



IAIA 21

VIRTUAL EVENT

#iaia21

O&G offshore activities and Economic Impact Assessment on fishery sector

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INTRODUCTION- Scope

- The present presentation describes the methodology used to conduct the Economic Impact Assessment (EclA) of O&G offshore activities on fishery sector. This approach has been applied to various offshore projects.
- The possible impacts of offshore activities may include the reduction of fishing area, with economic impact on the sector.



INTRODUCTION- Methodological Approach

PROJECT EVALUATION



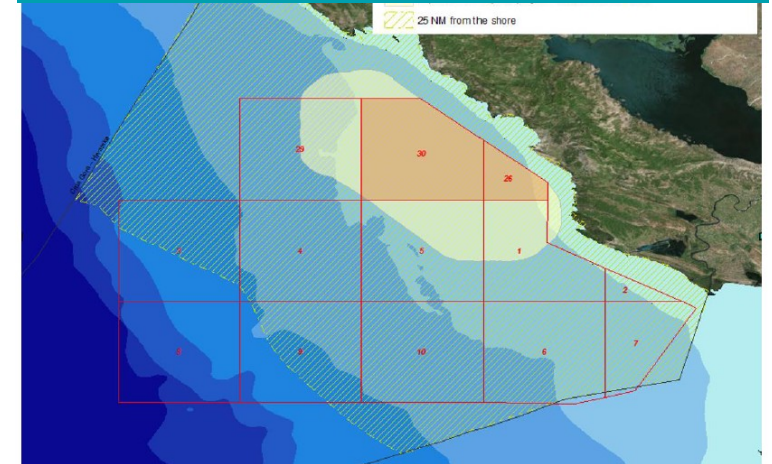
- Definition of the project
- Project Area
- Duration of the project

FISH AND MARINE SECTOR



- Fishing sector
- Fleet and fishing methods
- Fishery resources
- Economic value of the fishery sector
- *Ante-operam* Monitoring

ESTIMATION AND ASSESSMENT OF IMPACTS

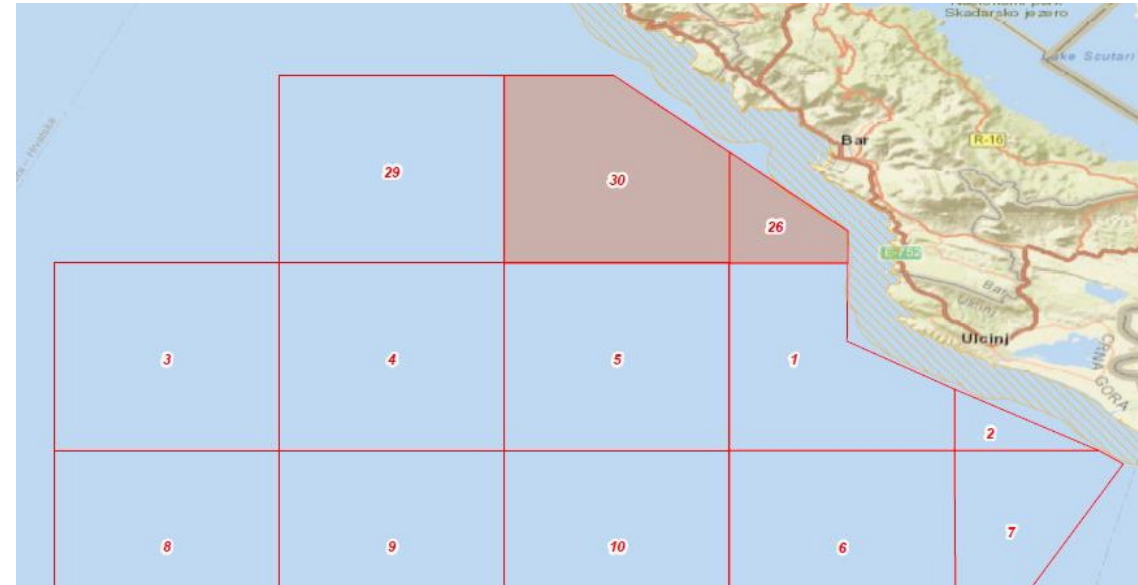


- Evaluations of the Environmental and social-economic sensitivities potentially affected
- Environmental and Economic Impact Assessment
- Environmental and Economic monitoring (*post operam*)

