



IAEA

الوكالة الدولية للطاقة الذرية

国际原子能机构

International Atomic Energy Agency

Agence Internationale de l'énergie atomique

Международное агентство по атомной энергии

Organismo Internacional de Energía Atómica

*Workshop on
Steps for Conducting Nuclear Power Plant Technology
Assessments.*

Vienna , Austria, 17-20 Nov,2008

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LIBYA

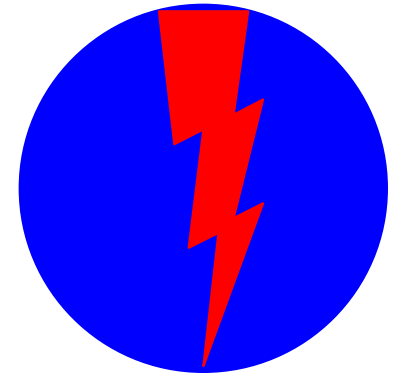
LIBYA

- **Located in North Africa with a Coastal Line along the Mediterranean Sea of 1700 Km.**
- **The country Area about 1.76 km² with a population of 6 million (2006).**
- **Libya is an oil exporter country and soon gas will become at top list of the country primary energy.**
- **Libya experienced strong economic 2003-2005 due to oil prices and world opening.**
- **Libya is hoping to reduce it's dependency on oil and to increase investments on the other sectors such as Tourism , fisheries and natural gas.**
- **Libya is also attempting to position itself as a key economic intermediary between Europe and Africa.**

Energy Situation

- **Proven oil reserve of 35 billion barrels and 53 TCF natural gas**
- **Exports revenue \$34 billion.**
- **GDP 49 billion (\$US) , 8638 (\$US) per Capita.**
- **Total Energy Supply 955 PJ (23Mtoe)**
- **Energy Exports 3639 PJ (86 Mtoe) (51% are crude oil and refined product and 49% natural gas)**
- **Final Energy demand 445 PJ (10.6 Mtoe)**
 - Industry 85**
 - Transport 175**
 - Others 185**

Electricity



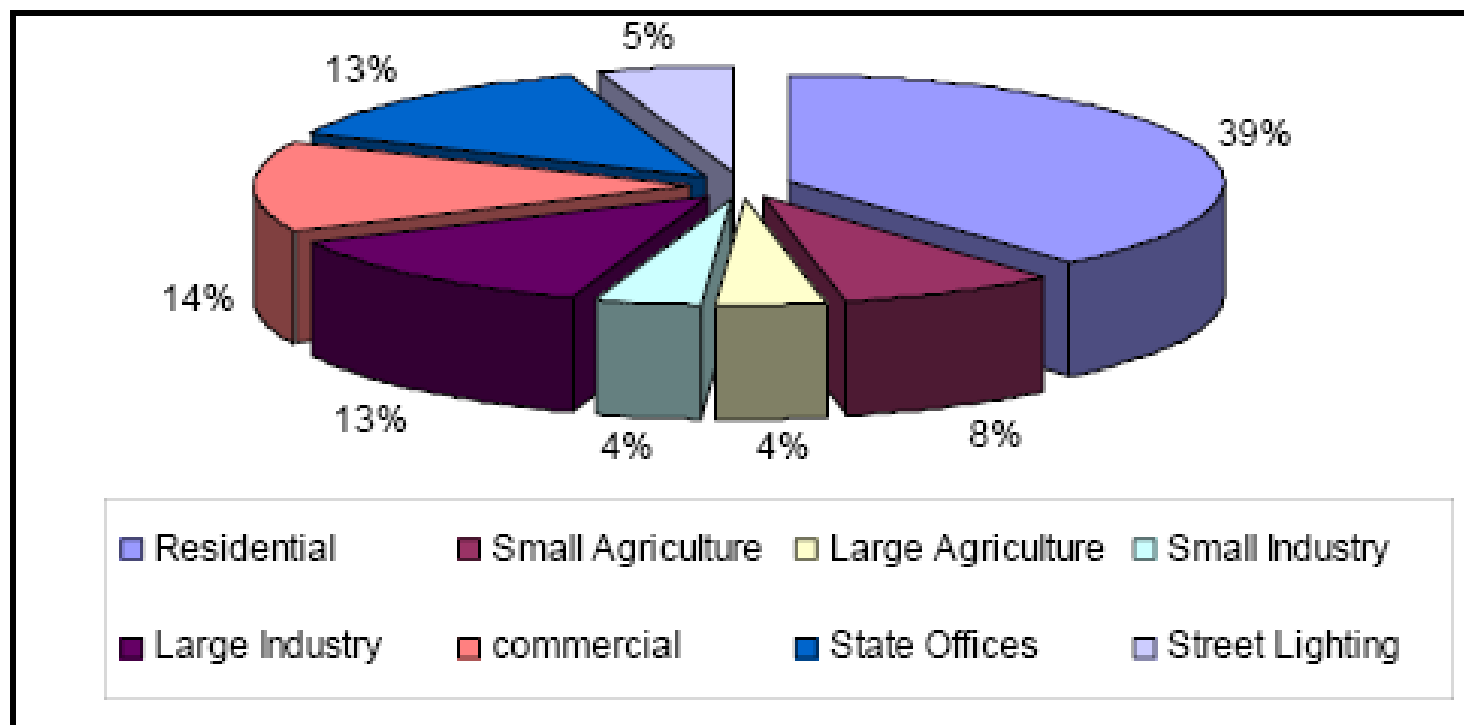
General Electricity Company of Libya (GECOL)

