



Current Status Of Nuclear Power Project In Egypt

Human Resources Development and Lessons Learned

By

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Outline of the Presentation



1. History and Background
2. Nuclear Power Programme, Roadmap And Status
3. Organizational Setup
4. Human Resources Development
5. Lessons Learned from the HRD So Far
6. Conclusion



1- History and Background



History and Background



- **Historical development:** Nuclear ambitions in Egypt date back to 1954.
 - Egypt is one of the countries that participated in the establishment of the International Atomic Energy Agency (IAEA) in 1957.
 - The Egyptian Atomic Energy Commission was established in 1955.
 - The Nuclear Power Plants Authority (NPPA) was established in 1976 as the future owner/operator of nuclear power plants.
 - The Egyptian Supreme Council for Peaceful Uses of Atomic Energy has functioned as Egypt's NEPIO.
- **Research reactors:** There are 2 nuclear research reactors :
 - From Russia (1961) with (2 MW); and
 - From Argentina (1998) with 22 MW.



History and Background (Cont.)



- **Diversification:** The growing energy demand in Egypt with limited indigenous resources, (especially fossil fuel resources such as oil and coal) has encouraged Egypt to diversify its energy mix.
- **Nuclear energy:**
 - Consideration of nuclear energy as an option for electricity generation was revived in 2006.
 - In October 2007, the strategic decision was taken to start a programme to construct a number of nuclear power plants for electricity generation.





History and Background (Cont.)

- Since 2007, many steps have been taken to implement the programme:
 - ❑ **Consultant:** In 2009, a contract with an international consultant was signed to support NPPA in the implementation of the nuclear power programme.
 - ❑ **Nuclear law:** In 2010, Nuclear Law No.7 of 2010 was issued (together with Executive Regulations) which established:
 - The Egyptian Nuclear and Radiological Regulatory Authority (ENRRA), the independent nuclear regulatory body; and
 - The framework of nuclear regulation in Egypt, including in areas of nuclear safety, nuclear security and non-proliferation.
 - The Nuclear Law was updated in 2017.
 - ❑ **Site permit:** The site permit application was submitted to ENRRA in February 2010.
 - Received “No Objection” in August 2010 as no rejection criteria exist.
 - **Site Approval Permit obtained in March 2019.**



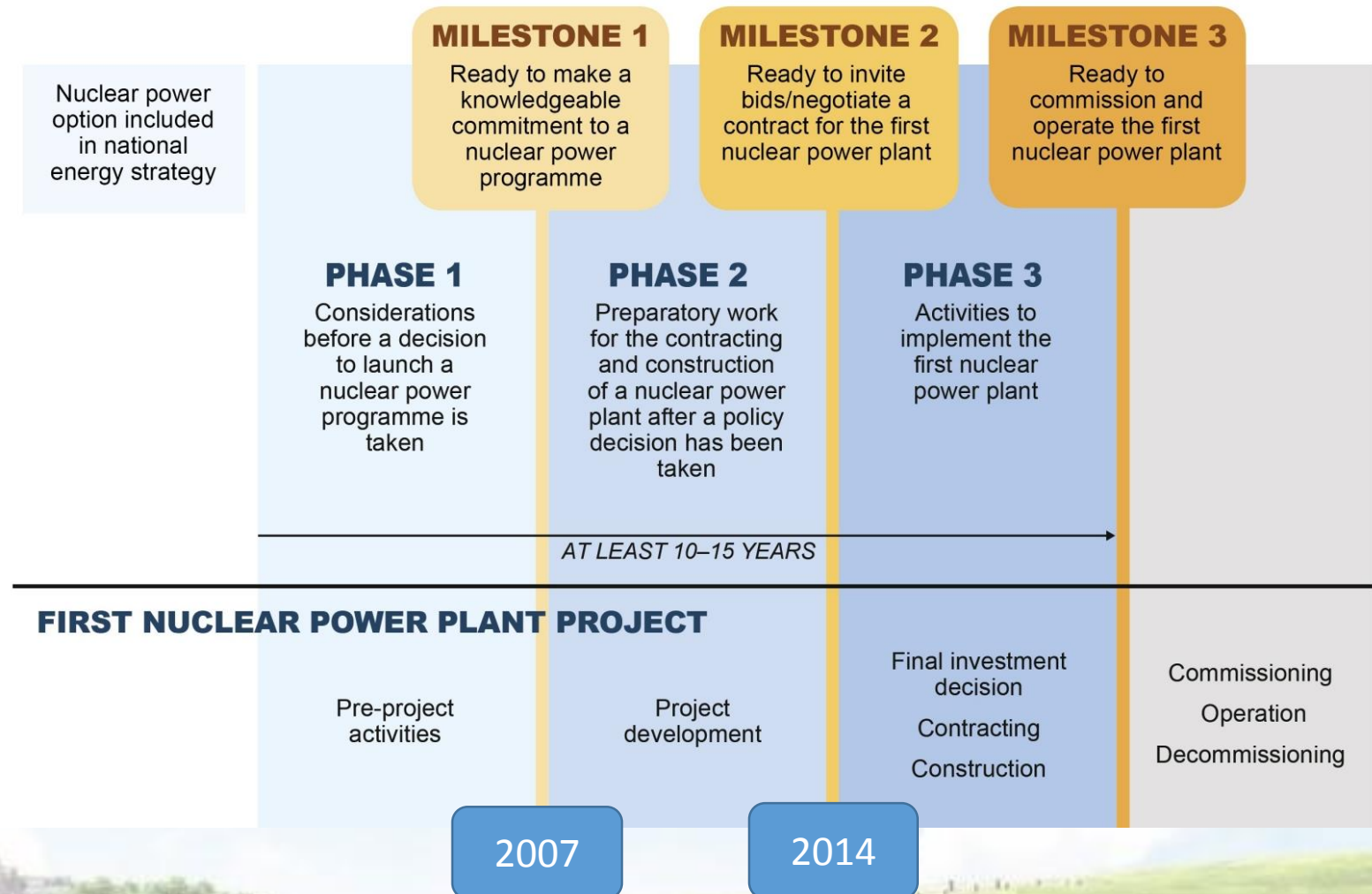
2-Nuclear Power Programme, Roadmap and Status



