IAEA 60 Years
Atoms for Peace and Development

SNUS
Slovak Nuclear Society

Nové krajiny rozvíjajú jadrovo-energetický program

apríl 2018

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Obsah

- Nové krajiny pre jadrovo-energetický program
- Pomoc MAAE pri rozvoji JE programu
- Čo je to „Milestone Approach“
- Krátky film

(35 minút + diskusia ak budú otázky)

Anglická verzia prezentácie

Jozef Zlatňanský – člen SNUS

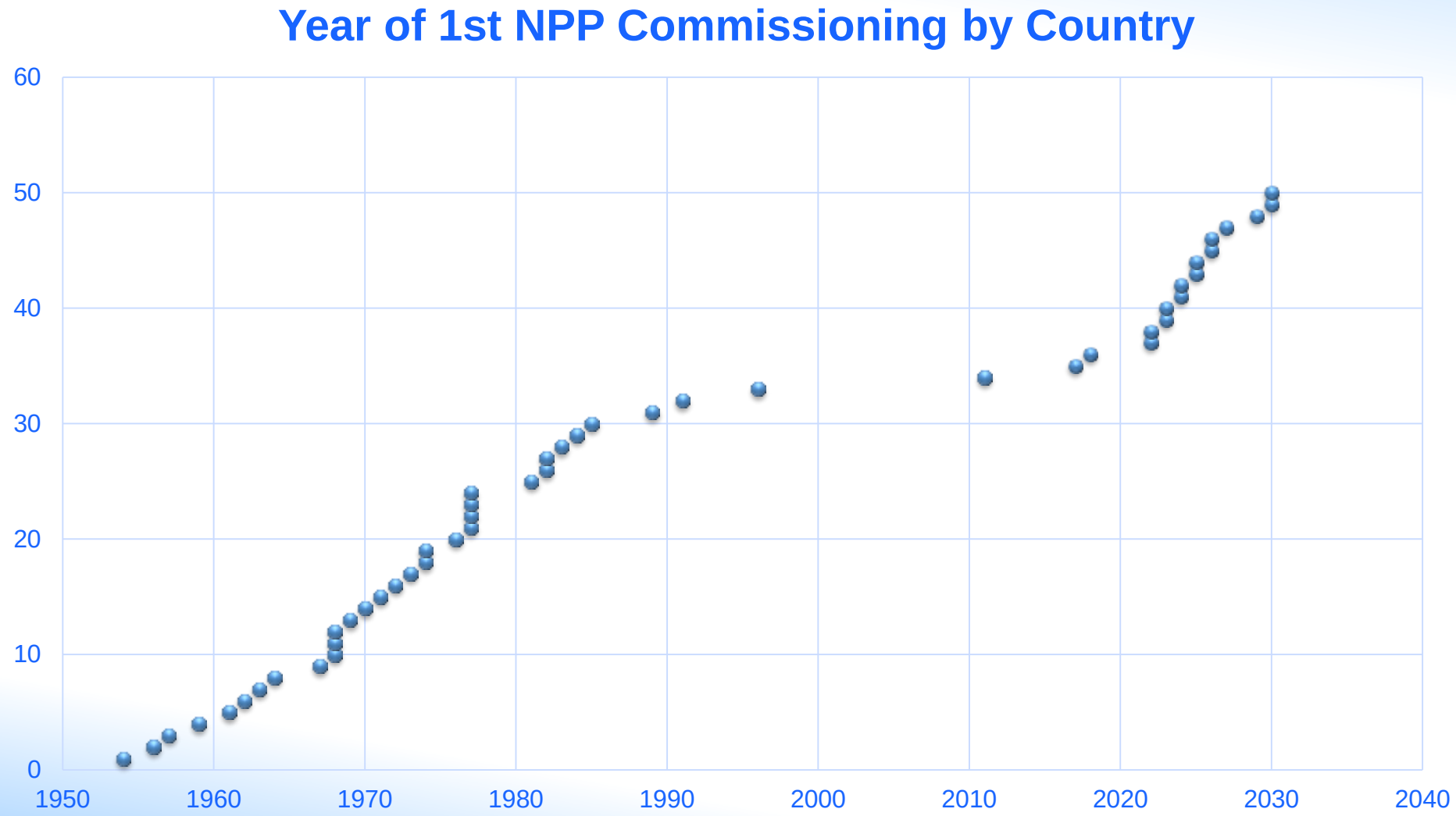
- *Member of Nuclear Safety Advisory Committees - ENDESA & FORTUM*

- ✓ ***INIR Programme Coordinator,*** *International Atomic Energy Agency*

- ✓ Director of Management Systems & Head of Independent Nuclear Oversight in SE/Enel Group – BoD Member
- ✓ ENISS Steering Committee *(European Nuclear Installation Safety Standard Initiative)*
- ✓ *FORATOM (Chairman of Task Force for New Member States)*

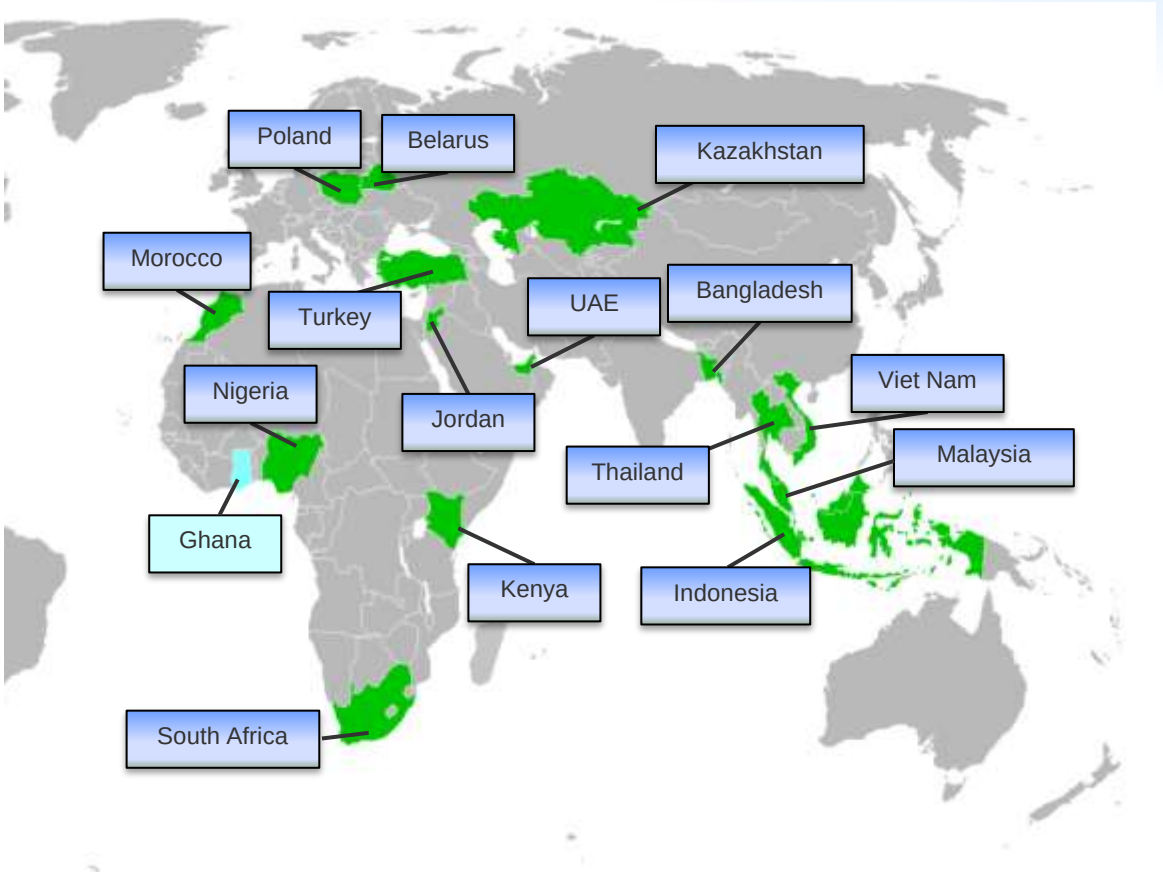
- ✓ *Vice Chairman of UJD – Slovak national nuclear regulatory authority*
- ✓ Acting Head of Europe Section - IAEA, Vienna,(2000-2006)

