

# ENEN's Challenges in Response to the Industry and Regulatory Needs

ETRAP 2009

Lisbon, Portugal, 8 – 12 Nov 2009

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European Nuclear Education Network  
Association



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**8-12 Nov 2009**  
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# 1. What is ENEN

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# STARTING POINT

## ECTS (European Credit Transfer and Accumulation System)

was introduced in 1989 within the framework of Erasmus.

## Bologna Declaration of June 1999

The aim was to create a European Higher Education Area by 2010

The Lisbon 2000 summit proposed the strategic goal for the European Union to become the most competitive knowledge-based economy with more and better employment and social cohesion by 2010.

# What is ENEN

## The European Nuclear Education Network Association

- A non-profit organization established in September 2003 under the French law of 1901
- For the continuity of achievements through the past Euratom-EC projects on nuclear E&T
- Headquarters is located near Paris, hosted by the Institut National des Sciences et Techniques Nucléaires in the CEA Centre of Saclay, France

# ENEN Objectives

The main objective is the preservation and further development of expertise in the nuclear fields by *higher* education and training

- Promote and further develop the collaboration in nuclear education and training of students, researchers and professionals
- Ensure the quality of nuclear education and training
- Increase the attractiveness for engagement in the nuclear fields for students, researchers and professionals
- Promote life-long learning and career development at post-graduate or equivalent level

*It should be achieved by...*

- Support to the Universities (exchange of students, lecturers, materials and information etc.)
- Making a bridge between the Universities and the End-users (industries, regulatory bodies, research centre, universities etc.)

# ENEN Members

## Effective members

- have a legal status in an EU country or a candidate EU member country
- provide **high level** scientific education in the nuclear field, as full time teaching or in combination with research work – “**Mutual recognition**”
- use selective admission criteria

## Associated members

- have a legal status in an EU country or a candidate EU member country
- have a long term tradition of relations with effective members in the field of research, training or education
- commit themselves to support the ENEN Association

