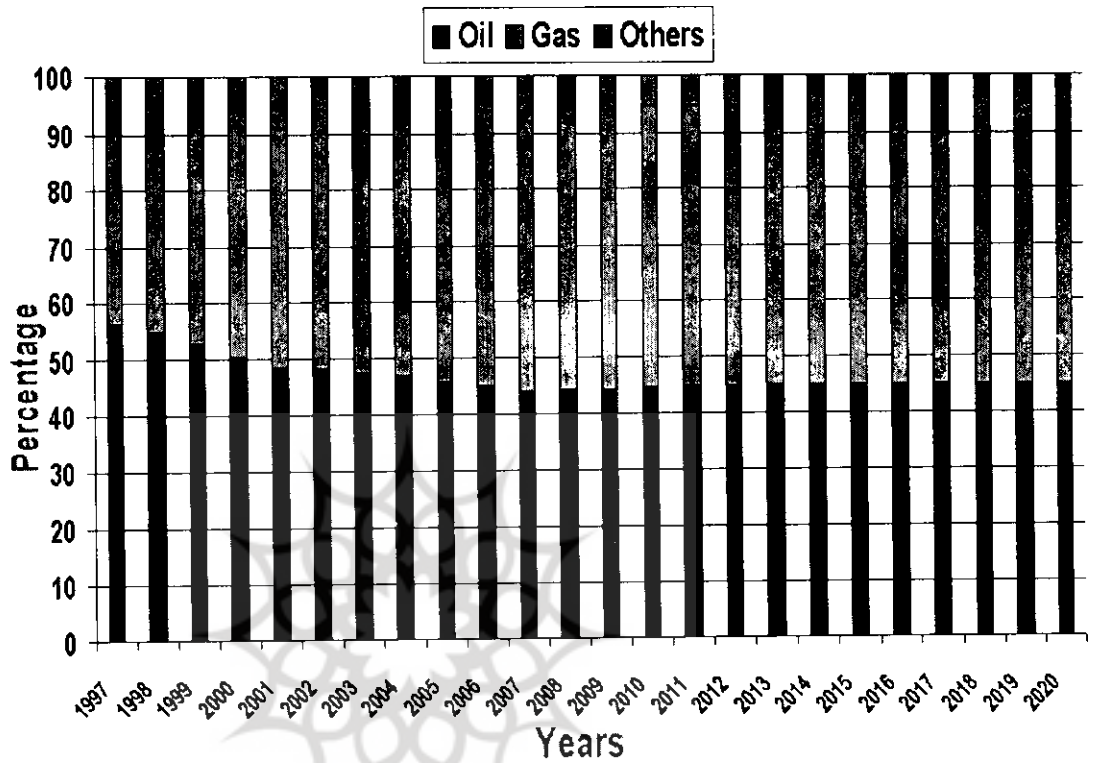
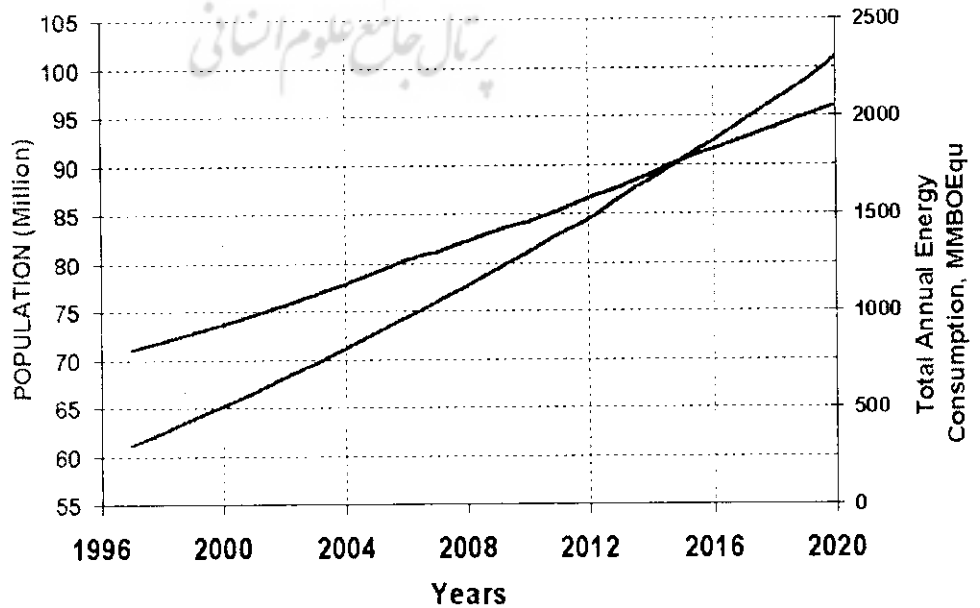


