Tunisian Electricity and Gas Company

Role of Partnerships in Supporting the Tunisian NPP Project

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Why considering the Nuclear Option in Tunisia?
ABOUT TUNISIA

- Population: 11.8 million (2020)
- Area: 163,610 km²
- Unemployment rate: 16% (2020)
- Inflation rate: 5.4% (2020)

- Rate of national electrification (99%)
- Total electricity Capacity: 5.6 GW (2019)
  using Natural Gas (CC, ST and GT)
  including 0.3 GW REN (240 MW wind, 60 MW hydro
  10 MW PV)
- Peak load: 4.3 GW (2019)
- MWh price (≈60 US $ for households)
- Grid Connection: Algeria, Libya and Italy (future)
Continuous Energy Deficit since 2001

National Resources Limited and in decline
Electricity generation 2015

- Dependency on Natural Gas (NG)
- +50% of NG is imported
Need for Energy Diversification

- Energy security
- Long-term sustainability transition

- Natural Gas
- Coal
- Nuclear
- Renewable Energies
The Tunisian government decided on November 3rd 2006 to conduct a feasibility study to introduce a first nuclear Plant.

The Tunisian Electricity and Gas Company (STEG) is in charge of leading the feasibility study with the collaboration of national and international partners.

Advantages of Nuclear Power

- Cost Effectiveness
- No GHG emission
- Stability of electricity Price
- ...
Partnerships in the Tunisian NPP Project

- IAEA Milestones approach
- Techno- Economic Feasibility studies
- Sites studies
- Legislation, Safety and Human Resource Development
National Nuclear Power Programme Stakeholders

- Head of Government
- Ministry of High Education and Scientific Research
- Ministry of Energy and Mines
- Ministry of Health
- Ministry of High Education and Mines (with the collaboration of National Experts)
- CNEA: National Commission of Atomic Energy
- CNSTN: National Center of Nuclear Sciences and Techniques
- CNRP: National Center of Radiation Protection
- STEG: Tunisian Electricity and Gas Company

NPP Project
IAEA PARTNERSHIP

- IAEA Milestones Approach
- National Projects through Technical Cooperation TUN2007 to TUN 2010
  - National Trainings
  - Scientific Visits
  - Review
- Technical Meeting, Workshops, Trainings, Coordinated Research Project
- General Conference
INTERNATIONAL PARTNERSHIPS

• CEA-France partnership
  – INSTN for capacity building
  – AFNI for technical assistance

• Bilateral conventions

• Meetings with constructors

• International experts/consultants
1 Plan
Prefeasibility studies:
Considerations before a
decision to launch a nuclear
power programme is taken

2 Prepare
Feasibility studies
& bid process:
Preparatory work for
the construction of a
NPP after a policy
decision has been taken

3 Construct
Construction
Activities to
implement a first
NPP

4 Operate
Maintenance and
continuous
infrastructure
improvement

5 Decommission

Tunisian government
decision to consider
the NP Nov. 2006

Strategic Action Plan
HR development &
communication
Legal & regulatory
infrastructure
Techno-Economic
PF studies
Safety, Security and
radiation protection
Site studies

 feasibility studies
Governmental
decision GO/ No GO
Feasibility
studies
Bidding process
PFS: SYSTEMATIC APPROACH

NP Project Management

- D & communication group
- Technical and economical FS group
- Siting group
- Safety, Security and radiation protection group

International consultants

National institutions and ministries

- National position
- Procurement
- Industrial involvement
- Radioactive waste
- Nuclear fuel cycle
- Security and physical protection
- Emergency planning
- Legislative framework
- Funding and financing
- Management
- Nuclear safety
- Safeguards
- Radiation protection
- Regulatory framework
- Electrical grid
- Human resources development
- Stakeholder involvement
- Site and supporting facilities
- Environmental protection

IAEA
Studies realized by the STEG and national institutions

- Energy planning
- Grid code
- National industrial involvement
- Economic study
- Funding and financing
- Electrical grid
- Fuel cycle and radioactive waste management
- Reactor technology selection

IAEA & AFNI (International Nuclear French Agency) assistances

Studies to be realized in FS phase

- Environmental impacts assessment
- Site safety evaluation report
- NPP-construction schedule
- Invitation to tender
EXAMPLE1 OF COLLABORATION: ENERGY MIX STUDY

IAEA Models
MAED and WASP
Proposal of a national strategy in order to:

• Assess the **optimal** rate of local participation in the different phases of NPP cycle (construction, operation and maintenance).

• Upgrade the national industry in terms of products and services **qualities**.

• Encourage the **employment** of local people.
EXAMPLE 3: MACROECONOMIC IMPACT STUDY
(with the collaboration of IAEA and Carthage University)


- Impact on employment
- Impact on GDP
- Social and environmental impacts

IAEA Model “Empower”
With the collaboration of national institutions, national experts, IAEA and AFNI (CEA-France)
LEGISLATIVE FRAMEWORK

With the collaboration of national experts, IAEA (OLA) and (ASN-France)

Achievements:

• The project of the nuclear law (3S and liability included)
• The law creating the National Nuclear Energy Agency (NNEA)
• The law creating the Tunisian Nuclear Safety Agency (TNSA) (RB)
• Reviewed by IAEA (Office of Legal Affairs) and the French RB ASN

Ongoing action: Decrees being written by a national commission

The nuclear law is waiting for promulgation by the parliament
Identification of appropriate nuclear safety criteria

Definition of TOR related to environmental impacts assessment

Emergency plan preliminary study

Radiation protection study

With the collaboration of national institutions and IAEA
STEG hired 40 young engineers (10/year) to pursue nuclear engineering at INSTN France.

A study was conducted, to identify competencies needed for all phases of the nuclear programme. In second step, a strategic study is elaborating to define how to provide, develop and maintain these competencies.

They integrated the NPP project team with other general engineers hired after their studies in France.
NEXT STEPS

2015

- PFS report finalized

2016

- Self evaluation process

To be planned

- INIR mission

- INIR Support

INIR
Integrated Nuclear Infrastructure Review Missions
CONCLUDING REMARKS

• Partnerships in a nuclear power Programme (NPP are required especially for embarking countries:
  
  – National partnership (as NPP is a National Programme)

  – International partnership during the different phases of a NP programme
    • Capacity building
    • Technical assistance
    • Technology transfer
    • Nuclear standards (Safety)
    • ...
Thank you for your attention

Sidi BouSaid (Tunisia)
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