Commissioning Projections



INIR Missions 2009-2018

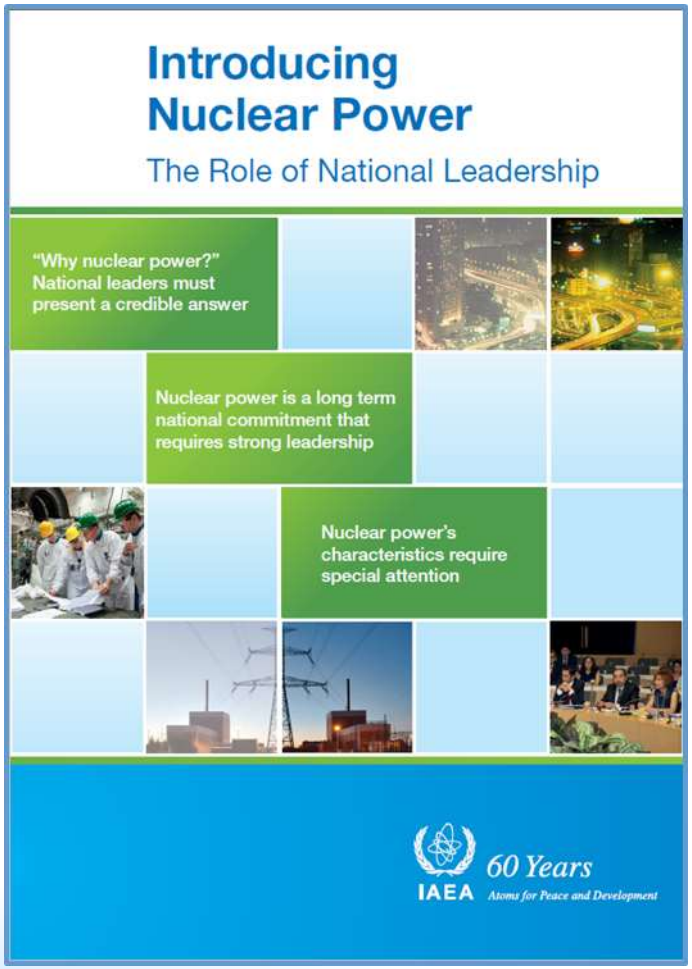
1.	**Jordan**	2009
2.	**Indonesia**	2009
3.	**Vietnam**	2009
4.	**Thailand**	2010
5.	**UAE (Phase 2)**	2011
6.	**Bangladesh (Phase 1&2)**	2011
7.	**Jordan follow-up**	2012
8.	**Belarus (Phase 1&2)**	2012
9.	**Vietnam (Phase 2)**	2012
10.	**Poland**	2013
11.	**South Africa (Phase 2)**	2013
12.	**Turkey (Phase 2)**	2013
13.	**Jordan (Phase 2)**	2014
14.	**Vietnam follow-up**	2014
15.	**Nigeria (Phase 2)**	2015
16.	**Kenya**	2015
17.	**Morocco**	2015
18.	**Bangladesh follow-up**	2016
19.	**Poland follow-up**	2016
20.	**Malaysia (Phase 1)**	2016
21.	**Kazakhstan (Phase 1)**	2016
22.	**Ghana (Phase 1)**	2017
23.	**Sudan Phase 1)**	2018
24.	**Niger (Phase 1)**	2018
25.	**Poland (Phase 2)**	2018



Embarking Countries Overview

			2011	2012	2013	2014	2016	**2018**
Phase 3	First nuclear power plant under construction (construction licence)		0	1	2	2	2	3
Phase 3	First nuclear power plant ordered (site licence)		3	2	1	1	2	1
Phase 2	Decided to introduce nuclear power and started preparing the appropriate infrastructure		6	6	6	7	7	6
Phase 1	Active preparation for a possible nuclear power programme with no final decision		6	6	5	5	7	7
Phase 1	Considering nuclear power programme		14	13	19	17	10	11

