

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Assessment of conventionally recoverable petroleum resources
of Venezuela

by

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This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

1981

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PREFACE

The following preliminary report is a product of the World Energy Resources Program of the U.S. Geological Survey (USGS). The program is designed to prepare geologically based resource assessments of the potential petroleum basins of the world. Initial investigations of the program focus on the major petroleum-producing regions of the world with the objective of acquiring a critical, unbiased perspective on the resource potential of a field, a basin, and ultimately a country as a whole. In selected areas, follow-on studies to analyze production potential are conducted by U.S. Department of Energy (DOE) petroleum engineers, and the combined results are incorporated in a report for the Foreign Energy Supply Assessment Program (FESAP) of the DOE and the USGS. This USGS Open-File Report includes only the preliminary assessment with some minimal backup data and comments relevant to the assessment.

INTRODUCTION

The locations of the Venezuela basins are shown in figure 1. Unconditional estimates by the USGS of oil and gas resources in these basins are given in table 1 and figures 2 and 3. Data supporting these estimates are supplied in table 2.

ACKNOWLEDGEMENT

The resource assessment for this report was prepared under the guidance of the Resource Appraisal Group of the Branch of Oil and Gas Resources. The geologic investigation leading to the assessment was conducted by H. Douglas Klemme, who was on contract to the U.S. Geological Survey.