## Partners through MoU

- Special cases in Europe
- Beyond Europe
- International cooperation

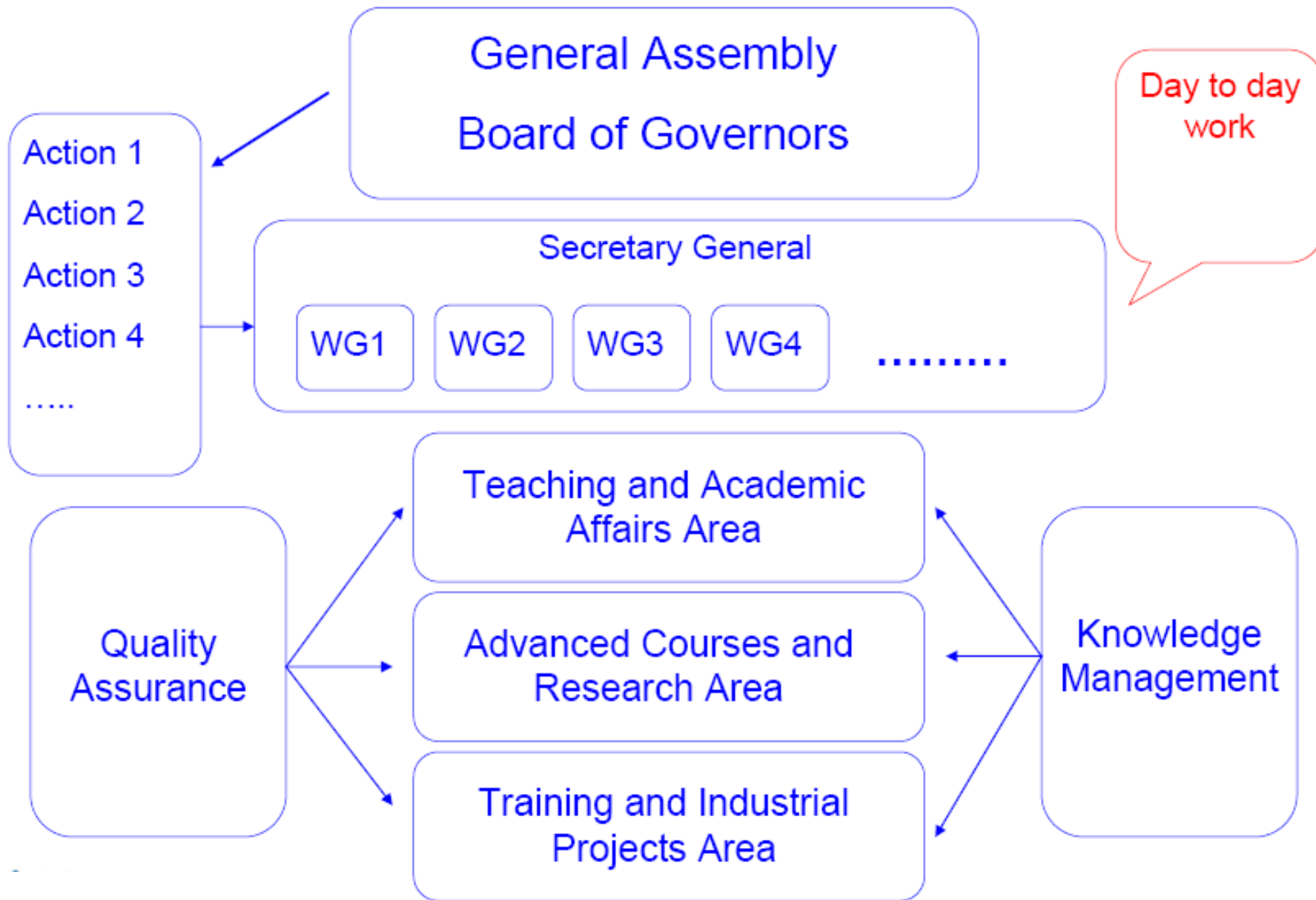
# ENEN Members in July 2009

- 50 Universities
- 7 Research Centres
- 1 Multinational Company  
located in 17 European Countries
- MoU concluded with
  - European Nuclear Society
  - North West University, Potchefstroom, South Africa
  - Moscow Engineering Physics Institute, Russian Federation
  - Tokyo Institute of Technology, Japan
  - Japan Atomic Energy Agency, Japan
  - IAEA for Asian Network (ANENT) and other items
- Memberships/cooperation under discussion with
  - EC Joint Research Centre, Italy
  - Regulatory bodies etc.

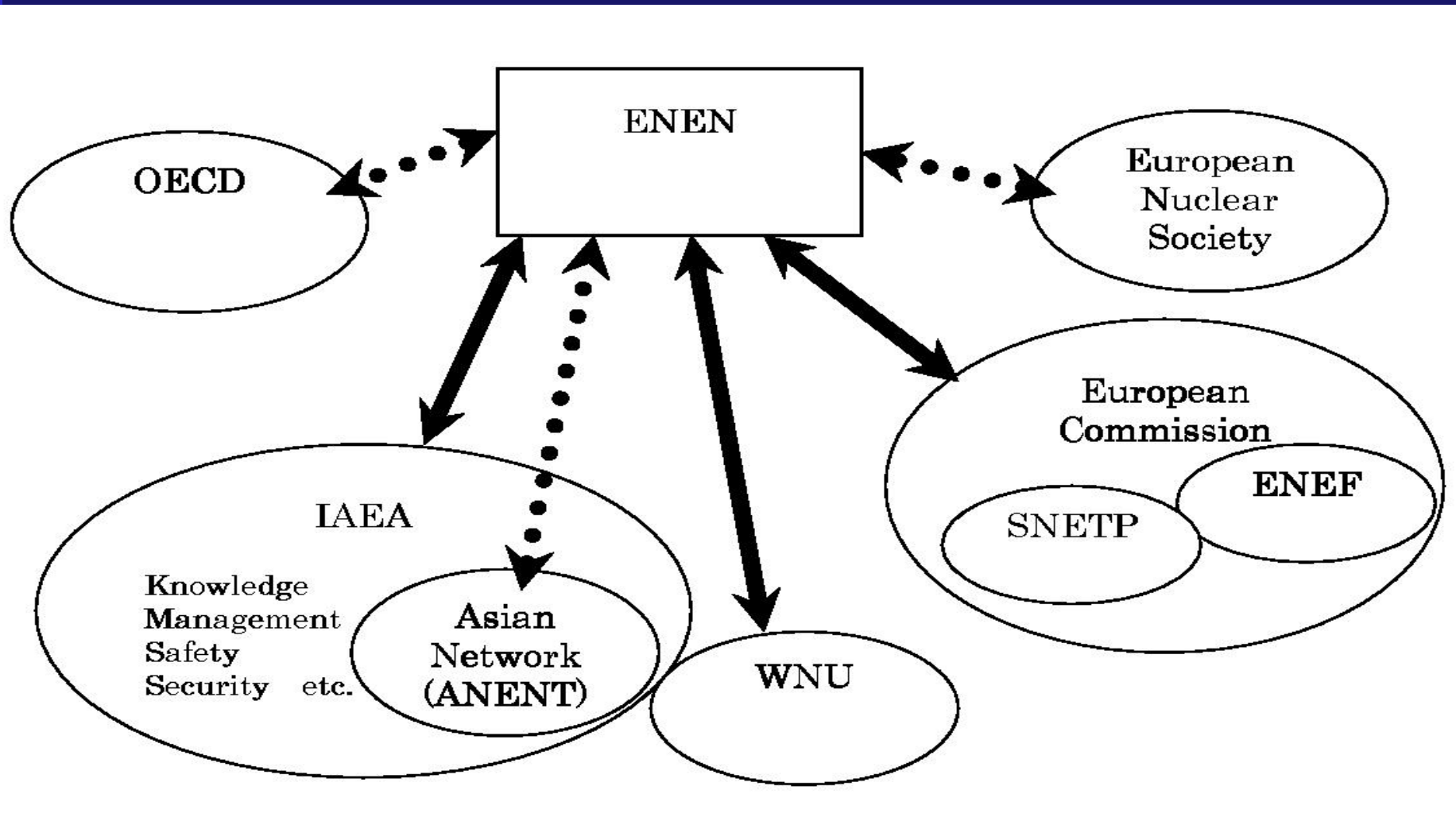
*+ Project partners  
beyond  
ENEN membership*