PROJECT EVALUATION

Evaluation of the project in all its main aspects, with particular regard to:

- ❑ Project scope
- ❑ Area concerned by the project
- ❑ Time of implementation
- ❑ Economic sectors potentially impacted by the project (areas excluded or limited to fishing activities)



- Energean signed an exploration and production Concession Contract covering the Montenegro offshore blocks nos. 26 and 30
- Energean planned to carry out a 3D geophysical seismic survey
- 3D geophysical survey will be performed within the blocks involving an area of 338 km²
- 30 days for the survey execution

FISH AND MARINE SECTOR

Sector of interest:

- Aquaculture
- Underwater sport fishing
- Fishing

Data analysis:

- Economic value of the local fish sector
- Characteristic of the fishing fleet
(dimensions, tonnage, power, age)
- Types of fishery and catch
- Real economic value of the catch



- RETRIEVAL OF BIBLIOGRAPHIC DATA
- DESKTOP ANALYSIS
- ANTE – OPERAM MONITORING
- STAKEHOLDER CONSULTATION

ESTIMATION AND ASSESSMENT OF IMPACTS

Evaluations of the Environmental and social-economic sensitivities potentially affected:

- ❑ Fauna and Flora (fishes, corals, economically important species in fisheries, seagrasses and phytobenthos, mael beds, phytoplankton, etc..)
- ❑ Water resources and sea water conditions, Air quality and climate
- ❑ Sensitive habitats, Protected areas and Proposed Marine Protected Areas
- ❑ Existing infrastructures, business entities, maritime traffic and undersea cables
- ❑ Fisheries and aquaculture
- ❑ Existing noise level
- ❑ Cultural heritage sites, Tourism



● Loggerhead turtle (*Caretta caretta*) - (LC - IUCN)

ENERGEAN – BIODIVERSITY MONITORING

- Common bottlenose dolphin (Verified presence during the Aug-Sept 2018)
- Loggerhead turtle (Verified presence during the Aug-Sept 2018)

ESTIMATION AND ASSESSMENT OF IMPACTS

Assessment of the main impacts that could be generated on the fisheries sector in relation to the impacted areas:

- ❑ Suspension and dispersion of sediments
- ❑ Noise pollution at project stage
- ❑ Light pollution during project implementation
- ❑ Maritime traffic in relation to the increase generated by activities

ENERGEAN ASSESSMENT

Category	Affected environmental components	Mob/Demob phase	Acquisition phase
		Impact Value	Impact Value
Air and Sea	Air quality and climate	Low -	Low -
	Seawater quality		
	Seascape		
Socio-economic context	Human health	Low -	Low -
	Tourism		
	Maritime traffic	Moderate -	High -
	Fishery	No impact	No impact
Biodiversity and Ecosystems	Aquaculture	Low -	Low -
	Seagrasses, Mäerl beds and Benthos		
	Marine invertebrates		
	Plankton	Moderate -	High -
	Marine mammals		
	Marine reptiles		
	Fishes and Ichthyoplankton	Low -	Moderate -
	Seabirds		
	Sensitive habitats		
Protected areas			

Fishery			
Characteristics of sensitivity	For both the project phases		
Existing regulations and guidance	Moderate		
Societal value	High		
Vulnerability for changes	Low		
SENSITIVITY	High (Moderate to high)		
	Mob/Demob phase	Acquisition phase	
<i>Drivers of change</i>	<i>Increased marine traffic due to the vessels use</i>	<i>Increased marine traffic due to the vessels use</i>	<i>Generation of noise from airguns</i>
<i>Characteristics of magnitude</i>			
Intensity and direction	Low -	Low -	Moderate -
Spatial extent	Low	Low	Low
Duration	Low	Low	Moderate
MAGNITUDE	Low -	Low -	Moderate -
SIGNIFICANCE	Moderate -	High -	

