

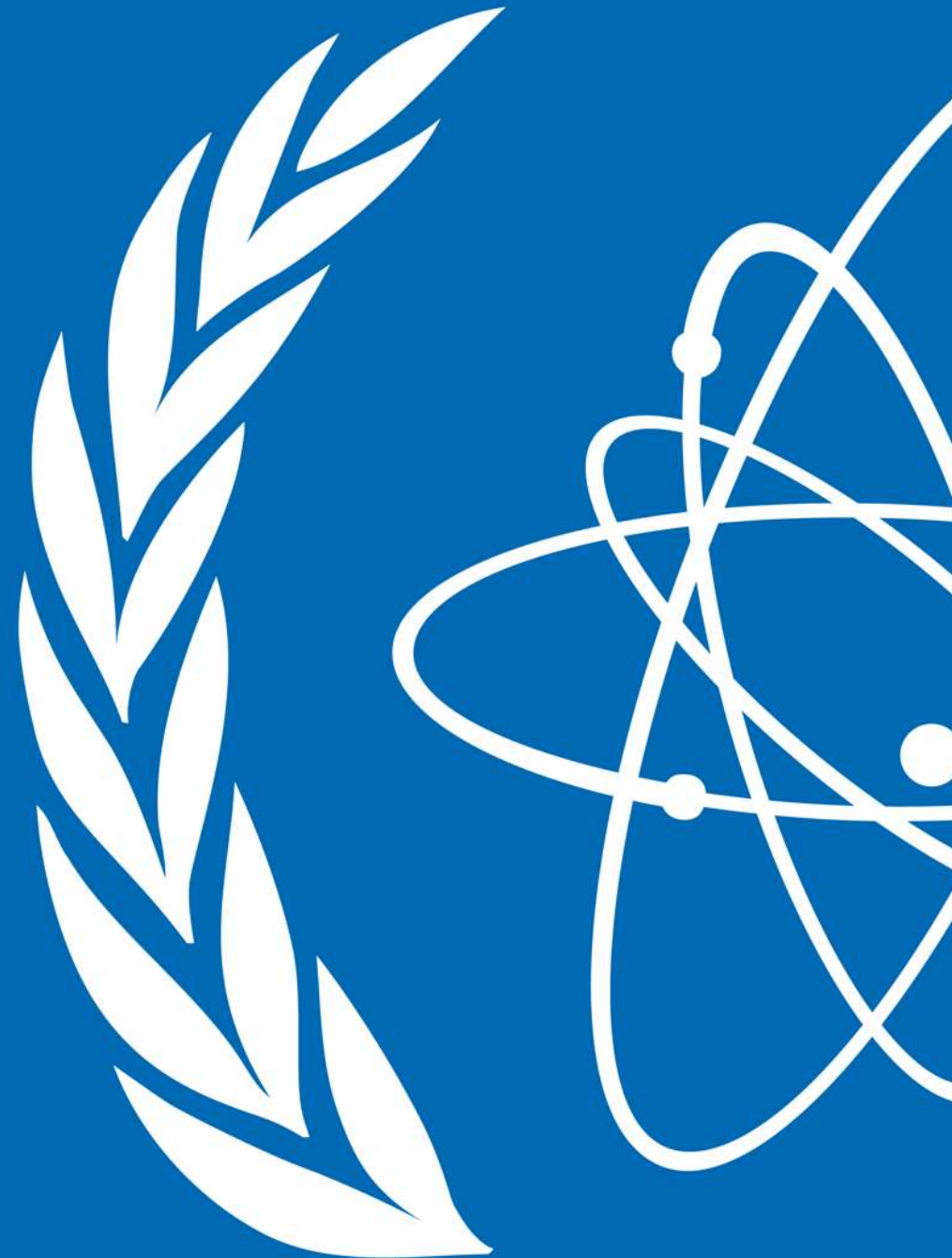
IAEA's Support in Building Capacity in Strategic Planning for Sustainable Nuclear Energy

International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO)