Phases and Milestones of the First Nuclear Power Project



NUCLEAR POWER INFRASTRUCTURE DEVELOPMENT



Milestone 1 - (2007)
Strategic Decision has been taken to include nuclear power in Egypt's national energy strategy.

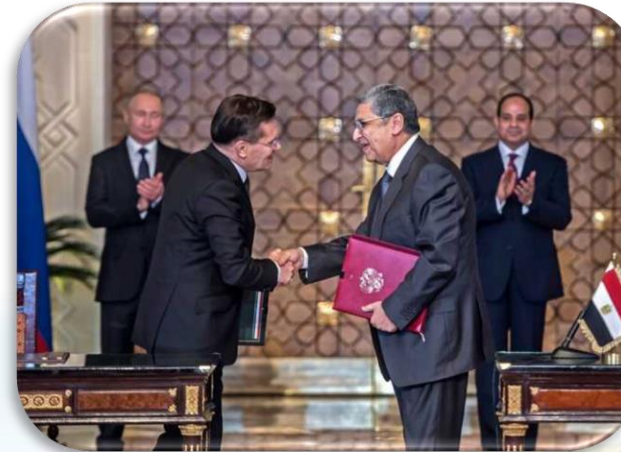
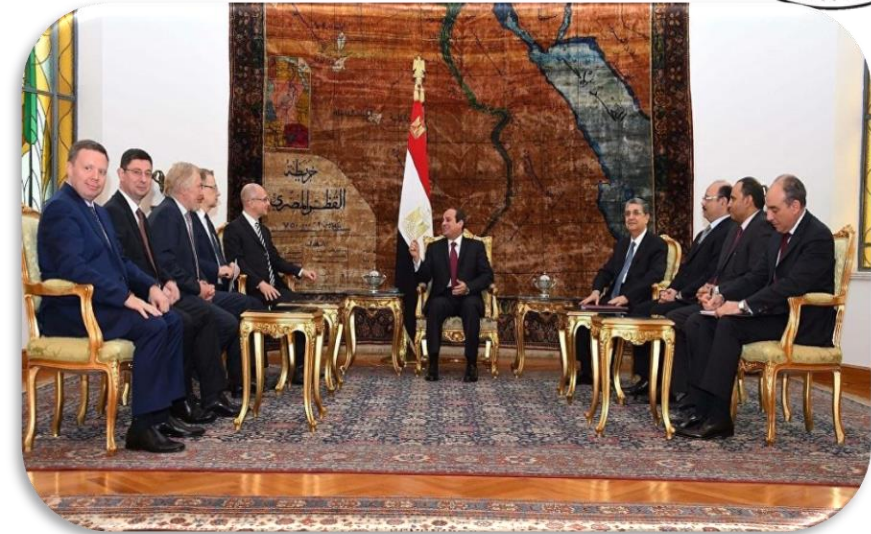
Milestone 2 – (2014)
Egypt completed project preparatory work and launched El Dabaa Nuclear Power Plant (NPP) Project.



El Dabaa NPP Project Events



- **November 2015:** Signing of Inter-Governmental Agreement (IGA) & Finance IGA (CIGA).
- **December 2016:** Signing of EPC Contract.
- **December 2017:** The EPC, Nuclear Fuel Supply, Spent Nuclear Fuel Treatment, and Operation Support & Maintenance Contracts became effective.
- **El Dabaa NPP consists of four Units with VVER-1200 reactors and is being built based on the terms and conditions of the EPC Contract.**

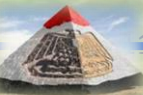


El Dabaa NPP Project (Cont.)

