



International Workshop on Energy Statistics (Mexico, 2-5 December 2008)

Aguascalientes

ENERGY STATISTICS IN IRAN

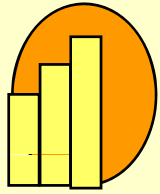
By : Saeid Abbasi

STATISTICAL CENTRE OF IRAN

Department of Manufacturing, Mining & Environment Statistics

In the name of god

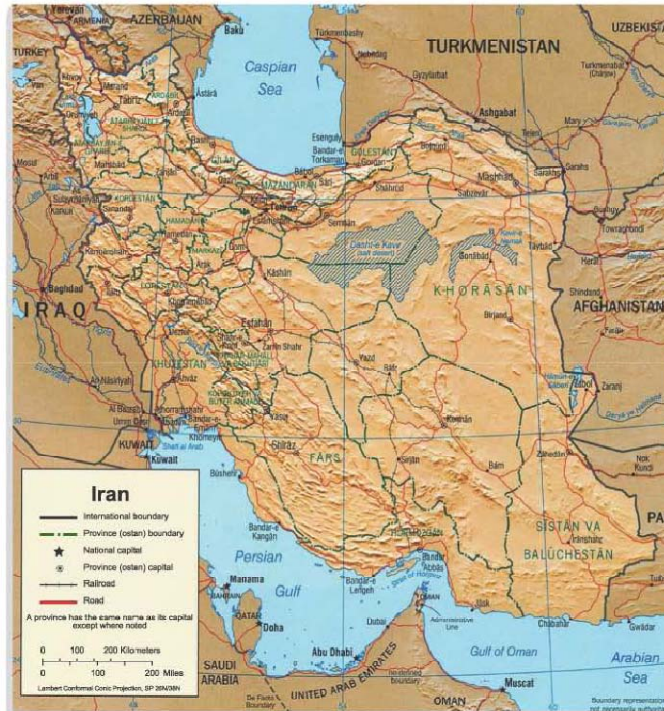




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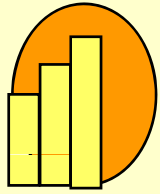
Introduction

Iran, with an area of **1.6 m.km²** and boundary of **8731 km** is located in the heart of Middle East, southwest of Asia .



According to **2006 Population and Housing Census**, Iran has a **population** of over **70 million**.

Iran's economy is highly linked to its **energy sector**, particularly the **oil** and **gas** revenues



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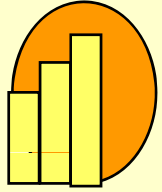
Main tasks and duties of the SCI

The SCI is affiliated to the Vice Presidency for Strategic Planning and Supervision (VPSPS).

-The **head** of the SCI is Deputy for VPSPS.

- Based on the revised **1974 Law** is:

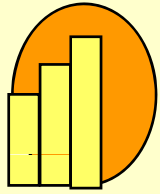
- Responsible for **formulating** and **adopting statistical policies**
- **Definitions** and **concepts**.
- **Stratification** and **production** of statistics through the **implementation** of **censuses** and **sample surveys** .
- **Evaluation** and **confirmation** of statistics produced by **other organizations** .



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Main tasks and duties of the SCI

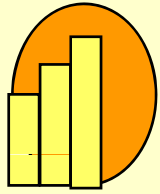
- **Implementation** of demographic, economic, and **social censuses** and **sample surveys** and **dissemination** of results;
- **Provision** of statistical data to meet national development **planning requirements**;
- **Provision** of technical **advice** to the statistical departments of **ministries**, **government agencies** and/or government **affiliated bodies**, state-owned companies, and –whenever possible – to **private sector agencies**;



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Main tasks and duties of the SCI

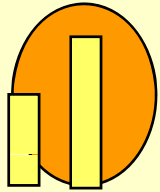
- Preparation and compilation of standards, methods, and regulations for statistical data production and dissemination;
- Implementation of scientific studies and researches on official statistics and related issues for quality improvement of the SCI's performance; and
- Compilation of required statistical data obtained from public and private sectors and centralized documentation of administrative records.