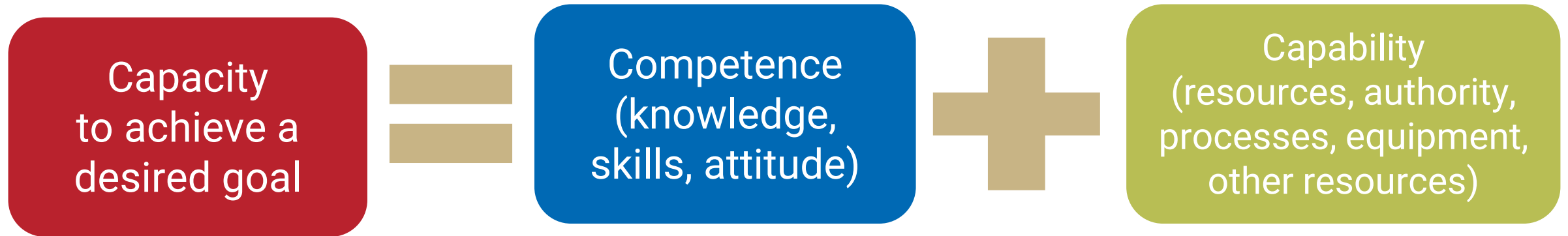
Maxim GLADYSHEV, INPRO, IAEA

25th INPRO Dialogue Forum on Nuclear Energy Development in Embarking Countries