- General Electricity company is established in 1985 by the law No (17-1984) Public utility company integrated in charge of Production, transmission and distribution of electrical energy in Libyan national territory.

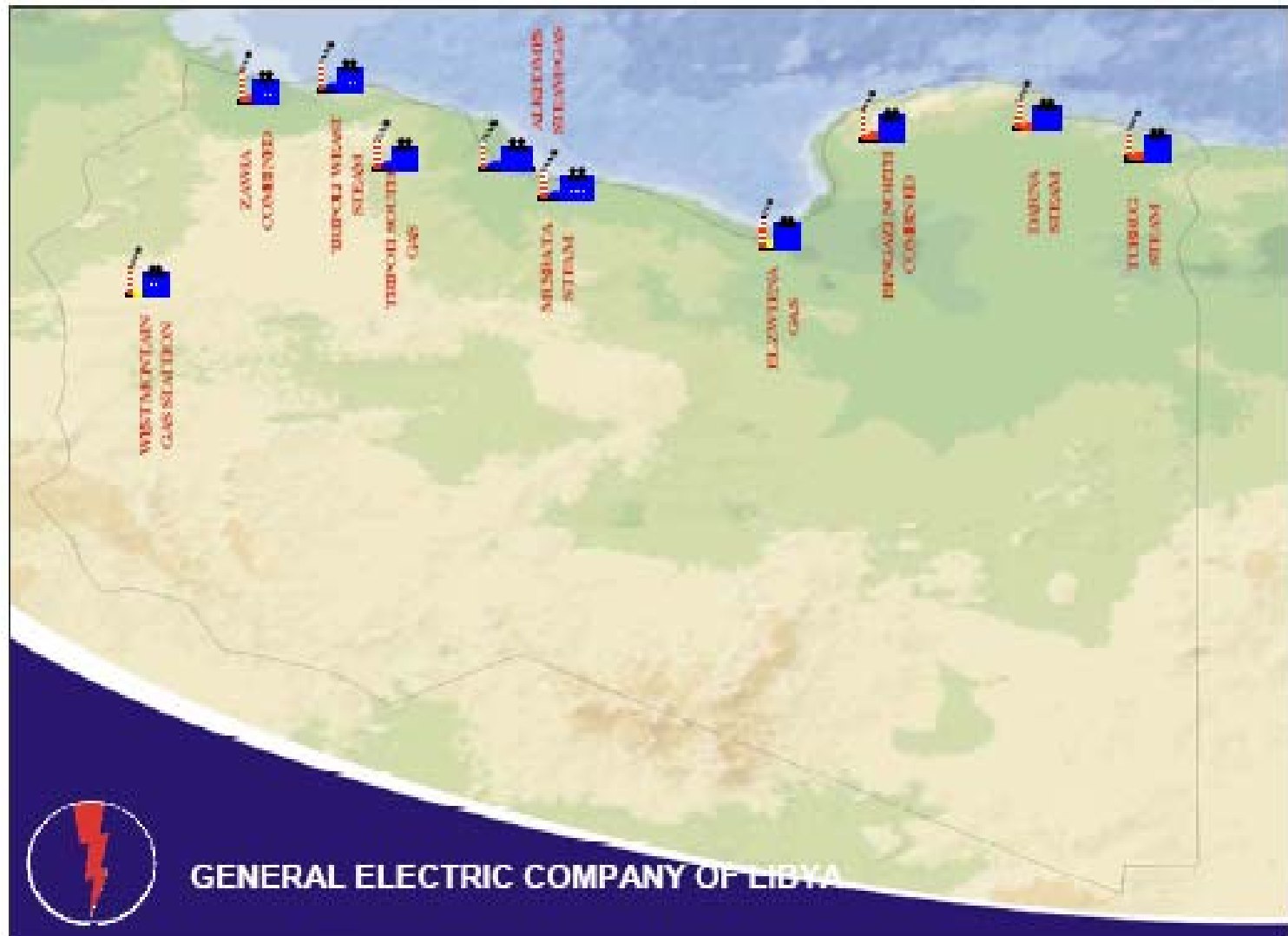