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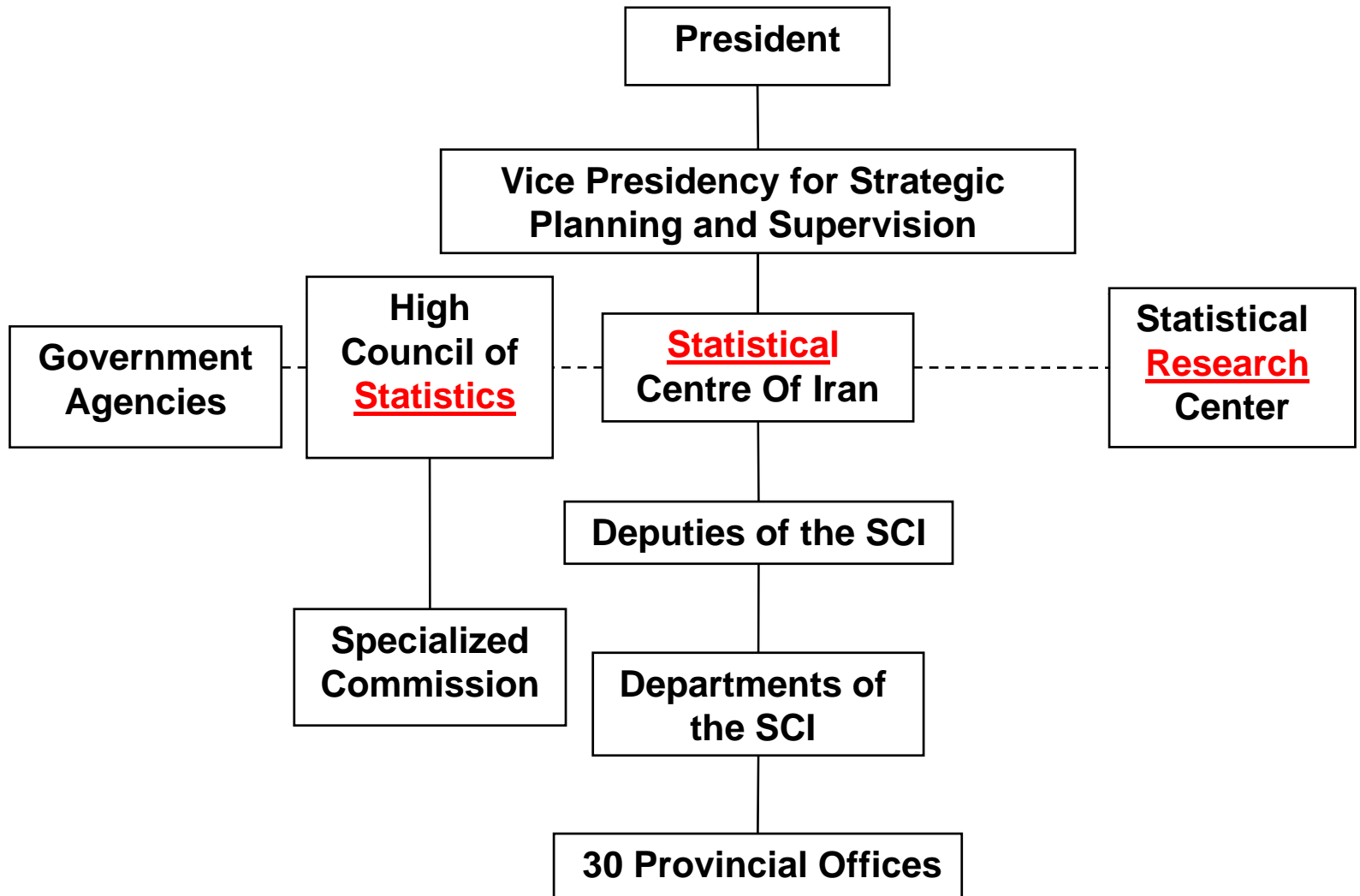
High Council of Statistics (HCS)

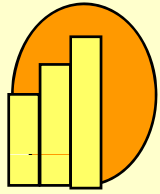
- A part of SCI's 1974 law is allocated to the High Council of Statistics and its **duties**.
- The Council is headed by the Head of the VPSPS and the **SCI** is the **secretariat** of it .
- The Council is also **composed** of **representatives** of other **main statistics producing organization** and **Central Bank** of I.R. Iran.
- The **mission** of the High Council of Statistics **includes determination** of national statistics **plan** and **strategies** and manner of **distribution** of statistical activities among **responsible organizations**.



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Organizational Chart of the National Statistical System





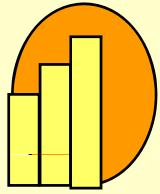
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Energy statistics

Iran is the **second** main oil producer in the **Persian Gulf** region, having **the world's third** largest proven **oil** reserves and the **second** largest proven reserves of **gas**.

Main fields of energy statistics in Iran are as follows :

- 1-**Oil**
- 2-**Gas**
- 3-**Electricity**
- 4-**Solid fuels**
- 5-**Renewable energy**
- 6-**Energy & Environment**
- 7-**Atomic energy**

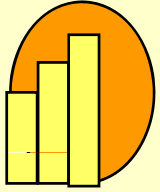


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Main producers of Iran's energy statistics

Major Iranian organization engaged in production of energy and its statistics :

- **Ministry of petroleum** including four main Companies:
 - 1- **National Iranian Oil Company**
 - 2- **National Iranian Oil Refining & Distribution Company**
 - 3- **National Iranian Petrochemical Company**
 - 4- **National Iranian Gas Company**
- **Ministry of Energy** including **water, electricity and energy sections**
- **Iran Power Generation Transmission & Distribution Management Company**
- **New energies** organization of Iran (SANA)
- **Atomic energy** organization of Iran
- **Statistical centre of Iran**



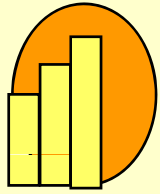
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Energy statistics sources

Various energy **resources** are utilized in **Iran** as well so it is very important to have for **Iran statistics** of its energy **production** and **consumption**.