17-21 November 2025, Nairobi, Kenya

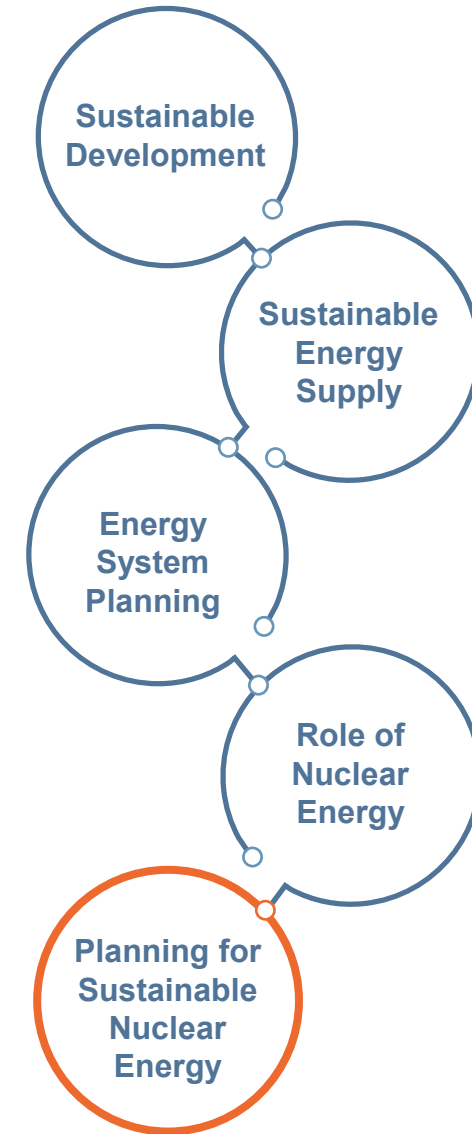
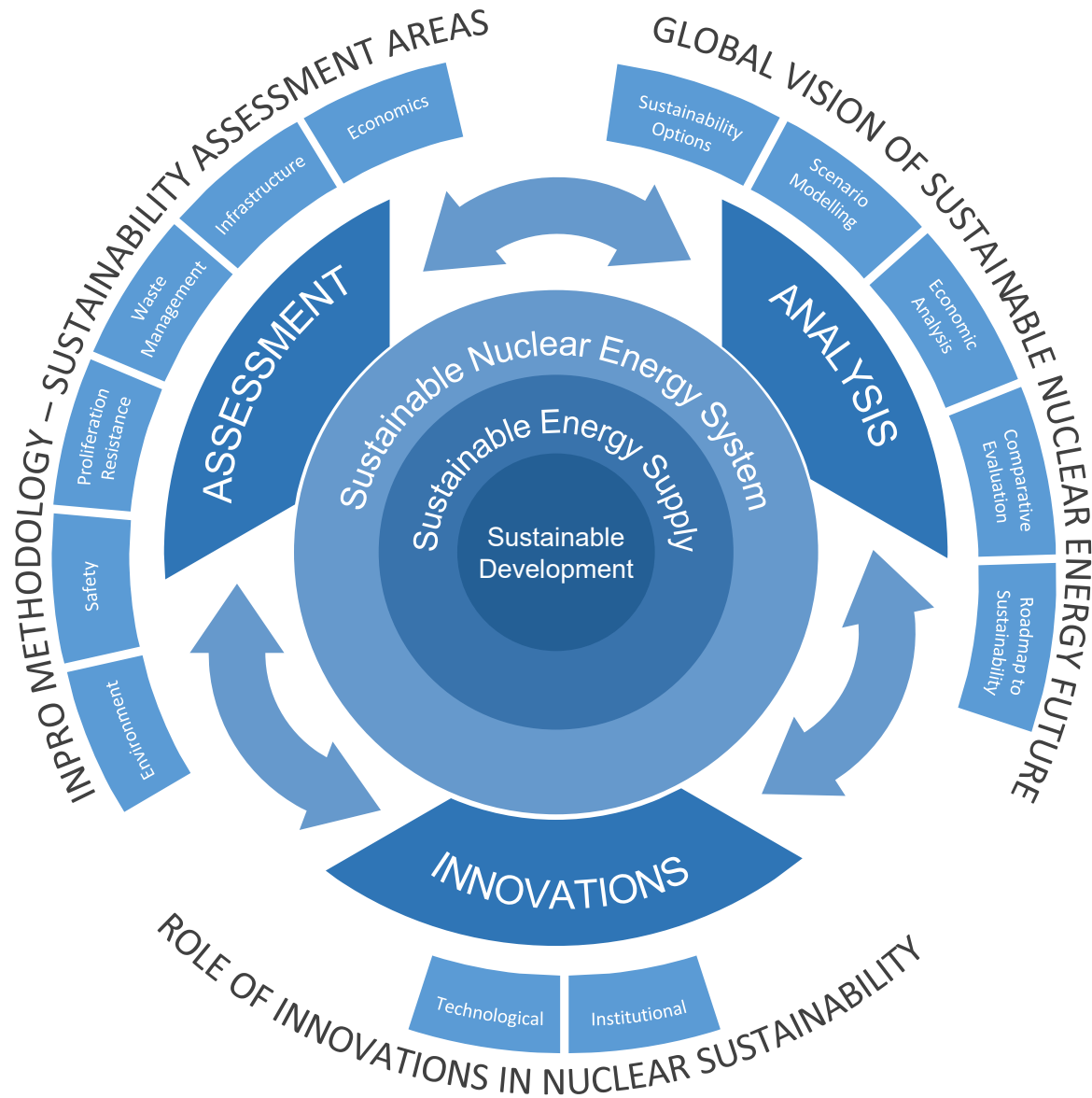


