



Possible designation of the Mediterranean Sea, as a whole, as an Emission Control Area for sulphur oxides (Med SO_x ECA) pursuant to MARPOL Annex VI, within the framework of the Barcelona Convention

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National Workshop (virtual) on Ratification and Effective Implementation of MARPOL Annex VI for Egypt

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A possible Mediterranean SOx ECA in the region

Common agenda since 2005



2005 Regional Strategy (2005-2015) (Specific Objective 13)

2008 Guidelines & Procedures: ratification process of MARPOL Annex VI and preparations for the submission of an application to IMO for the Mediterranean Sea to be designated as a SOx ECA

2010 MARPOL Annex VI Regional Workshops
2014

2016 Regional Strategy (2016-2021) (Specific Objective 15)

2016 Establishment of a SOx ECA(s) Technical Committee of Experts (22/22 Contracting Parties)

2017 Consultations on the Terms of References

2018 Launch of the preparation of a technical and feasibility study

Consultation process

Co-funding: Mediterranean Trust Fund, IMO's ITCP, Italy and France

2018

- 1 Oct Draft Technical and Feasibility Study circulated
- 15 Nov 1st Consultation - SOx ECA(s) Technical Committee of Experts
- 11-13 Dec Regional Workshop on Ratification and Effective Implementation of MARPOL Annex VI

2019

- 16 April Revised draft Technical and Feasibility Study
Draft recommendations
Draft road map
Initial draft submission to the IMO circulated
- 29 April 2nd Consultation - SOx ECA(s) Technical Committee of Experts
- 11-13 Jun Thirteenth Meeting of the Focal Points of REMPEC
- 10-13 Sep Meeting of the MAP Focal Points
- Oct-Dec **MARPOL Annex VI National Workshops**
- 2-5 Dec 21st Ordinary Meeting of the Contracting Parties to the Barcelona Convention and its Protocols