# ENEN Structure



# European and International cooperation



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## 2. Achievements since 2003

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## 2-1. Master level

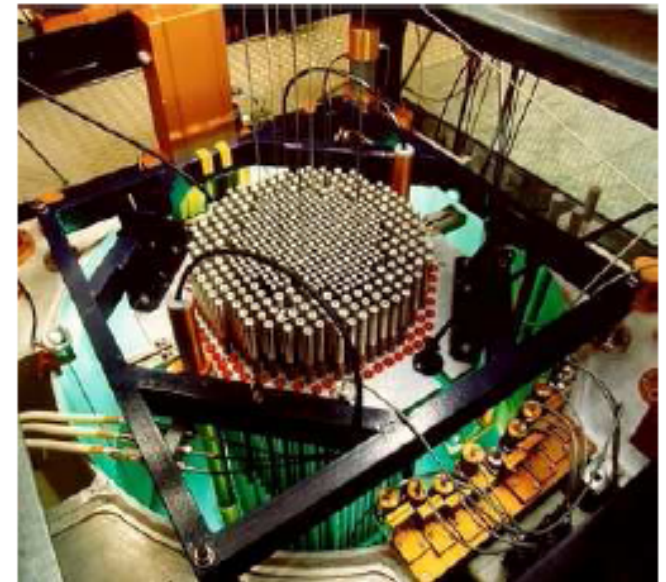
# New Master in Switzerland (in English)-1

## SWITZERLAND

- A new program for a Master of Science degree in Nuclear Engineering

Starting September 2008

- Offered jointly by the Swiss Federal Institutes of Technology, EPF Lausanne and ETH Zurich.
- One semester course at each of the two university (Lausanne, Zurich),
- Master's research project will generally be carried out at the Paul Scherrer Institute (PSI)



# 2-1. Master level

## New Master in France (in English) -2

### FRANCE

Starting September 2008

- A new program for Master of Science degree in Nuclear Engineering
- Offered jointly by Paris XI – Orsay University and CEA-INSTN
- 8 modules' course, over 7 months equivalent to 40 ECTS, courses are taught in English
- Master's research project will generally be at University, CEA research centres or Industry equivalent to 20 ECTS

The brochure for the Master Nuclear Engineering program features the logos of Université Paris-Sud 11 and Instn. It is structured into several sections: Objectives, Careers Opportunities, Main Educational Topics, Admission Prerequisites, and a vertical timeline of nuclear energy development. The timeline includes stages such as 'First generations' (1940-1960), 'Present reactors GEN II' (1960-1980), 'Advanced reactors GEN III' (1980-2020), and 'Systems of future GEN IV' (2020-2050). Each section is accompanied by small images related to nuclear technology and education.

**UNIVERSITÉ PARIS-SUD 11** **Master** **instn**  
**Nuclear Engineering**

**Objectives :**  
- Education of Engineers and Researchers :  
- pluridisciplinary skills  
- thorough knowledges in nuclear reactors field

**Careers Opportunities :**  
- Engineer in nuclear industry  
- Researcher, Teacher :  
universities, research centers

**Main Educational Topics :**  
• Nuclear Physics  
• Neutronics, Particle Propagation  
• Thermal hydraulics  
• Nuclear Materials  
• Modelisation and calculation codes  
• Nuclear Reactor Design and  
Operation - Reactor lines  
• Nuclear Fuel Cycles  
• Safety - Criticality  
• Protection/Radiation shielding  
• 5 months training in industrial company or in research laboratory

Teaching in English language

**Admission Prerequisites:**  
- This master M2 applies to students of :  
- Master 1 or equivalent,  
- Engineering schools  
- Opened to international candidatures  
- Selective entry based on students' academic file  
« Subject to accreditation »

