

Capacity Building Towards Strategic Planning for Sustainable Nuclear Energy



25th INPRO Dialogue Forum

By

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PRESENTATION OUTLINE

❖ **Introduction**

❖ **Kenya's Nuclear Energy roadmap**

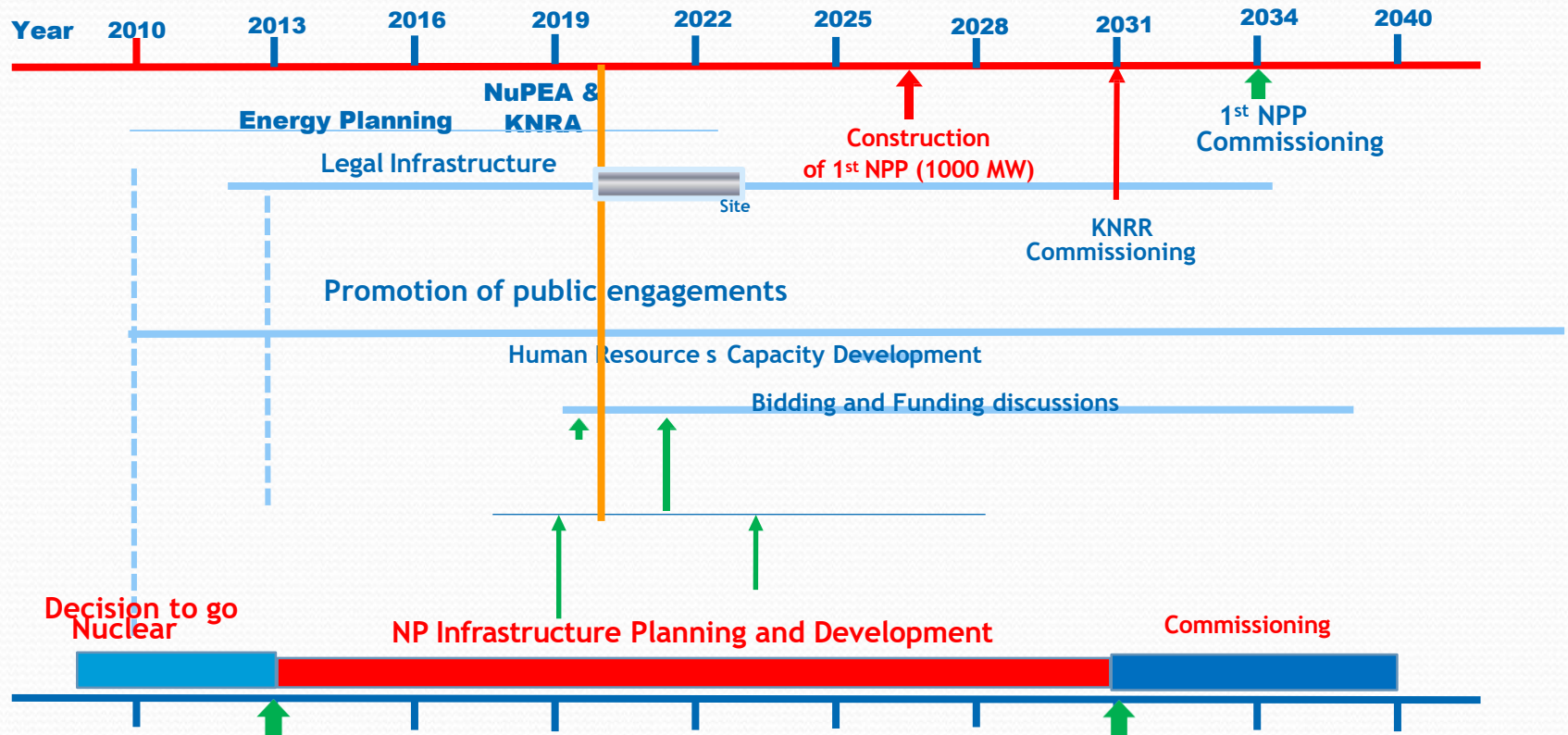
❖ **Human Resource Capacity building**

❖ **Conclusion and way forward**

Sustainable Nuclear Energy

- ❖ African countries are faced with insufficient energy and rising energy costs yet energy is critical for economic development.
- ❖ Kenya has a projected electric power demand of 16,000 MW by 2030
- ❖ Kenyan government through NuPEA made a knowledgeable commitment to explore nuclear power options to meet Kenya's energy demands.
- ❖ NuPEA aims to develop a safe, secure, and sustainable nuclear energy programme.
- ❖ Nuclear power will enhance energy security by diversifying the energy mix, reducing over-reliance on renewable sources like hydro and geothermal.
- ❖ For sustainable nuclear energy, human capacity building is essential.
- ❖ The Kenyan government (2000) acceded to the IAEA's INPRO membership.

Kenya's Nuclear Energy Roadmap



The need for locally skilled human resources cannot be overlooked in the quest for embracing sustainable nuclear energy

Human Resource Capacity Building

- Training for sustainable nuclear energy capacity building:
