Concept for new Initiative: NEA Nuclear Education, Skills & Technology (NEST) Framework

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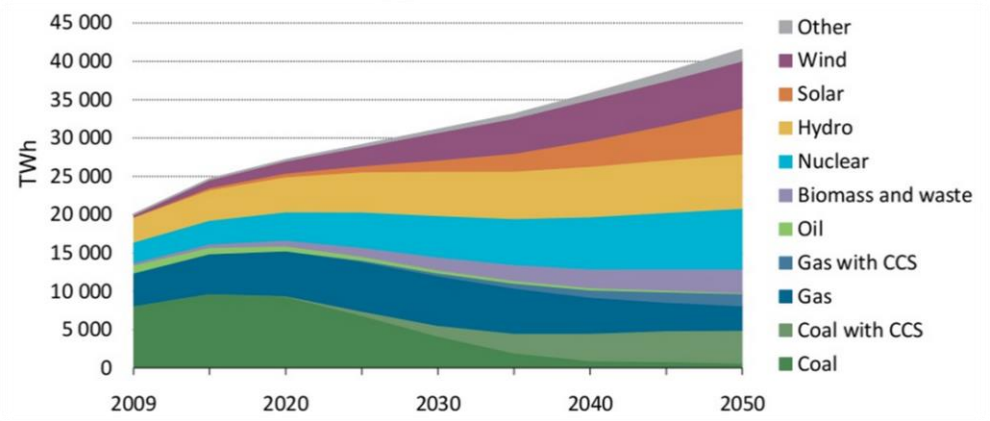
NI2050 Initiative, Advisory Panel Meeting, 20-21 June, 2016

Future Use of Nuclear Technologies: Considerations

Nuclear power contributes to global energy and environmental challenges



IEA 2 Degrees C Scenario: Nuclear Provides the Largest Contribution to Global Electricity in 2050

- ❑ **Long-term operation, flexibility**
- ❑ **New applications, desalination, hydrogen, heat, …**
- ❑ **Development of evolutionary and innovative NPP technologies**

- ❑ **Optimising long-term issues, waste, decommissioning & remediation**

2015 NEA/IEA Technology Roadmap: Nuclear Energy

https://www.oecd-nea.org/pub/techroadmap/

Key Recommendations

- Governments should recognize the value of low-carbon capacity
- R&D is needed to support long-term operation
- Industry needs to optimise constructability of Gen III designs
- Accelerate development of SMRs
- Support development of one or two Gen IV reactors
- Demonstrate nuclear desalination or hydrogen production
- Invest in environmentally sustainable uranium mining
- Continue cooperation and discussions on international fuel services
- Establish policies and sites for long-term storage and disposal

Who will Implement These Goals?

- The current talent-base in nuclear science, technologies and engineering has been built in many countries over several decades through aggressive projects
- A very large portion of the most experienced specialists is now at or near retirement age

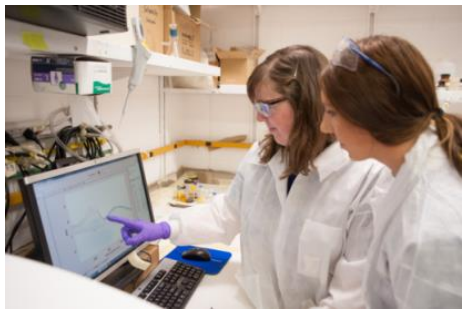
From large pioneering projects (XXth century) to international network

For creating new generations of highly-trained nuclear scientists and engineers over the decades to come

NEA Nuclear Education, Skills & Technology (NEST) Framework: Goals

- To energize students, young scientists and engineers to pursue careers in nuclear area by:
  - Establishing a multinational framework between interested countries to maintain & build skills capabilities
  - Establishing international links between universities, research institutes and industry
  - Attracting young people in an international network to solve real-world problems

NEST Framework: Opportunities for students and young professionals



- Hands-on experience and practical knowledge on
  - nuclear science
  - design, construction, operation of reactors
  - advanced and innovative technologies
- Multi-discipline environment
- Access to experimental facilities and computer codes
- Work together with senior staff in integrated teams
- Building a network of international contacts

