Hydrocarbons in SE Mediterranean?
Is it a dream or reality?
A synoptic view from Ionian Sea, NW Greece, as far as the SE edge of Mediterranean Sea, in Cyprus, is concerned.
The Northwestern part (A), with the red, shows the Apulian platform, the Southern part (B), with the deep blue, show the Mediterranean Ridge, the North Aegean sea (C) with green, show the troughs with Prinos and Epanomi hydrocarbon fields, and (D) Levantine basin with huge oil and gas fields of Cyprus and Israel (modified from Chamot-Rooke et al., 2005).
WHAT WE SUGGEST FOR THE NORTHWESTERN PART (A) (1998 – 2011)

APULIAN PLATFORM
The blue crosses depict the three areas with the drill projects. The Greek government prepares the second circle of licenses in the same areas?? What about the other most interesting areas??

Geological map with proposed gas and oil plays. The red cycles show Diapontia islands and Preveza basin (modified from Zelilidis et al., 2003).
Synthetic sketch map showing Italian and Albanian hydrocarbon plays with an attempt for correlation with the northwestern part of Greece (Diapontia islands). Cross-sections AA’ and BB’ based on seismic data.
The red dashed lines are seismic lines.
The yellow line is the coastline.
1. Internal Albanides,
2. Internal Helenides,
3. Pindos zone (Krasta),
4. Gavrovo zone (Kruja),
5a. Internal Ionian zone,
5b. Middle Ionian zone,
5c. External Ionian zone,
6. Apulian platform:
   6a. Plateau Rospo,
   6b. Gargano promontory,
   6c. Murge ridge,
   6d. Salento peninsula,
   6e. Apulia plateau,
7. Albanian Alps,
8a. Dures basin, 8b. Ionian-Albania basin,
9. Hellenic trench,
10. Mediterranean ridge,
11. Ionian abyssal plain,
12. Africa, 12a. Hyblean plateau,
13. Calabrian arc,
14. South Tyrrhenian sea,
15. South Apennine.
Diapontia Islands with the three potential hydrocarbon regions.

A) The first region is north to the Borsh-Khardhiqit fault, B) the second area is located westward to the Ionian thrust - the Ionian foreland basin. The seismic line Northern to Kerkira shows the foreland, C) The piggy-back basins of Ionian thrust

The numbers on the seismic line are:
(1) Pliocene-Quaternary sediments, (2) Middle-Upper Miocene sediments and (3) Lower Miocene and older formations (modified from Monopolis and Bruneton, 1981).

There is no detailed offshore research, there is no drill project!!!! OR THERE IS? Petroleum companies are interested in this region.
Seismic lines from the region around Corfu island. Proposed potential hydrocarbon fields (pink arrows). The red dashed line shows the Ionian thrust. **Oil companies are interested in this region**
This 3D model is divided into four blocks where the Durres basin, the proportional basins in Diapondia Islands and Preveza, are shown (A1, A2, and A3 circles; Zelilidis et al., 2003).
GULF OF PATRAS

Miocene clastics

Pliocene to present clastics

Mesozoic carbonates

200 million barrels of oil, according to ministry information based on the Triton results?

Greece has been aware since 2001 but don’t act WHY???
BUT

WHAT WE HAD FROM 1977-2000 FOR THE NORTHWESTERN PART (A)
We show this map for first time on 4/11/2011
Many seismic lines and boreholes.

WHY?

Who knows the results?

We are talking for the suggested areas.
WHAT WE SUGGEST FOR THE SOUTHERN PART (B) (2005 – 2011)
MEDITERRANEAN RIDGE-BACKSTOP BASINS
Bathymetric map of Mediterranean Sea, where Mediterranean Ridge with mud volcanoes, backstop and foreland basins are noted, Maravelis et al., 2011).

We know the stratigraphy, the geological evolutionary stages and the basins’ configuration.

We believe that there are both GAS (mostly) and OIL (minor) fields.
Southern part: Mediterranean Ridge (modified from Chamot-Rooke et al., 2005), separated into three distinct areas.

