C-26 OIL PLAYS AND EXPLORATION POTENTIAL OF ITALY

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Summary
*In this paper we present the review of the Italian Oil Plays and an evaluation of the Yet To Find (YTF). The YTF has been calculated adding together the mean risked reserves of Prospects, Leads and Notional Leads. The YTF is estimated at **3760 MMbbls** of oil subdivided in 5 major sub-basins (Tab I). These sub-basins are defined on the basis of the geography and on the existence of one or more plays. A ranking of the different sub-basins is also provided.*

Introduction
A regional review of Italy has been undertaken aimed to evaluate the remaining exploration potential. The study is focused on the oil prone "Play" (mainly carbonate reservoirs). The main objectives of this study were to calculate the YTF of the different sub-basins, to rank them accordingly. This study was undertaken over the course of more than one year and involved five full time geoscientists.

Methodology
The YTF has been calculated summing the risked reserves of identified Prospects, Leads and Notional Leads. This evaluation has been carried out using a standard methodology to evaluate the prospects. This methodology has been imposed by the need to compare and rank the results of this study with the other opportunities around the world. Therefore the calculated YTF can be considered equivalent to a "Mean Risked Recoverable Reserves".
The values obtained following this methodology have been validated using historical data (creaming curve, Fig.1, field size distribution, etc.).

Risk: The adopted risking methodology considers separately the Play Risk (PR) and the Prospect Specific Risk (PSR) (Allen & Allen Basin Analysis 1990). A PR map of Italy has been produced starting from the Gross Depositional Environment map (GDE) of selected stratigraphic intervals representing the play key elements (source rock, reservoir, and seal). The PSR has been evaluated using all available data (prospect inventory, internal reports, scouting data, etc.). The PSR of the notional leads has been calculated analysing typical prospect (benchmark prospect) for the area in terms of tectonic environment, sedimentary sequence, geological evolution etc.

Reserves: To calculate the reserves of the identified structures we have undertaken a review of petrophysiscal parameters of the principal Italian reservoirs. The results of this study are synthesised by the reserves in millions of barrels per cubic kilometre of "gross rock volume" (GRV) for each reservoir horizon. The GRV of the different structures has been estimated by detailed mapping of the main reservoir intervals.

Statistics: To understand the evolution through time of exploration in Italy we have produced oil-creaming curves and field size distribution (Fig.1). Where sufficient data were available the result obtained by the risks & reserves calculation was validated by comparing it with the relevant statistical analysis result.

Main Plays (Source Rock, Reservoir, Seal)

The identified plays can be subdivided in two main groups according to the reservoir type. As general rule the "carbonate reservoirs" are charged by oil whilst the "siliciclastic reservoirs" are charged by gas even though there exist some important exceptions (Bomba, Vallauria, Medusa, Marnosa Arenacea, etc.). In this paper we focus only on the "carbonate reservoir" play (Fig.2).

Source Rock (SR): Even though organically rich sediments are known throughout the entire sedimentary sequence just three stratigraphic intervals have been conclusively proven to be effective SR. *Late Triassic* anoxic sediments (Riva di Solto, Noto, Emma etc) are the most widespread SR of Italy (i.e. Malossa, Rospo, Gela etc.). *Middle Triassic* and *Upper Cretaceous* SR have generated significant amount of oil however they appear to be localised exclusively in the Lombardy Basin (Middle Triassic) and in the Southern Apennines (Upper Cretaceous).

Reservoir & Seals: Several types of reservoir are known at the top of the carbonate sequence in different geological environments. Reservoirs have been developed in platform (primary porosity, fractured, karst), in slope (talus deposits, dolomite) and in basinal (chalk, calcareous turbidites, fractured) settings. The overlying siliciclastic sequence has provided excellent seals. Several other potential reservoirs are also known throughout the carbonate sequence. However, due to the absence of an efficient seal (generally too brittle) it has produced only a few oil accumulations in the less tectonised zones (i.e. Sicily Channel, Lombardy Basin).

YTF & Sub-Basin Ranking

The YTF of Italy calculated in this study is approx. 3760 MMbbls of oil (Tab. I-III). This value, as already mentioned, represents the mean risked recoverable reserves of the identified prospects, leads and notional leads. The equivalent unrisked value is about 24000 MMbbls of oil. Consequently the average geological risk is about 1 in 6. The calculated YTF has been identified in five major sub-basins. The S.Apennines potentially still holds most of the future reserves and appears as one of the most prospective areas. The potential of the S.Apennines is also shown by the oil-creaming curve (Fig.1). Other particularly interesting areas appears to be the Central Adriatic/Apennines, Southern Adriatic and Lombardy Basin.

