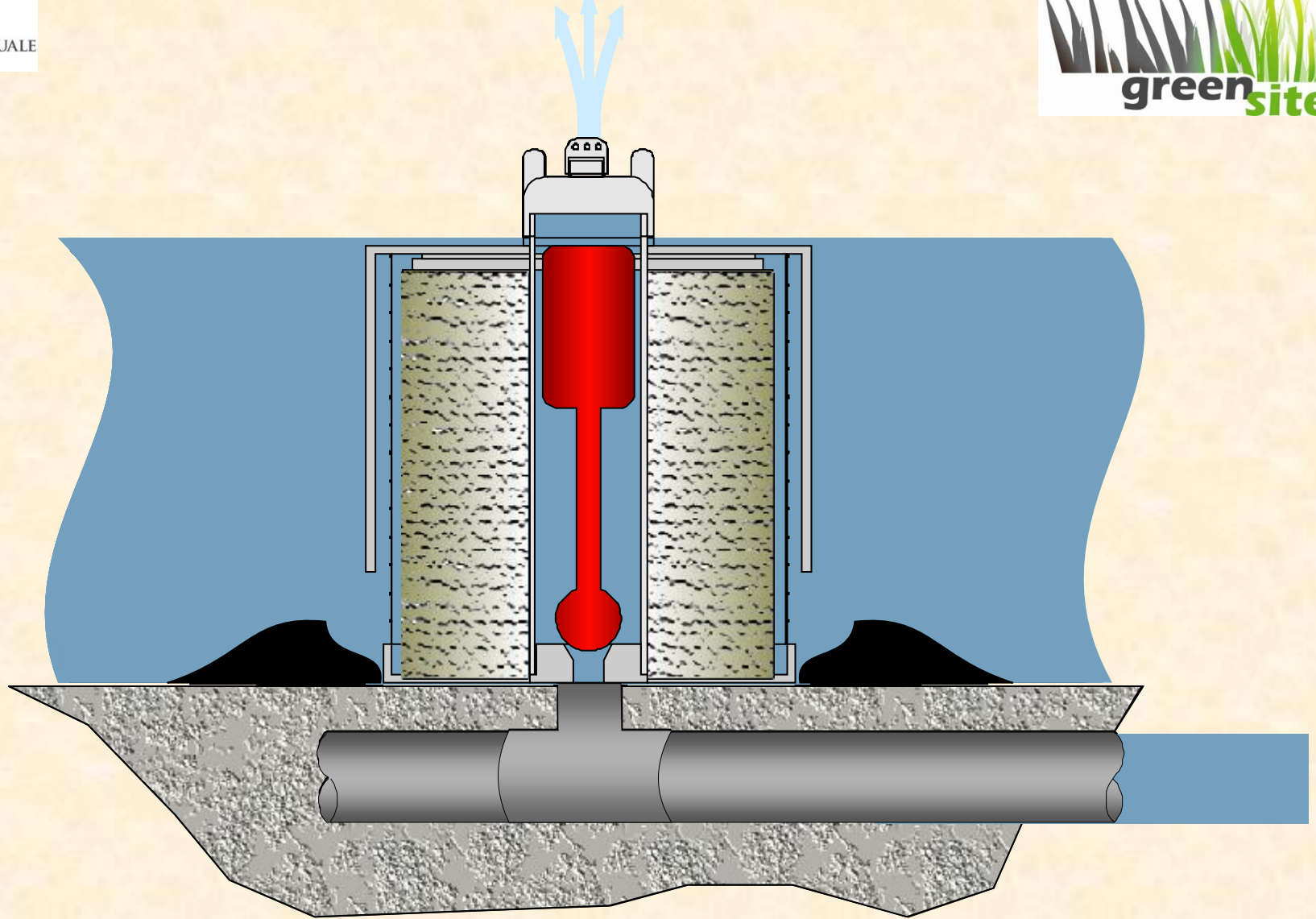
# STORMWATER TREATMENT: MARITTIMA PLANT



**Area 14 hectars**  
**Treatment capacity:**  
**352 l/sec**  
**Total cost: 1 million euro**



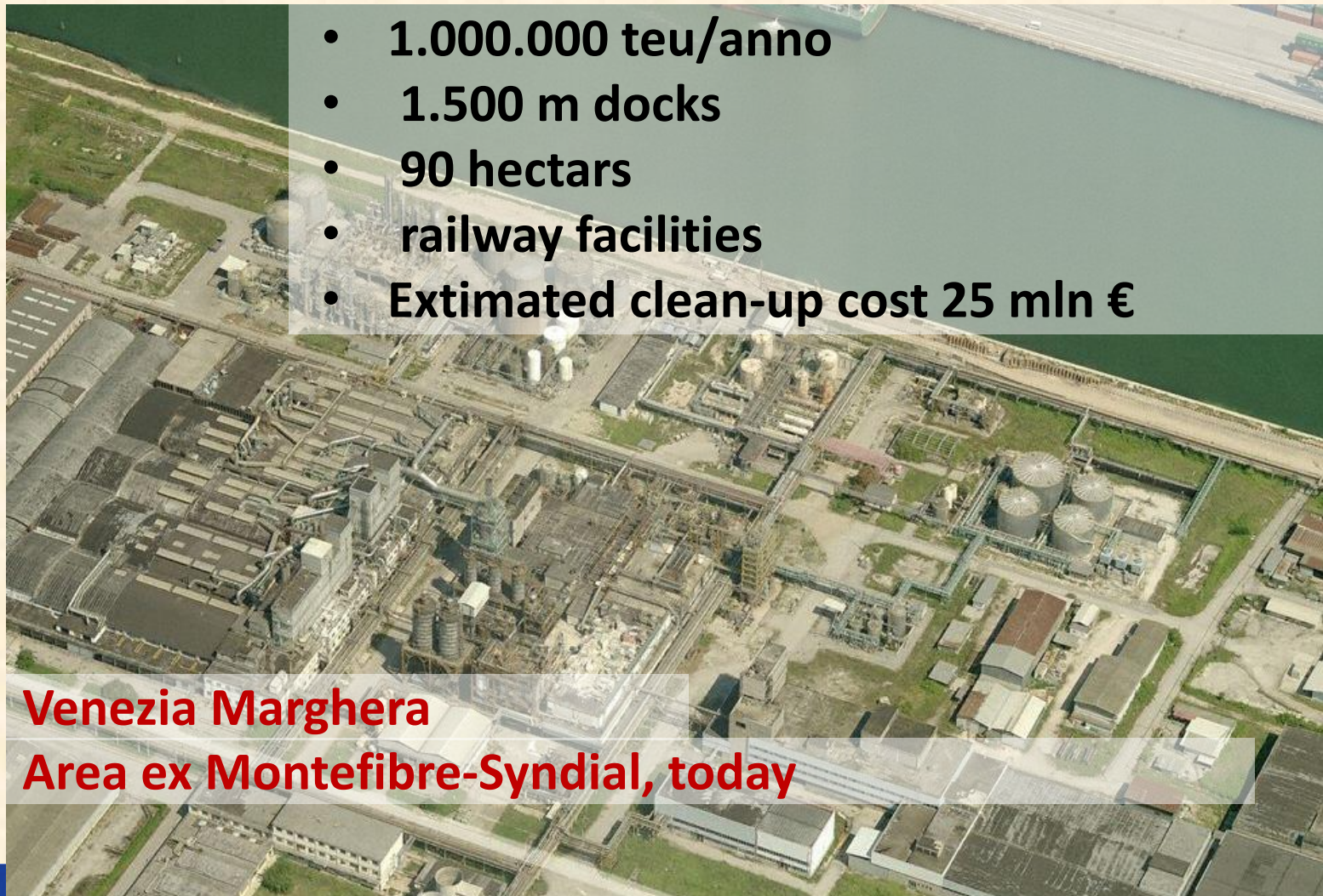
# STORMWATER TREATMENT



**VPA is implementing the same system in Marghera  
Via dell'Azoto area and in Via dell'Elettronica area**

# OLD INDUSTRIAL SITES RECONVERSION

## THE NEW CONTAINER TERMINAL



- 1.000.000 teu/anno
- 1.500 m docks
- 90 hectars
- railway facilities
- Estimated clean-up cost 25 mln €

