Ex-Post Climate Change Assessment Study – Methodology and Preliminary Results

Final Event - 1 December 2021

INES-Implementing New Environmental Solutions in the Port of Genoa

2014-IT-TM-0276-W

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RINA's activities

Grant Agreement n. INEA/CEF/TRAN/M2014/1037689 requires preparation of a dedicated study («*Ex post climate change assessment*») relevant to the electrification project for cold-ironing system of Pra' terminal.

AdSP assigned to RINA Consulting the study, consisting of:

- modelling of environmental effects (aerial noise, air pollutant fallout, GHG)
- monitoring for modelling setting
- final reporting

Study references

- EIA Guidance Document on the preparation of the EIA Report (https://ec.europa.eu/environment/eia/pdf/EIA_guidance_EIA_report_final.pdf)
- Italian Ministry for Environment - Guidelines for preparation of Environmental Monitoring Program (https://va.minambiente.it/it-T/DatiEStrumenti/MetadatoRisorsaCondivisione/1da3d616-c0a3-4e65-8e48-f67bc355957a), for relevant environmental components (air, noise)

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Acoustic Impact Evaluation

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- study of the problem and available documentation
- identification of receptors
- acoustic characterization of the area by means of phonometric measurements
- characterization of sound sources (container ships) by means of phonometric measurements
- modeling of the measured data

Measurement location

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Selection criteria for noise monitoring stations identification

- noise sources current/future location
- road/railway traffic incl. Pra' Terminal access roads
- paths of noise diffusion in free field
- setting/calibraration of the acoustic model
- receptors/surrounding places of life

Noise Monitoring

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- Reference document – Genoa Municipality "*Mappatura Acustica secondo le disposizioni del D. Lgs. 194/2005 e della Direttiva Europea 2002/49/EC29, aggiornamento anno 2016 con sorgenti portuali esaminati Bacino Storico – Area riparazioni navali e Voltri Terminal Europa*», July 2017

  - Noise monitoring @ 5 stations (h24 – duration of port activities)
  - port surroundings + hills
  - 10-11 November 2021
  - Noise source : 2 ships moored

Preliminary results

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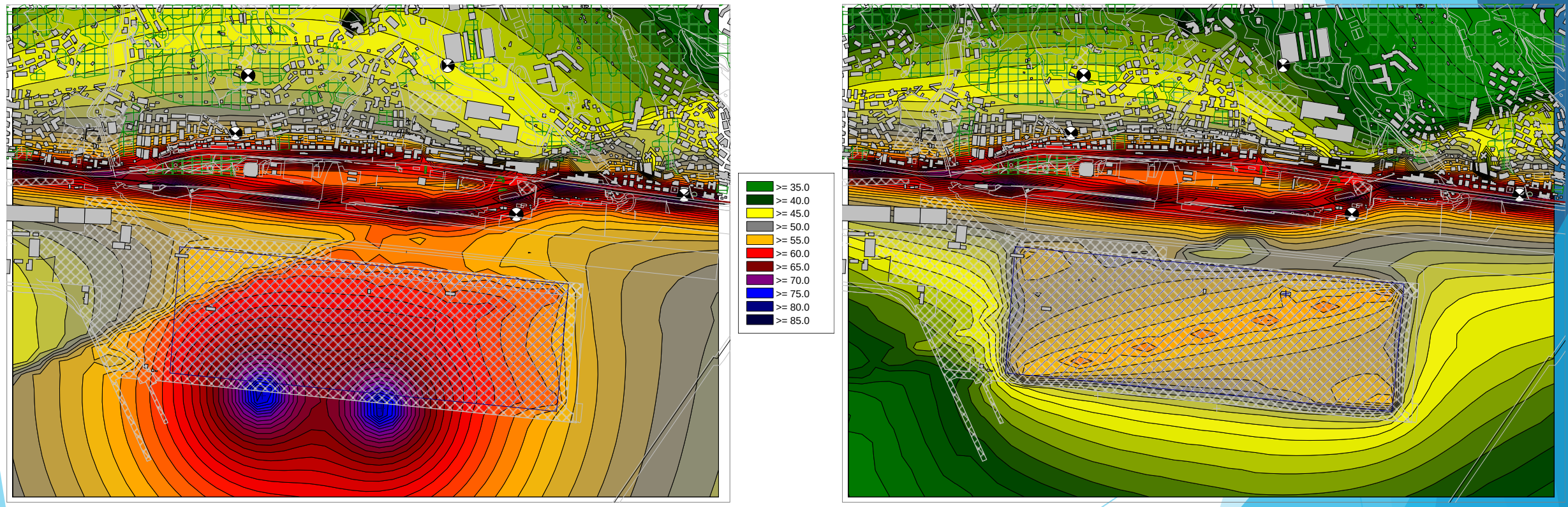