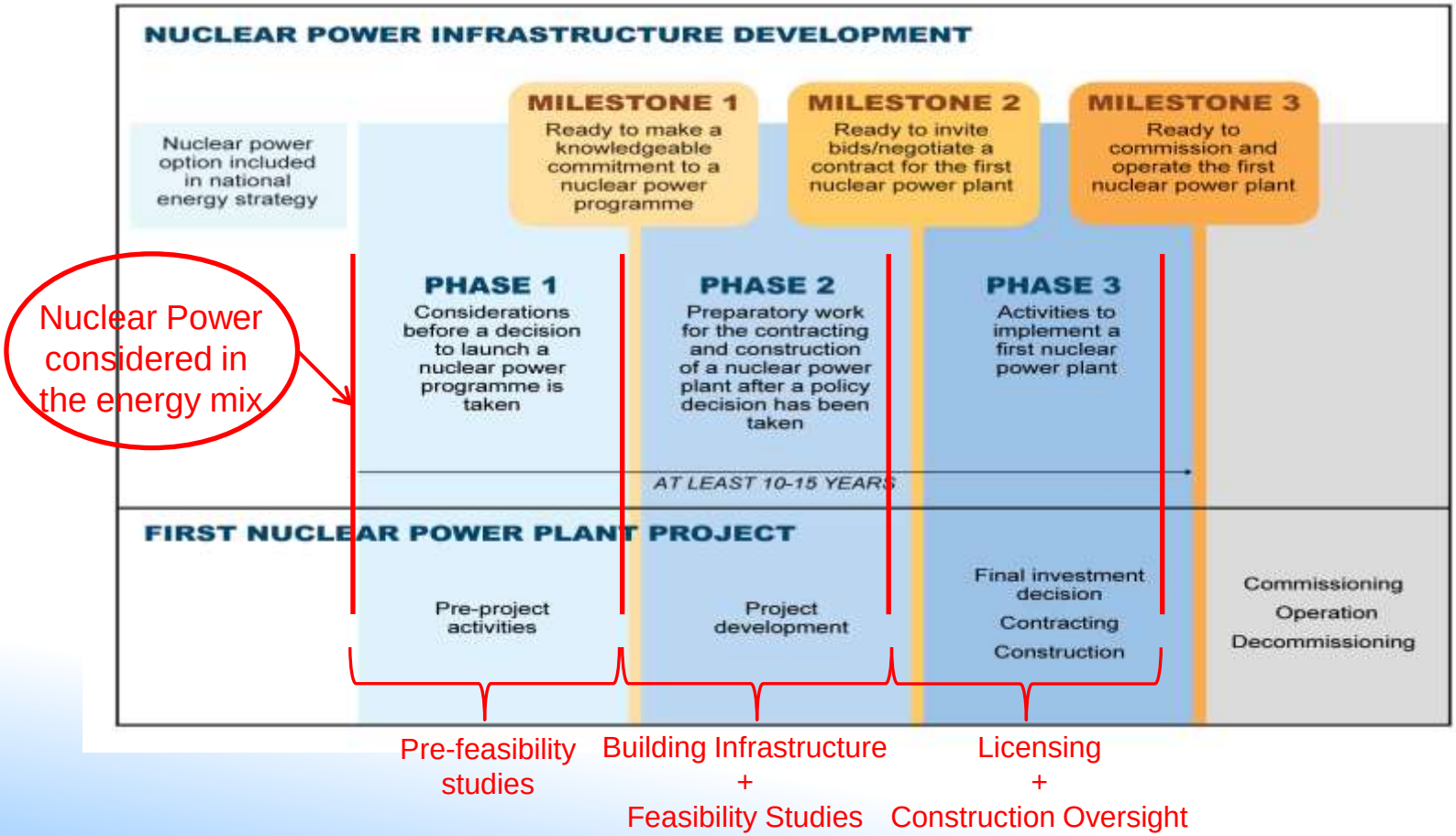
Considerations for Nuclear Power



- ✓ Nuclear power is a long term commitment that requires strong national leadership
- ✓ A successful nuclear power programme requires commitment of at least 100 years.
- ✓ Creating the infrastructure and building the first nuclear power plant will take at least 10–15 years.
- ✓ The leadership should ensure coordination and broad political and popular support.
- ✓ The highest standards of safety, security and safeguards must be applied.
- ✓ The penalties of interruptions and restarts are significant.

Milestones Approach

The IAEA Milestones Approach - introduced in 2007, has been universally appreciated and adopted as THE approach, by countries initiating new nuclear power programmes, by countries expanding their existing programmes after many years and by vendors …



NEWCOMERS

The IAEA Milestones Approach identifies 19 nuclear infrastructure issues that need to be considered in each phase. *Which issues should be assessed*

a. builds its first NPP or

b. construct New NPP but already operate NPP

Purpose of an INIR mission

- The objective of an INIR mission is to assist the Member State in determining the status of development of its nuclear power infrastructure compared to the relevant Milestone
- Each of the 19 infrastructure issues is considered for the specific phase

Integrated Nuclear Infrastructure Review (INIR missions)

- ✓ Based on the Milestones Approach:
  - ➢ *19 Infrastructure Issues*
  - ➢ *3 Phases,*
  - ➢ *3 Milestones*
- ✓ International expert review led by a high level IAEA manager
- ✓ Identifies areas for further actions recommendations & suggestions
- ✓ Results are delivered:

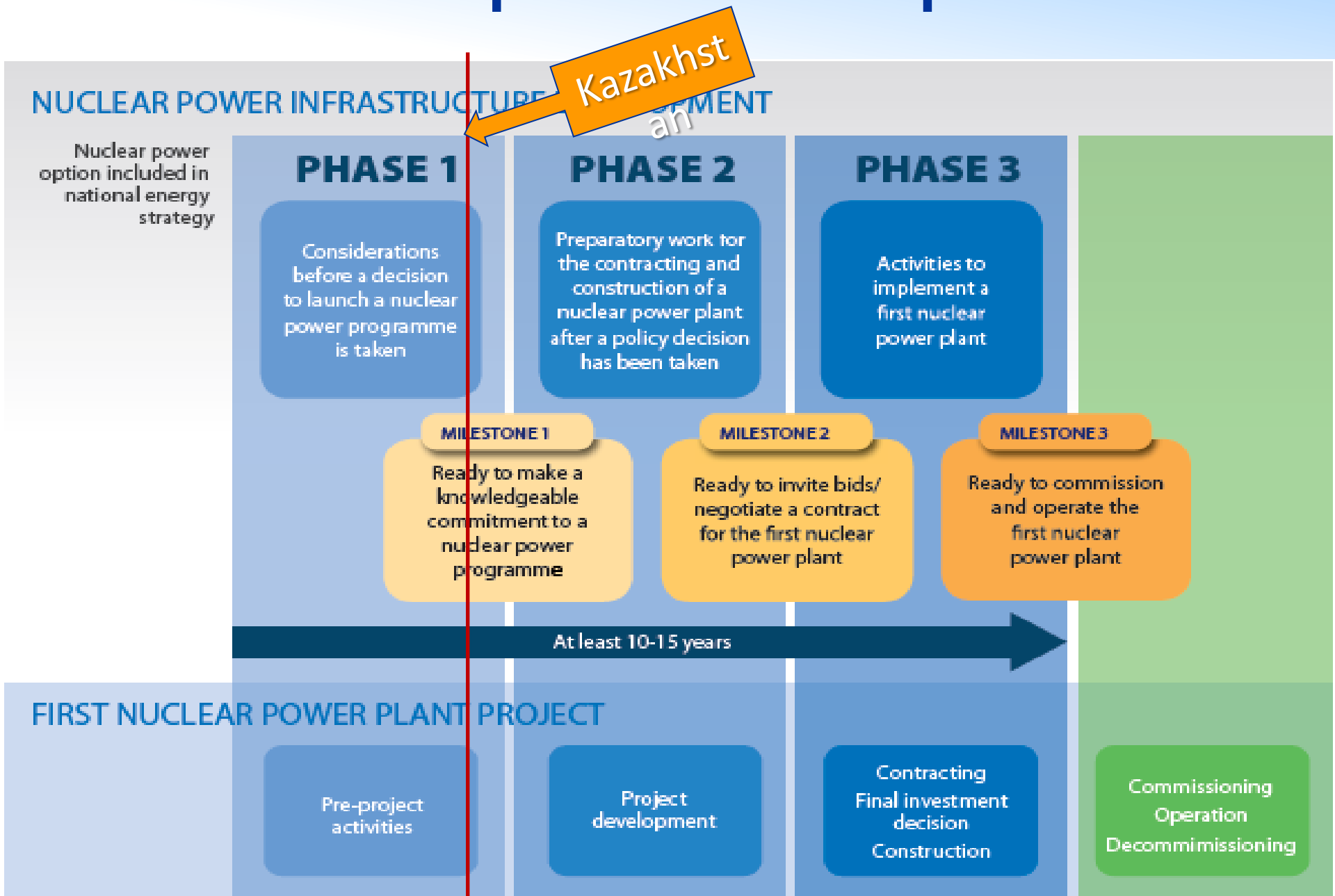
  to the Government

  and decision-makers

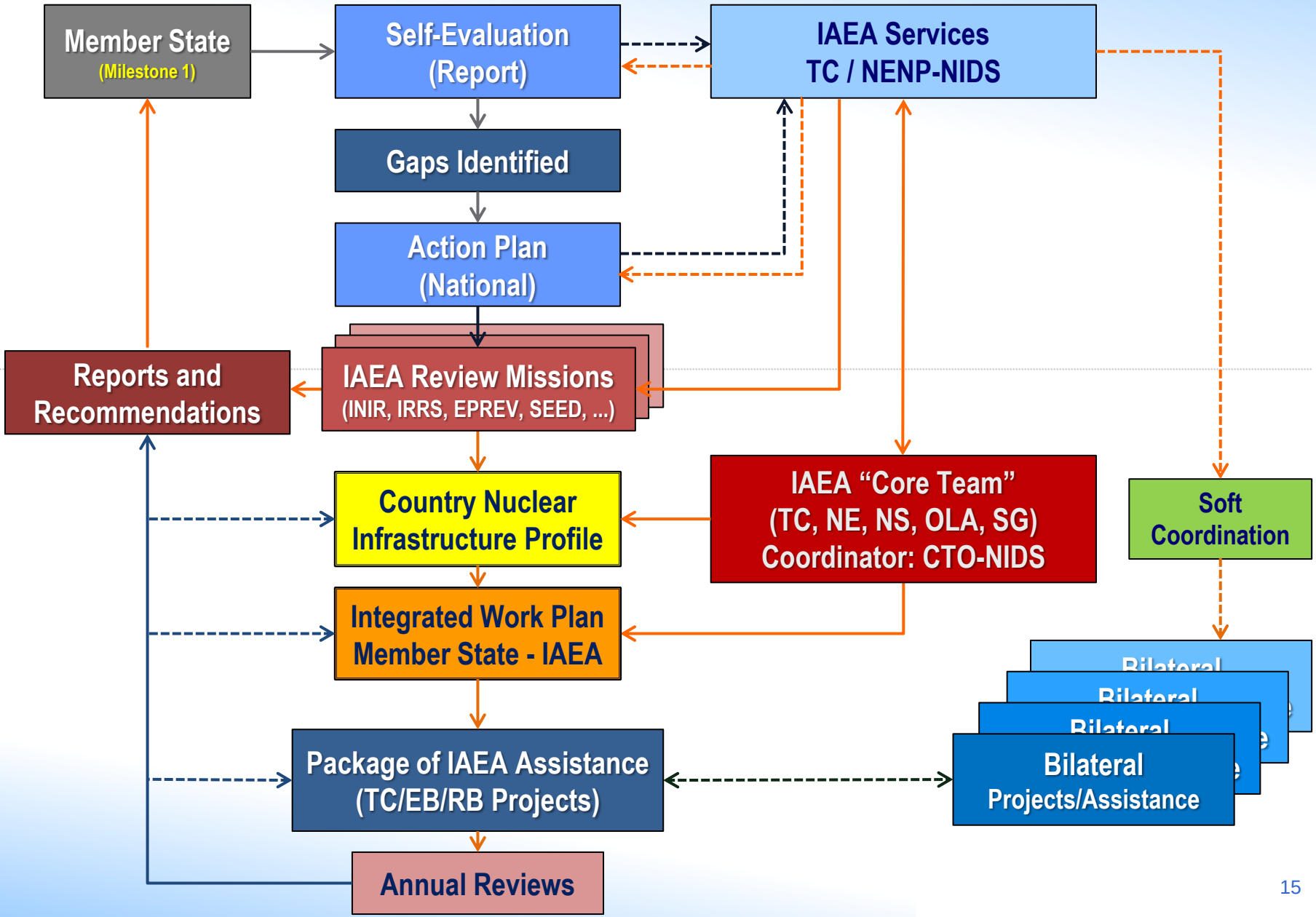
INIR Missions

INIR Report handover

Focus on Comprehensive Report



IAEA Assistance to Newcomers



The Role of National Leadership

- National Leaders must present credible answer to question **“ Why Nuclear Power?”**
- Nuclear Power is a long term commitment that requires **strong leadership**
- Assistance from the IAEA and Other Partners

Example of Vision for Newcomers

Vision

Safe, efficient and reliable nuclear technology for **electricity generation**

Mission

To promote safe and secure application of nuclear technology **for sustainable electricity generation**

Phase 1: NEWCOMER *& Challenges*

- How do I start?
- Is there public support?
- Do I have the people?
- Can I find the money?
- What am I going to do with radioactive waste?
- Is it safe? Can I manage if there is an accident?

A pre-feasibility study should provide high level answers to all these questions and enable a knowledgeable decision to be taken

The Milestones Approach to Nuclear Power

Decide!

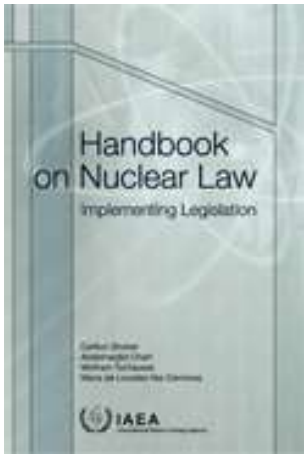
Prepare!

Construct!