It mentioned energy resources in Iran are very diverse and we **intend** to make **comprehensive** the statistics on following resources:

- **crude oil**
- **Coal**
- **gasoline-**
- **renewable energy sources**
- **wind**
- **solar energy**
- **nuclear energy**
- **noncommercial fuels**
- **geothermal energy**



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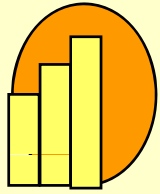
Methods of producing energy Statistics

- Most of energy statistics in **Iran** are collected and produced **administrative register** recorded statistics **methods**.
- Those statistics are collected by concerned parts of the mentioned organizations such as:
 - **oil refineries**
 - **gas refineries**
 - **electricity power plants gas**
 - **liquefied gas factories**

After processing and confirming the data will be available for statistics users in the form of :

- **Periodical**
- **CDs.**

And - **Organizations websites** of Produced Energy statistics



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Methods of producing energy Statistics

Energy statistics are collected :

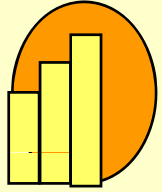
- administrative register
- statistical surveys
- censuses

Statistical Centre of Iran's surveys plans are carried out monthly, seasonal or annual basis at province or national levels.

Some energy statistics item like energy carriers consumption are produced from different sectors such as:

- Manufacturing
- Mine
- Agriculture
- Construction
- Trade & services

during these periods.



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Methods of producing energy Statistics

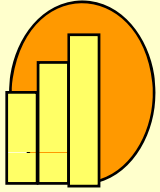
For example :

- In national population and housing **censuses** as well as household expenditure and **income surveys**, which are carried out by Statistical Centre of Iran,

household's consumption expenditure is questioned in different parts like:

- **different fuels** used for **cooking** by the households
- **gasoline**
- **energy carriers**

consumed by them.

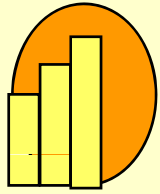


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Methods of producing energy Statistics

And :

- Such as **Solid Fuel** and **Energy Intensity** which are related to energy sector the **MDG Indicators** are **calculated** by using this information.
- In SCI's manufacturing establishment **surveys**, the volume and **value of the consumed** energy carries are questioned.
- **Resulted** statistics are used for **providing** national accounts and also to **publish** the results in publications for energy statistics users.



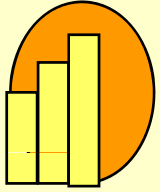
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Scope of energy statistics

- Statistical **items** and **indices** are produced and disseminated by the **relevant organization** who **need** those statistics.
- Those **items** and **statistics** are used by Ministry of Energy for **energy balance**. The SCI also **published** them in its **Statistical Yearbook**.

Some of **items and indexes** is:

- **Energy Intensity**
- **Primary energy**
- **Final energy**
- **Import & export statistics**



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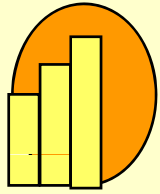
Scope of energy statistics

- Production and Consumption of:
 - crude oil
 - gasoline
 - coal
 - gasoil
 - kerosene
 - etc.

These items are produced the:

- household
- trade
- manufacturing and mining
- transportation
- agriculture

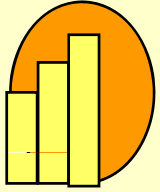
sections.



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Time period and geographical expanse of energy statistics

- Energy Statistics for **some items** are presented in **annual period** and for **some others** in **monthly periods**.
- Energy Statistics in **a national scale** are produced by Iranian Statistical producers, Although sometimes they are produced in **provinces** of **our country**.



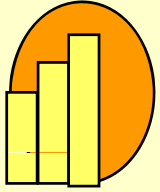
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Classification in producing energy statistics

Recommended **classifications** by:

- **OECD**
- **EUROSTAT**
- **IEA**

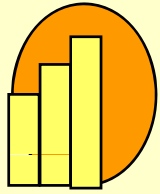
are used by the SCI for **collecting** energy statistics and preparing **energy balance**.



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Energy Balance

- The background of preparing and producing **energy balance** in Iran by **Ministry of Energy** dates back to **20 years** ago and it is about **two years** that **hydrocarbon balance** is also produced by The International Energy Researches Organization of the **Ministry of Petroleum**.
- In order prepare the energy balance , we use the information which is collected by different organization such as
 - **Tavanir Company**
 - **Water resources management**
 - **Iran's New Energies Organization**
 - **Iran's gas company**
 - **Ministry of industries and mines**



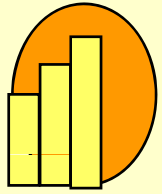
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Energy Balance

and

also the results of the **surveys conducted** by the Statistical Center of Iran , like **Household Income and Expenditure Survey** and **Independent Industrial Electricity Generators Survey**.

In order to **prepare** the energy balance, we **use** the above mentioned **classifications** .



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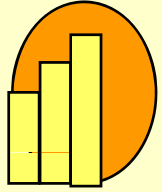
Main publications on Energy Statistics :

In addition to the above mentioned **balances** , publications such as **Energy in Iran** and **Statistical and Energy Graphs of Iran and the World**, are the main periodicals on energy Statistics in Iran.

Furthermore , **other organizations** in energy field, **publish** their **own publications** on energy statistics .