ESTIMATION AND ASSESSMENT OF IMPACTS

Determination of compensation (**Ctot**)

$$\mathbf{CTOT} = (\mathbf{Id} \times \mathbf{RsubArea} \times \mathbf{DSubArea})$$

- ❑ **Id** = total daily income or revenue deriving from fisheries sale determined as first sale or landing stage price
- ❑ **RSubArea** = index of relevance of the fishing activity (catch) of the defined SubArea on the total fishing activity
- ❑ **DSubArea** = number of days of project activities in the defined SubArea

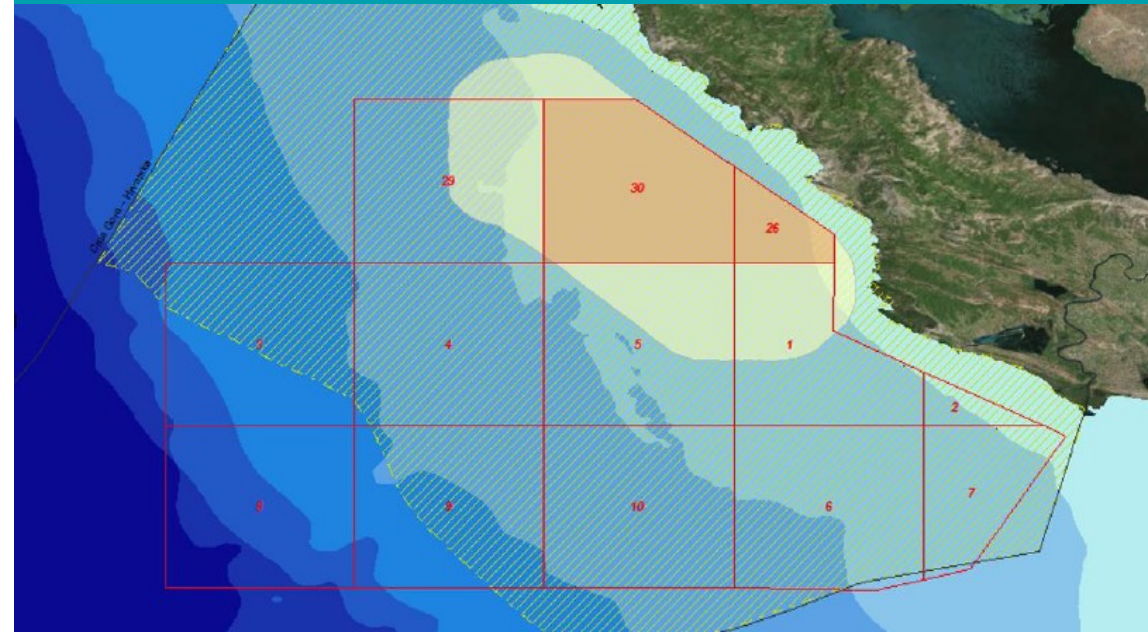
PROJECT INPUT:

Id = Deriving from fisheries sale in Montenegro determined as first sale or landing stage price

RSubArea = Total surface of fishing area of Montenegro within 25 NM (17,6%) = 4,211 km²-

Total surface of the Fishing Potentially Impacted Area = 740 km²

DSubArea = approximately 21 days



ESTIMATION AND ASSESSMENT OF IMPACTS

Assessment of possible mitigation measures to reduce impacts

- ❑ Definition of the best intervention period to limit impacts
- ❑ Advanced notice of activities to avoid possible conflicts with shipping and fishing operations (communication of timing, are of intervention)
- ❑ Fisheries observer will be boarded on the vessel to help avoiding conflict with and impacts to the fishing industry
- ❑ Mitigation measures provided for fishes will indirectly act as mitigation measures for fisheries too
- ❑ Fisheries Compensation Approach to determine the 'disturbance allowance' on fisheries deriving from project activities within the exclusion zone