# Total Energy Consumption I.R. IRAN



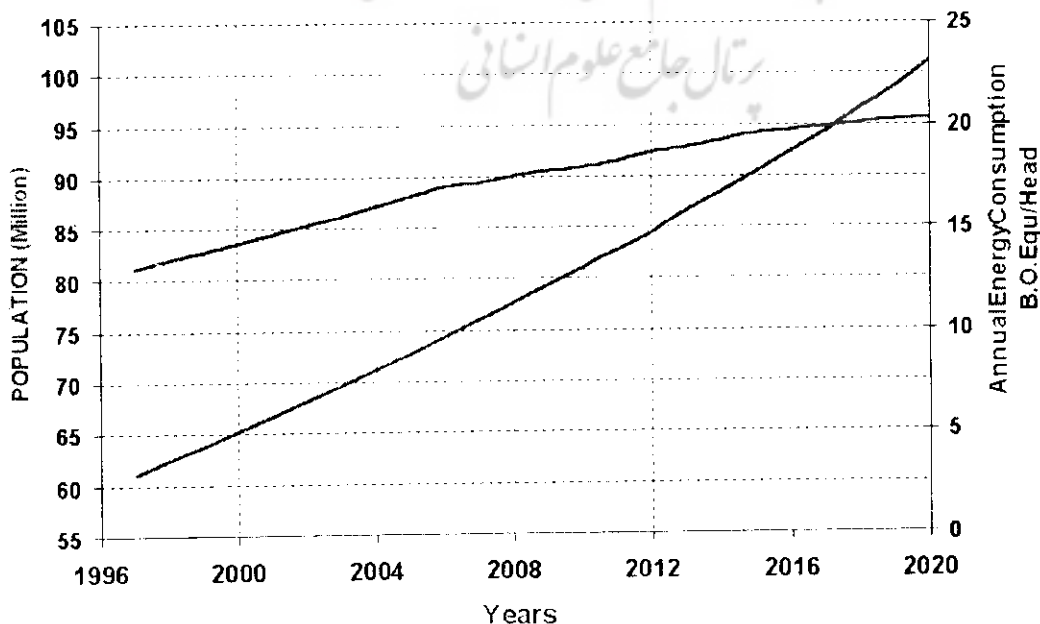
## POPULATION AND TOTAL ANNUAL ENERGY CONSUMPTION



## Population & Energy Consumption

Year	Population	Annual Energy Consumption	
	million	MMBO Equ.	B.O. Equ/Head
1997	61.14	803.00	13.13
1998	62.48	844.00	13.50
1999	63.86	888.00	13.90
2000	65.26	935.00	14.32
2001	66.70	983.00	14.74
2002	68.17	1035.00	15.18
2003	69.67	1088.00	15.61
2004	71.20	1144.00	16.07
2005	72.77	1204.00	16.54
2006	74.37	1270.00	17.08
2007	76.00	1308.00	17.21
2008	77.68	1362.00	17.53
2009	79.39	1415.00	17.82
2010	81.13	1460.00	17.99
2011	82.92	1518.00	18.30
2012	84.47	1580.00	18.70
2013	86.60	1638.00	18.91
2014	88.51	1705.00	19.26
2015	90.46	1776.00	19.63
2016	92.45	1829.00	19.78
2017	94.48	1883.00	19.93
2018	96.56	1940.00	20.09
2019	98.68	1998.00	20.24
2020	101.20	2056.00	20.32