Major applications of energy statistics :

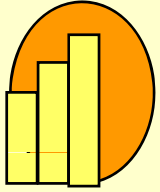
- **Preparing energy balance**
- **Preparing development plans**
- **Preparing input/output tables**
- **Calculation of national accounts**



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The main users of energy statistics in Iran are

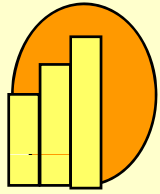
- National **Policy** makers and **legislators**
- Executive organizations**
- Statistical Centre of Iran**
- Research** centers
- Private** companies
- Researcher** such as **university professors** and **students**



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The main activities on energy statistics

- Statistical Center of Iran has **developed** and carried out **National Strategy** for the Development of Statistics (**NSDS**) in **recent** years (from 2005 to 2009). The second NSDS is also under process for 2010 to 2015.
- In the NSDS, **administrative registers** has gained a **high degree** of priority. In this line, all **executive bodies** are bound to organize information-operation systems to **collect** and **process** relevant statistics and subsequently submit the resulted data to the **National Statistical Database**.

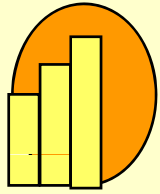


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The main activities on energy statistics

-These systems are set up under **supervision** of Statistical Center of Iran to be **ratified** by the High Council of Statistics.

- With regard to the **nature** of energy statistics which are **considered** mainly as **administrative registers**, during the recent years implementation of such systems have been followed up by the SCI particularly in case of the **information – operation** systems of the Ministry of Energy and The Ministry of Petroleum. **Information- operation** system in **Tavanir Company** (affiliated to Ministry of Energy) has been designed to **collect electricity consumption** by electrical customers, tariffs of **electrical prices** etc. and **currently** is **active**.

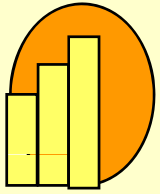


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The main activities on energy statistics

One of the **efficient** and unique systems in the World is devoted in Iran for **distributing gasoline** by means of a **smart cards**. This system not only **controls distribution** and **consumption** systematically, but also it is able to produce the pertinent **administrative register** in **online** manner.

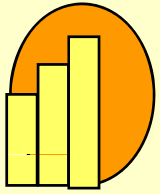
Another information system, is System for Collecting Data for Iran **Statistical Yearbook**. Statistical Centre of Iran maintains a close cooperation with international organizations such as **UNSD, IEA, ESCAP and ECO** and regularly fills out and sends them back the **questionnaires** to the relevant organizations.



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Constraints and Challenges :

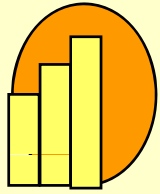
- Lack of proper attention to energy statistics at managerial levels.
- Lack of centralization and integrity in production of energy statistics
- Differences in methods of data collection among organizations producing energy statistics.
- Lack of energy statistics in the provincial levels due to differences in coverage and classifications in use .
- Budget cut and shortage of skilled experts with experience on energy statistics.



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Constraints and Challenges :

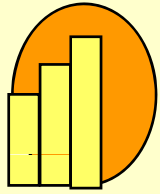
- Lack of proper controls on production of energy statistics.
- Differences in definitions and concepts applied for energy statistics.
- Parallel activities in statistical units of concerned organization .
- Production of two balance on energy by two different organization.



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Suggestions

- Formation of a work group of experts of state members of Economic Cooperation Organization and other countries in the region .
- Conducting training courses on methodologies for producing energy statistics.
- Formation of local and regional organization to supervise the production of energy statistics and energy balance in countries.
- Coordinating and harmonizing of data sources, statistical units and the definitions and concepts used by different international organizations.
- Promotion of cooperation and expansion of relations among international organizations for improving the quality of energy statistics.