PROJECT MITIGATION MEASURES

- ❑ Least sensitive period (winter season) for marine species
- ❑ Avoid unnecessary strong energy sources
- ❑ Advanced notice of geophysical activities
- ❑ Ensure communication with fisheries and Fisheries observer will be boarded on the vessel
- ❑ Fisheries Compensation Approach
- ❑ Appropriate signals to warn other vessels of the exclusion zone

After the adoption of the adequate mitigation measures the impact induced on fisheries will be reduced as much as possible to Moderate/Low

ESTIMATION AND ASSESSMENT OF IMPACTS

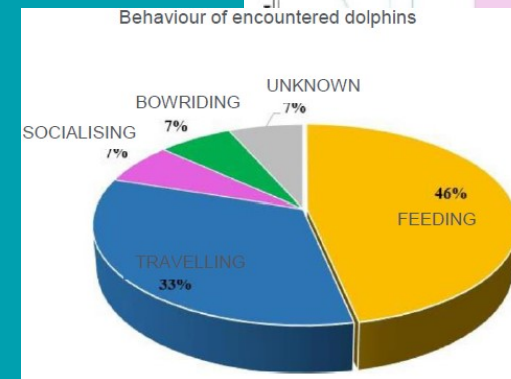
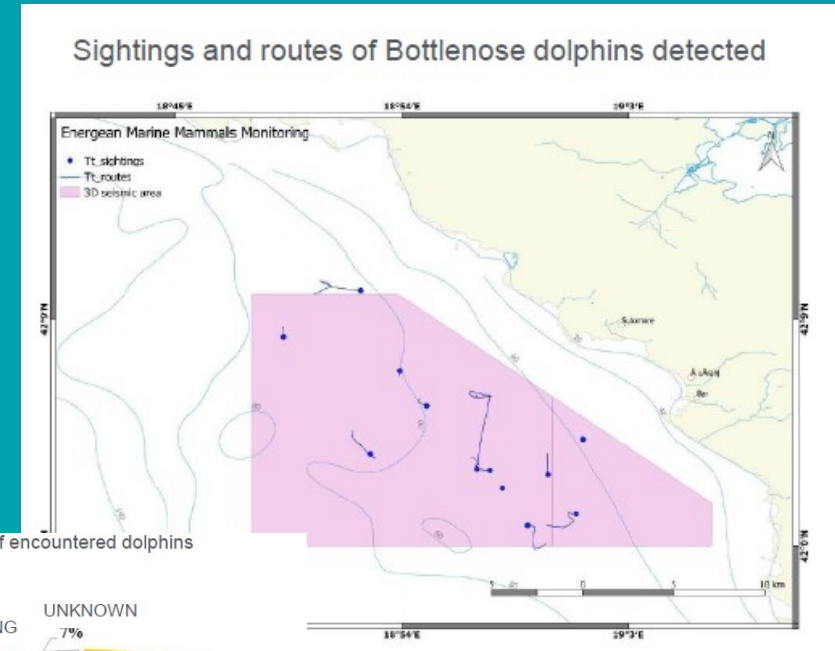
MARINE ENVIRONMENT MONITORING ACTIVITIES BEFORE AND AFTER THE PROJECT ACTIVITIES

The following monitoring activities concerning the most impacted receptors/indicators have been planned:

- Fishery landing survey
- Ichthyoplankton sampling survey
- Marine Mammals survey

This approach permitted to investigate the existing conditions before and after the project and to confirm the absence/presence of residual impacts after the closure of the project.

This approach permitted to investigate the existing conditions before (QIV 2018) and after (QIV 2019) the geophysical survey, demonstrating the absence of project generated significant variations and fluctuations on the status of selected receptors.



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