Capacity Building

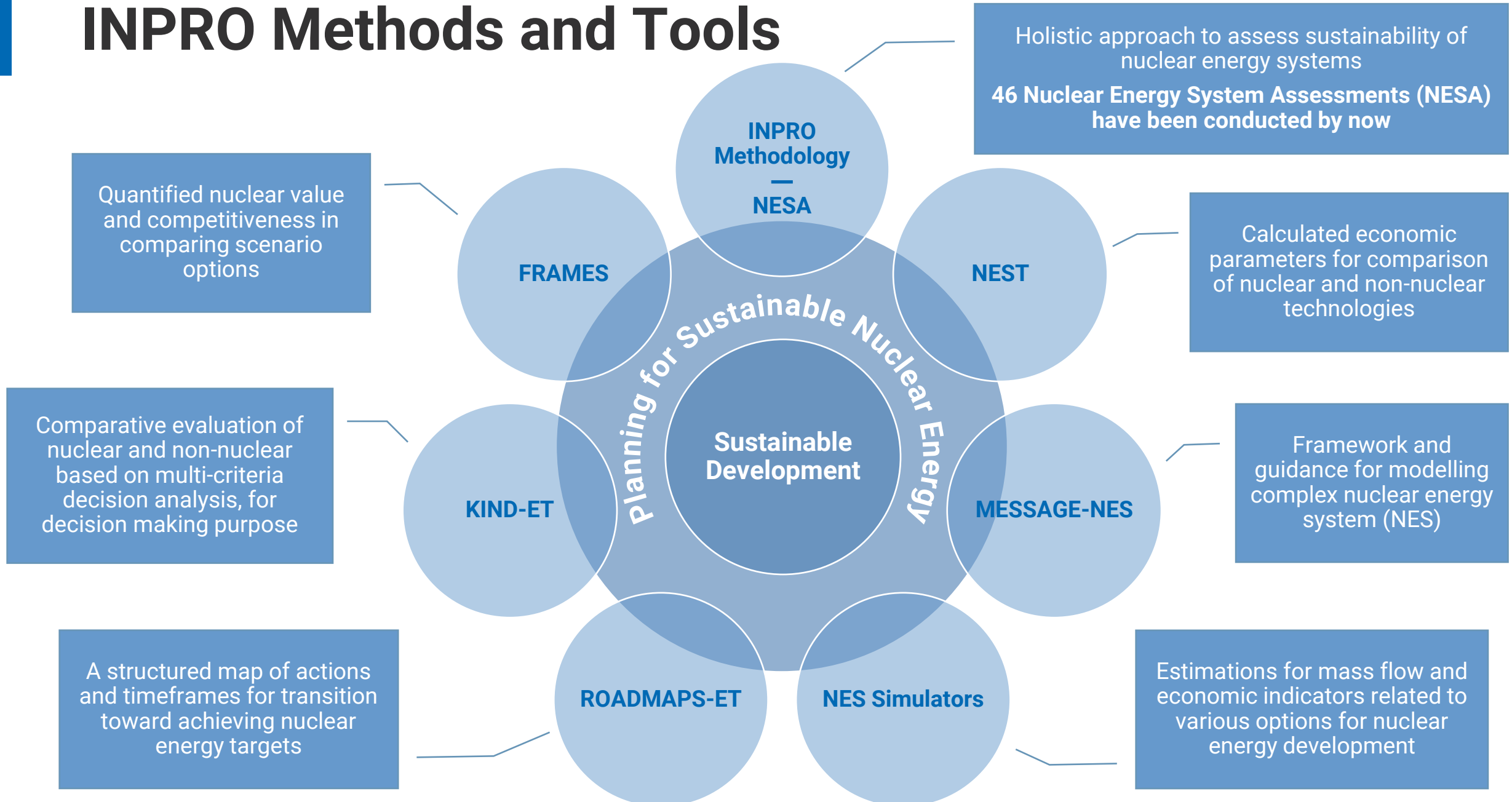


- Capacity building – the systematic and integrated approach to develop and continuously improve the governmental, organizational and individual **competencies** and **capabilities** necessary for achieving a safe, secure and sustainable nuclear power programme
- Main elements of capacity building:
 - **Education and training**
 - Human resource development
 - Knowledge management
 - Knowledge networks