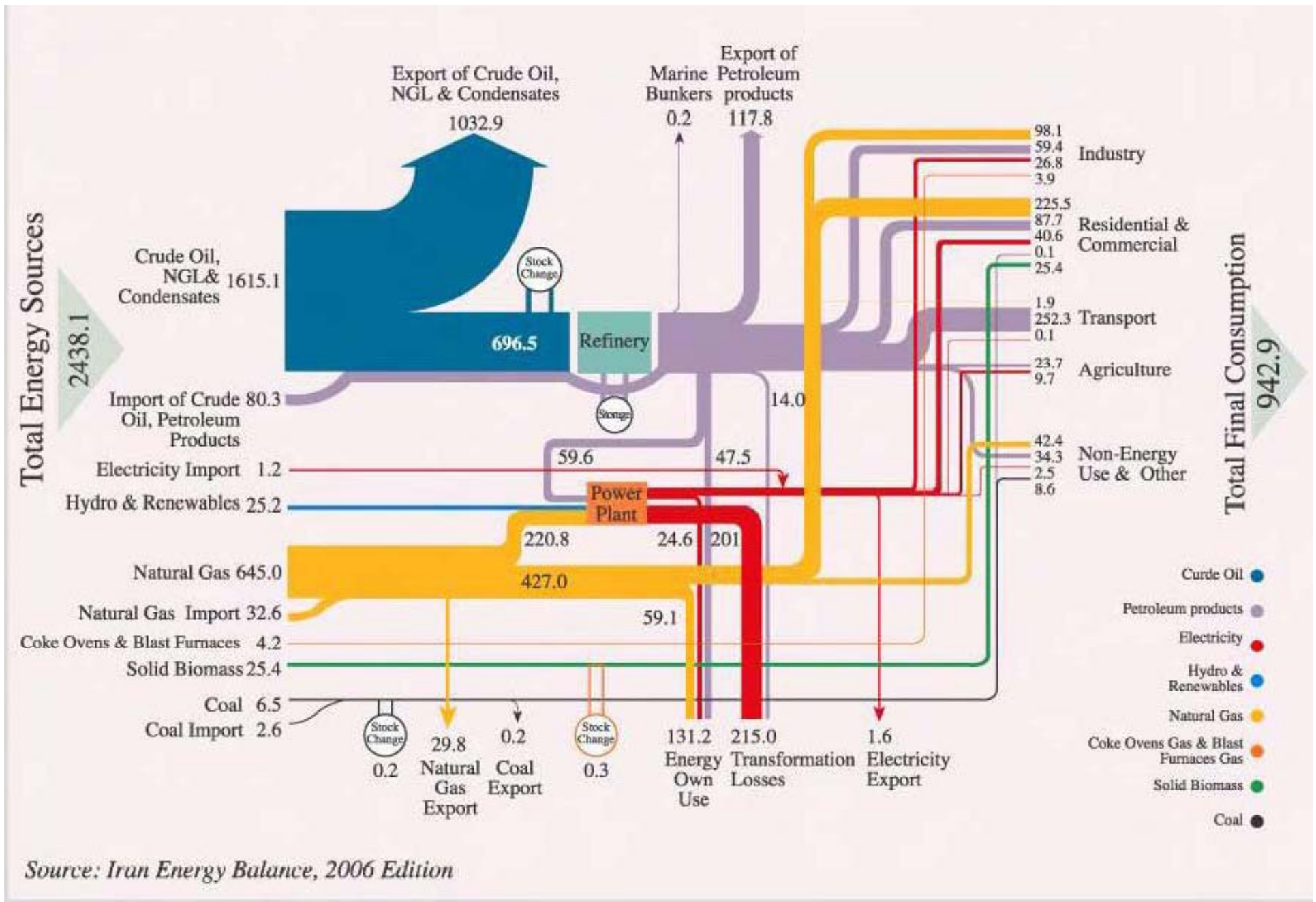


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Some tables and graphs of energy statistics

Source: Iran Energy Balance, 2006 Edition

Iran Energy Flow, 2005



Source: Iran Energy Balance, 2006 Edition

Table 1 Iran Energy Balance, 2005**(Mboe)**

Description	Oil ^a	Natural Gas	Coal (Gases)	Coal	Solid Biomass	Hydro	Renewable	Electricity	Total
Supply									
Production	1615.1	645.0	4.2	6.5	25.4	25.1	0.1	-	2321.4
Import	80.3 ^b	32.6	-	2.6	-	-	-	1.2	116.7
Export	-1150.7 ^c	-29.8	-	-0.2	-	-	-	-1.6	-1182
International marine Bunkers	-0.2	-	-	-	-	-	-	-	-0.2
TPES	578.5	648	3.9	8.7	25.4	25.1	0.1	-0.4	1289
Oil Refineries losses	-14.0	-	-	-	-	-	-	-	-14.0
Extraction of oil & gas	-11.9	-	-	-	-	-	-	-	-11.9
Transfer ^d	-29.7	-	-	-	-	-	-	-	-29.7
Power Plant :	-59.6	-221	-	-	-	-25.1 ^e	-0.1 ^e	-	-305.7
Fuel Consumption									
Electricity Generation	-	-	-	-	-	9.5	0.04	104.7	104.7
T&D Losses	-1.9	-4.3	-	-	-	-	-	-19.0	-25.2
Own Use	-4.0	-54.8	-	-	-	-	-	-5.6	-64.4
TFC	457.4	368	3.9	8.7	25.4	-	-	79.7	942.9
R & C	87.7	225.5	-	0.1	25.4	-	-	40.6	379.3
Industry	59.4	98.1	3.9	-	-	-	-	26.8	188.2
Transport	252.3	1.9	-	-	-	-	-	0.1	254.3
Agriculture	23.7	-	-	-	-	-	-	9.7	33.4
Other Use	-	-	-	-	-	-	-	2.5	2.5
Non-Energy Use	34.3	42.4	-	8.6	-	-	-	-	85.2

Source: Iran Energy Balance, 2006 Edition

a) Including crude oil, NGL and condensate, Petroleum Products.

b) Including SWAP

c) Including SWAP, LPG export by petrochemical, NGL and condensate

d) Transfer results from classification of products either because their specification has changed or because they are blended in to another product

e) Primary energy

Graph 1 Production of Different Petroleum Products in Iran (10⁶m³)