Informations - Candidature - Contact | <http://www.master-nuclear-engineering.eu>  
IPN, Bât 100, Campus universitaire - 91405 Orsay, FRANCE ☎ +33 1 69 15 74 29  
INSTN, CEA/Saclay - 91191 Gif-sur-Yvette, FRANCE ☎ +33 1 69 08 43 33

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*Scholarship available for non-European students.* 13

# 2-1. Master level

## International Exchange Courses -1



21 days

6 ECTS

Editions

2003

2004

2005

2006

2008

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**„Eugene Wigner” Training  
Course for Reactor Physics  
Experiments 2008**  
with special emphasis to enhance  
Research Reactor Safety

### Organising institutions

Budapest University of Technology and Economics (BME) <i>Hungary</i>	
Slovak University of Technology in Bratislava (STUB) <i>Slovak Republic</i>	
Vienna University of Technology, Atominstut (AI) <i>Austria</i>	
Czech Technical University in Prague (CTU) <i>Czech Republic</i>	

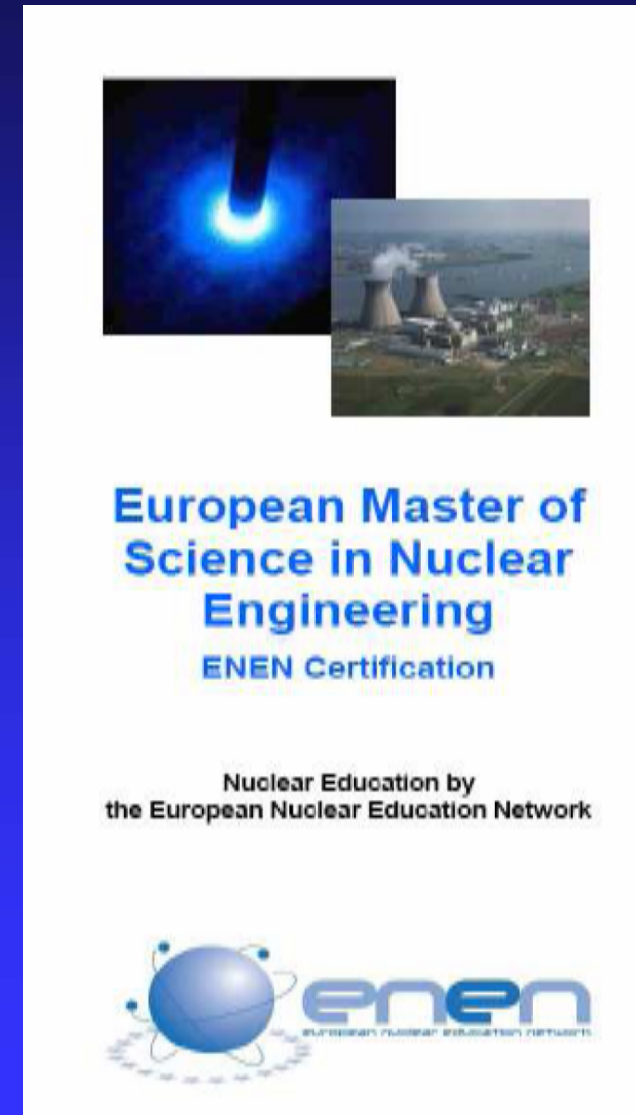
## 2-1. Master level

# European MSc in Nuclear Engineering



- Established under the European Commission – EURATOM 5<sup>th</sup> FP **ENEN project** and 6<sup>th</sup> FP **NEPTUNO project**
- Common reference curricula and mutual recognition among ENEN members
- Promotes and facilitates mobility of students and teachers
- Definition and assessment of ENEN international exchange courses
- Implemented since 2005
- “ENEN Certificate” recognised among ENEN Members

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## 2-1. Master level

# European MSc in Nuclear Engineering

### ➤ List of topics

- Reactor engineering
- Reactor physics
- Nuclear thermal hydraulics
- Safety and reliability of nuclear facilities
- Reactor engineering materials
- Radiology and radiation protection
- Nuclear fuel cycle and applied radiochemistry

### ➤ Requirements

- Full Two Years Program –120 ECTS
- At least 60 ECTS must be “purely nuclear”
- 20 ECTS must be obtained from a “foreign” institution, member of the ENEN Association
- Mandatory and optional courses
- Master thesis



# EMSNE Certificates Ceremony 2007



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Student receiving the ENEN EMSNE certificate during  
ENS conference on E&T NESTet Budapest May 4-8,  
2008

## 2-1. Master level

### Possible expansion of EMSNE in 2009

Revision of the EMSNE model is currently under discussion in order to cover other nuclear disciplines

- Radiological Protection, Radiochemistry, Radioecology (FP6 **ENEN II project**)
- Radioactive Waste Management and Geological Disposal (FP6 **ENEN II project**)
- European Master in Radiation Protection (EMRP, led by CEA/INSTN Grenoble)
- Needs for Safeguards and Nuclear Security (IAEA, EC JRC Ispra, ESARDA) etc.