 - ✓ Regional training centres for countries embarking on sustainable nuclear energy
 - ✓ Local training programs at universities and technical institutions
 - ✓ The IAEA trainings for trainers in both regional and national institutions
 - ✓ IAEA technical support and extensive training and capacity-building for sustainable nuclear energy
 - ✓ International bilateral training for sustainable nuclear energy development

Human capacity building

Before acquiring nuclear power a country needs *multitudes of well educated and competent engineers, physicists and technicians trained not only at universities but also at nuclear facilities.*

- ❖ Degree Programs (in various science and engineering disciplines e.g. *Nuclear Physics, Nuclear Engineering, Radiological Engineering, Reactor Engineering, Nuclear Chemistry, Radioanalytical Chemistry, Accelerator Physics.*
- ❖ Postgraduate programs (Masters and PhD) for sustainable energy planning and management.
- ❖ Legal and Regulatory Programs
- ❖ Non-Degree Training (Technical)

Current Courses

Undergraduate

SPH 401	Atomic Physics
SPH 402	Nuclear Physics
SPH 414	Elementary Particle Physics
SPH 420	[Research] Project

Postgraduate

SPH 620	Advanced Nuclear Physics
SPH 621	Radiation Physics
SPH 622	Radiation Measurement and Spectroscopy
SPH 623	Radiation Protection and Dosimetry
SPH 624	Applications of Radiation
SPH 632	Advanced Laboratory Techniques