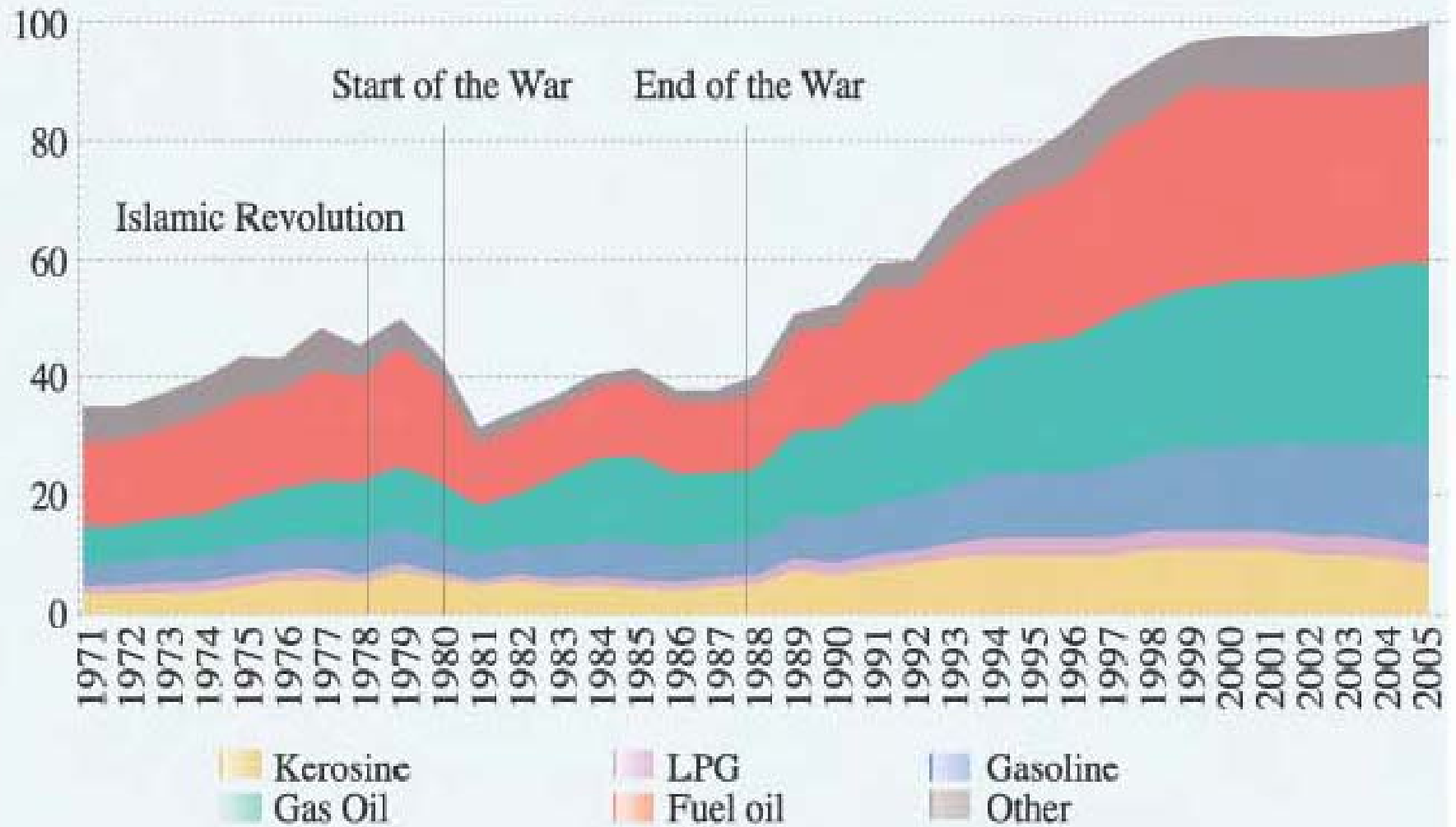


Table 2 Consumption of Petroleum Products by Sectors, 2005 (10³ liters)

Products	Industry and Mines			Residential Public Commercial	Agriculture	Transport		Total
	Power plant		Other industries			Shipping	Other	
	MOE	other						
Motor gasoline	2	-	55	12	13	34	24179	24396
Kerosene	-	-	50	7363	74	-	-	7487
Gas oil	2612	37	2710	2844	3730	441	16321	28695
Fuel oil	6329	-	6033	1529	-	594	-	14486

Table 3 Nominal and Operational Capacity of the Power Plants in Iran

(MW)

Year	Nominal Capacity				Average of the operational capacity		
	MOE	large industries	other	total	MOE	large industries	total
2000	26287	901	18.54	27206.54	24147	840	24987
2001	28032	901	18.54	28951.54	25645	840	26485
2002	30604.7	901	19.64	31525.34	28008.7	840	28859.6
2003	33415.4	901	16.10	34332.5	30439.7	840	31295.8
2004	36291.2	1009	a	37300.2	32871.5	930	33801.5
2005	38213.1	1594	b	41020.1 ^c	34624.2	1380	37071.2 ^d