# 2-2. PhD level Advanced Courses -1



- **Course 1** Reactor Core Physics: Deterministic and Monte Carlo Methods  
*from September 1st to September 5*
- **Course 2** Materials for Reactor Fuels and Structures  
*from September 8 to September 12*
- **Course 3** LWR and FR Thermal-Hydraulics, Fuel Design, Safety and Risk Assessment  
*from September 15 to September 19*
- **Course 4** LWR Core Physics and Fuel Management  
*from September 22 to September 26*
- **Course 5** Experimental Validation and Calibration of Numerical Simulation Models  
*from September 29 to October 3*
- **Course 6** Reactor Kinetics and Dynamics  
*from October 6 to October 10*
- **Course 7** Neutronics Experiments and Simulations  
*from October 13 to October 17*
- **Course 8** Reactor Dismantling and Waste Management  
*from October 20 to October 24*
- **Course 9** Fuel Cycle Back-End and Reprocessing  
*From October 27 to October 30*

**2007  
INTERNATIONAL SCHOOL  
IN NUCLEAR ENGINEERING**

**2008  
INTERNATIONAL SCHOOL  
IN NUCLEAR ENGINEERING**



SAGLAY, France

9 Doctoral-level Courses  
in Advanced Nuclear Science  
From September 1<sup>st</sup> to October 30, 2008



www.instn.cea.fr



## 2-2. PhD level

### Advanced Courses -2

- **Integrated Project EUROTRANS (FP6)** in 2005-2010
- 17 Universities participated under the ENEN umbrella
- ENEN provides links between research scientists and doctoral students (50 - 60 PhD's in the project)
- ENEN organizes / facilitates lectures, scientific visits, joint experiments, and specialized training in 10 advanced Internal Training Courses (ITC)
  - ITC8 “Impact of new results on the design of the spallation target and subcritical blanket” in Pisa, Italy, 3-6 Feb 2009
  - ITC7 “Impact of new nuclear data on the design of transmutation experiments” in Strasbourg, France, 15-18 December 2008
  - ITC6 “Core design and reactor safety analysis” in Madrid, Spain, 2-5 April 2008

## 2-2. PhD level

# Annual ENEN PhD Event



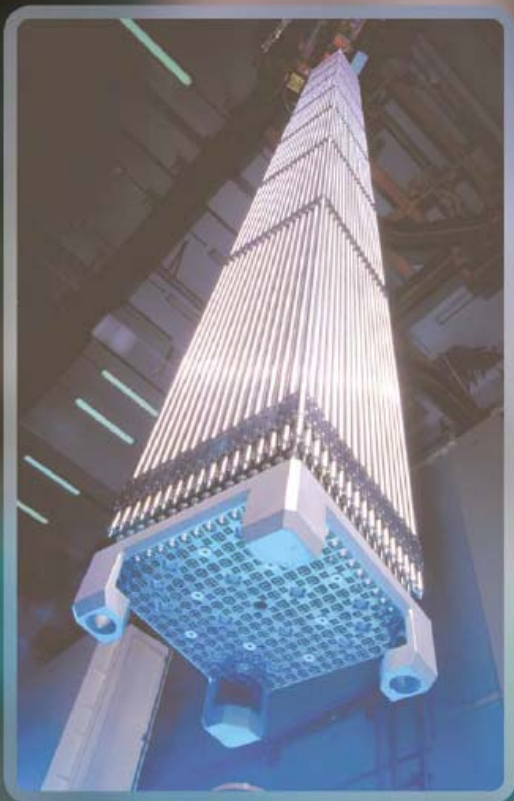
- One-day event during an
- international conference
- 12-14 PhD students
- ENEN Prize
- ENEN Alumni
  - 1st at International Youth Conference on Energetics 2007 in Budapest, Hungary, 1 June 2007
  - 2nd at International Youth Nuclear Congress (IYNC) in Interlaken, Switzerland, 23 September 2008 in collaboration with the EC JRC
  - 3rd at International Youth Conference on Energetics 2009 in Budapest, Hungary, 4-7 June 2009



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# 2-3. For young professionals Training Courses