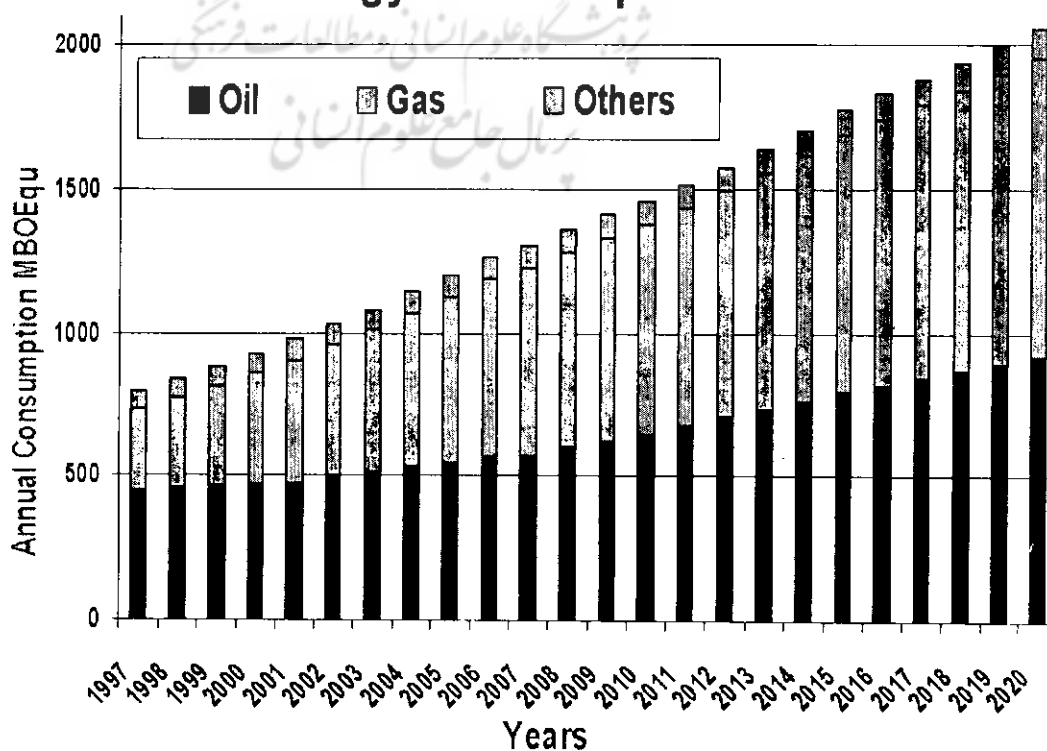
### POPULATION AND ANNUAL ENERGY CONSUMPTION ( B.O.E/Head)



# Total Energy Consumption in IRAN

Year	Annual Consumption (MMOB Equ)	Oil (Percent)	Gas (Percent)	Others (Percent)	Oil	Gas	Others
					MMOB Equ		
1997	803	56.2	35.2	8.6	451	283	69
1998	844	54.9	36.8	8.3	463	311	70
1999	888	52.7	39.3	8.0	468	349	71
2000	935	50.5	41.8	7.7	472	391	72
2001	983	48.6	43.7	7.7	478	430	76
2002	1035	48.4	44.5	7.1	501	461	73
2003	1088	47.5	45.7	6.8	517	497	74
2004	1144	47.0	46.4	6.6	538	531	76
2005	1204	45.7	47.9	6.4	550	577	77
2006	1270	45.0	48.8	6.2	572	620	79
2007	1308	44.0	50.0	6.0	576	654	78
2008	1362	44.2	50.0	5.8	602	681	79
2009	1415	44.2	50.0	5.8	625	708	82
2010	1460	44.6	50.0	5.4	651	730	79
2011	1518	44.7	50.0	5.3	679	759	80
2012	1580	44.8	50.0	5.2	708	790	82
2013	1638	45.0	50.0	5.0	737	819	82
2014	1705	45.0	50.0	5.0	767	853	85
2015	1776	45.0	50.0	5.0	799	888	89
2016	1829	45.0	50.0	5.0	823	915	91
2017	1883	45.0	50.0	5.0	847	942	94
2018	1940	45.0	50.0	5.0	873	970	97
2019	1998	45.0	50.0	5.0	899	999	100
2020	2056	45.0	50.0	5.0	925	1028	103