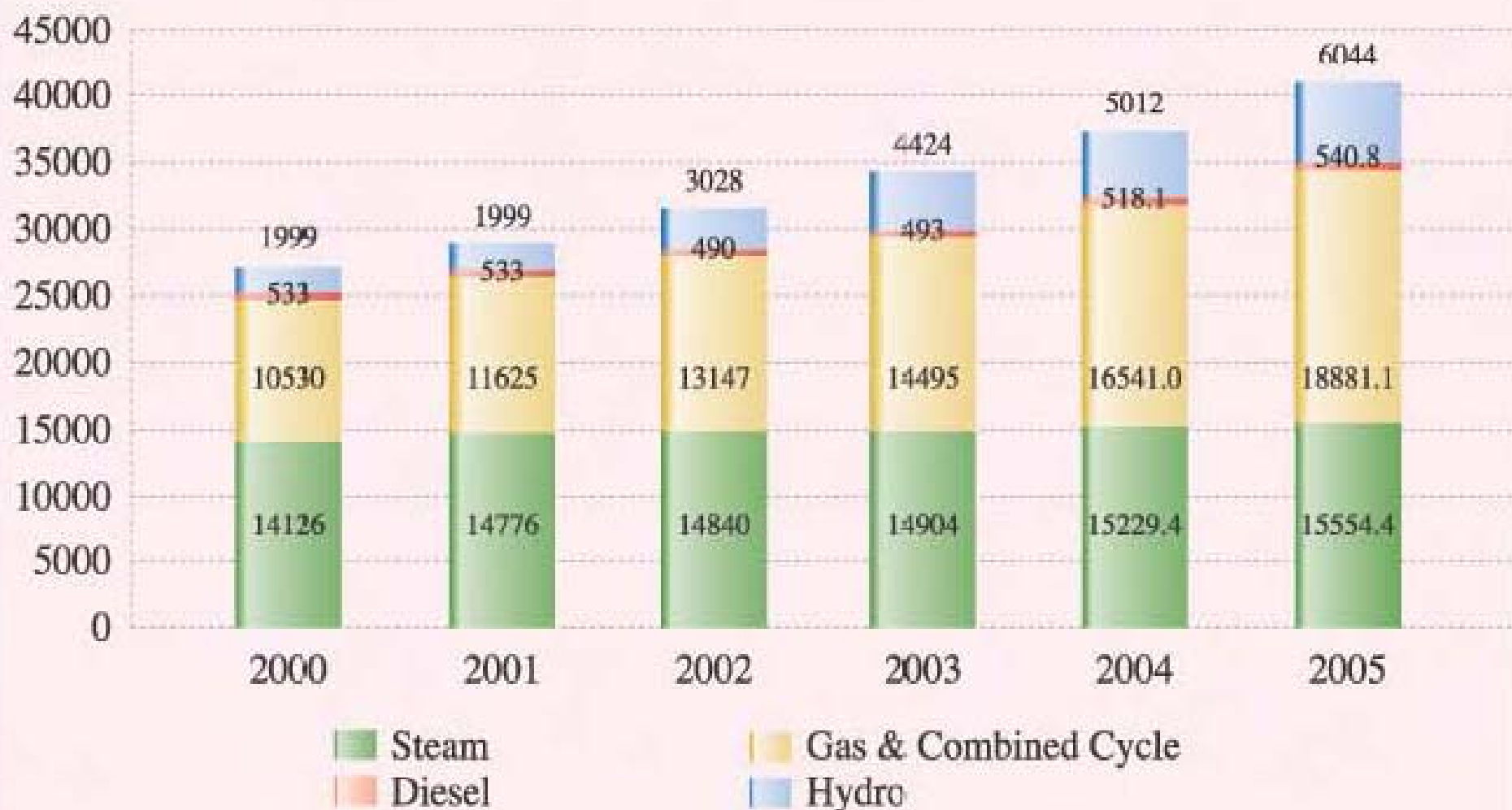
a. Including 24.9 solar and wind power plants of MOE and AEOI, that both are considered in MOE column.

b. Including 47.6 MW wind power plant and 0.144 MW solar power plants which was accounted to MOE

c. Including 1213 MW power plants operated by private sector

d. Including 1067 MW power plants operated by private sector.

Graph 2 Nominal Capacity of the Power Plants by Type (MW)



Graph 3 Trends of Greenhouse Gas Emissions from Natural Gas Combustion

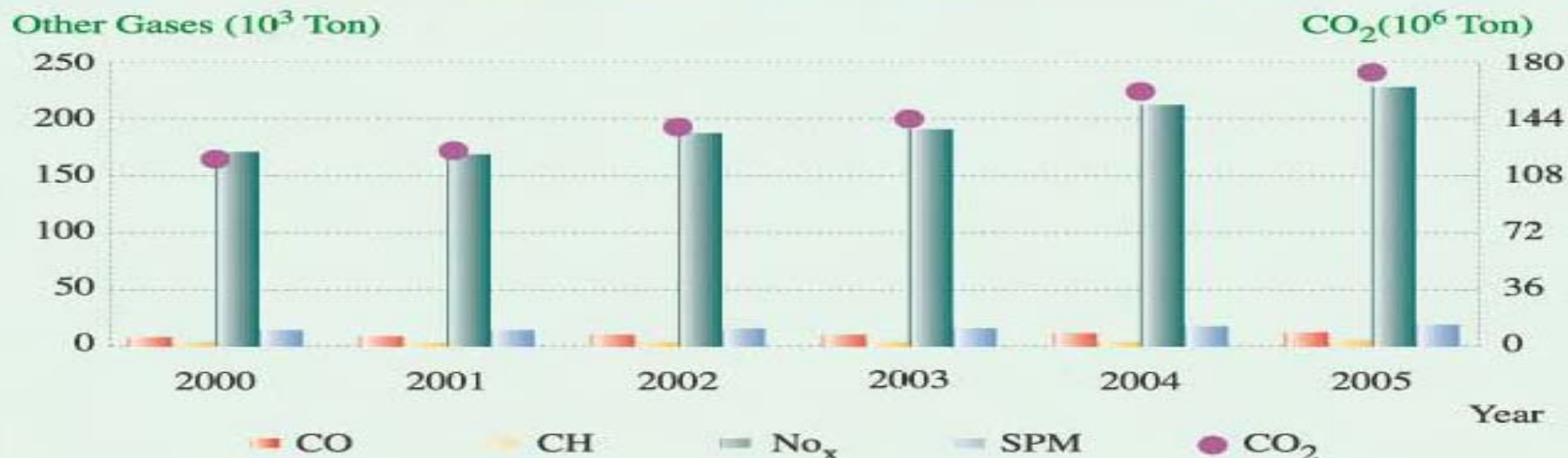


Table 4 GHG Emission from Fuel Combustion in Iran, 2005

(10³ton)