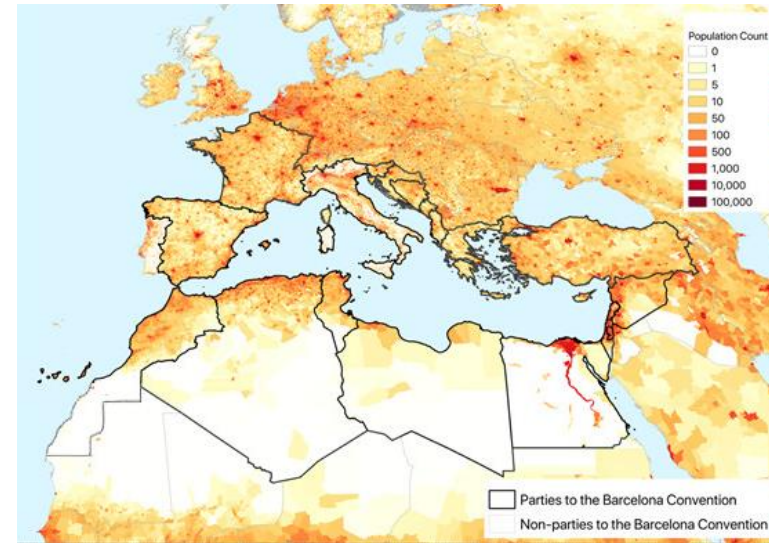
Area of Study



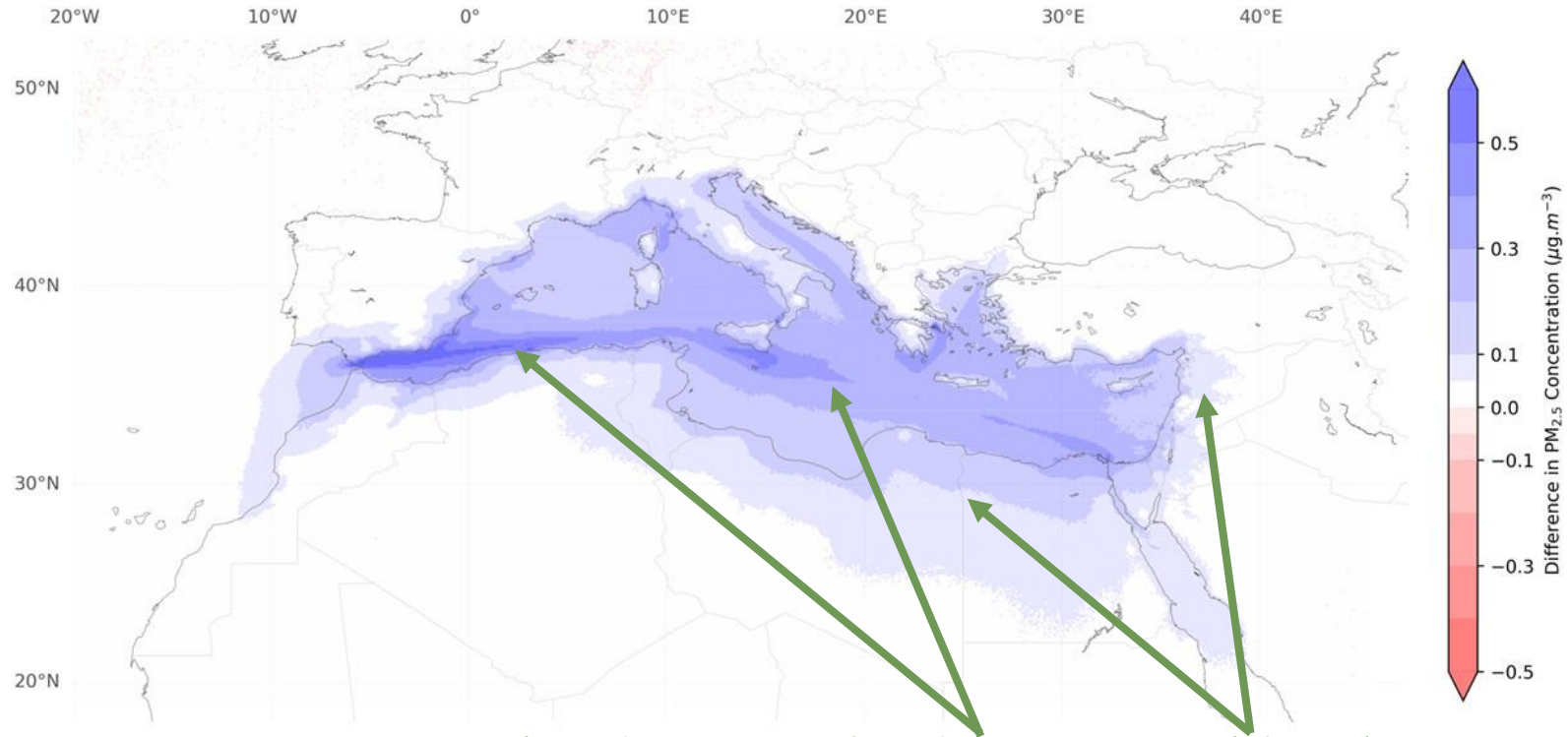
Populations and areas at risk from exposure to ship emissions

Emissions studied

- Sulphur Oxides
...resulting PM_{2.5} and PM₁₀
- Comparison of emissions from 0.5% sulphur to 0.1% sulphur fuels