Followed by Research Thesis - both at MSc or PhD

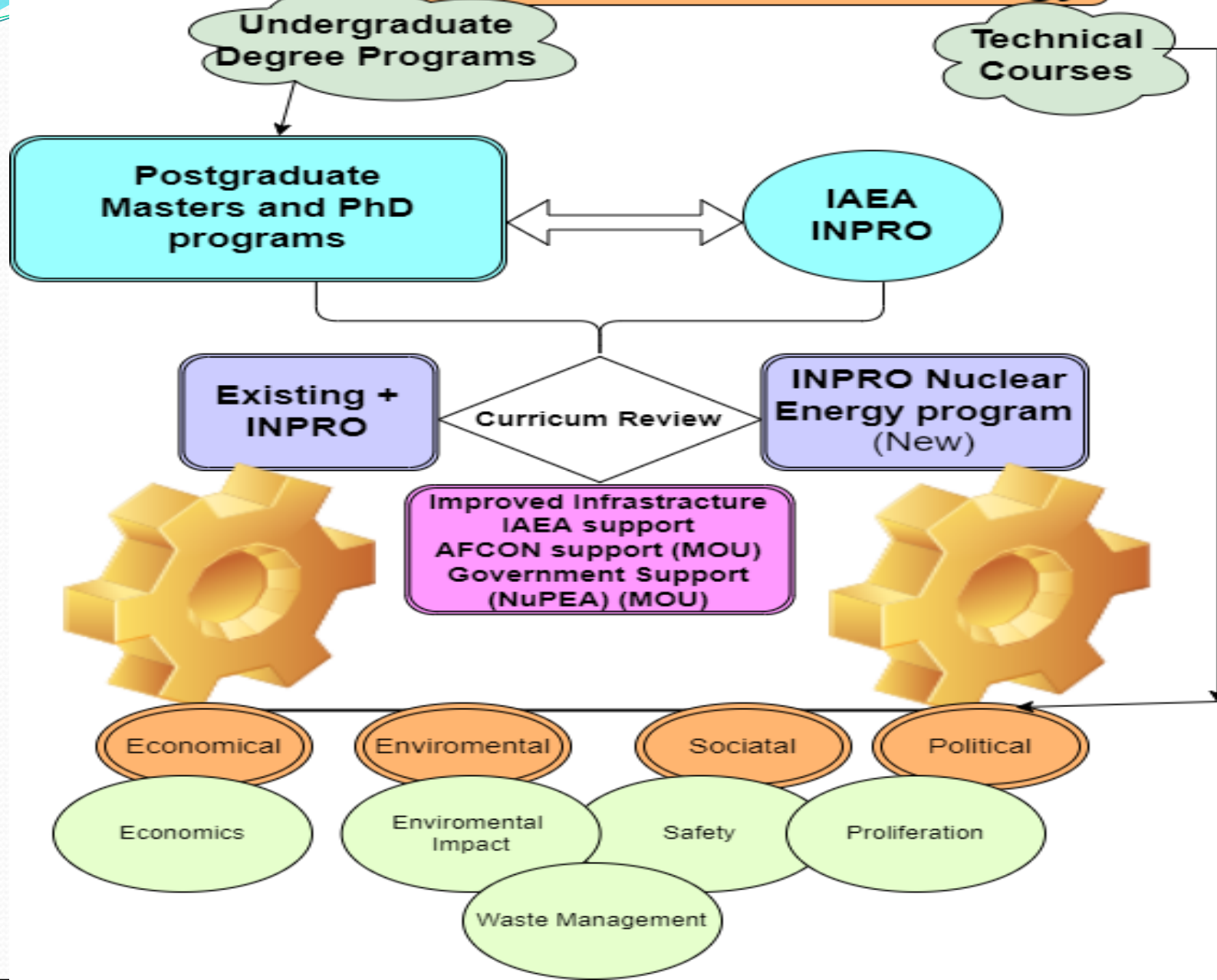
MSc Courses at Institute of nuclear science and technology

1. Atomic and Nuclear Physics
2. Radiation protection and Dosimetry
3. Nuclear Electronics and solid state physics
4. Particle detection and measurements
5. Radiochemistry
6. Application of nuclear techniques
7. Nuclear and reactor physics
8. Medical physics and instrumentation
9. Radioactive waste and source management