NEST Framework: Ground for the Benefits of Cooperation

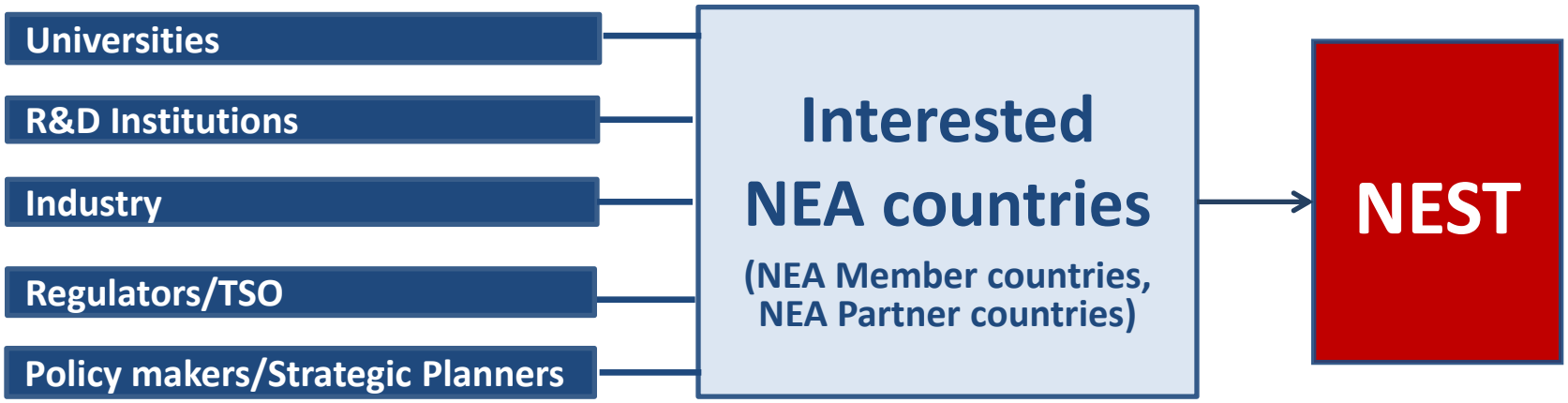
- Direct links to national policy makers
  - Energy policy
  - R&D priorities
  - Future critical skills
- Extensive international network of students and young professionals together with high-level technical experts from industry and R&D institutes
- Access to proven tool: NEA multinational projects
  - Shared by the Community as relevant problems
  - State-of-the-art and high impact
  - Multi-discipline

NEST Framework: Benefits

- For Next Generation Professionals
  - Experience gained in relevant work jointly with experienced scientists, engineers and university professors
  - Building a network of international contacts
  - Opportunities for getting employment and/or better position
- For Universities
  - Education excellence connected to the state of the art
  - Education strategy consistent with energy and R&D policy
- For Member States
  - Building national reference skills among advanced students, post-doctoral appointees, young professionals