## INTERNATIONAL SEMINAR ON NUCLEAR FUEL CYCLE 2008

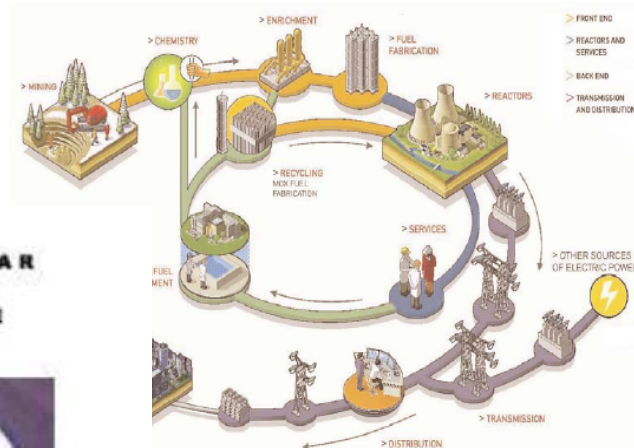


FRANCE

June 23rd - July 4th 2008



## INTERNATIONAL SEMINAR ON NUCLEAR FUEL CYCLE



## INTERNATIONAL SEMINAR ON NUCLEAR FUEL CYCLE

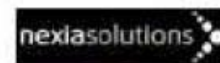


UNITED KINGDOM

19<sup>th</sup> - 30<sup>th</sup> November 2007



Nuclear Department, HMS SULTAN  
DCMT, Defences Academy



FRANCE

NOVEMBER 20<sup>th</sup> - DECEMBER 1<sup>st</sup>, 2006



## 2-3. For young professionals

### Three EFTS projects starting in 2009

- Three projects on Euratom Fission Training Schemes will start in 2009
- The objective is to establish a Training Scheme which covers the structuring, organisation, coordination and implementation of training in cooperation with local, national and international training organisations, to provide training courses and sessions at the required level to professionals in nuclear organisations or their contractors and subcontractors.

***To establish a common certificate for professionals at European level***

# 2-3. For young professionals

## Three EFTS projects starting in 2009



**ENETRAP II project**  
on radiation protection  
(12 partners from 12 countries)

**ENEN III project** on nuclear engineering  
(19 from 12 countries)

**PETRUS II project** on radioactive waste and disposal  
(14 from 10 countries)

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### Euratom Fission Training Schemes (EFTS) in all areas of Nuclear Fission and Radiation Protection

European Fission Training Schemes (EFTS) of Radiation 2006-11

- Advance scheme a significant development from former training and mobility programmes to one dedicated either to structured research training and research and/or career development across the EU
- Address long learning and career development of experienced researchers in all areas of nuclear fission and radiation protection, touching upon both the public and the private sector
- Maximize the transfer of high level knowledge and technology with emphasis on the industry sector (nuclear and inter-sectoral mobility)
- Define and test the different steps in the systematic approach to high level training (theoretical training, design, development, implementation and evaluation)
- Target = research workers and industrial experts at level of post-graduate level, with non-worked incidents in their existing activities
- Ultimate goal = develop an European passport for Continuous Professional Development, which relies on the principles of modularity of courses and common qualification criteria, a common mutual recognition system, and the facilitation of teacher, student and worker mobility across the EU