Challenges faced

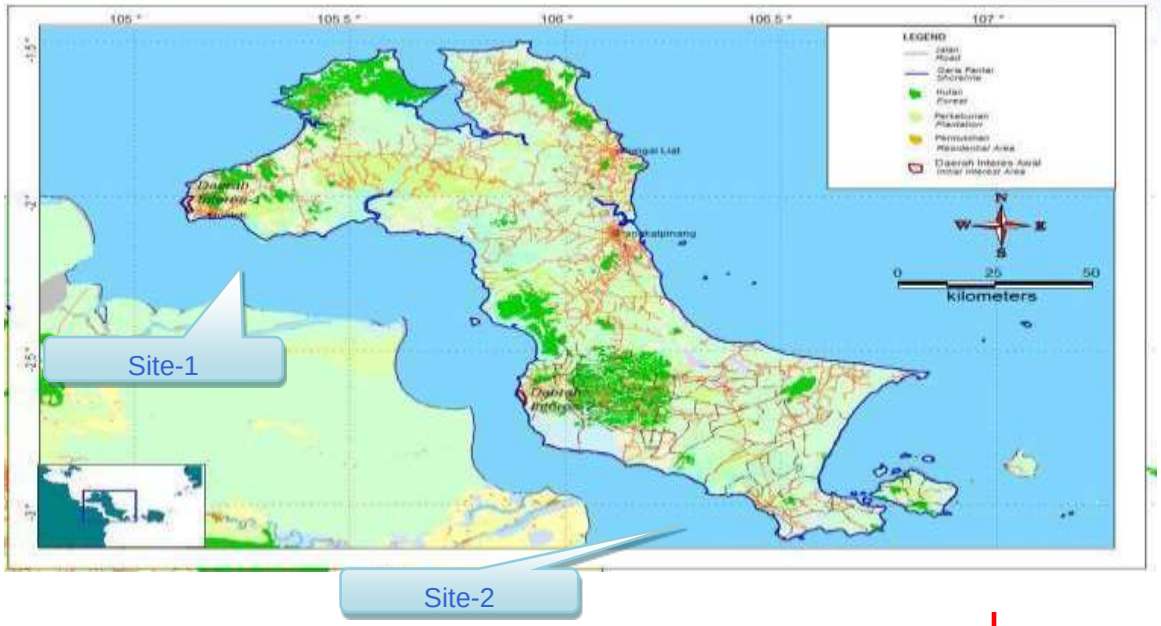
Human resource development

Budget allocation/Financing



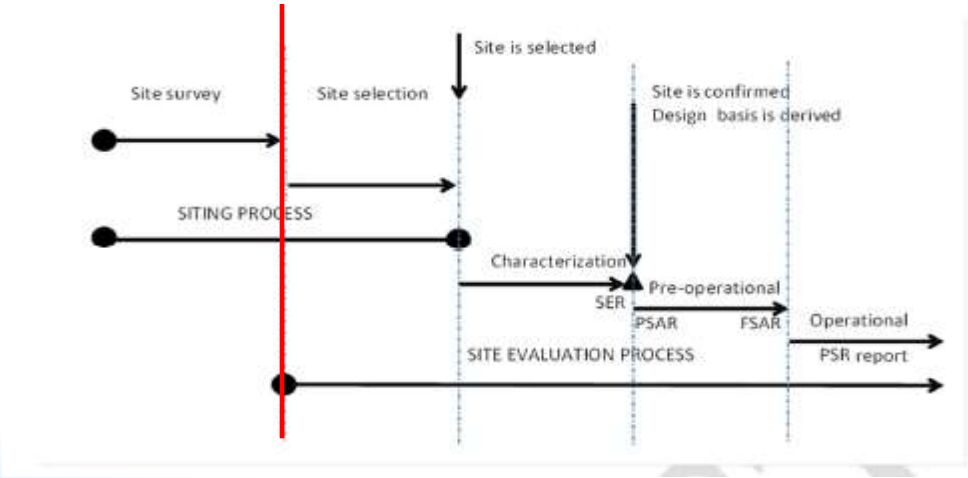
Legal and regulatory framework

Phase 1: Site survey and selection



SITE SURVEY STAGE:

Identification of potential regions, potential sites and candidate sites through screening and comparison