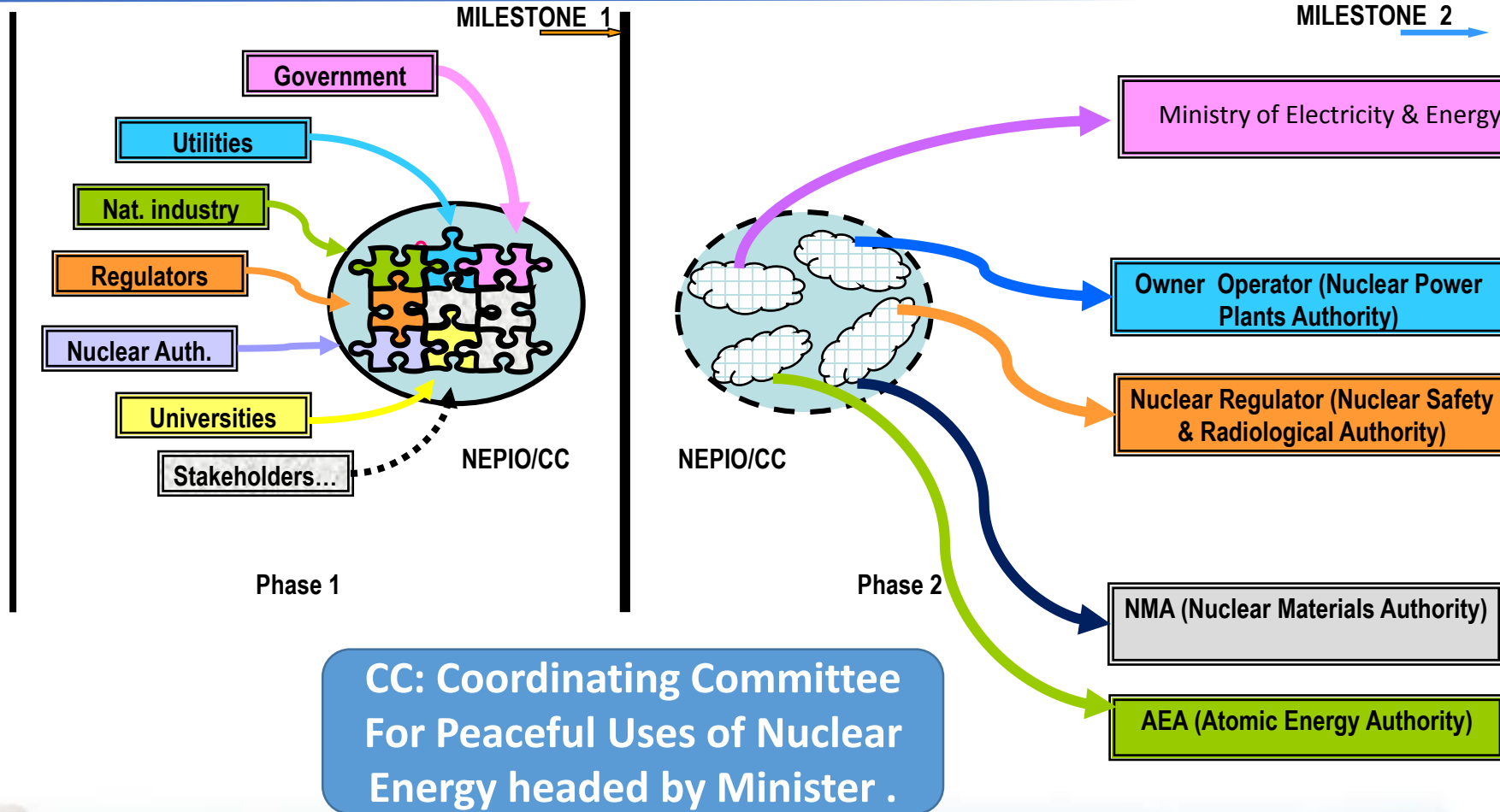
- The IGA and CIGA established Russia as **Egypt's strategic partner** for the El Dabaa NPP Project.
- The Russian side will assist its Egyptian partner through:
 - Supply of Russian nuclear fuel for the entire life cycle of the El Dabaa NPP;
 - Construction of a storage facility and supply containers for storage of spent nuclear fuel;
 - Implementation of localization commitments;
 - Human resource development and training; and
 - Supporting Egyptian partners in operation and maintenance of El Dabaa NPP during its first 10 years of operation.