ENETRAP II	ENEN III	PETRUS II
<p><b>CONSORTIUM</b></p> <ul style="list-style-type: none"> <li>12 partners in 12 countries</li> <li>SOFCEN, CEAN/STN/IF, FZK/TU/G, ENEC, ENEA, MIRA/CEMATIS, HW-SCHUB, IREN/IF, ITN/IF, IMN-NTI/IF, UPRI/IF</li> </ul>	<p><b>CONSORTIUM</b></p> <ul style="list-style-type: none"> <li>18 partners in 12 countries</li> <li>ENEN/IF, SOFCEN/IF, UCL/IF, TROST/IF, LUTIF, INST/IF, ASD/IF, ENEC/IF, IMR/IF, CRIT/IF, EUTN/IF, APRI/IF, UCL/IF, UCL/IF, TECHN/IF, UME/IF, UPRI/IF, UPR/IF, HMS SULTAN/IF</li> </ul>	<p><b>CONSORTIUM</b></p> <ul style="list-style-type: none"> <li>14 partners from 10 countries divided in two pools</li> <li>Pool of "providers": 6 major Waste Management Organisations = a Technical Nuclear Safety Organisation: ANDRATIS, ARADISE, ENRESA/IF, INDUR/IF, POSI/IF, SYNERJIC/IF and UPR/IF</li> <li>Pool of "providers": 7 partners from academia, research centres and training centres: CU/UK, EMRP/IF, ENR/IF, ITN/IF, ITN/IF, MIRA/IF and TU/IF</li> </ul>
<p><b>OBJECTIVE</b></p> <p>The overall objective of this project is to develop European high quality reference standards and good practices for education and training in radiation protection, specifically with respect to the radiation protection expert (RPE) and the radiation protection officer (RPO). These "standards" will reflect the needs of the RPE and the RPO in all sectors where ionising radiation is applied (i.e. in the industry, medical sector, research, non-nuclear industry). The introduction of a radiation protection training passport as a mean to facilitate efficient and transparent European mutual recognition is another objective of this project.</p>	<p><b>OBJECTIVE</b></p> <p>To establish training schemes for selected professional profiles</p> <ol style="list-style-type: none"> <li>Basic training in nuclear topics             <ul style="list-style-type: none"> <li>for non-nuclear engineers and professionals in the nuclear industry</li> <li>for contractors and subcontractors of the nuclear industry</li> </ul> </li> <li>Technical training for the design challenges of GEN III Nuclear Power Plants             <ul style="list-style-type: none"> <li>systems and process engineering</li> <li>safety analysis methodology</li> </ul> </li> <li>Technical training for the construction challenges of GEN III Nuclear Power Plants             <ul style="list-style-type: none"> <li>loading, ventilation, air conditioning and conditioning systems</li> <li>primary circuit and auxiliary systems</li> </ul> </li> <li>Technical training on the concept and design of GEN IV nuclear reactors             <ul style="list-style-type: none"> <li>research on molten salt reactors</li> <li>research on gas-cooled reactors</li> <li>research on lead-bismuth cooled reactors</li> </ul> </li> </ol>	<p><b>OBJECTIVE</b></p> <p>Ensuring the continuation, renewal and improvement of the professional skills in the field of radioactive waste disposal by building a stable framework for implementing and delivering sustainable training programmes in both formal (Master degree) and non-formal (Professional Development) sectors.</p>
<p><b>IMPLEMENTATION</b></p>	<p><b>WORK PACKAGES</b></p>	<p><b>DELIVERABLES</b></p> <ul style="list-style-type: none"> <li>The identification of needs, the inventory of available resources and the conception of the training programmes by taking into account both training providers and end-users point of view.</li> <li>The development of the adequate training schemes and the delivery of courses integrated to their schedules.</li> <li>The development of a framework for the mutual recognition and accreditation of the training programmes.</li> <li>The statement of a plan for assuring the update and long-term sustainability of the programmes.</li> </ul>
<p><b>CONTACT - COORDINATOR</b> MIRA/IF/Czechia</p> <p>SOFCEN Boulevard 200, 910000 Miraflores, Spain</p> <p>Tel: +34 34 33 21 48 Email: mira@sofcen.es</p>	<p><b>CONTACT - COORDINATOR</b> Peter de Waeg</p> <p>European Nuclear Education Network Association Centre CEA de Saclay • BP715 • 91191 91191 ORFÈVRES Cedex, France</p> <p>Tel: +33 1 69 26 94 21 Email: peter@ednec.eu</p>	<p><b>CONTACT - COORDINATOR</b> Benoist Bourgeois</p> <p>Environnement &amp; Santé Palais de la Merie Place de la Merie FR-67000 Nancy, France</p> <p>Tel: +33 3 83 53 63 23 Email: benoist.bourgeois@ednec.eu</p>