AREA B1: Example from seismic line between Cephalonia and Zakynthos Islands (modified from Kokkinou et al., 2005). The red arrows show the possible hydrocarbon fields.
AREA B1: Possible hydrocarbon plays:

1. Two major anticlines (red cycles):
   - Medit. Ridge and Hellenic Trench, 2km under sea-level.
   - Abyssal Plain, 4km under sea-level (Maravelis et al., 2011)
Mediterranean Ridge in Eastern Mediterranean: AREA B2 is the one with the seven backstop basins – trenches (Maravelis et al., 2011).


Detailed block diagrams from Southern Crete, with mud volcanoes from Olympus field on Mediterranean Ridge, Gavdos, Ptolemeus, Pliny and Stravon basins behind the ridge (modified from Huguen et al., 2006).
AREA B2: An example from the six backstop basins southward to Crete Island (Gavdos, Gortys, Poseidon, Ptolemeus, Pliny and Stravon Trenches) where seismic lines show basin geometry and sedimentary configuration with the presence of Messinian evaporites (Maravelis et al., 2011).
Structures that affect AREA B2. Anticlines and Plio-Quaternary depocenters, both onshore and offshore, represent possible hydrocarbon plays (Maravelis et al., 2011).
Messara Basin is a restricted basin formed in the northern margins of the Cretan Trench, whereas Gavdos Island is the southern margin of this Trench.

Messara Basin sediments, up to 2km thick, mostly Tortonian in age, consist of fine grained sediments, rich in organic carbon, could be the sources for the possible hydrocarbon field of Cretan Trench.

Within the Messara basin a biogenic gas field was developed.
BUT

WHAT WE

HAD FROM 1977-2000

FOR THE SOUTHERN

PART (B)
Ministry published on 4/11/2011 maps with seismic lines and with boreholes

WITH DETAILS FOR

Area 1: Katakolon field - Strophades area (B1)
Area 2: Matapan basin
Area 3: Gavdos basin
Area 4: Stravon and Pliny basins (B2)
Many seismic lines and boreholes. WHY? Who knows the results? We are talking for the suggested areas.
Kastelorizo

5 trillion cubic meters of methane after hydrate degradation

Block diagram showing five areas with mud volcanoes (Amsterdam, Kazan, Kula, Athina, Thessaloniki) (from Lykousis et al., 2009).

Bathymetric map with major morphological features of Anaximandros high and peripheral basins (from Lykousis et al., 2009).
Levantine Basin: Cyprus is in co-operation with Israel

1.7 million barrels of oil and 3.5 trillion cubic meters of gases

Herodotus Basin – related to Nile delta
Bathymetric map of Mediterranean Sea, where Mediterranean Ridge is noted, [modified from MediMap Group, Loubrieu B. & J. Mascle (modified from Huguen et al., 2006)].
WHAT WE SUGGEST FOR THE NORTH AEGEAN SEA (C) (2004 – 2011)

TROUGH BASINS
North Aegean Trough is related with Prinos (1) and Epanomi (2) fields and as we know the Troughs evolution through the time and in relation to Lemnos island (3), in the southern margins of the trough, we could relate this evolution with possible fields in other places e.g. Mpampouras and Zourafa small islands (4 and 5).
BUT

WHAT WE

HAD FROM 1977-2000

FOR THE NORTH

AEGEAN SEA
Ministry published on 4/11/2011 map with boreholes

WITH DETAILS FOR

Area 1: Prinos field Area 2: Epanomi field

BUT we show this map for first time on 4/11/2011
It seems that it is not a dream but the reality

There are many areas where hydrocarbon plays with oil and gas could exist

What we need

• A state that will promote and accelerate all processes (since 1998 the state hydrocarbon explorations have been stopped).
• Prompt handling and safeguarding the interests and the rights of our country (process is moving forward slowly).
• Direct delimitation of the Greek EEZ (Diapontia islands → Albania, west of Corfu and west of Zakynthos islands → Italy, southwards to Crete island → Libya, SW to Crete in Herodotus basin → Cyprus, Egypt and southward to Kastelorizo → Turkey)
• Promoting and funding scientific research in the country
• Open minds and open ears to the scientific knowledge available in the country.
We owe our children a better future and a powerful country

No delay is excused

Contribution and cooperation for the common good

Our country needs us all!

Thank you for your attention