## Total Energy Consumption I.R. IRAN



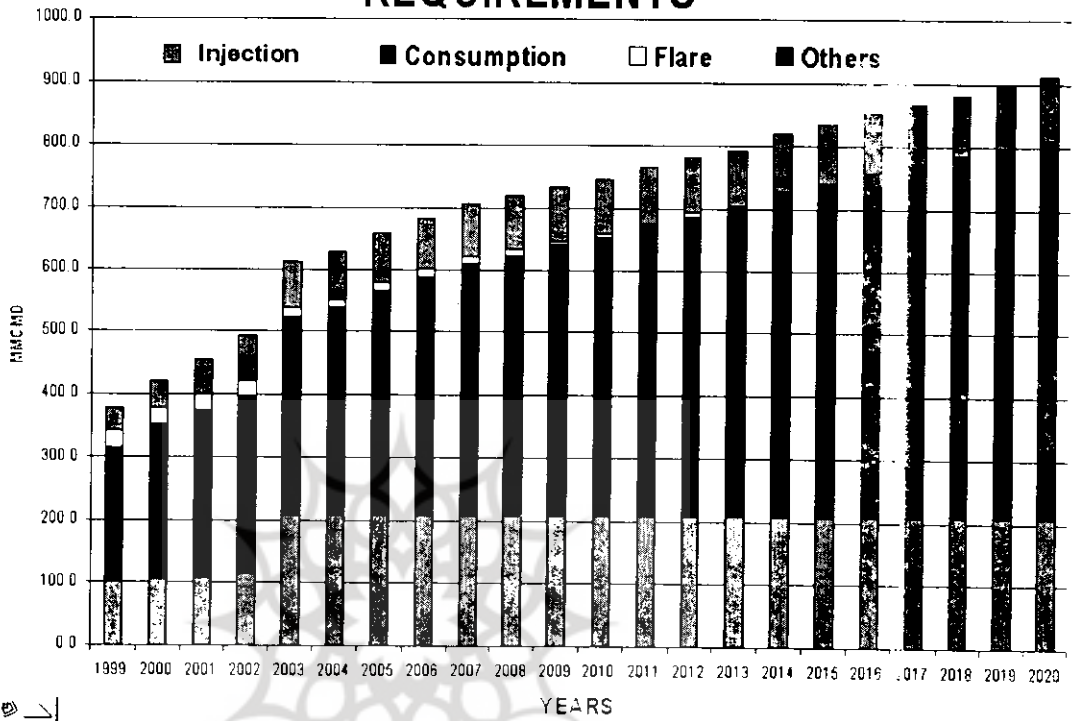
## GAS FIELD DEVELOPMENT

PERIOD	FIELDS
Before 1999 A	NAR, KANGAN, DALAN, AGHAR, GAVARZIN SARKHUN, SARAJEH, MIS, KHANGIRAN
1999 - 2006 B	S. PARS, SALMAN, GARDAN, SHANOL, VARAVI, S. GASHU, TANG -E- BIJAR
2007 - 2013 C	G. STRUCTURE, B. STRUCTURE, F. STRUCTURE N. PARS

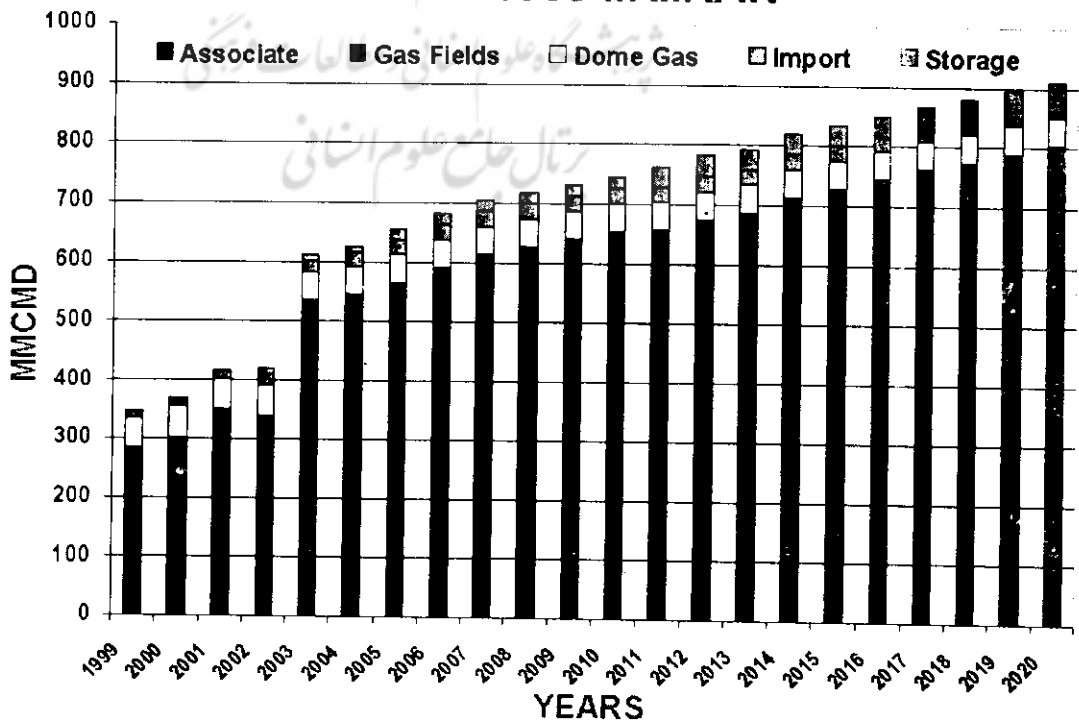
### PREFERRED GAS FIELDS FOR DEVELOPMENT BEYOND 2007