Electricity

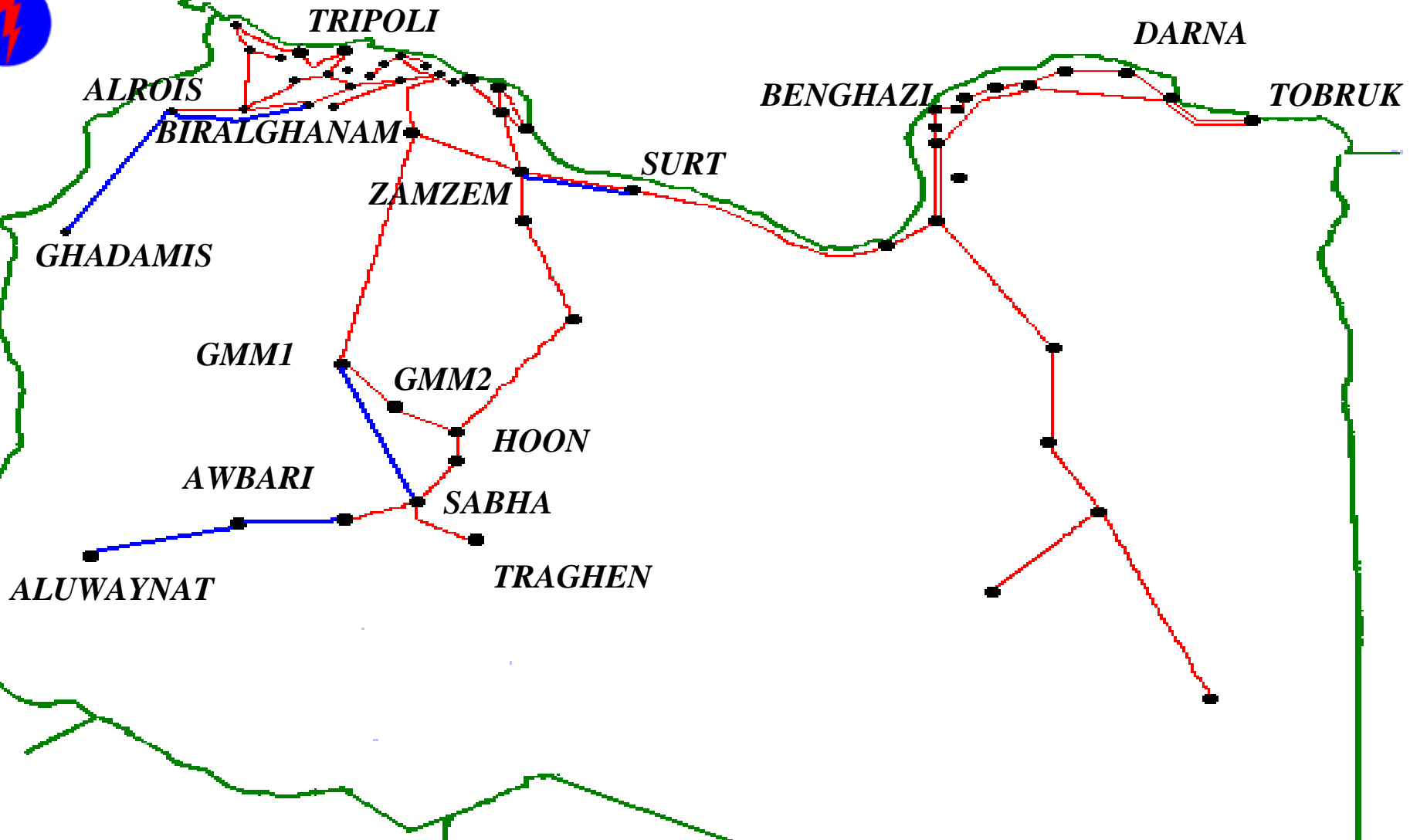
- **Installed Generation 5,440 MW**
- **Generated Energy 23,933 GWh**
- **Accessibility 99%**
- **Peak Demand 4,400 MW**
- **Per Capita Consumption (Kwh) 3,693**
- **Load Growth rate 7%-10% ann**