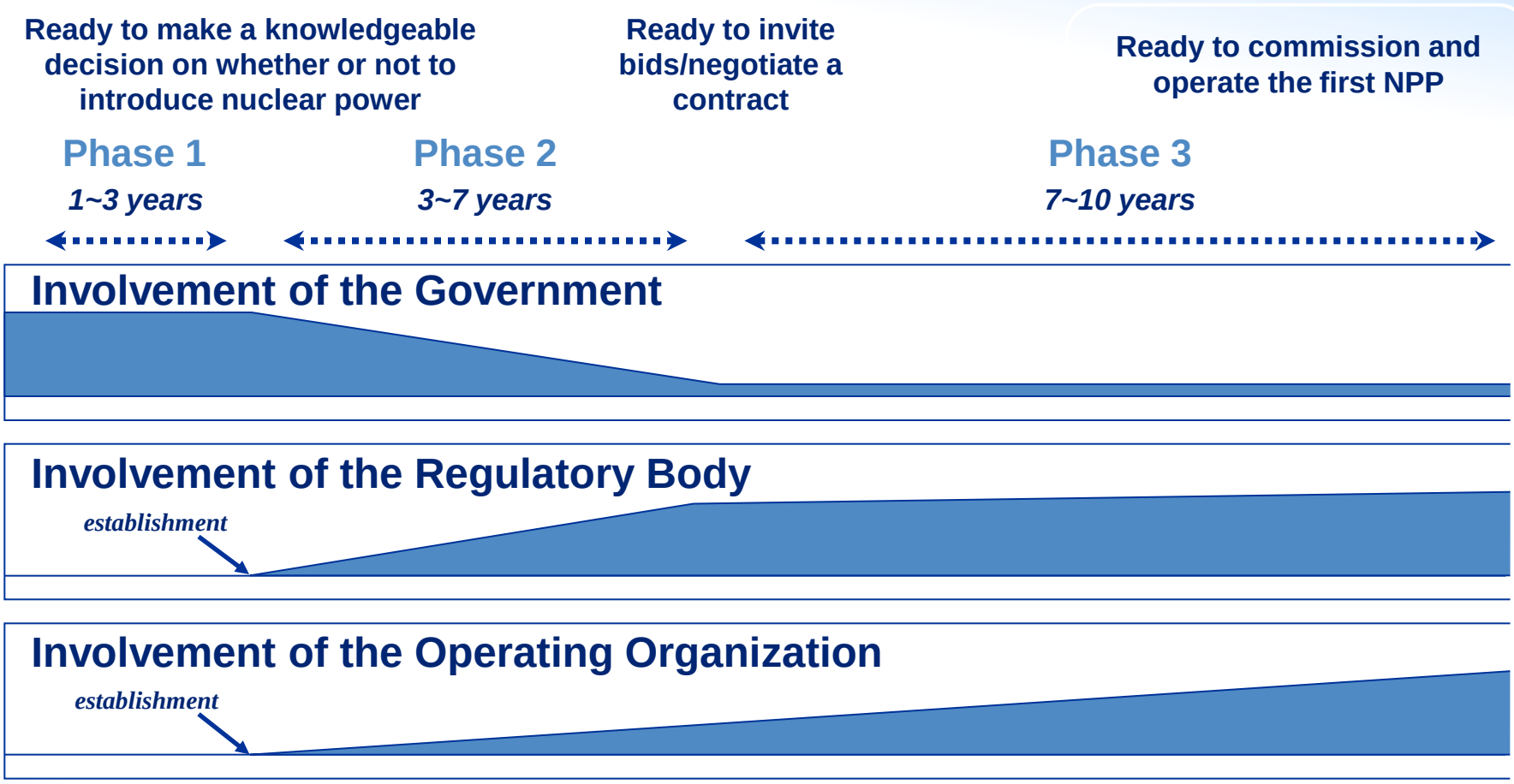
Phase 1: Public acceptance

Protests against the nuclear power programme organized by a local Greenpeace branch and a coalition called Irhamouna, formed by some residents of the city of Mafraq
2011

Establishment Of Nuclear Institutions

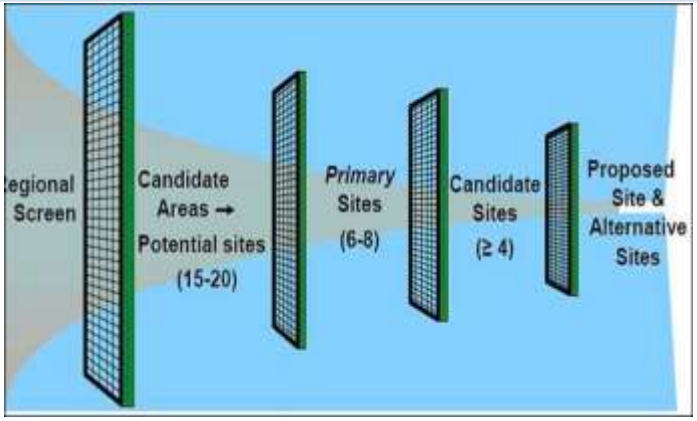
	Institutions
1.	Regulatory body
2.	Owner/operator
3.	Research & Development Institution (Technical Support Organization)
4.	Radioactive waste management institution