FIELD	RESERVE MMMCM	PRODUCTION CAPACITY MMCMD	CONDENSATE CM / MMCMG	DEVELOPMENT
G.	785	60	100	FULL DEVELOPMENT
B.	275	20	100?	FULL DEVELOPMENT
F.	235	15	100?	FULL DEVELOPMENT
N. PARS	1505	90	15	3 PHASE DEVELOPMENT
	2800	185		

## GAS PRODUCTION CAPACITY REQUIREMENTS



## GAS Sources I.R.IRAN



## Investment Requirement (MMUS\$)

### 1: Gas Field Development

#### A: 1999-2006

S.Pars = 10,000

Others = 2,000

#### B: 2007-2013

= 6,000

**Total** = **18,000**

### 2: Gas Injection

**Total** = **4,000**

### 3: Gas Storage

**Total** = **850**

**Grand Total** = **22,850**

## Gas Sources I.R.Iran(MMCM/day)

Year	Associate	Gas Fields	Dome Gas	Import	Storage	Total
1999	91	194	50	13	-	348
2000	95	208	52	15	-	370
2001	102	248	52	15	-	417
2002	106	234	51	20	10	521
2003	112	424	46	21	10	613
2004	114	432	46	25	10	627
2005	114	452	46	25	20	657
2006	114	478	46	25	20	683
2007	114	501	46	25	20	706
2008	116	513	46	25	20	720
2009	116	526	46	25	20	733
2010	116	539	46	25	20	746
2011	118	540	46	25	35	764
2012	118	558	46	25	35	782
2013	120	568	46	25	35	794
2014	120	593	46	25	35	819
2015	120	608	46	25	35	834
2016	122	623	46	25	35	851
2017	122	640	46	25	35	868
2018	123	652	46	25	35	881
2019	124	666	46	25	35	896
2020	125	679	46	25	35	910

view. Opportunities and Challenges.

- Gas reservoirs and the 20 year production plan (2 volumes)
- Oil, gas and condensates and the 20 year production plan
- Other energy resources
- Volumes of gas required for gas injection projects
- Volumes of recoverable crude oil by the natural production method and by gas injection
- Techno-economic examination of gas injection in oil fields (2 volumes)
- The chemical effect of injected gases on secondary recovery
- The theoretical mathematical

models and basis of data for the estimation of energy demand of Iran

- Summary of energy demand modeling
- Energy demand and share of natural gas in it; Past trends and explanation of the status quo
- Forecast of energy demand of Iran in separate divisions
- Forecast of gas demand for injection, petrochemicals and export
- Primary energy status of Iran (crude oil)
- Primary energy status of Iran (natural gas and other carriers)
- Secondary energy status of Iran

● Utilities for generation and distribution of Electricity in Iran

- Primary energy supply models and their forecasts
- Mathematical model for gas transmission priority in Iran
- Improved siting method for locating sub soil storage creation for natural gas
- Main choice domains and strategic options (priorities & goals)
- Requirements of realization of strategy of development and allocation of gas resources of Iran
- Strategic option from among combinations of supply, energy consumption and natural gas. ■

## A Strategy for Gas Development in I.R. Iran 2000-2020

Presented By: Ali Moshtaghian

Project Manager,

Institute for International Energy Studies, I.R. Iran

in persian Gulf Gas Resources Conference

7-8 Nov 1999 Tehran Iran

### Gas Consumption in Iran (MMCM/DAY)

Year	Injection	Consumption	Flare	Others	Total
1999	100	215 (157)	28	37	380 (322)
2000	107	245 (176)	28	43	423 (354)
2001	110	264 (193)	27	56	457 (386)
2002	115	283 (207)	24	73	495 (419)
2003	210	312 (234)	16	75	613 (535)
2004	210	330 (239)	12	75	627 (536)
2005	210	357 (259)	12	79	658 (560)
2006	210	379 (279)	12	82	683 (583)
2007	210	400 (291)	12	84	706 (597)
2008	210	413 (303)	12	85	720 (610)
2009	210	431 (315)	6	86	733 (617)
2010	210	443 (328)	6	87	746 (631)
2011	210	460 (341)	6	88	764 (645)
2012	210	476 (355)	6	90	782 (661)
2013	210	493 (368)	-	91	794 (669)
2014	210	517 (383)	-	92	819 (685)
2015	210	531 (399)	-	93	834 (702)
2016	210	547 (411)	-	94	851 (715)
2017	210	563 (423)	-	95	868 (728)
2018	210	575 (436)	-	96	881 (742)
2019	210	588 (449)	-	98	896 (757)
2020	210	600 (462)	-	100	910 (772)

The Institute for International Energy Studies (IIES) was assigned in 1996 by National Iranian Oil Company (NIOC) the undertaking of study plan of above subject.