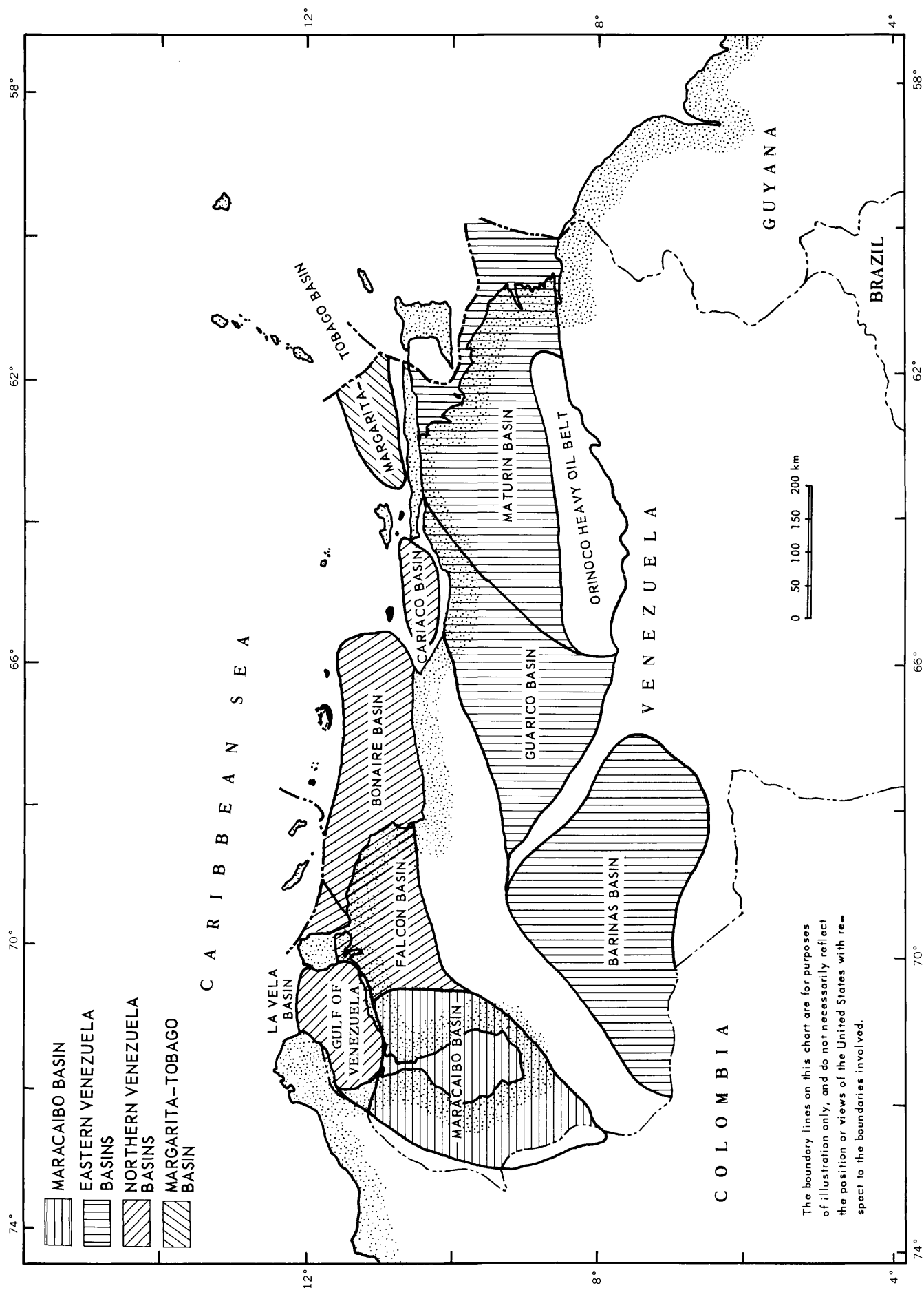


FIG. 1. LOCATION OF VENEZUELA ASSESSMENT REGION

Modified from: Petroconsultants.

Table 1.--Assessment of conventionally recoverable petroleum resources of Venezuela

Unconditional resource assessment by USGS as of 6/25/81; see also figures 2,3.

Probability of occurrence in %	Crude Oil in Billions of Barrels (BB)			Natural Gas in Trillions of Cubic Feet (Tcf) and Billions of Barrels of Oil Equiv- alent (BBOE) @ 6,000 cuft/bbl.		