3- Organizational Setup



Organizational Setup

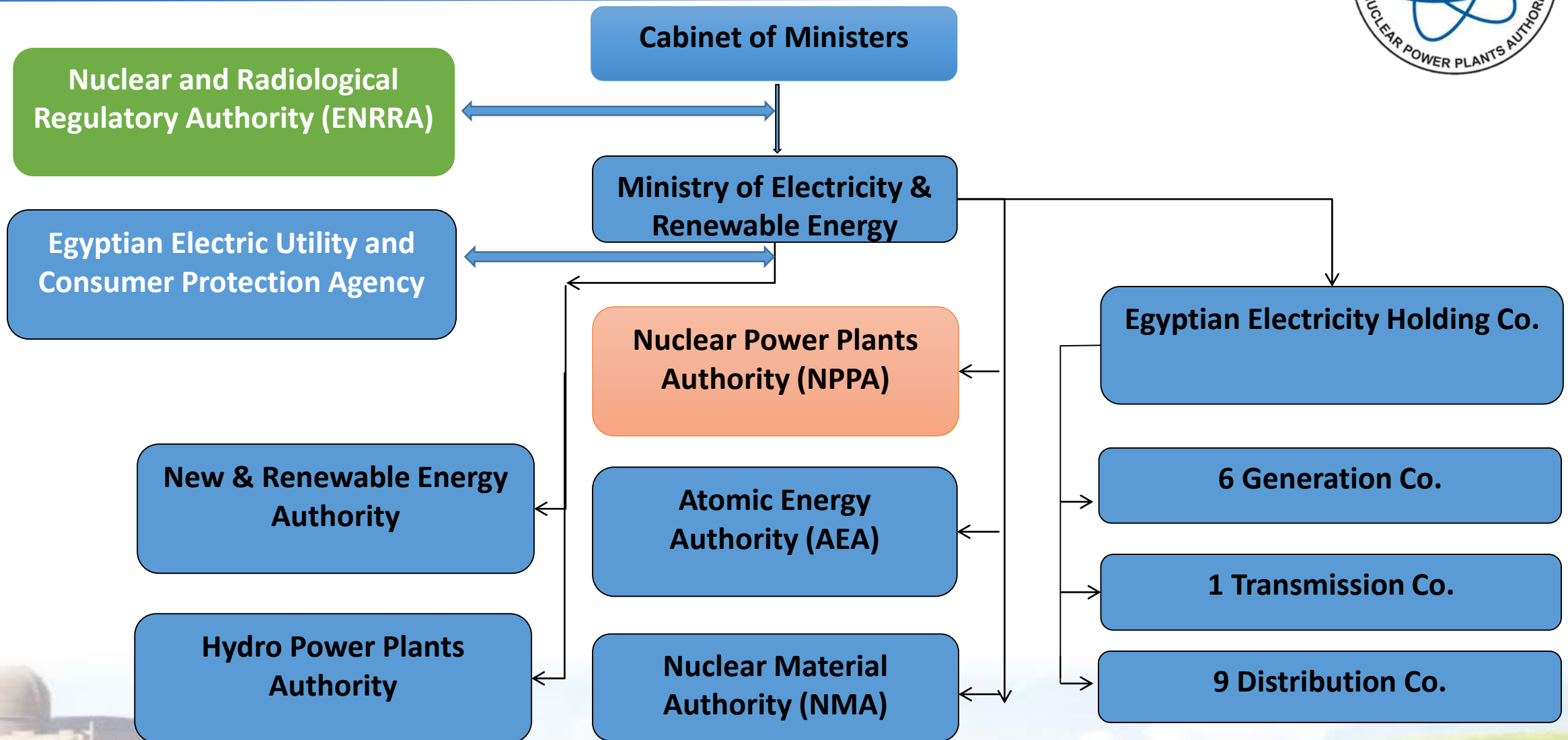


- Established in 1976
- An independent nuclear regulatory body was established and became affiliated to the Prime Minister in March 2012.
- Established in 1977
- Established in 1955

• **NEPIO:** Supreme Council for Peaceful uses of Nuclear Energy, headed by the President, and participated by relevant ministers.



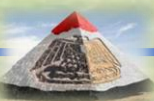
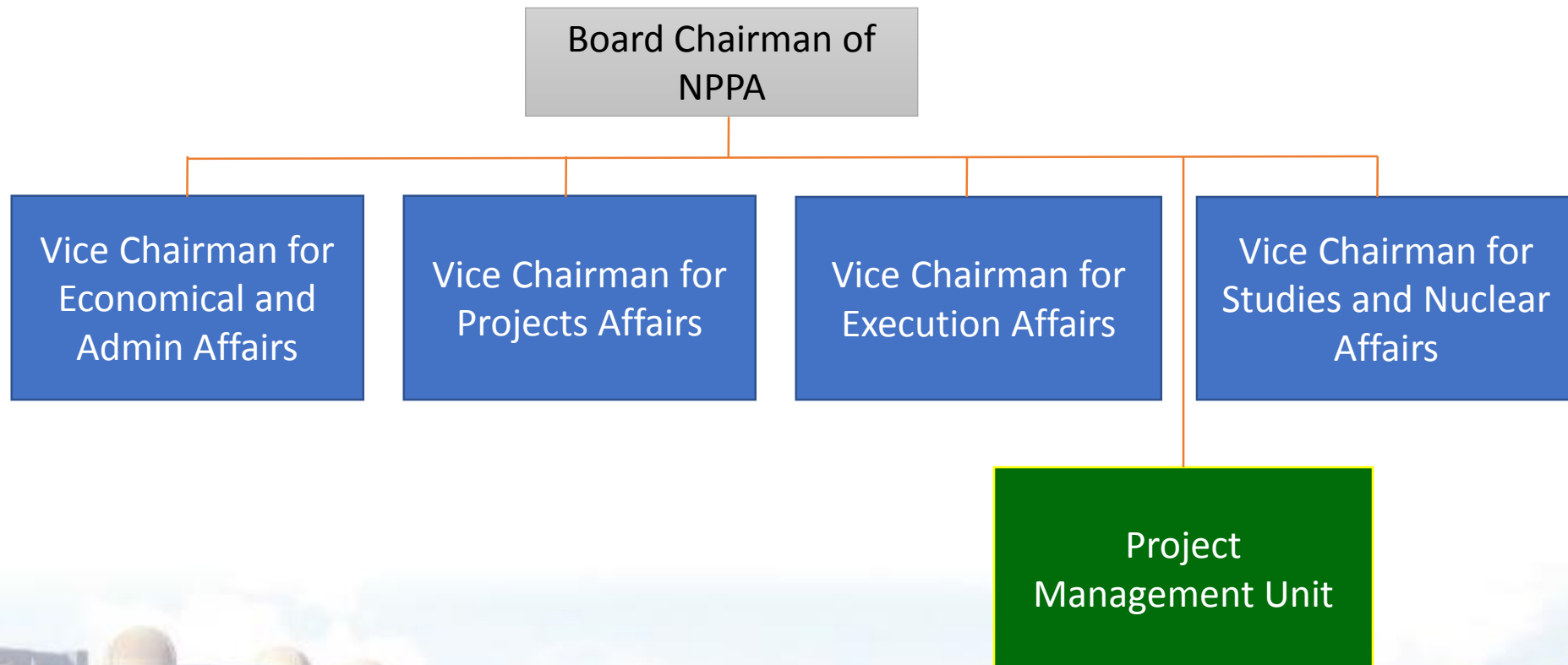
Egyptian Electricity Sector Structure