Consumption By Sectors



Generation Plants





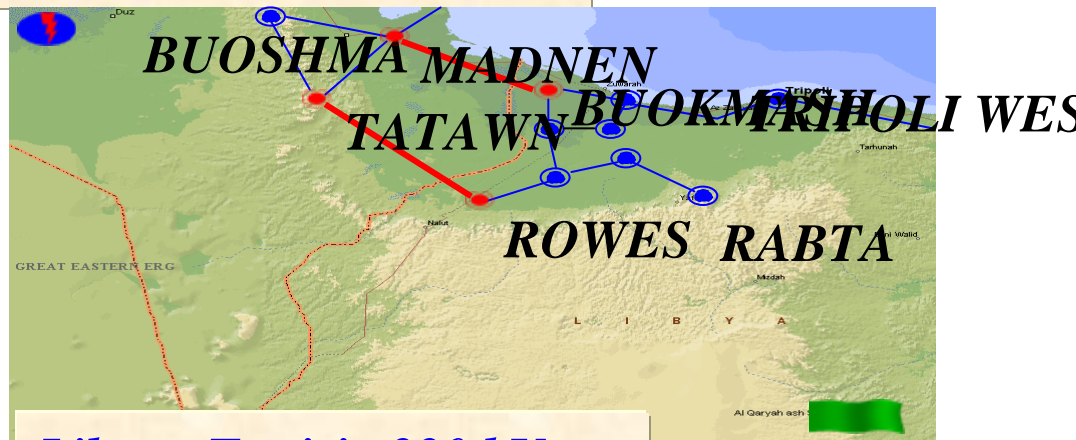
220 kV Transmission system

- Existing 220 kV T. lines
- Planned 220 kV T. lines

Grid Regional Connection

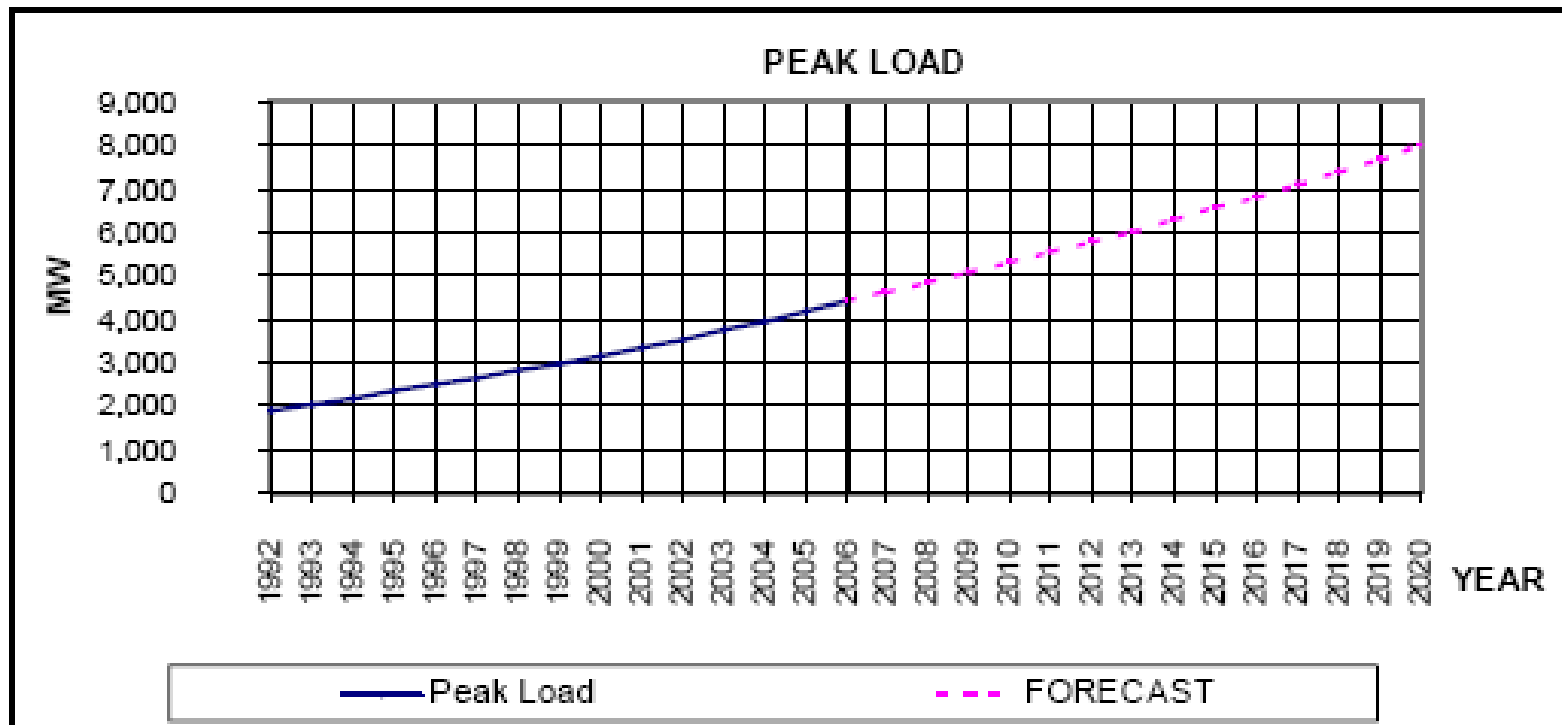


Libya - Egypt 220 kV Electrical interconnection



*Libya - Tunisia 220 kV
Electrical interconnection*

Load Peak & Forecast



Master Plan Future Perspectives

FACTS

The peak load of electrical power in Libya is continuously increasing with a relatively high growth rate from **7** to **10%** per annum.

The working stations having technical difficulties.

The power generation as well as the transmission network are also **expanding**.

The fundamental objective of the electrical Master Plan of the Libyan system, is to **secure and guarantee the electrical power supply to the growing demand of electrical energy to all sectors in the country.**