Building the institutions

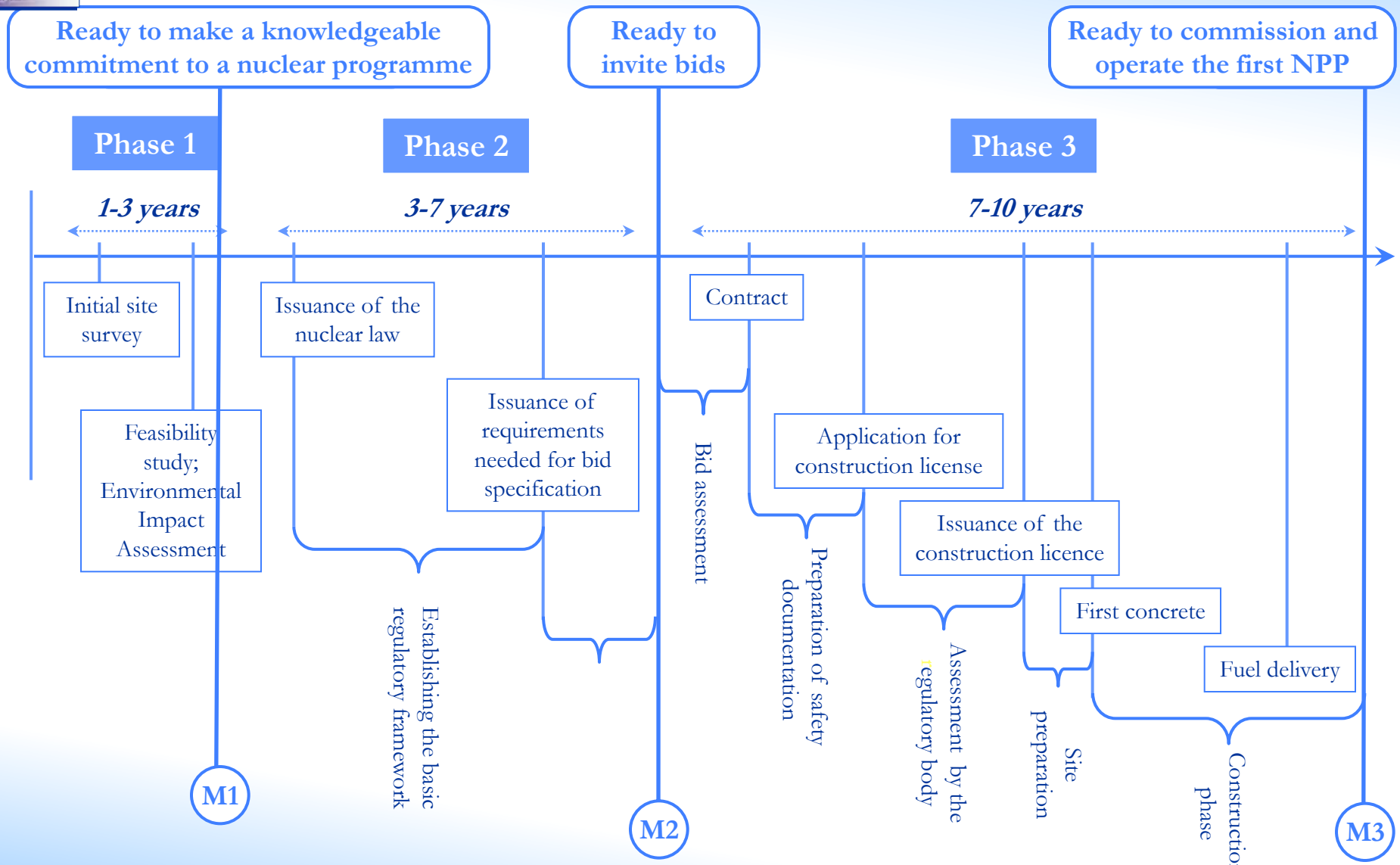


TECHNICAL ACTIVITIES

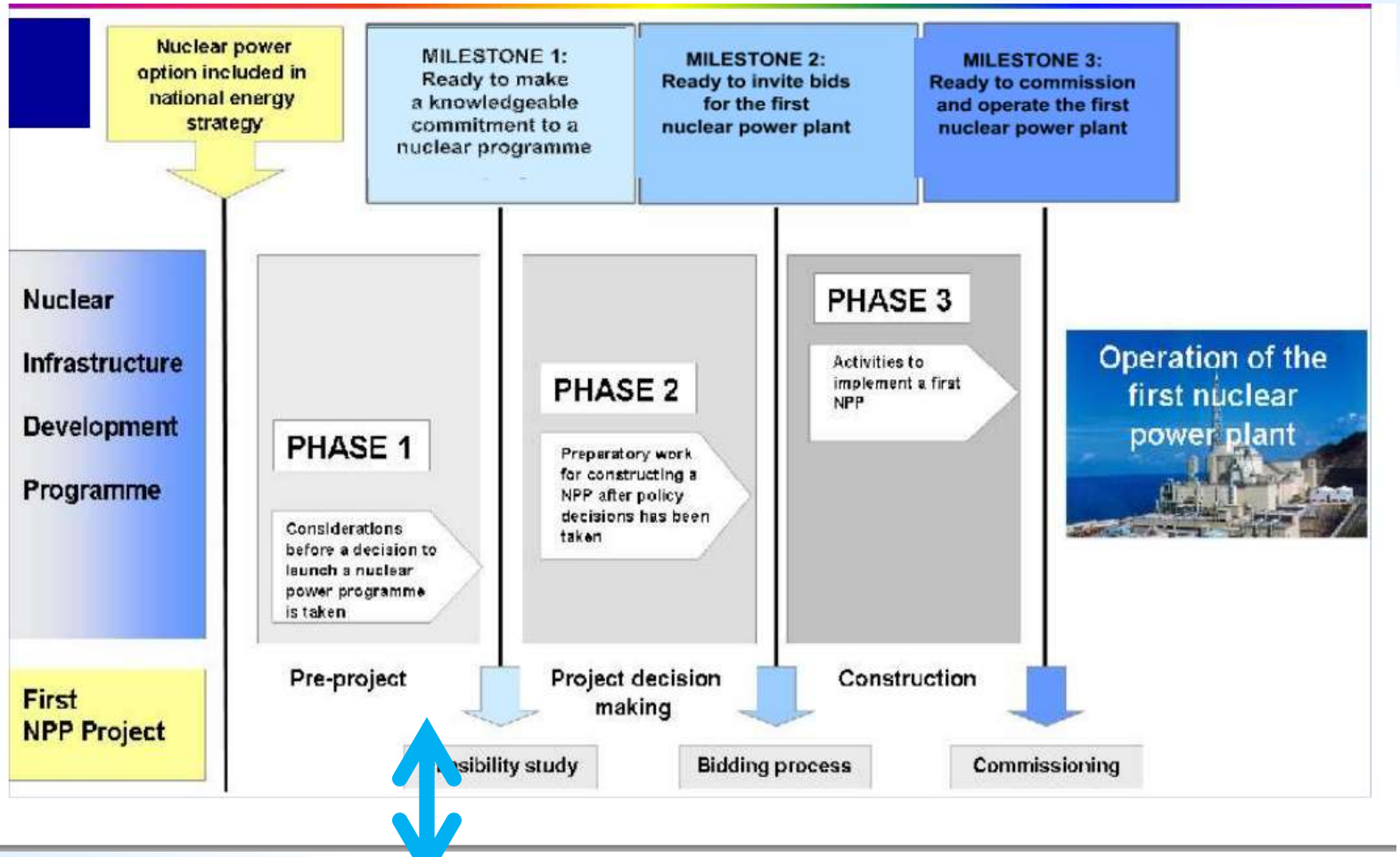
	STUDY
1.	Comprehensive Site Selection Process
2.	Technology assessment
3.	Strategies - Radioactive Waste Management, Emergency Preparedness
4.	Feasibility Study – Nuclear Plant
5.	Nuclear Plant Bid Invitations



Phases and Milestones in a NP Programme
(INSAG 22 and the Milestones Document (NG-G-3.1)