El Dabaa NPP Project Management Organization

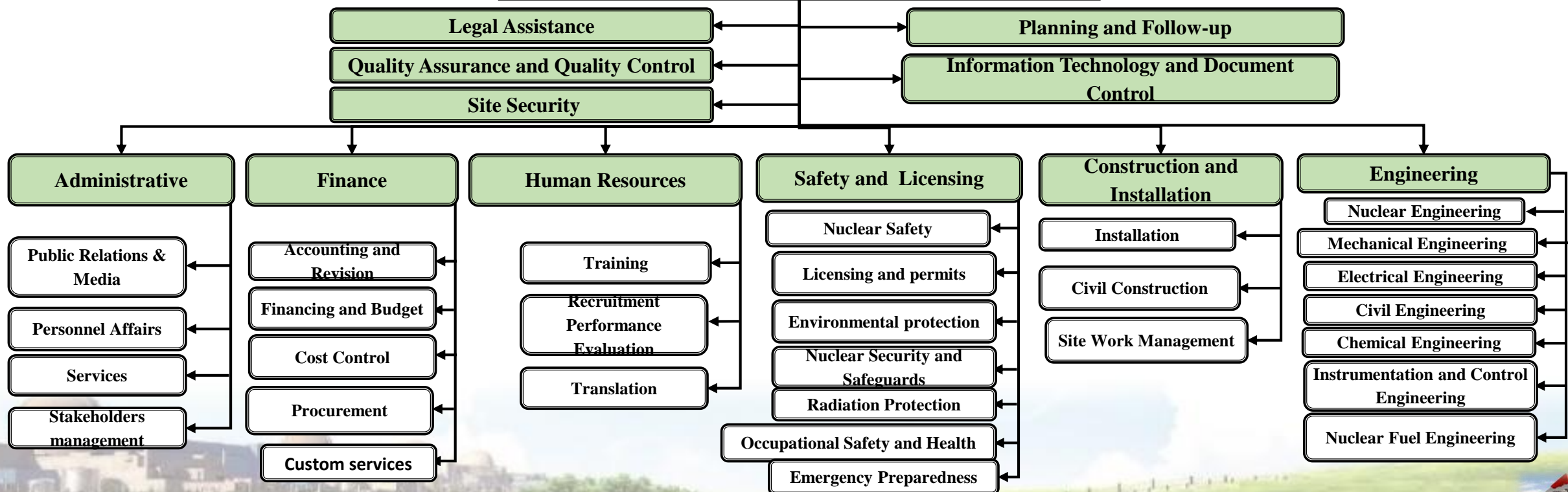
Organizational Structure of the NPPA



El Dabaa NPP Project Management Unit

Board Chairman of NPPA

Executive Manager



4- Human Resources Development



Human Resources



HRD is a key element that impacts all 19 nuclear infrastructure issues identified by the IAEA for the successful implementation of NPP Project



Human Resources



Purpose of Human Resource Development

Ensure that nuclear industry personnel have the necessary competence to carry out their roles

Monitor and improve performance of personnel

Organize and enable work activities

Anticipate human resource needs throughout the programme



Challenge

Achieving the initial **Competencies**

Sustainability to support Nuclear Power Programme

Goal

4R (Right)