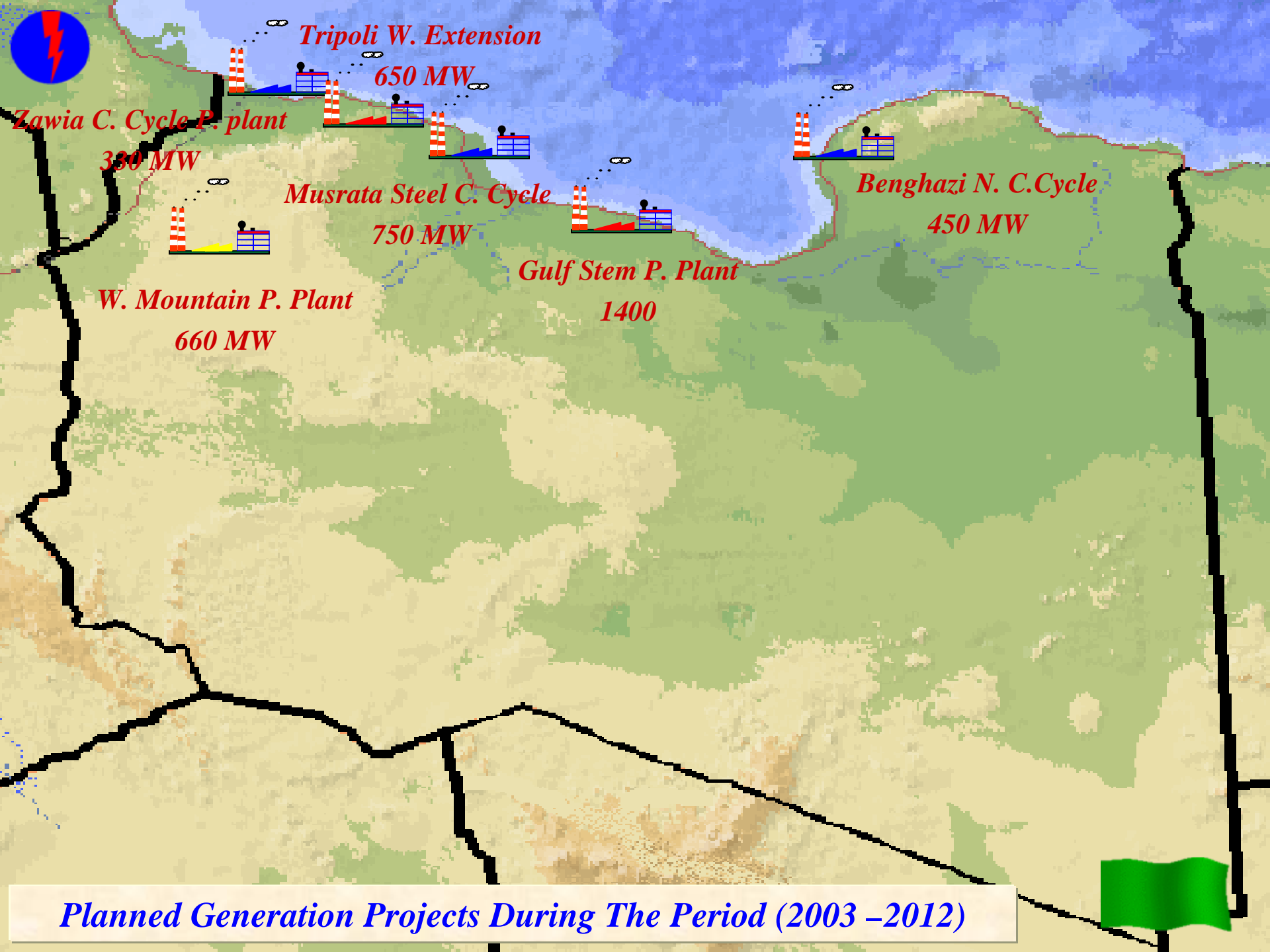
Goal and Strategies

- **Development and Strengthens the Power System in all Phases.**
- **Constructing Modernized Monitoring and Control Centers**
- **The Use of Up to date Communication Systems.**
- **Increase the share of Renewable Energy Sources.**
- **Enhancement of Power Sharing with neighboring Countries.**
- **Manpower development.**
- **Quality in management and production.**
- **Improve Efficiency and minimize Losses**

The Generation Expansion Plan.

A total of **5000 MW** generation capacity need to be added during the period (2003 - 2012) with a mixed generation options (**Steam & Combined Cycle**) using natural gas .

Name of Power Plant	Installed Capacity (MW)
W. Mountain P. Plant	625
Tripoli W. Extension I	650
Benghazi N. C.Cycle	450
Gulf Stem P. Plant	1400
Zawia C. Cycle P. Plant	330
Musrata Steel P. Plant	750
Tripoli W. Extension II	650



Transmission System

The New 400 Kv Grid

The Future plan of the Libyan Transmission System is concentrated on the EHV 400 kV grid.

The **400 kV** system will be implemented by constructing:

8(400/220kV) substations

6500 MVA

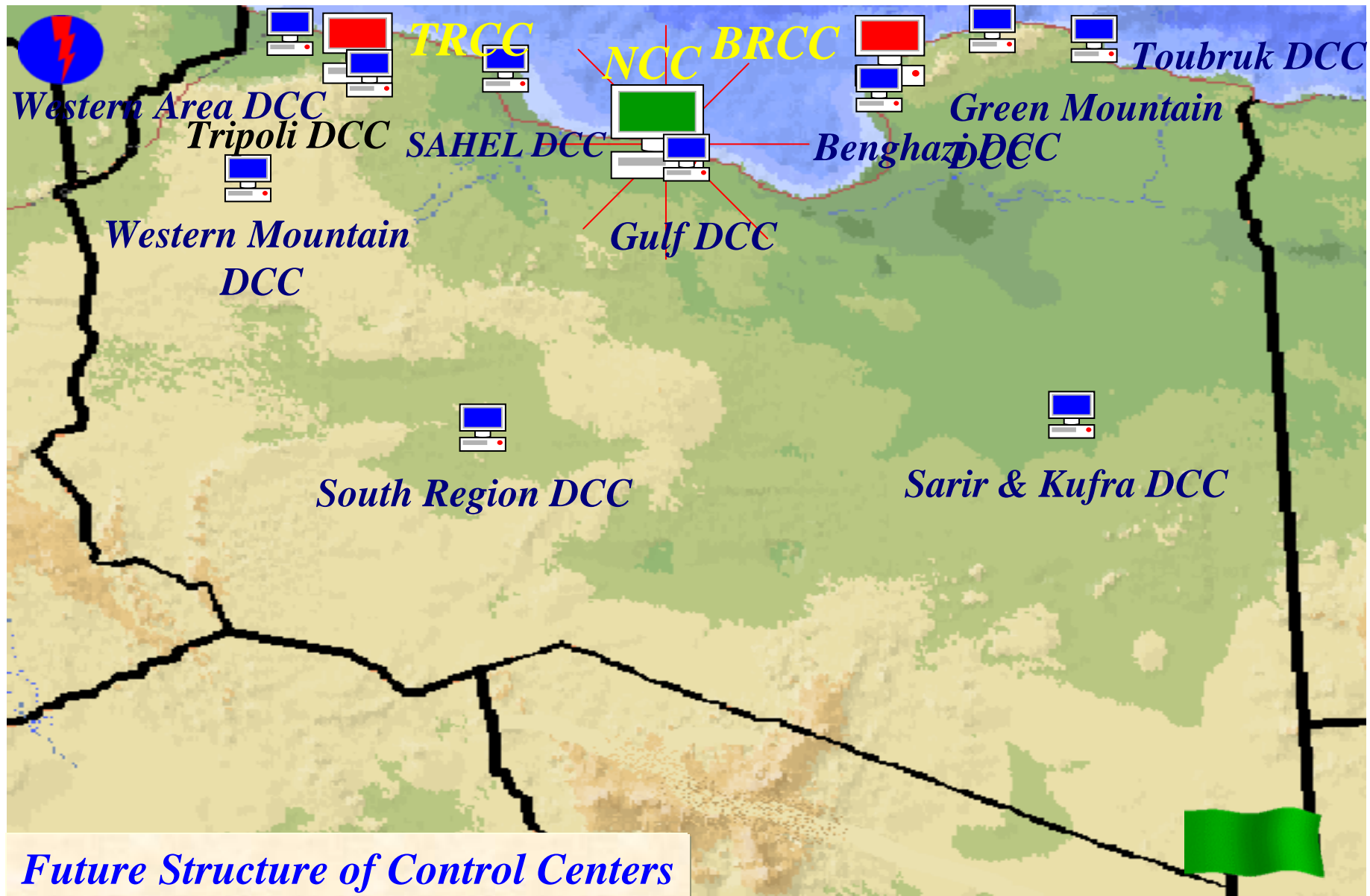
400 kV lines

4000 KM



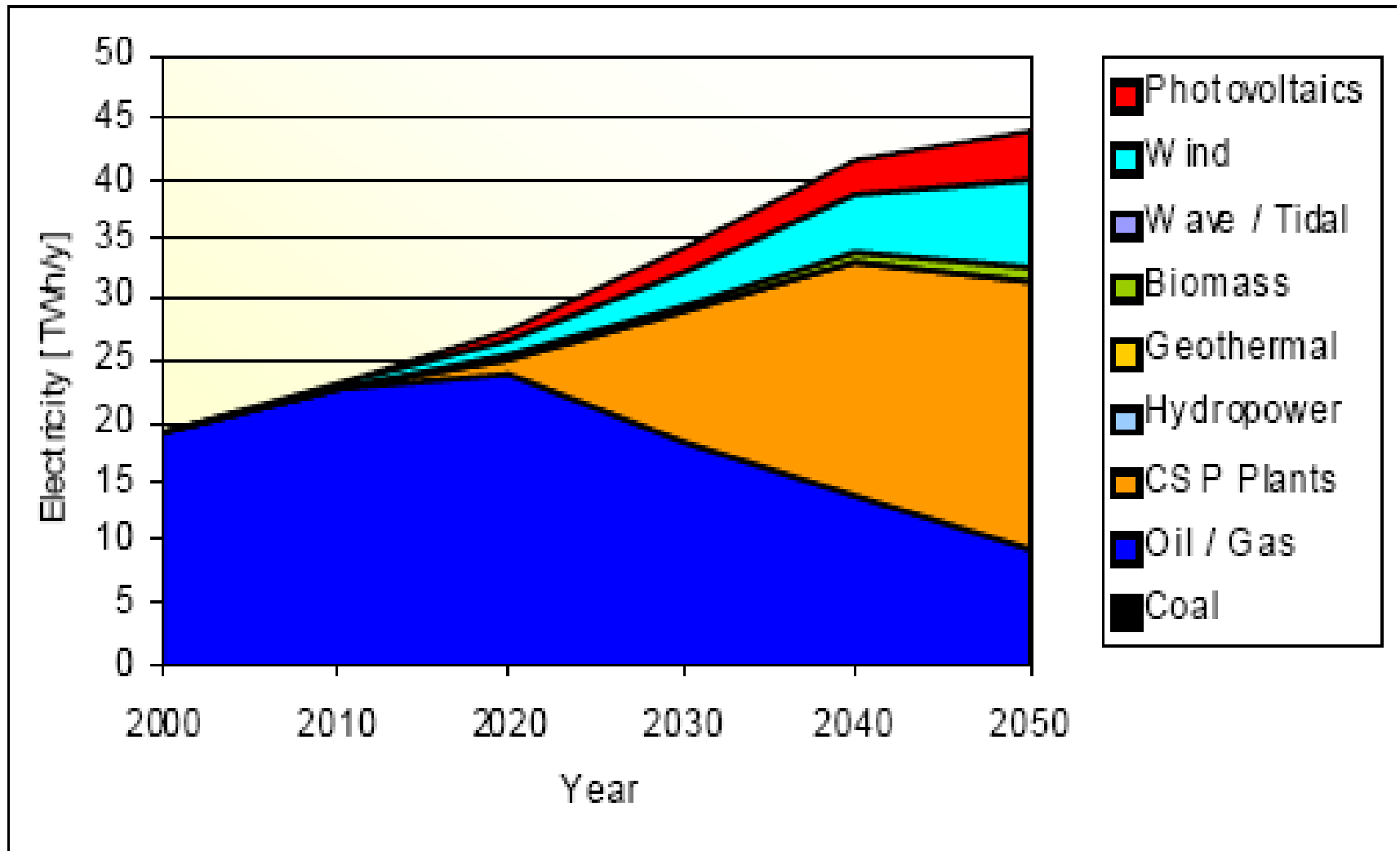
The New Libyan EHV 400 kV Network

Control Centers

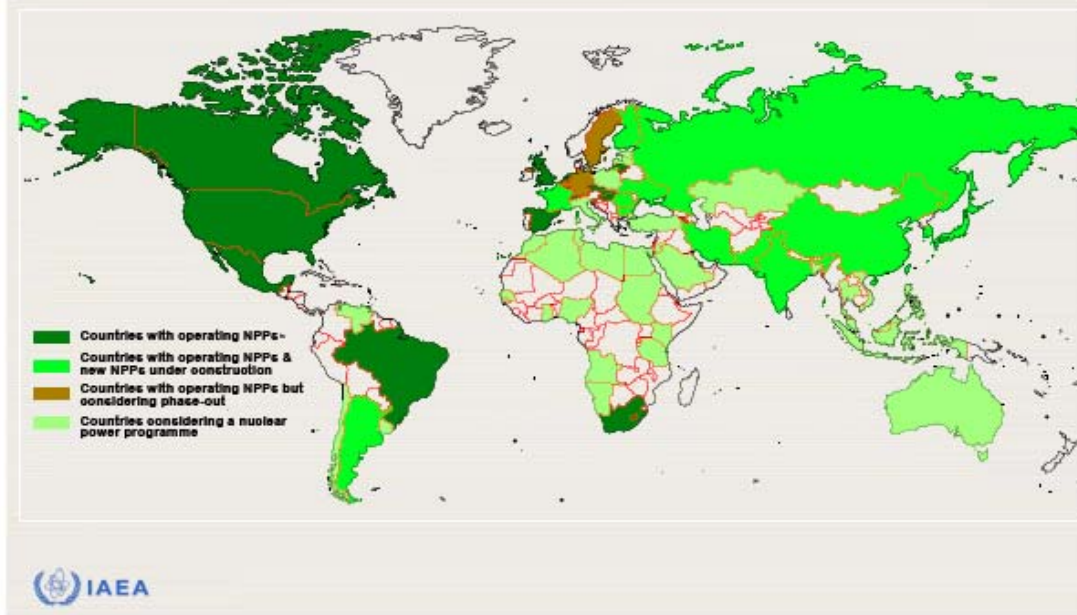


Renewable Energies

Proposed Plane 2006-2050



Nuclear Power



- No nuclear power plants in Libya nor NPP assessment study.
- Only experience in nuclear Technology is with Tajoura Research Center (reactor 10 MW ,Russian, WWR-C,1979) used for peaceful application of nuclear power in co-operation with the [IAEA](#).
- In 2008 Signing co-operation agreement in Nuclear power generation and the application of nuclear technology in peaceful application such as medicine and Agriculture with France & Russia.
- Establishments of National nuclear energy commission starting year 2009 for the peaceful application of nuclear technology.

Forward,,,,

- **Increase the Use of Natural Gas as a source of primary Energy**
- **The use of Renewable Energies and water Desalination plants.**
- **Maintain the co-operation with the IAEA.**
- **Make use of recent signed co-operation agreement in peaceful applications of nuclear power.**
- **Learn the new trends of technology in power generation and build the required elements for such application and this work shop is a key step.**



In Conclusion

Technology Assessment of new trends of technology such as the topic of this workshop and Electricity sector in Libya was gone through a lot of technical difficulties along with other energy sectors and economic situation so this workshop is very valuable to the needed country such as Libya and hoping this workshop is a start of a long commitment of co-operation from the IAEA such as another regional workshop.



In Closing

- Wishing all the success to this workshop and sincere thanks to the organizing committee and to all invited experts and also wishing success to all.



Thank you