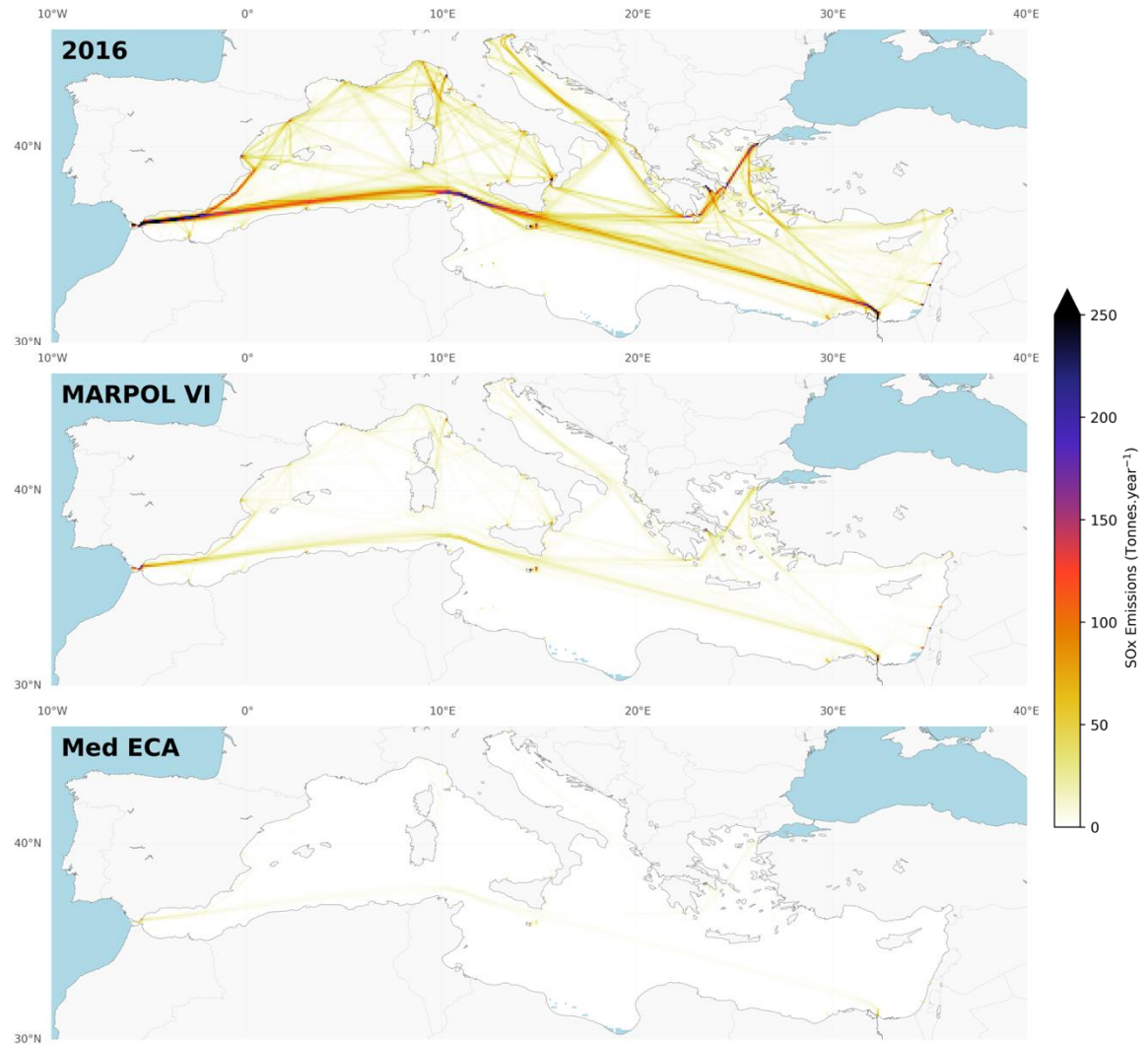


Med ECA results in overall PM_{2.5} concentrations reductions



Impacts reduction over both water and land

Med ECA
results in
overall SOx
emissions
reductions



Summary of Health Benefits

Table 15. Summary of health benefits evaluated for the Med ECA (model year 2020)

Scenario Results (Linear C-R Model)	Reduced Mortality (annual premature adult deaths)	Avoided Childhood Asthma (annual avoided incidents)
Health benefit of Med ECA	Reduced Mortality	Reduced Asthma Morbidity
	CV Mortality Avoided	Avoided Childhood Asthma 2314 (CI 95% 1211; 3406)
	LC Mortality Avoided	
	Combined Avoided Mortality	
969 (CI 95% 551; 1412)		
149 (CI 95% 32; 270)		
1,118 (CI 95% 583; 1682)		

Summary of Health Benefits

Table 16. Regional allocation of estimates for health benefits

REMPEC Results by Country	Reduced Mortality (CI 95% Low; High)	Avoided Childhood Asthma (CI 95% Low; High)
Albania	19 (CI 95% 10; 28)	6 (CI 95% 3; 9)
Algeria	162 (CI 95% 90; 240)	338 (CI 95% 177; 497)
Bosnia and Herzegovina	8 (CI 95% 4; 12)	6 (CI 95% 3; 9)
Croatia	7 (CI 95% 4; 11)	4 (CI 95% 2; 6)
Cyprus	2 (CI 95% 1; 4)	4 (CI 95% 2; 6)
Egypt	32 (CI 95% 17; 46)	34 (CI 95% 18; 50)
France	17 (CI 95% 7; 27)	61 (CI 95% 32; 90)
Greece	62 (CI 95% 30; 96)	76 (CI 95% 40; 112)
Israel	1 (CI 95% 0; 2)	7 (CI 95% 4; 10)
Italy	82 (CI 95% 40; 126)	143 (CI 95% 75; 210)
Lebanon	17 (CI 95% 9; 26)	35 (CI 95% 18; 52)
Libya	39 (CI 95% 22; 58)	76 (CI 95% 40; 112)
Malta	4 (CI 95% 2; 5)	7 (CI 95% 4; 10)
Monaco	0 (CI 95% 0; 0)	0 (CI 95% 0; 0)
Montenegro	3 (CI 95% 2; 6)	3 (CI 95% 2; 5)
Morocco	114 (CI 95% 63; 169)	350 (CI 95% 183; 516)
Slovenia	2 (CI 95% 1; 3)	3 (CI 95% 1; 4)
Spain	43 (CI 95% 20; 67)	118 (CI 95% 62; 173)
Syrian Arab Republic	48 (CI 95% 26; 70)	71 (CI 95% 37; 105)
Tunisia	70 (CI 95% 38; 104)	107 (CI 95% 56; 158)
Turkey	386 (CI 95% 197; 582)	865 (CI 95% 452; 1272)