**Venezia Marghera**

**Area ex Montefibre-Syndial, today**



# OLD INDUSTRIAL SITES RECONVERSION: THE RO-RO TERMINAL



**TOTAL AREA: 36 HECTARS**  
**CLEAN UP OF CONTAMINATED**  
**SOIL AND GROUNDWATER COST:**  
**55.400.000 €**

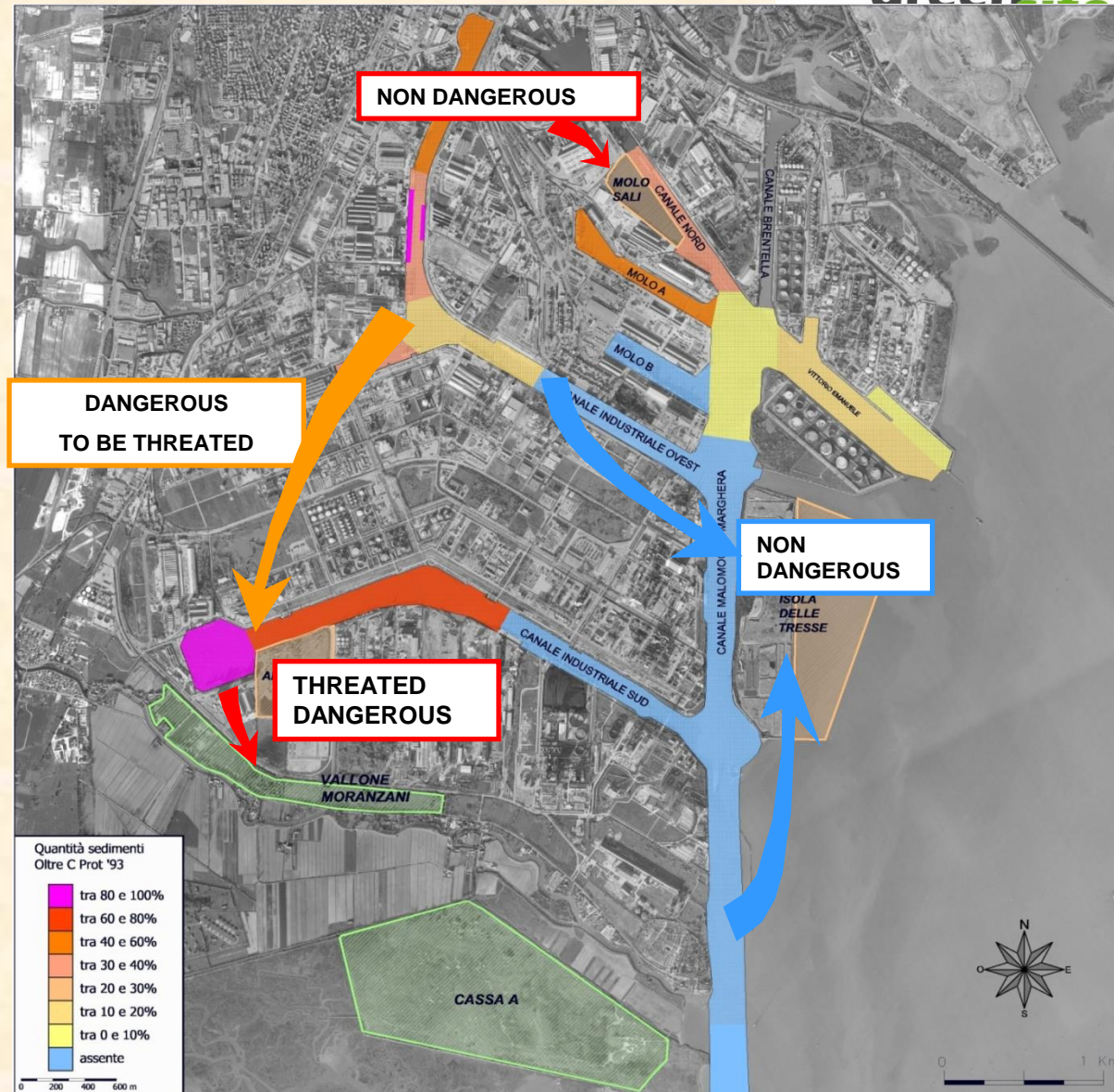


**NAVIGATIONAL DREDGING =  
REMEDIAL DREDGING**

**VPA investimenti since  
2004 = 150.000.000 €**

**5.000.000 cubic metres  
sediments dredged**

**MORANZANI AGREEMENT  
Treatment Plant**



# PORTO MARGHERA MEGASITE: VPA ENVIRONMENTAL INVESTEMENT



WORK	COST
DREDGING AND DISPOSAL OF CONTAMINATED SEDIMENTS	150.000.000 €
EX MONTEFIBRE (NEW CONTAINER TERMINAL AREA CLEAN UP)	25.000.000 €