INPRO Knowledge Domain

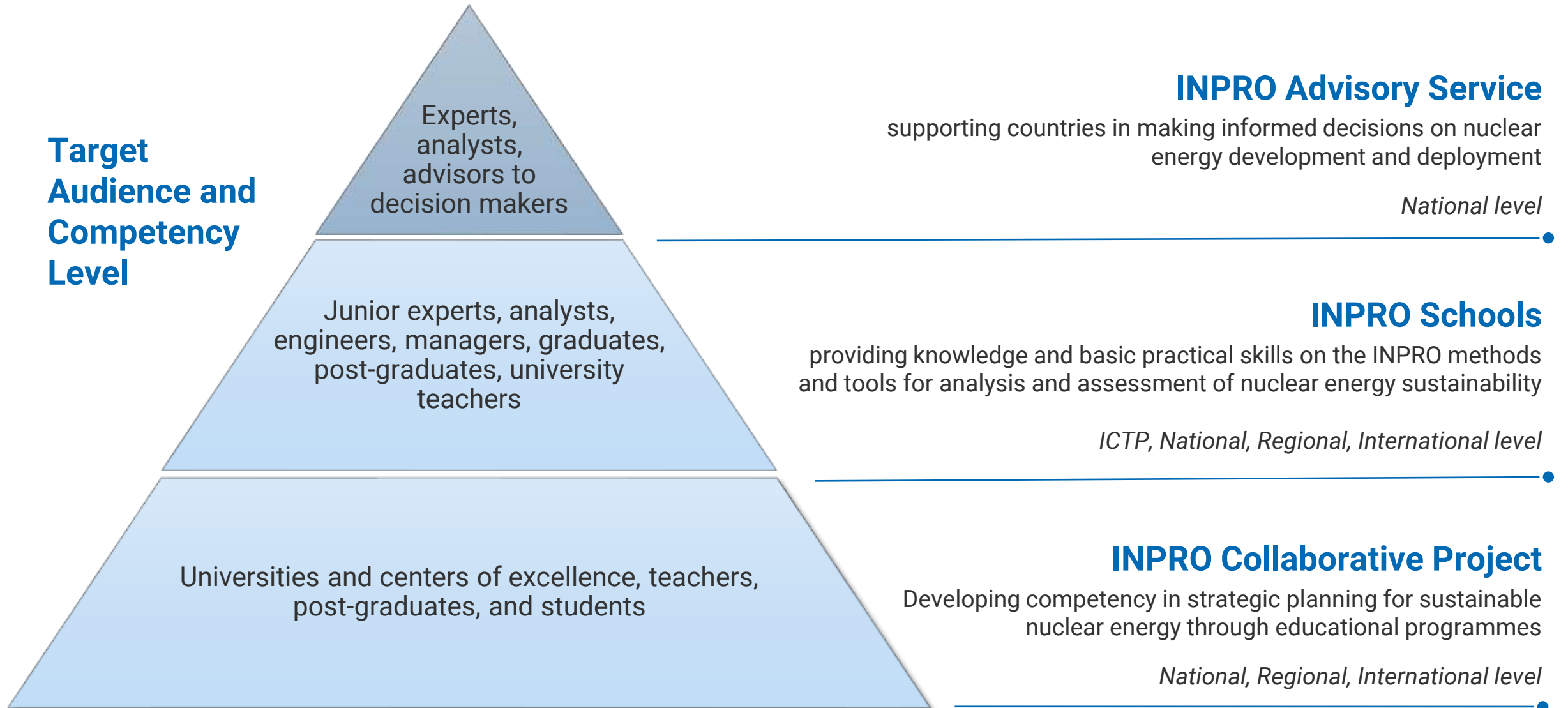


INPRO Methods and Tools



Building Capacity in Strategic Planning for Sustainable Nuclear Energy

Target Audience and Competency Level



Experts,
analysts,
advisors to
decision makers

INPRO Advisory Service

supporting countries in making informed decisions on nuclear energy development and deployment

National level

Junior experts, analysts,
engineers, managers, graduates,
post-graduates, university
teachers

INPRO Schools

providing knowledge and basic practical skills on the INPRO methods and tools for analysis and assessment of nuclear energy sustainability

ICTP, National, Regional, International level

Universities and centers of excellence, teachers,
post-graduates, and students

INPRO Collaborative Project

Developing competency in strategic planning for sustainable nuclear energy through educational programmes

National, Regional, International level

The IAEA INPRO School

- Annually and jointly with ICTP in Trieste, Italy
- Regional INPRO schools organized at the requests of Member States
- About 350 people from over 50 Member States participated since 2021





International Atomic Energy Agency
Agency for Peaceful Development



The IAEA INPRO School
on Strategic Planning
for Sustainable
Nuclear Energy

CERTIFICATE COURSE



Many countries, faced with sharply rising energy costs and heightened security of supply concerns, are reconsidering nuclear power. They are realizing more and more that nuclear power has a proven ability to reduce greenhouse gas emissions, avoid air pollution, improve energy security and access, mitigate fuel price volatility and power sustainable development.