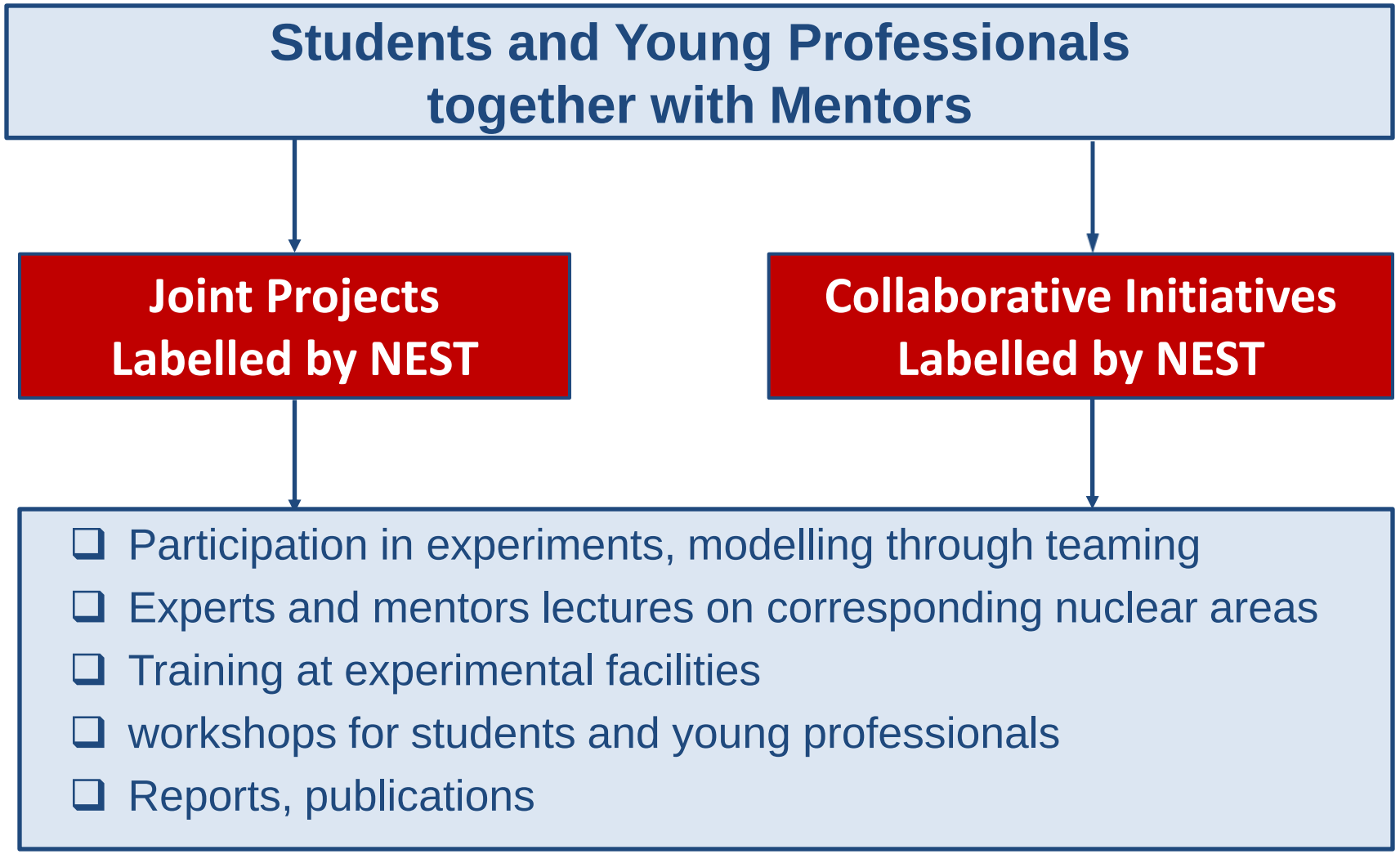
NEST Framework: Concept

- Participants, Membership, Mentors



- Sharing the objective
  - To support the development of a new generation of nuclear scientists and engineers in NEA countries
  - By providing them opportunities to get practical experience and knowledge

NEST Framework: Concept



NEST Framework: Concept

- NEST Framework
  - A set of Joint Projects labelled by NEST
  - Managed by an Host Organisation and NEA
  - Welcoming students and young professionals from NEST participating countries