EX ALUMIX (NEW RO-RO TERMINAL AREA CLEAN UP)	55.400.000 €
VIA AZOTO CLEAN UP	4.500.000 €
DARSENA CANALE OVEST	600.000 €

# PORT GREEN ACTIONS AND ISO 14001



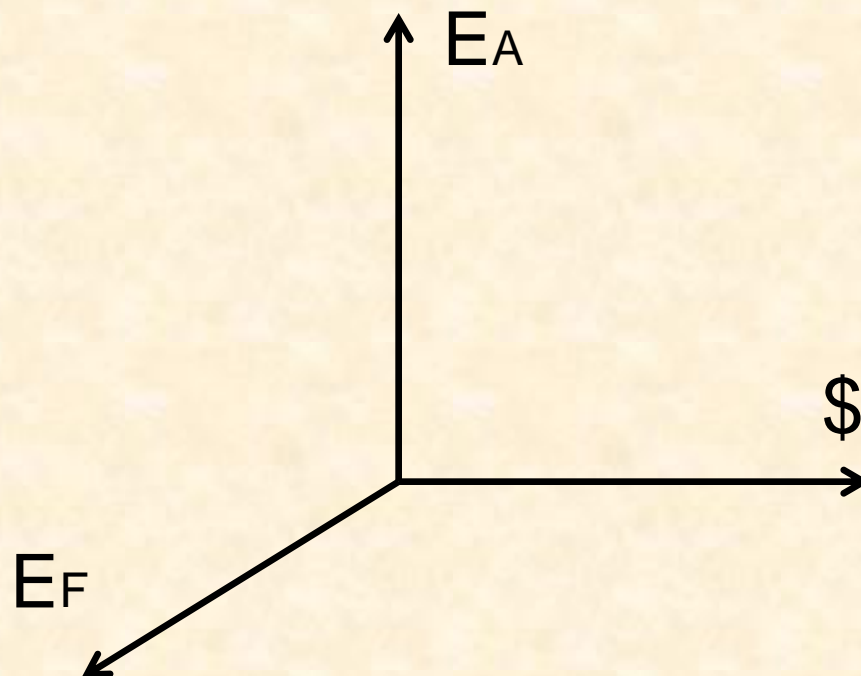
**IN JANUARY 2012 VPA  
OBTAINED**

**UNI EN ISO 14001 CERTIFICATE**



**FOR THE ENVIRONMENTAL  
MANAGEMENT SYSTEM**

# WHAT IS THE BEST SOLUTION?



$$F = F(\$ \text{ min}; E_F \text{ max}; E_a \text{ max})$$

# Greensite prototype

The Venice Port Authority is seeking and promoting such a kind of experimentation!

# Thank you for attention!

## Nicola Torricella

Technical Manager

[nicola.torricella@port.venice.it](mailto:nicola.torricella@port.venice.it)

Venice Port Authority