The IAEA works with young people, engaging a new generation of scientists so that they have the opportunities to work together to face these problems and to provide the necessary solutions.

Rafael Mariano Grossi
IAEA Director General

MAIN REASONS FOR ATTENDING THIS SCHOOL

- 1 The curriculum covers the most important topics related to strategic planning for sustainable nuclear energy.
- 2 Participants will gain knowledge and practical experience on modelling, analyzing and assessing the sustainability of nuclear energy systems.
- 3 The School offers a unique opportunity for capacity building and career growth by supporting interaction and networking with international nuclear energy experts and peers.

The International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) was established in 2000 to ensure that nuclear energy is available to contribute, in a sustainable manner, to the growing energy needs of the current century and beyond.

INPRO is one of several key IAEA programmes. It is a forward-looking project that integrates all areas important to the sustainability of nuclear energy. INPRO's activities are centred on the key concepts of global nuclear energy sustainability and the development of long-range nuclear energy strategies. INPRO promotes technological and institutional innovations in the development and deployment of nuclear energy systems that are safe, secure, economically viable, and environmentally sustainable. INPRO supports Member States' capacity building through its educational and training programmes.



ACHIEVING A SUSTAINABLE FUTURE

Sustainable development aims to meet the needs of the present generation while ensuring that future generations would have the resources to meet their own needs. Achieving such a future is a complex process that involves balancing economic growth, social equity, and environmental protection in a way that benefits both the present and the future generations. The United Nations sustainable development goals (SDGs) encompass the spectrum of human life and set time-bound targets to achieve sustainable development.

Energy plays a critical role in sustainable development by enabling economic growth, improving social well-being, and reducing poverty. However, the way energy is produced, distributed, and consumed has significant impacts on the environment and climate. The present global energy system relies heavily on fossil fuels, which are not only finite but also cause substantial environmental damage. The use of fossil fuels is also the main source of greenhouse gas emissions (GHGs) causing climate change. A swift transition to reliable, affordable, clean and GHG-free energy systems is vital for achieving sustainable energy development. Nuclear energy is a reliable, clean and competitive source of energy that can support the realization of sustainable

development. Its use, however, requires a comprehensive evaluation of a wide range of issues covering technology, economics, safety, non-proliferation, and waste management. Strategic long-term planning is thus necessary to ensure that the nuclear energy system is fully aligned with sustainable development.

The IAEA's INPRO has developed a set of decision support tools for developing nuclear energy scenarios and conducting studies for formulating national strategies for sustainable nuclear energy systems. INPRO disseminates these tools and conducts specialized training in the IAEA INPRO School on Strategic Planning for Sustainable Nuclear Energy (the INPRO School), to help Member States build local expertise for strategic planning for sustainable nuclear energy development.

THE INPRO SCHOOL

The IAEA assists Member States in capacity building through various educational and training programmes, including long-term and strategic planning for sustainable nuclear energy. The INPRO School introduces the INPRO concept of nuclear energy sustainability and develop competencies for assessment and analysis of nuclear energy systems to support national decisions on the future use of nuclear energy.

Main Elements of INPRO School Programme

1. Energy planning and strategies for sustainable development – 8 hours
2. Planning for nuclear energy sustainability – 13 hours
3. INPRO methodology – 9 hours
4. Role of innovations for sustainability of nuclear energy systems – 8 hours
5. INPRO methods and tools with hands-on training – 20 hours
6. Group projects on NEST, NES simulators, and KIND (FRAMES, RTA, and NESAs are coming) – 8 hours in-class and 8 hours of preparation/homework

**Over 70 hours of
intensive training in a
compact two-week
programme**

- 38 hours of lectures
- 20 hours of hands-on training and practical exercises
- 8 hours in class for group projects
- 6 hours of poster sessions

INPRO Collaborative Project

Joint initiative of the educational networks (ANENT, LANENT, STAR-NET, AFRA-NEST, ENEN) within the IAEA framework

To support the educational community by facilitating and contributing to the development and implementation of university-level courses based on the '**Model Curriculum on Strategic Planning for Sustainable Nuclear Energy**'

The project aims to enhance the capacity of Member States by equipping the next generation of nuclear experts with the competencies needed to develop long-term strategies for sustainable nuclear energy

Universities interested in participating in this new Collaborative Project are welcome to join!