Based on a planned program the abovementioned assignment was carried out using the services of 40 experts specialized in relevant field 12 months time. The results of the survey was published in 35 volumes (totally 5800 pages) and in 5 chapters as here under:

## Chapter One

*Determination of share of natural gas in the energy demand of the country for the next 20 years.*

In this chapter emphasis was laid on the following issues:

Assessment of the entire existing energy resources, examination of undeveloped energy resources, estimation of energy supply and demand for different consuming sections by using mathematical models, evaluation of the world gas supply in the next 20 years and finally examination of the existing and needed facilities and technologies for the production of oil, gas and refining.

In addition it has been tried in this chapter to estimate the level of necessary investments for the development of infrastructural means of oil and gas production to keep up with the anticipated demand.

## Chapter Two

*Determination of share of natural gas in the gas injection projects.*

In this chapter the gas reservoirs that are to be selected for gas injection in the next 20 years have

# A Brief Introduction to the 20-Year Comprehensive Gas Plan of Iran

been identified. The volumes of gas for the purpose for each one of them, the relevant gas supply sources as well as the corresponding investments involved have been determined.

## Chapter Three

*Determination of Iran's share of natural gas in the global markets.*

In this chapter following issues have been closely examined:

The global demand for natural gas, the trend of global gas market developments, the economic conditions of countries potentially interested in Iran's natural gas and their energy consumption models, trend of market prices and comparison with other energy carriers, international investment trends in gas industries, and finally the capabilities of competitors of Iran, particularly in the export of natural gas to the neighbouring countries.

## Chapter Four

*Determination of feed stocks for Iran's petrochemical industries*

*in the next 20 years.*

In this chapter the major emphasis has been laid on the evaluation of volume of needed gas for the petrochemical industries. All petrochemical complexes of the country have been studied and their gaseous hydrocarbon needs assessed. In addition the supply sources of natural gas and condensates for the present and future complexes have been identified and the relevant investment requirements estimated.

## Chapter Five

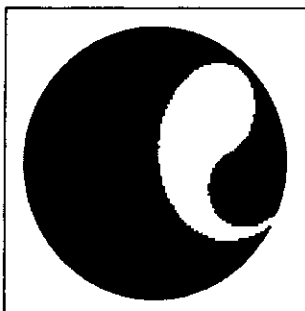
*Determination of the long-term strategy of utilization of gas resources.*

In this chapter while a summary of the whole study is presented, the long term strategy of the utilization of gas for the country as well as its export are clarified.

Following are the itemized issues examined:

- The global economic atmosphere (trends and inclinations)
- World energy prospects and trends in 2020
- Fossil based energy potentials of crude oil and coal
- Fossil based energy potentials of natural gas
- Non fossil based and renewable energy potentials
- Price and cost structure trend in energy carriers and evaluation of gas policies in selected countries
- Technological transformations and developments in the energy sector (procedures and global achievements)
- International finance and investment in oil and gas sectors
- Atmosphere and developments of the national economy of Iran and the future prospects (growth options)
- Iran's oil & gas industries status from an international point of





## موسسه مطالعات بین‌المللی انرژی

نماینده انتشارات Pennwell در ایران  
Pennwell با بیش از ۳۰۰ عنوان کتاب، لوح فشرده، کاست  
ویدیویی و نقشه در صنایع بالادستی و پایین‌دستی نفت و  
گاز، صنعت برق و...

مؤسسه مطالعات بین‌المللی انرژی کتاب‌های بخش انرژی این  
انتشارات را به صورت ارزی یا ریالی (به نرخ واریزنامه) و با ۲۰٪  
تخفیف در اختیار علاقه‌مندان قرار می‌دهد.

روابط عمومی موسسه مطالعات بین‌المللی انرژی

تلفن: ۲۲۵۸۰۹۲-۵

فاکس: ۲۲۲۰۱۴۹