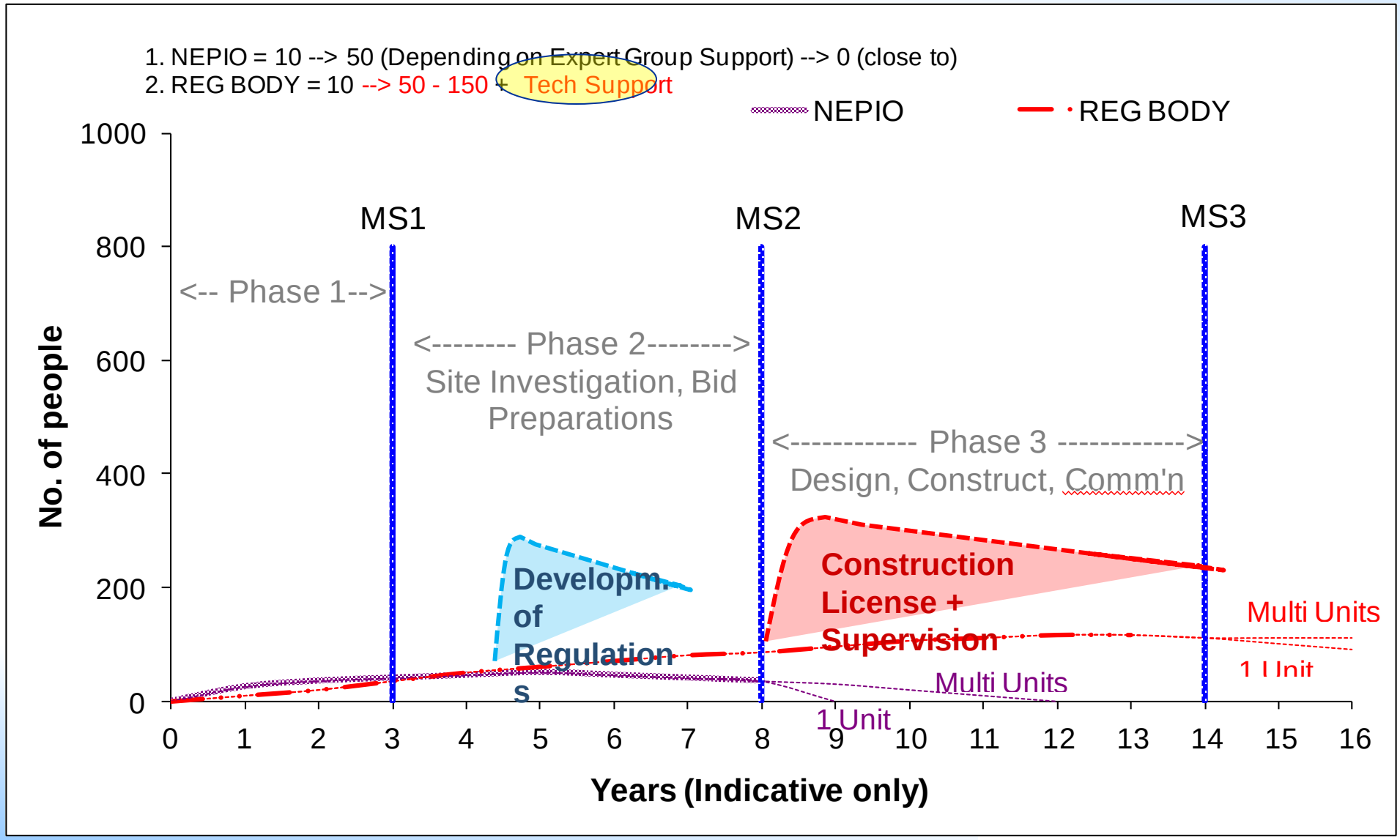


Kenya nuclear energy programme infrastructure milestone



Kenya is here

Regulatory Body Resources for Phase 1-3



Mechanisms for IAEA Support

- Workshops/Training Courses
- Expert Missions/Advisory Services
- Review Missions/Peer Reviews
- Training Tools and Networks

Link to IAEA Catalogue of Services for Nuclear Power Infrastructure Development: (https://www.iaea.org/NuclearPower/Infrastructure/catalogue.html)

IAEA Guidance

Training Materials available for embarking countries

Link to full IAEA Nuclear Power Infrastructure Bibliography: (https://www.iaea.org/NuclearPower/Infrastructure/Bibliography/index.html)

UAE Construction Site

BELARUS

- Unit 1 – 2019
  - Unit 2 – 2020

Conclusions

- Some 28 countries are moving ahead with its plans for nuclear power introduction
- IAEA has developed the Milestones Approach to help guide countries through this process -**19 Infrastructure Issues**
- IAEA -guidance documents, training, review missions, and expert advice.
- NIDS coordination work and its essential tools including Self-Evaluation, INIR missions, CNIPs and IWPs ensure that Agency support is relevant, timely and of high quality.

Conclusion

- Nuclear power programme requires strong leadership
- Research Reactor programme is not a prerequisite for NPP programme
- Many countries – Jordan, Bangladesh, Belarus and others improve HRD programme and RR programme

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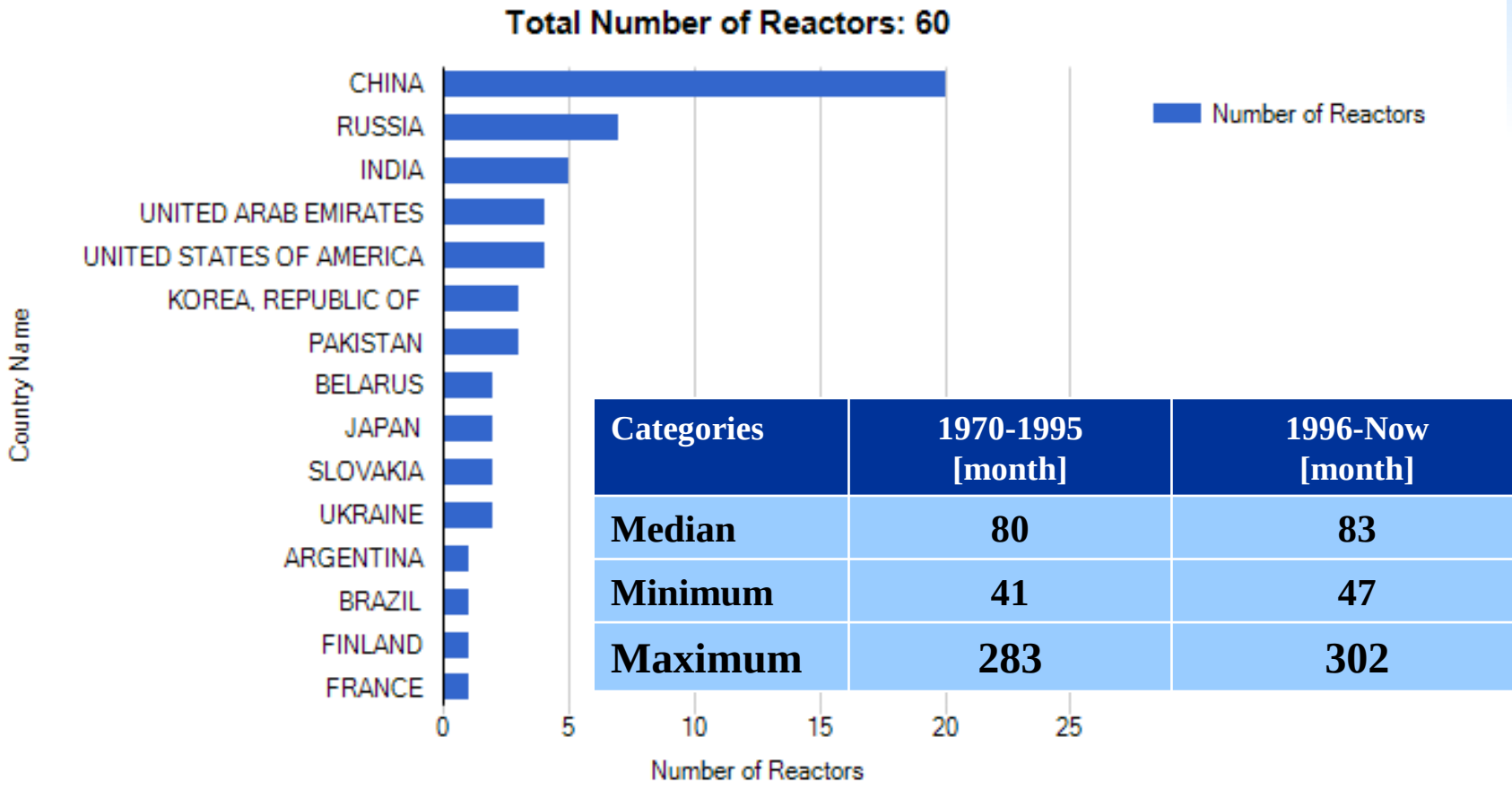
Thank you!

Construction reactors



Categories	1970-1995 [month]	1996-Now [month]
Median	80	83
Minimum	41	47
Maximum	283	302