Conclusion

The study suggests that 3760 MMbbls of oil (risked reserves) remain to be found in Italy. This YTF is distributed in 5 different main sub-basins. S.Apennines is still considered the area with the most remaining potential whilst C.Adriatic/Apennines, S.Adriatic and the Lombardy Basin appear to offer significant remaining prospectivity.

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Figures and Table Caption

Tab. I YTF in MMbbls of oil per identified sub-basins (risked, unrisked with and without notional lead)

Tab. II Number of identified structures per each sub-basin

Tab. III Average size and average risk of the prospects, leads and notional leads

Fig.1 Oil Creaming Curve of Italy

Fig.2 Conceptual Plays Cross Section of Italy- Hellenides

Tab.I

Reserves	UnRisked		Risked	
	With	Without	With	without
	Notionals	Notionals	Notionals	Notionals
S.Apennines	**5714**	**4725**	**1125**	**834**
C.Adriatic/C.Apennines	**5296**	**2570**	**833**	**395**
S.Adriatic	**7688**	**5297**	**702**	**474**
N. Italy	**3101**	**2731**	**688**	**652**
Sicily	**1676**	**1420**	**411**	**387**
Total	**23474**	**16743**	**3760**	**2741**

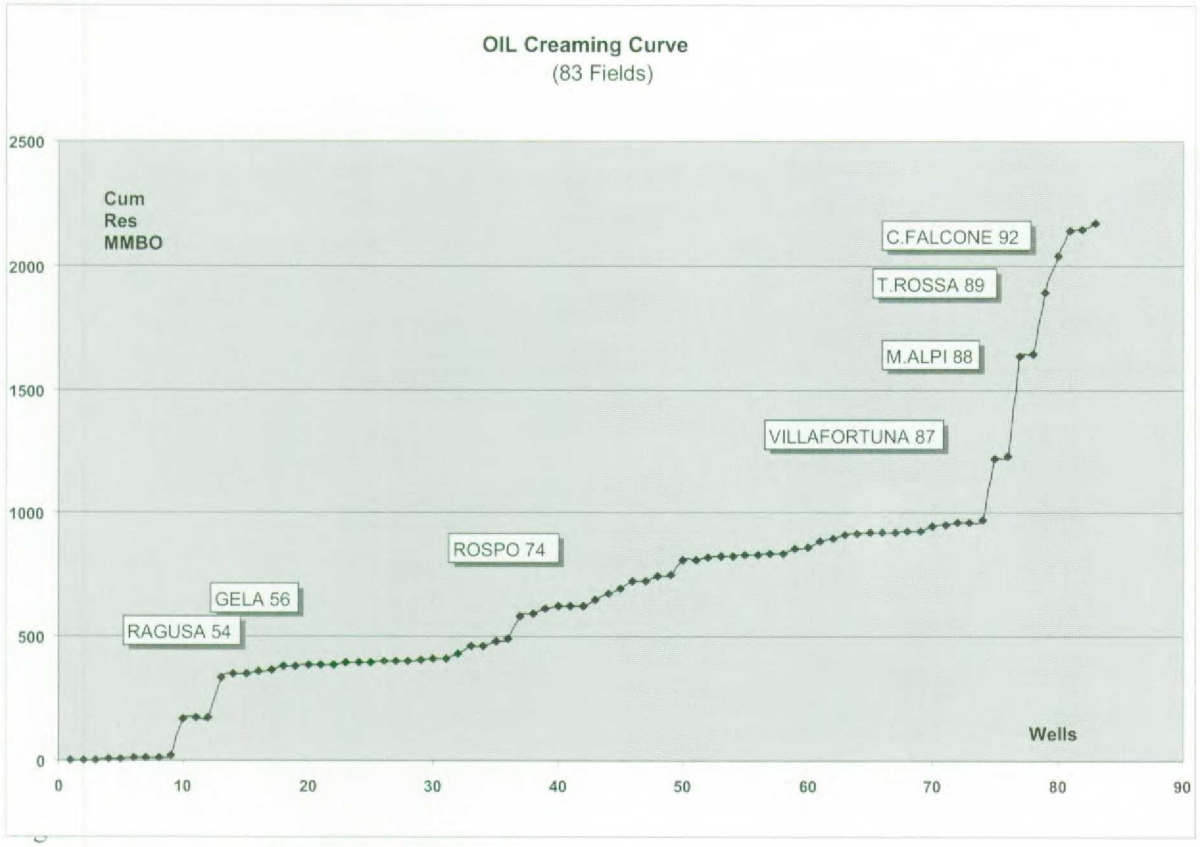
Tab.II

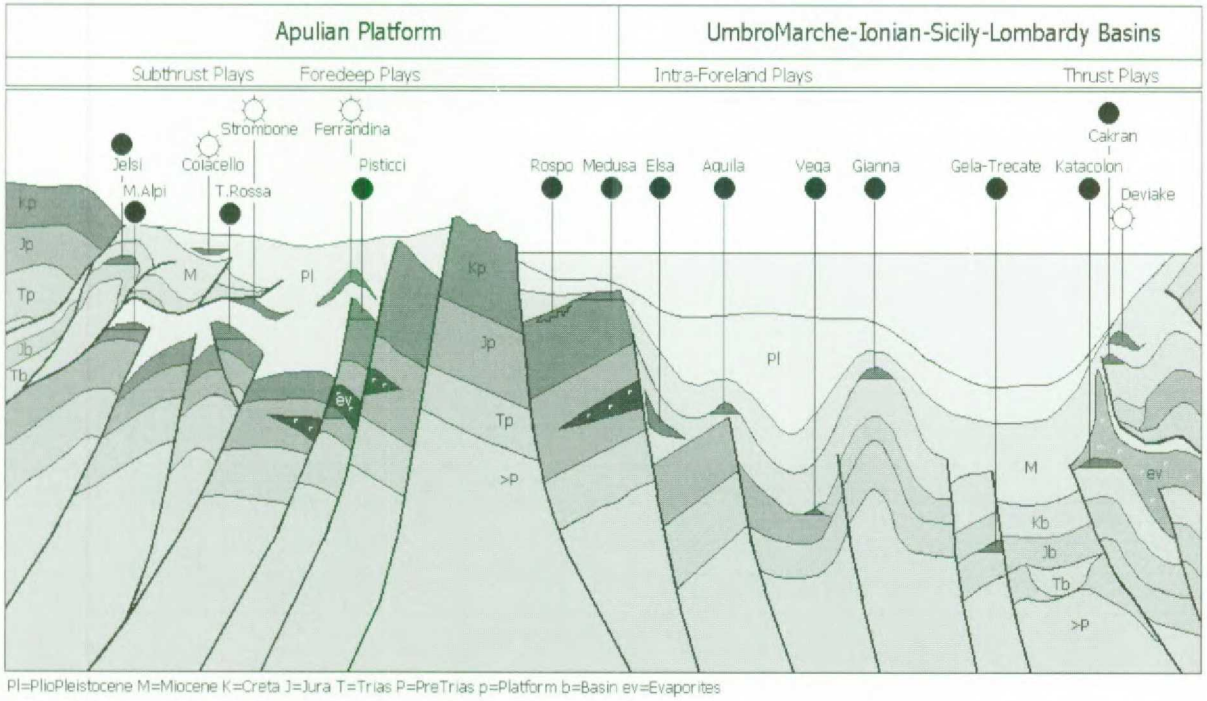
Prospect	Number of	
	with	without
	Notionals	Notionals
S.Apennines	**56**	**39**
C.Adriatic/C.Apennines	**60**	**38**
S.Adriatic	**47**	**23**
N. Italy	**40**	**35**
Sicily	**24**	**22**
Total	**227**	**157**

Tab.III

	Ave Size UnRisked		Average Size Risked		Ave Risk(1 in)	
	with	without	with	without	with	without
	Notionals	Notionals	Notionals	Notionals	Notionals	Notionals
S.Apennines	**102**	**121**	**20**	**21**	**5**	**6**
C.Adriatic/C.Apennines	**88**	**68**	**14**	**10**	**6**	**7**
S.Adriatic	**164**	**230**	**15**	**21**	**11**	**11**
N. Italy	**78**	**78**	**17**	**19**	**5**	**4**
Sicily	**70**	**65**	**17**	**18**	**4**	**4**
Total	**103**	**107**	**17**	**17**	**6**	**6**

Fig. 1





Pl=PlioPleistocene M=Miocene K=Creta J=Jura T=Trias P=PreTrias p=Platform b=Basin ev=Evaporites