	<u>95%</u>	<u>5%</u>	<u>Mean</u>	<u>95%</u>	<u>5%</u>	<u>Mean</u>
=====						
1. Maracaibo basin						
Estimate	2.3	16.8	7.4	2.3	20.3	8.5

2. Eastern Venezuela basins including Barinas, Guarico, and Maturin						
Estimate	3.8	17.4	9.0	7.2	41.2	19.9

3. Northern Venezuela basins including Gulf of Venezuela, Falcon, La Vela, Bonaire, and Cariaco						
Estimate	0.9	13.9	5.0	0.8	13.1	4.7

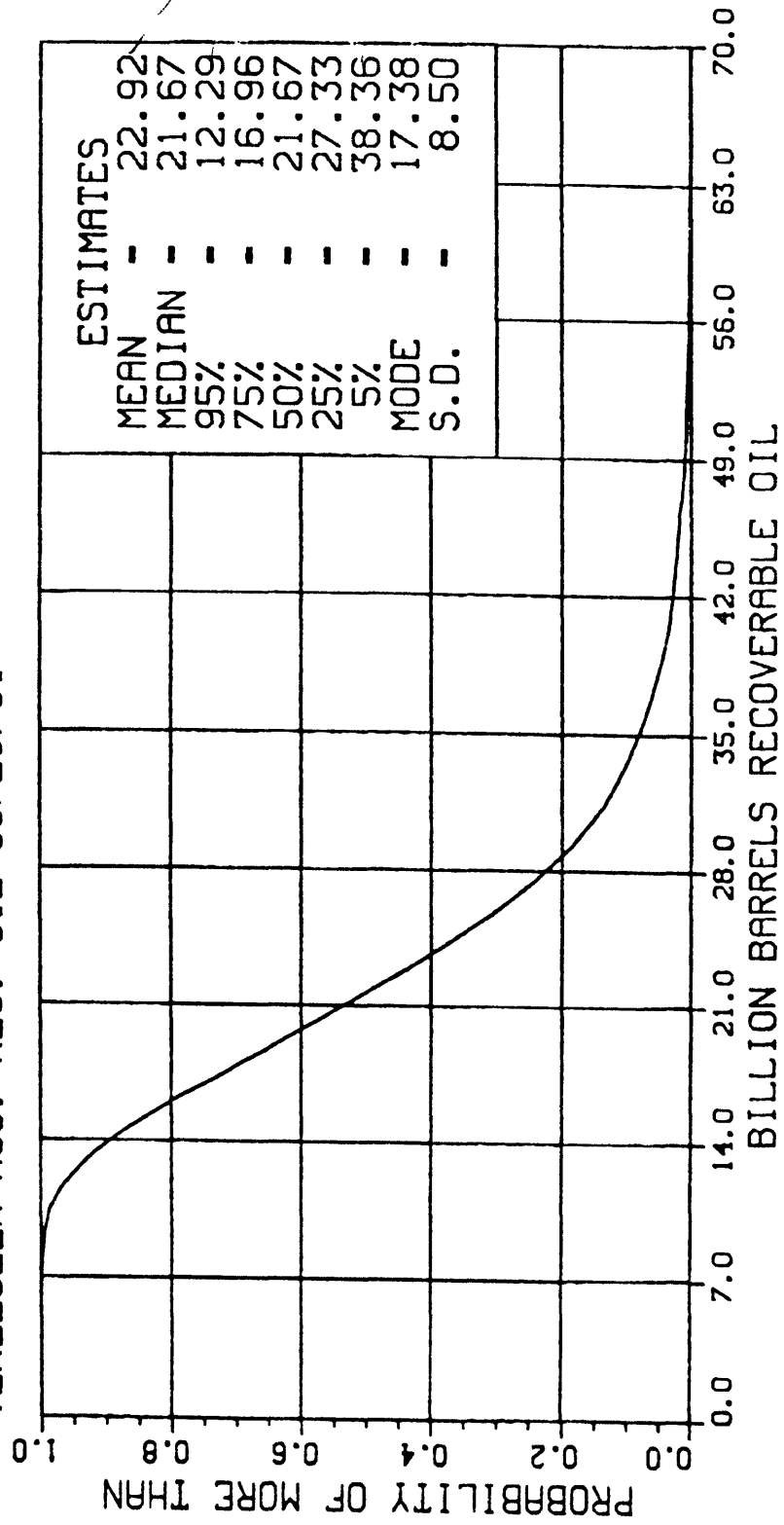
4. Margarita Tobago basin						
Estimate	0.3	4.1	1.5	7.1	62.4	26.2