Fuel	NO _x	SO ₂	CO ₂	SO ₃	CO	CH	SPM
Fuel oil	113.2	226.6	43138.9	3.5	0.1	5.8	14.5
Gas oil	553.5	470.6	75817.3	5.5	134.9	412.0	256.8
Kerosene	3.7	18.0	18080.1	-	5.8	-	-
Gasoline	329.4	36.6	56675.6	-	8539.2	1537.0	31.7
LPG	1.6	0.03	5838.8	-	13.1	0.9	-
Natural Gas	227.3	0.6	179578.8	-	11.9	5.0	19.2
ATK	26.1	16.2	2560.6	0.2	7.0	21.3	12.8
JP4	1.4	0.2	247.4	-	37.3	6.7	0.1
Total	1256.2	768.8	381937.5	9.1	8749.1	1988.7	335.1

Table 5 Energy Carriers Subsidies in Iran, 2005

(10⁹ Rials)^a

Fuels	Residential	Industry	Agriculture	Transport	Commercial	Public	Total
Gasoline	-	149.0	36.4	65846.5	1.4	303.4	66336.8
Kerosene	26645.8	186.5	280.4	-	385.8	867.8	28369.1
Gas oil	3520.6	9419.0	13088.7	58819.5	2494.6	3963.1	611814.2
Fuel oil	-	13207.0	-	1300.7	2858.8	488.8	17855.2
LPG	7297.2	496.0	-	912.0	195.7	-	8900.8
Electricity	37434.4	24430.5	12073.7	-	4639.6	12249.8	90828.1
Natural Gas	60508.0	28988.4	-	591.0	6455.3	1615.8	98158.6
Total	135406.0	76879.3	25479.3	127469.7	17031.1	19488.7	922262.8

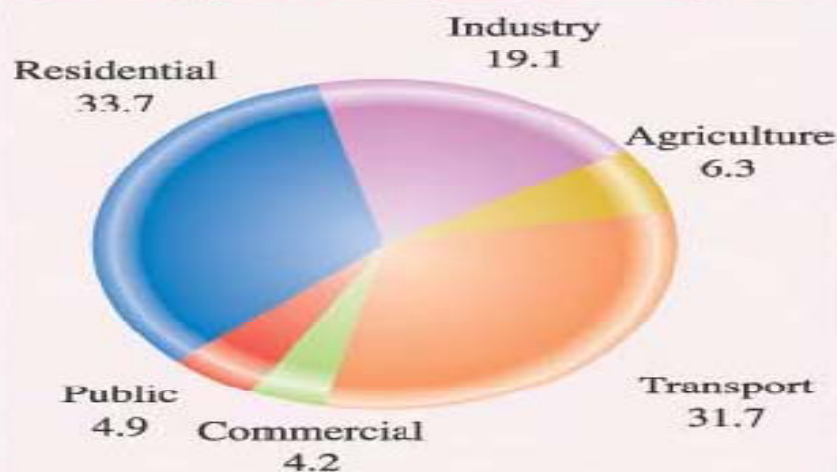
Source: Iran Energy Balance, 2006 Edition

1) Currency exchange rate is equal to 9098 rials per dollar (according to dollar exchange rate in 2005 budget of I.R IRAN)

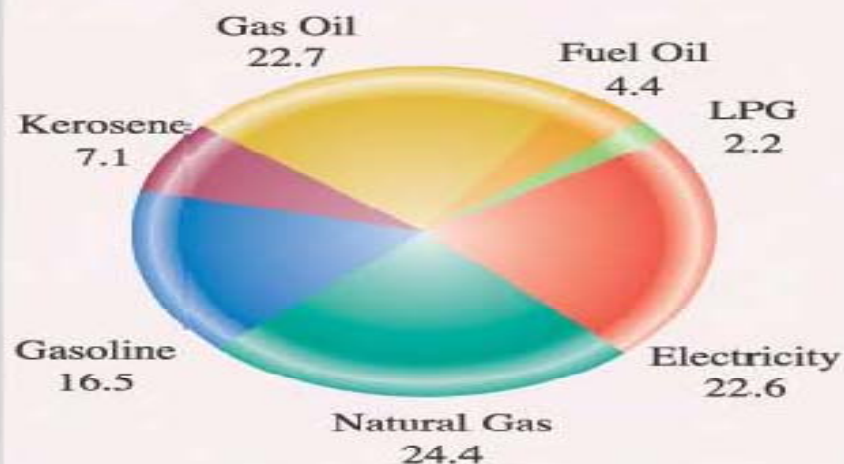
-Economic value of the petroleum products is equal to Persian Gulf FOB prices and natural gas is equal to import prices to Turkey.

-Final cost of electricity is calculated according to the economic value of the fuel used in power plants

Graph 4 Energy Subsidies by Sectors, 2005 (%)



Graph 5 Energy Subsidies by Energy Carriers, 2005 (%)





Thank You