Summary of Environmental Benefits

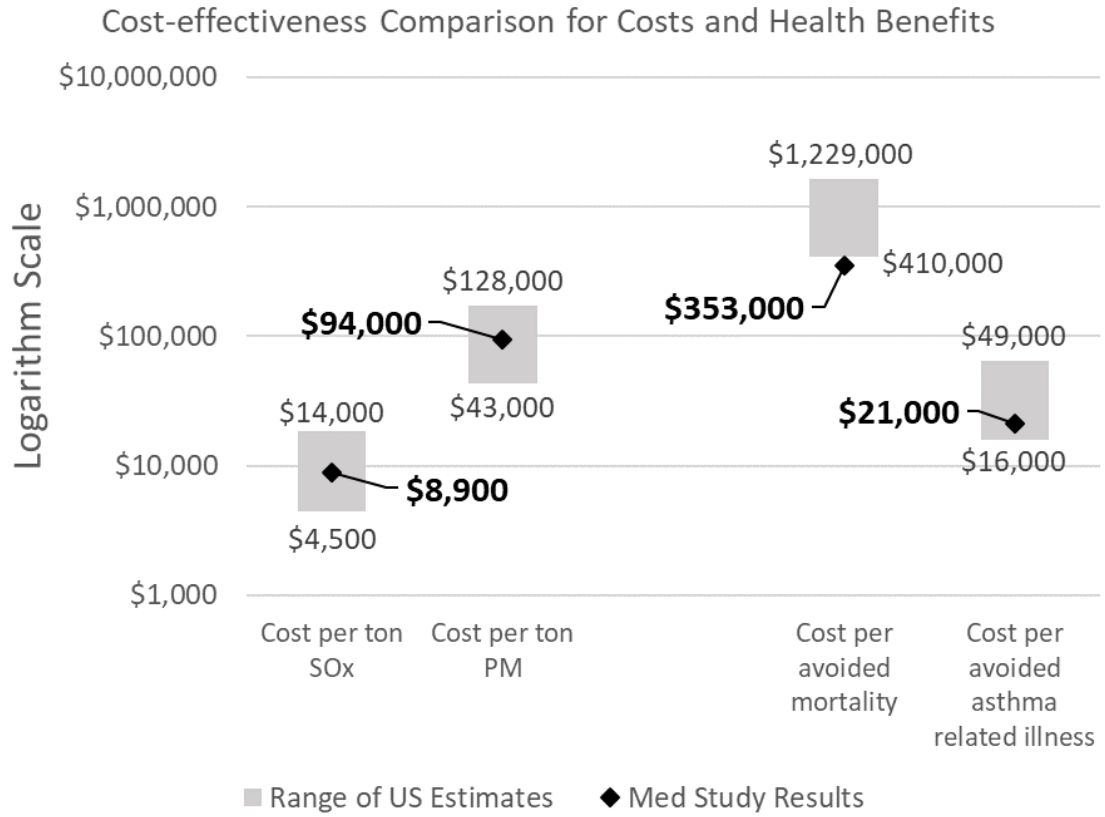
Environmental Benefit	Reduction (%)	Med ECA benefit compared with MARPOL VI (Global 2020)
Wet sulphate deposition	1-15 %	Percent decrease in annual wet sulphate deposition
Dry sulphate deposition	1 to 50 %	Percent decrease in annual dry sulphate deposition
Wet PM _{TOTAL} deposition	0.5 to 5 %	Percent decrease in annual wet PM _{TOTAL} deposition
Dry PM _{TOTAL} deposition	0 to 10 %	Percent decrease in annual dry PM _{TOTAL} deposition
Aerosol optical depth	1 to 6 %	Percent change in aerosol optical depth

Per Vessel Costs

Table 25. Summary of average annual compliance cost per vessel by type

Vessel Type	Ship Count	2020 MARPOL VI Average Cost	Med ECA Average Cost	Med ECA + Scrubber Average Cost
Cargo ships	7,333	\$290,000	\$327,000	\$325,000
Misc.	7,932	\$48,400	\$54,000	\$52,200
Passenger ships	943	\$70,600	\$79,300	\$74,100
Tankers	4,309	\$681,000	\$763,000	\$750,000
Unknown	7,065	\$24,500	\$27,400	\$26,300
Service ships	859	\$110,000	\$123,000	\$118,000
Fishing vessels	1,268	\$30,500	\$34,100	\$32,900
Vehicle carriers	675	\$1,550,000	\$1,760,000	\$1,650,000
Cruisers	180	\$3,280,000	\$3,830,000	\$3,540,000
RoPax vessels	538	\$2,920,000	\$3,280,000	\$2,970,000
Container ships	2,061	\$2,340,000	\$2,640,000	\$2,540,000