International Project on Innovative Nuclear Reactors and Fuel Cycle (INPRO)

NENP/INPRO Section

TERMS OF REFERENCE

INPRO Collaborative Project

**DEVELOPING COMPETENCY IN STRATEGIC PLANNING FOR
SUSTAINABLE NUCLEAR ENERGY THROUGH EDUCATIONAL
PROGRAMMES**

An interdisciplinary project supported by the INPRO members and
IAEA inter-departmental cooperation

Rev 2024-11-26

Rationale for Developing Model Curriculum on Strategic Planning for Sustainable Nuclear Energy

- IAEA 65th General Conference resolution emphasized the important role the Agency can play in assisting Member States in building **long-term national nuclear energy strategies based on INPRO methodology**
- Need for **competent specialists** who understand the **long-term aspects of sustainable nuclear energy** and can apply the required knowledge, skills, methods and tools to support strategic planning and decision making
- Need to effectively **transfer accumulated knowledge** in INPRO to young professionals and future leaders in nuclear energy field

Such needs could be met by introducing **relevant educational programmes** at the university level

Model Curriculum on Strategic Planning for Sustainable Nuclear Energy

Supports professors, teachers, and other professionals

- Professors training in strategic planning in nuclear energy development
- Professionals responsible for developing and delivering programmes in education of strategic planning for sustainable nuclear energy

Audience of a course or courses based on the 'INPRO Model Curriculum'

- Master level students of Nuclear Science, Nuclear Technology and Nuclear Engineering
- Students studying international relations, political science and management, especially in nuclear energy planning and sustainability assessment
- Those in continuing education programme, for example managers and technical professionals working in the nuclear industry

Structure of the Model Curriculum

Core Modules

Module 1

Energy planning and strategies for sustainable development

Module 2

Planning for nuclear energy sustainability

Module 3

Innovations in the nuclear energy sector to meet the challenges of sustainable energy development

Advanced Modules

Module 4

Introduction to INPRO methodology for assessing the sustainability of nuclear energy systems