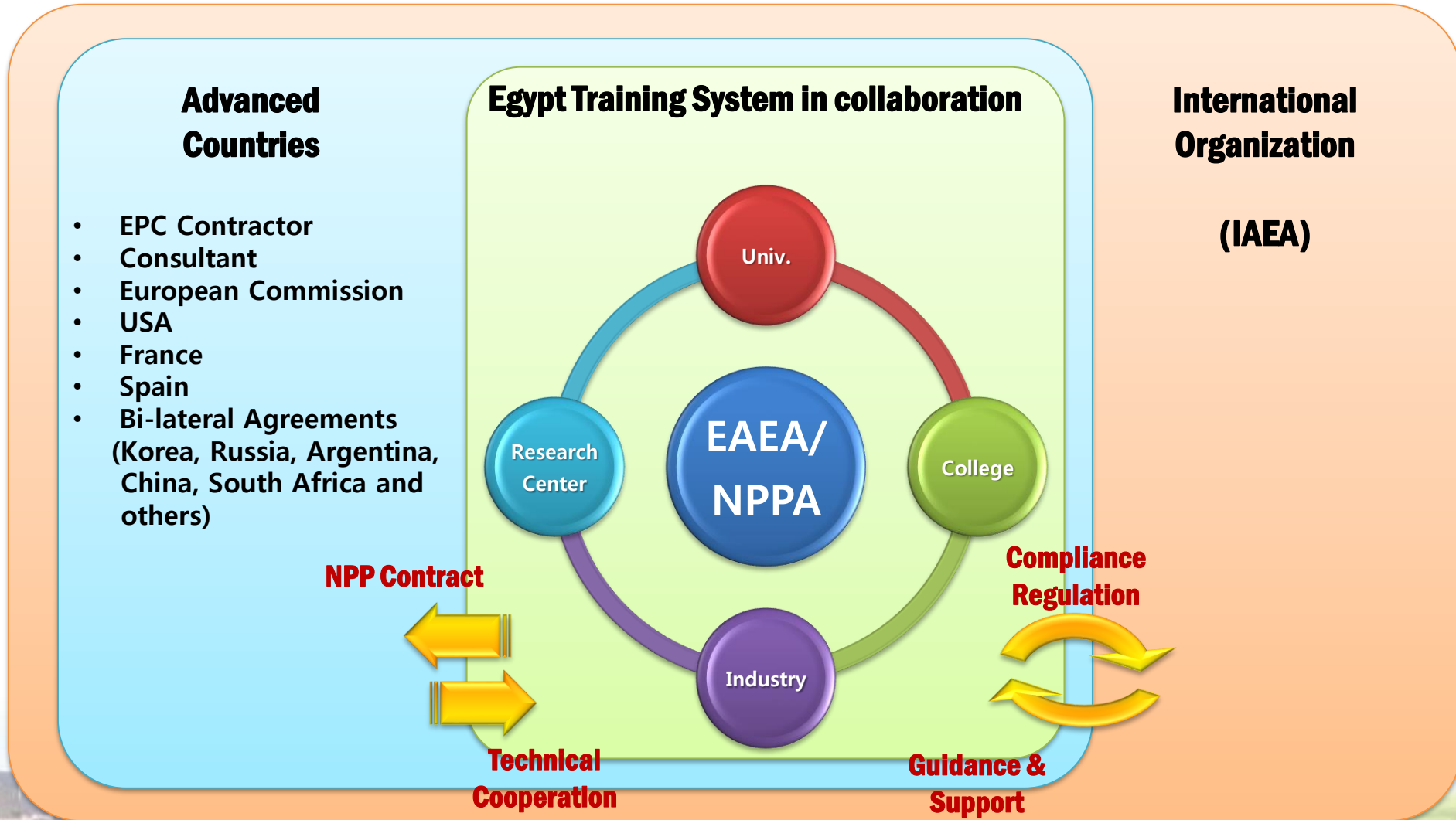
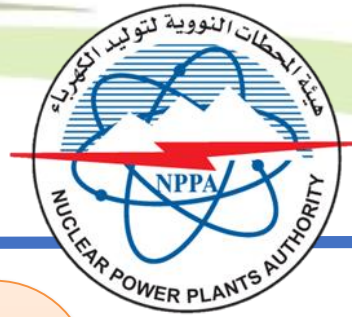
Right number of the **Right people** in the **Right place** at the **Right time**.

Why Important?

"Cross-Cutting" issue



International Cooperative Relationship



Cooperation with IAEA and Advanced Countries

IAEA

- Cooperation with IAEA in developing the Egyptian Nuclear Infrastructure
- One dimension of this cooperation is to build up the Egyptian capacity of human resources needed for the Nuclear Power Program.
- With IAEA assistance, many Egyptians attended in and outside Egypt workshops, training courses and scientific visits in various topics within the previous years

The topics include:

- Site requirements
- Workforce planning
- Project management
- Safety and security
- Economics and Financing
- Bid preparation and evaluation
- Public communication
- Quality Assurance/Quality control
- Emergency Plan



Cooperation with IAEA and Advanced Countries

USA

- organized two workshops in Egypt

Russia

- About 70 persons from NPPA were trained in Russia

Korea

- About 50 persons from NPPA were trained in Korea
- About 15 persons from NPPA were got MSc. From Korea

The topics include:

- Quality assurance
- Human resources planning
- Bid Invitation specification & evaluation
- Site selection
- Fuel cycle
- Nuclear security
- Nuclear & conventional Islands of the NPP
- Nuclear waste management
- Project management
- Nuclear Power Plants safety
- Quality management
- Training of the trainers
- Master degree in NPP