Med ECA cost-effectiveness: similar to North American ECA



Main outcomes - Technical and Feasibility Study

Overall net benefits of a Med ECA are positive considering health outcomes

Value of avoided impacts

$$= \text{Avoided Mortality } (\$V_{\text{Mortality}}) + \text{Avoided Morbidity } (\$V_{\text{Illness+ Care}}) \\ + \text{Avoided Deposition Damages } (\$V_{\text{Acidification}}) + \text{Improved Visibility } (\$V_{\text{Haze}}) + \text{etc.}$$

- Future emissions may decline as other measures adopted
- Costs depend on market prices, mitigated by alternative technologies
- Health benefits achieved in all Mediterranean populations, beyond
- Environmental benefits are achieved across the Mediterranean Sea

Road map

Main steps (2020-2021):

National actions

2020-21 Continued assistance to Contracting Parties to the Barcelona Convention, which so request

Regional actions

Apr-Dec 20 Knowledge gathering;

Further studies

Updating of the initial draft submission to the IMO

Discussion within the SOx ECA(s) Technical Committee of Experts tasked to:

- review the outcome of the further studies; and
- review and validate (technically) the draft IMO submission.

May 21 (tbc) **14th Meeting of the Focal Points of REMPEC**

Review and consideration of draft IMO submission.

Discussion on:

- whether or not to submit a proposal to IMO for the designation of the proposed Med ECA;
- the most appropriate timing for such a submission; and
- the effective date of entry into force of the proposed Med ECA.

Endorsement of a joint and coordinated proposal for the designation of the proposed Med ECA to the IMO.

Road map (cont.)

Main steps (2020-2021) (cont.):

Regional actions (cont.)

- Jul 21 (tbc) Submission of a draft COP decision to the Meeting of the MAP Focal Points
- Sep 21 (tbc) **Meeting of the MAP Focal Points**
Approval of draft COP decision
- Oct 21 (tbc) Submission of draft COP decision to COP 22.
- Dec 21 (tbc) **22nd Ordinary Meeting of the Contracting Parties to the Barcelona Convention and its Protocols (COP 22)**
Adoption of COP decision on the joint and coordinated proposal for the designation of the proposed Med ECA to the IMO.

Global actions

- Dec 19 (tbc) Submission of an information document, prepared by REMPEC, related to the adoption of the COP decision on the road map, to the IMO.
- Mar-Apr 20 **75th session of the IMO's Marine Environment Protection Committee (MEPC 75)**
Presentation by REMPEC of the information document related to the adoption of the COP decision on the road map.

Road map (cont.)

Final steps (beyond 2021):

Global actions

- Jan 22 (tbc) Submission of the joint and coordinated proposal for the designation of the proposed Med ECA to the IMO + proposed amendment to MARPOL Annex VI
- Apr 22 (tbc) **78th session of the IMO's Marine Environment Protection Committee (MEPC 78)**
Assessment of and, agreement to, the joint and coordinated proposal + proposed amendment to MARPOL Annex VI
Consideration and approval of a draft amendment to reg.14 of MARPOL Annex VI
Request to IMO SG to circulate it, with a view to adoption at the next session of the IMO's MEPC
- Apr 22 (tbc) Circulation of the draft amendment to regulation 14 of MARPOL Annex VI by the IMO SG to all Members of the Organization and all Parties.
- Oct 22 (tbc) **79th session of the IMO's Marine Environment Protection Committee (MEPC 79)**
Consideration and adoption of the draft amendment to reg. 14 of MARPOL Annex VI
Determination of the date of bringing into force of the amendment to reg. 14 of MARPOL Annex VI
- Sep 23 (tbc) Deemed acceptance of the amendment to reg. 14 of MARPOL Annex VI
- Mar 24 (tbc) Bringing into force of the amendment to reg. 14 of MARPOL Annex VI
- 15 (tbc) Effective entry into force of the Med ECA

REMPEC, an IMO / UNEP Centre assisting the Mediterranean coastal States in ratifying, transposing, implementing and enforcing international maritime conventions related to the protection of the marine environment



Thank you

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