Module 5

Methods and tools for planning sustainable energy development

Module 6

Methods and tools for modelling and analysis of nuclear energy systems

Research Project Module

Module 7

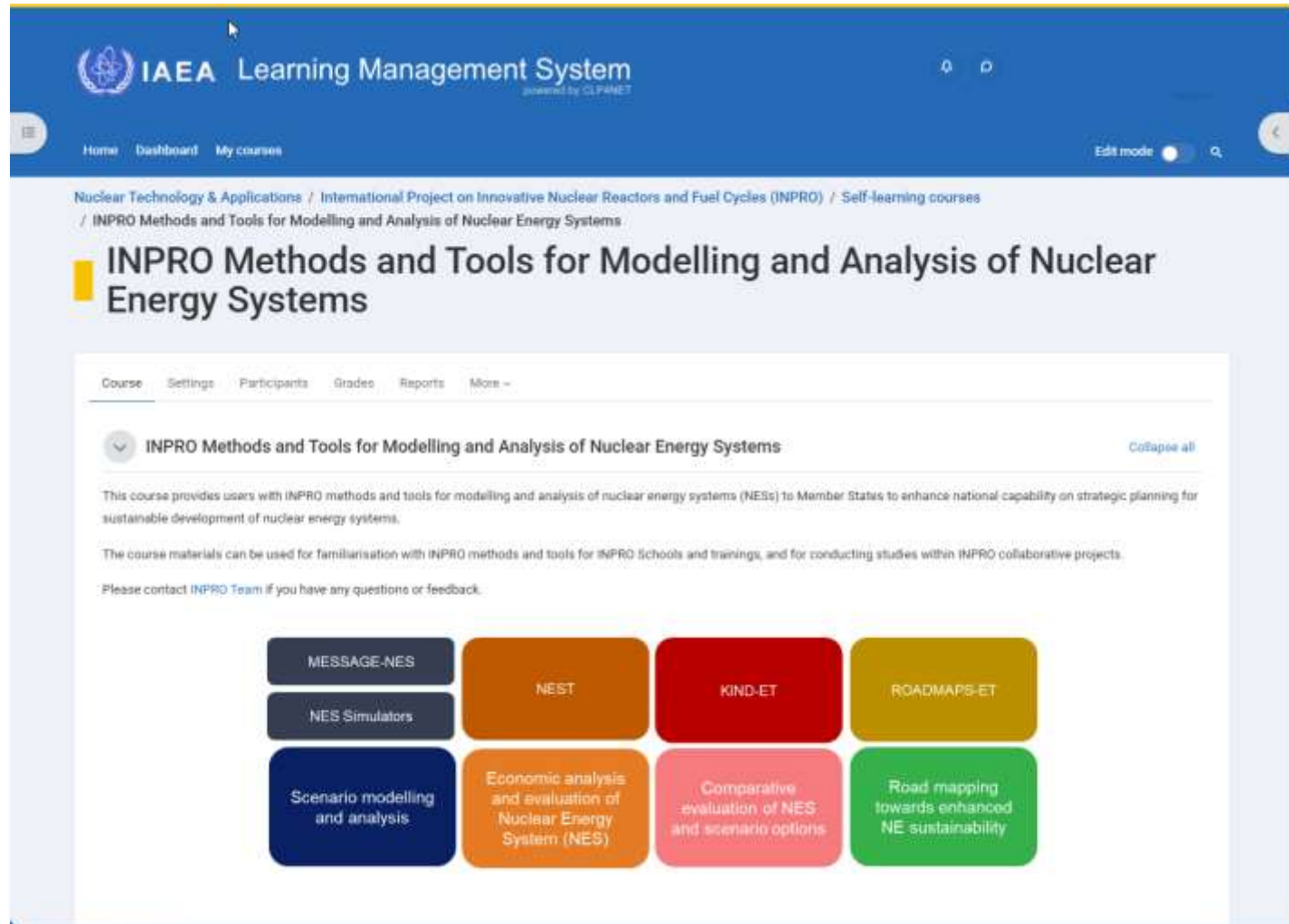
Research projects on planning and assessment of energy and nuclear energy systems

Implementation of Model Curriculum

The IAEA's support for interested universities in implementing the model curriculum may include the following:

- Providing IAEA methods and tools for modelling, analysis and sustainability assessments of nuclear energy systems, and training in their applications,
- Providing training/teaching materials and assisting in the design of educational courses using the model curriculum
- Providing access to the e-learning courses on the IAEA Learning Management System
- Organizing internships at the IAEA for practical study of relevant subjects; arranging scientific visits and fellowships
- **Assisting in the implementation of educational courses using the model curriculum**, e.g., by involving experts in specialized areas
- Collaborating with universities through a new INPRO Collaborative Project

INPRO Methods and Tools on the IAEA LMS



<https://elearning.iaea.org/m2/course/view.php?id=1341>

Activities in 2026

- INPRO Advisory Service
 - Upon request from INPRO Members through TC or paid by requestor
- INPRO School on Strategic Planning for Sustainable Nuclear Energy
 - **5th Joint ICTP-IAEA School in ICTP, Trieste Italy, 10–21 August 2026**
 - Regional INPRO School for CIS countries (TBD)
 - Joint INPRO School in Russia, Republic of Korea (TBD)
 - Train the trainer INPRO School (TBD)
- Collaborative Project on ‘Developing Competency in Strategic Planning for Sustainable Nuclear Energy through Educational Programmes’
 - Pilot implementation of the INPRO Model Curriculum in selected universities (TBD)



Thank you!

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