NEST Framework: Concept

A Joint Project or a Collaborative Initiative Labelled by NEST

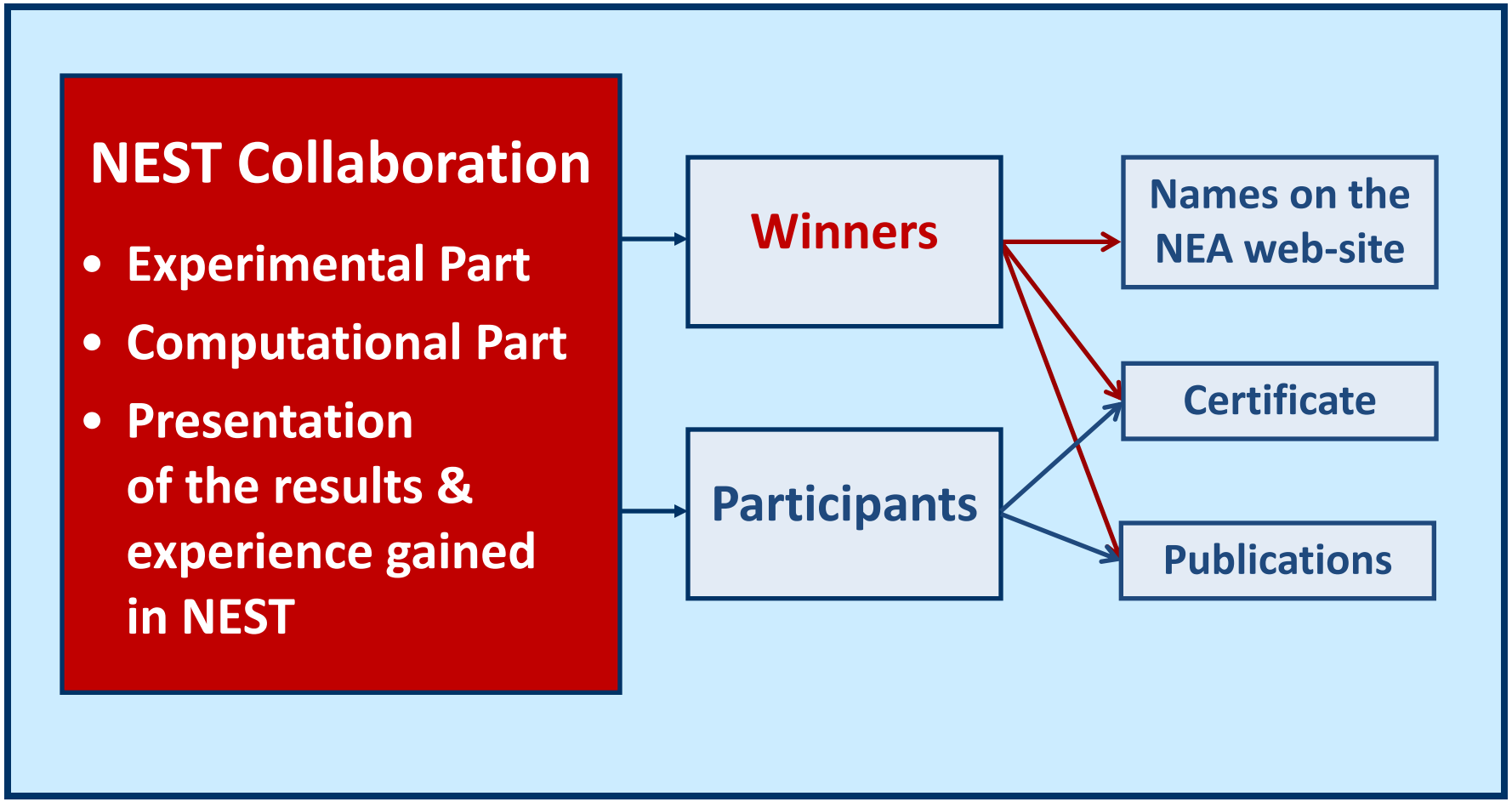
Depending on the project: few to 10 students per year

Hands-on programs
Research related, computer modelling, technology & experimental activities
On the project site, on the domestic site

Training programs
Training courses (1/2 weeks) , lectures, workshops
for the experimental part, the computational part, the project context and stake

NEST operational management (and label content)
Pool of Mentors from NEST participating countries and the Host organisation
Design of the programs
Presentation of the results by Students and Young Professionals
Evaluation and Recommendations

NEST Framework: Results of Participation



NEST Framework: A Maturing Process

- Membership of the NEST Framework
- Structure
  - A policy level for the guidance and for leveraging means
  - An operational organisation per Joint Project labelled by NEST
- Governance
- Definition of the policy role and support of participating countries
- Financing

NEST Framework: Next steps

- Collect the views from interest NEA Committees and NI2050
- Identify in 2016 a Pilot Joint Project labelled by NEST among NEA Joint Projects
- To report to the NEA Steering Committee in November 2016