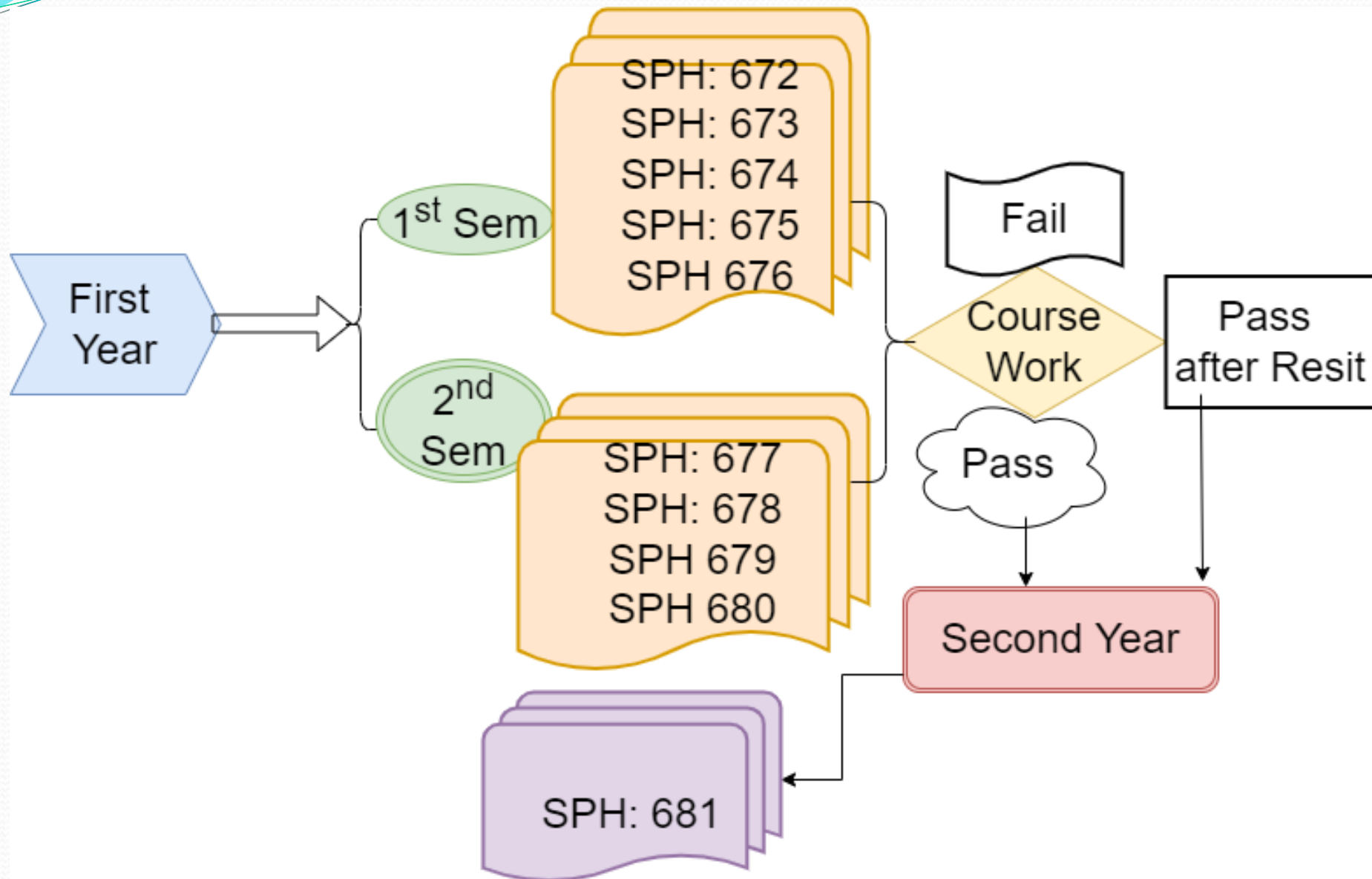
Proposed New Msc Courses

- SPH 666: Radioecology
- SPH 667: Particle Physics
- SPH 668: Reactor Physics
- SPH 669: Nuclear Forensics
- SPH 670: Experimental Methods in Nuclear and Particle Physics
- SPH 671: Nuclear Instrumentation and Radiometrics
- SPH 713: Nuclear Structure and Reactions
- SPH 714: Advanced Particle Physics

Human Capacity Building for Sustainable Nuclear Energy



MASTERS IN NUCLEAR ENERGY SUSTAINABILITY



MASTERS IN NUCLEAR ENERGY

CODE	COURSE TITLE
SPH: 672	Common course
SPH: 673	Common course
SPH: 674	Energy planning and strategies for sustainable development (N)
SPH: 675	Planning for nuclear energy sustainability (N)
SPH: 676	Innovations in nuclear energy (N)
SPH: 677	Introduction to INPRO methodology (N)
SPH: 678	Methods and tools for sustainable energy development
SPH: 679	Modelling of nuclear energy systems (N)
SPH: 680	Analysis of Nuclear Energy Systems (N)
SPH: 681	Project

Conclusions & Way forward

- ❑ Capacity building for NPP is beyond the Ministry of Energy.

Much wider stake-holding should be considered.

- ❑ For sustainable nuclear energy, there's need for Specific & Aggressive Education and Training initiatives;

- ❖ IAEA's INPRO model curriculum approach

- ❖ Curriculum review & New programs

- ❖ Improved infrastructure

- ❖ Improved funding



Partnerships
Collaborations
MoUs



**Thank You
(Asante Sana)**