5. Total Venezuela ^{1/}						
Estimate	12	38	23	31	104	59
				BBOE	5	17
						10

^{1/} Totals are derived by statistical aggregation; only the mean total equals the sum of the component parts.

UNCOND ** OR **

Figure 2.--- VENEZUELA AGG. REC. OIL 06/25/81



UNCOND ** OR **

Figure 3.-- VENEZUELA AGG. REC. TOTAL GAS 06/25/81

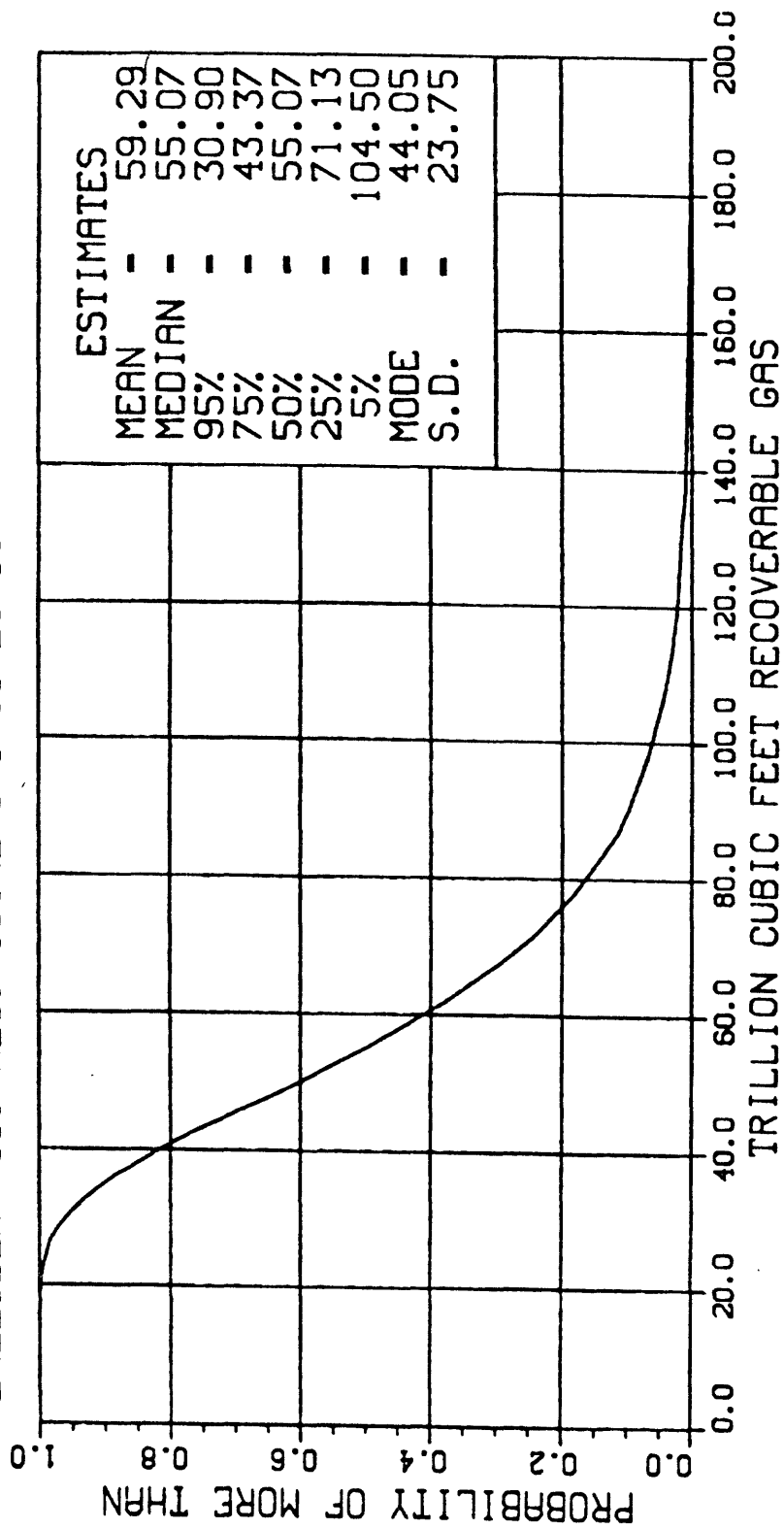


Table 2.--Supplementary and comparative data supporting this resource assessment of Venezuela^{1/}

Crude Oil (BB)		Natural Gas (Tcf)
Cumulative production to 1/1/80		
36		+ <u>2</u> /
Identified reserves ^{3/}		
Demonstrated	20	45
Inferred	+ <u>2</u> /	+ <u>2</u> /
Original recoverable resources (ultimate) of Venezuela		
Cumulative	36	+ <u>2</u> /
Identified Reserves	20	45
Undiscovered		
resources (mean)	<u>23</u>	<u>59</u>
	79	104+
		BBOE 17+
Total 96+ BBOE		

^{1/} Cumulative production and reserves are composited estimates from various sources.

^{2/} Quantity positive but data unavailable.

^{3/} Follows terminology outlined in USGS Circular 831. Demonstrated is equivalent to API Proved and Indicated Additional. Inferred represents anticipated field growth in existing fields.

COMMENTS

- o The assessment does not include the Orinoco heavy oil zone.
- o The assessment does not take into full consideration all the various offshore basins of northern Venezuela, owing to uncertainty of geographic and geologic information. Recent gas discoveries in the Margarita-Tobago basin area clearly indicate significant gas potential, and our assessment for northern offshore basins in general must be viewed as limited in its areal consideration.
- o The Maracaibo province is assigned about two thirds of the cumulative production and reserves of Venezuela.
- o Except for the recent offshore discoveries of gas, Venezuela has commonly been considered to be an oil-prone province, probably owing to poor seals. In this assessment, substantial gas potential is also accorded the northern overthrust flank of the eastern Venezuela basins because of the possibility of fractured Mesozoic and Paleogene reservoir rocks below a Paleogene seal; the seal and underlying gas-source possibilities are recognized in Trinidad by mud diapirs and mud volcanoes.
- o In making the assessment, considerable weight was given to other than Cretaceous source rocks, particularly the Eocene of the Maracaibo region.
- o So far, the eastern Orinoco delta has been disappointing as a possible continuation of prolific Trinidad production to the north. Data suggest that this lack of petroleum may be owing to excessive sandstone-shale ratios in the Neogene of this area, as well as to limited structure development. The assessment considers that significant offshore gas is likely but at relatively low probability.
- o Discoveries of giant fields are still likely in Venezuela from any or all of the major regions.