Training by Consultants and Contractor

International Engineering and Legal Consultants

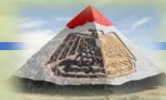
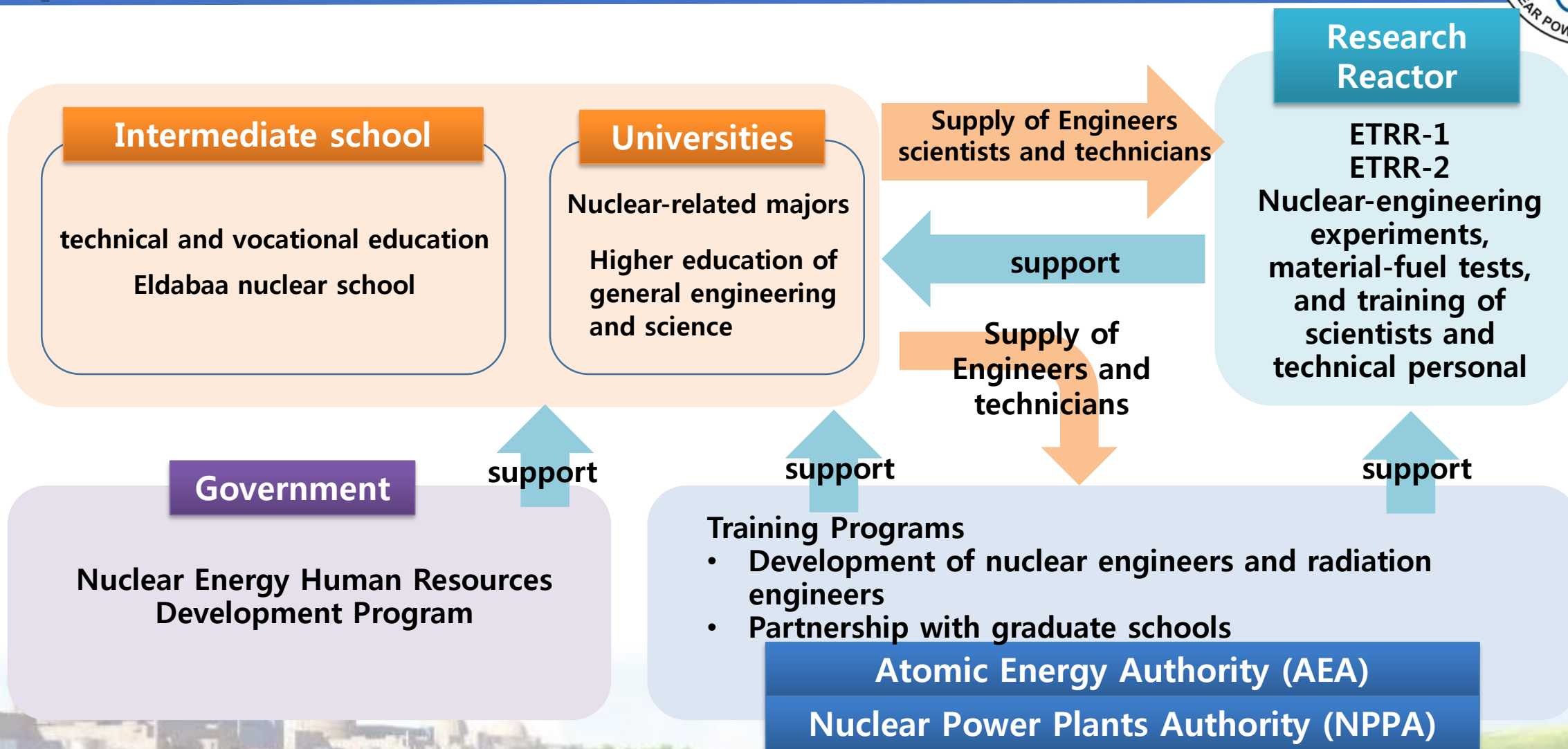
- Specifying and developing the training needs for NPPA personnel
- Preparation of a training programs for qualifying NPPA personnel in all project phases
- Transfer of knowledge and technology

EPC contractor shall

- Provide a comprehensive proposal for training & TT
- Ensure that there shall be sufficient number of certified personnel required for safe & reliable O&M of the NPP prior to plant start up
- Provide technical assistance and transfer of knowledge, technical documents, software and hardware and training materials