Preliminary results show a significant reduction of noise emission

Air Pollutant Modelling

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Adoption of Tier 3 Methodology («*Air Pollutant Mission Inventory Guidebook 2019*», EMEP/EEA)

- definition of Emission factors (ship gross tonnage, container ship, auxiliary power)
- calculation of Specific Fuel Oil Consumption (217 g/kWh – auxiliary, mooring, MDO)
- calculation of Fuel consumption (SFOC, auxiliary power)
- pollutant emission factors (NOx, PM10, SO2, CO and VOCs kg/t fuel)
- overall emissions (mooring duration, auxiliary engine load factor, emissions factors)
- calculation of pollutant mass flux to be modeled (CALPUFF)

Modelling activities under completion

GHG Emissions

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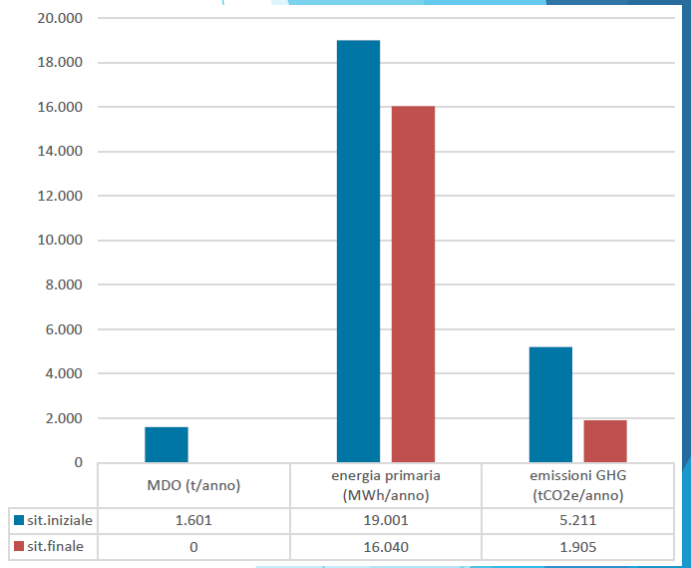
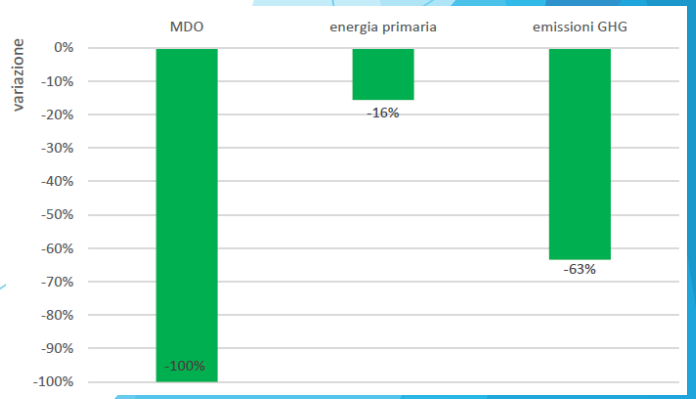
GHG emission reduction (tons of CO2- equivalent) is estimated considering:

- power supply to ships (MWeh – one year)
- fuel consumption (ton/MWeh)
- emission factor per fuel type (EMEP/EEA)
- grid emission factor (kgCO2eq/kWeh, ISPRA 2020)





Parameter	Ex Ante	Ex Post	Reduction	
Power consumption	7.377	7.377	0	MWh_e/year
Fuel consumption (MDO)	1.601	0	1.601	t/year
GHG Emissions	5.211	1.905	3.305	tCO_2eq/year

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Thanks for your attention