Local Institutions for Basic Training



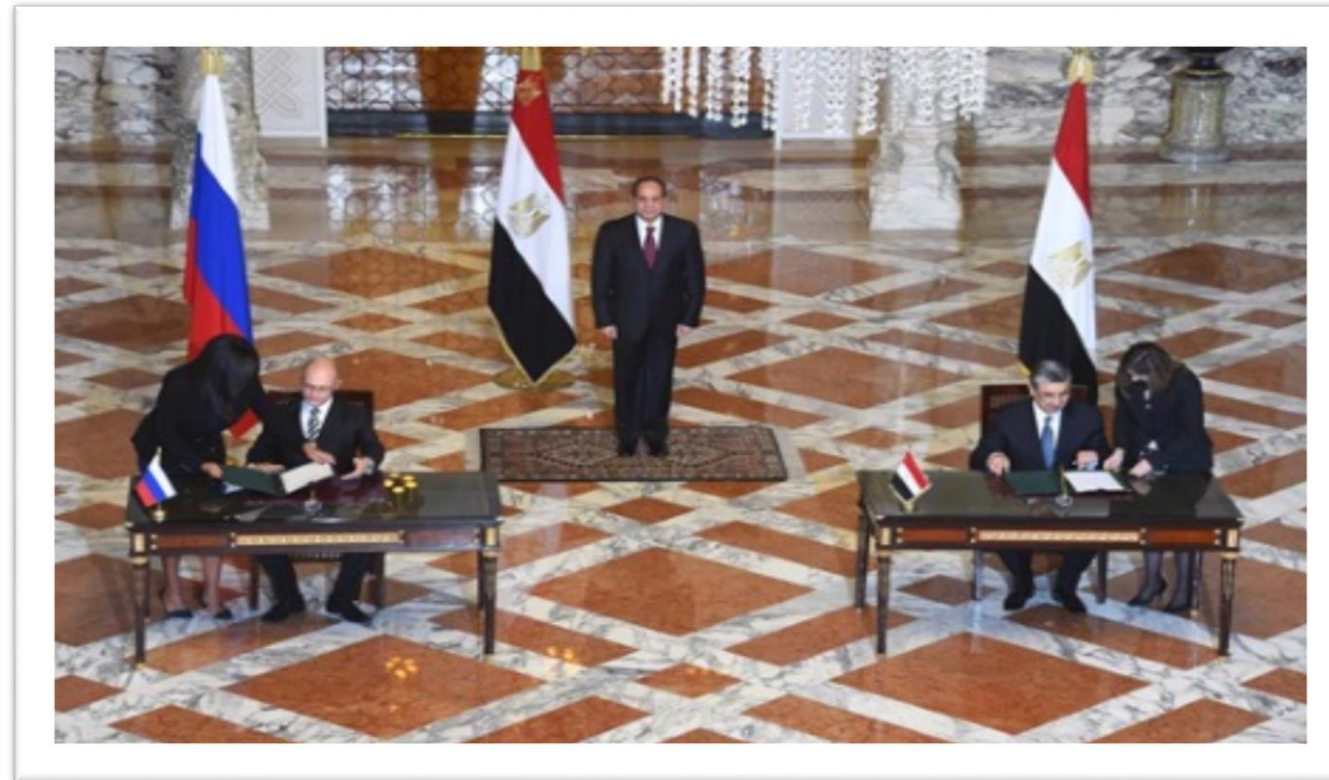
5- Lessons Learned from the HRD So Far



Governmental Commitment to the Project



- President A. El-Sisi and the GOE are fully supportive of the Project by:
 - Ensuring that the Project has all the financing resources and government-wide support needed; and
 - Maintaining close oversight of the Project through regular meetings with the Project supervisors.



Cooperation with IAEA



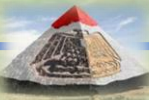
- Egypt has kept close cooperative relationship with IAEA since it decided to build its 1st NPP in 2007.
- Egypt adopted the **IAEA Milestones Approach** which is divided into three phases and three milestones.
- IAEA supports Egypt in many NPP project areas such as project management, providing training, as well as holding workshops in subjects related to the 19 infrastructure issues identified by the IAEA for a successful NPP project.



Contracting with Experienced International Consultants



- NPPA signed contracts with two international technical, commercial and legal consultants to support the Project during the preparatory phase (which included the activities of preparing the preliminary feasibility and strategic studies as well as plant specs.)
- The two consultants supported the Egyptian side during the negotiation phase.
- The two consultants will support in training personnel.
- The consultants should only support and not replace national organizations in taking decisions.



A Proper Formula for Project HRD Sustainability



- A strategic partner was expected to provide an “integrated package” that guarantees:
 - That the Project will be implemented on an EPC turnkey contract basis and at a fixed price.
 - That the main contractor shall bear all responsibilities and risks towards the implementation of the Project, which includes design, engineering works, construction, installation, start-up tests and commercial operation.
 - All four contracts signed with the Russian Side include training of the NPPA staff in the areas of project management, O&M, and fuel cycle management.
 - A full scope simulator will be provided.



6- Conclusion



Conclusion



National HRD Plan for 1st NPP Project

Technical Cooperation

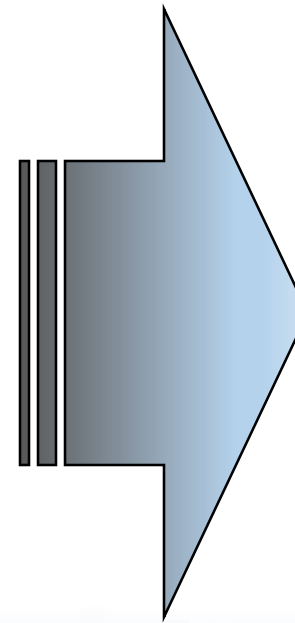
International Cooperation
Benchmark Advanced NPPs

Training Infrastructure

Build Capable Training Center

Qualified Workforce

Secure Sufficient HR Pool



HRD Building
for 1st NPP



National HRD Plan





Thank You