## 2-3. For young professionals

# ENEN-III Project

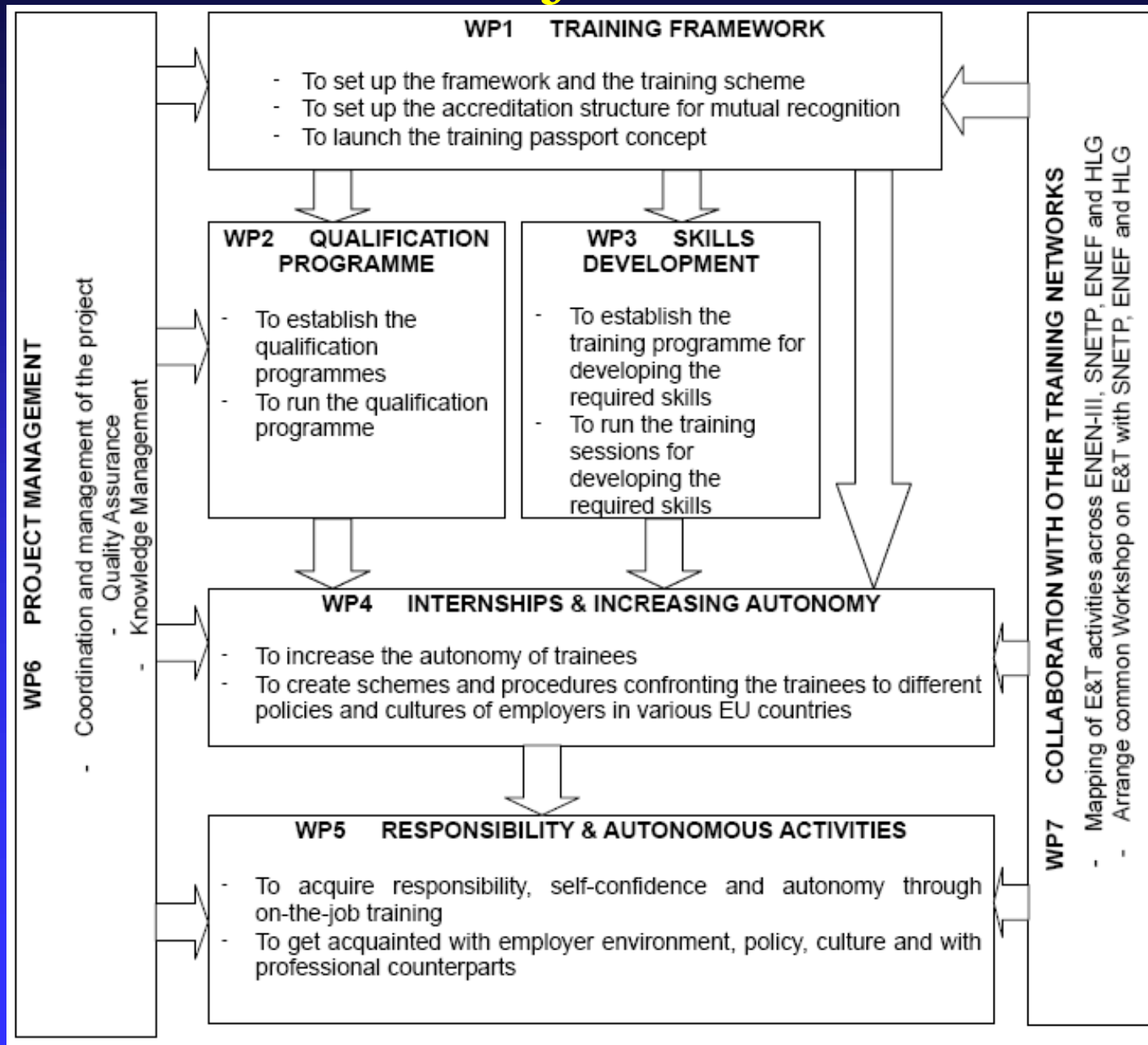


## ENEN-III project on Nuclear Engineering

- Three-year project: 2009 - 2011
- Four training schemes
  - Basic Nuclear Topics for Non-Nuclear Engineers
  - Design Challenges for Generation III NPP
  - Construction Challenges for Generation III NPP
  - Design Challenges for Generation IV Reactors
- Coordinated by the ENEN Association
- 19 Partners in 12 countries
  - ENEN, SCKCEN, UCL, TKK, LUT, INSTN, AREVA, ISAR, BME, CIRTEC, DUT, UPB, UL, JSI, TECNATOM, UPM, UPC, HMS SULTAN

# 2-3. For young professionals

## ENEN-III Project



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## 2.3. For young professionals

### ENEN role for PETRUS II (1)



- Quality Assurance of the courses and training sessions and the project deliverables
- Facilitate mobility and assist the organization of workshops and pilot sessions
- Assist to the implementation of a framework for mutual recognition of the courses and training sessions through the ENEN Network and realization of a training passport at the European level
- Harmonization of the attribution of the ECTS credits to the modules of the curriculum and the training program

## 2.3. For young professionals

### ENEN role for PETRUS II (2)

- Host and operate the webpages of the Petrus II project on the ENEN website
- Knowledge management by providing assistance to the advertising and documenting of the courses and training sessions through the ENEN database
- Assist in the coordination of the project by representing the ENEN members, who are partners in the project:
  - UPM Madrid
  - TKK Helsinki
  - CTU Prague
  - BME Budapest

## 2.3 For young professionals

### ENETRAP - II

#### ➤ Objective

To develop European high-quality "reference standards" and good practices for education and training in radiation protection (RP), specifically with respect to the radiation protection expert (RPE) and the radiation protection officer (RPO). These "standards" will reflect the needs of the RPE and the RPO in all sectors where ionising radiation is applied.

The introduction of a radiation protection training passport as a means to facilitate efficient and transparent European mutual recognition.

## 2.3 For young professionals

# ENETRAP - II



### Deliverables

- Cooperation between regulators, training providers and customers (nuclear industry, research, non-nuclear industry, etc.)
- Harmonization of the requirements for Radiation Protection Experts and Officers , and their education and training within Europe
- Stimulate the building of competence and career development in radiation protection to meet the demands of the future.

## 2.3. For young professionals

### ENETRAP-II WP 9 Objectives

Title : Introduction of a "RP training passport" and a system for mutual recognition

- To set up the framework, the criteria and the procedure for the mutual recognition of curricula, courses and training sessions supporting the training of Radiation Protection Experts and Radiation Protection Officers.
- To test the framework and the procedure against currently recognised curricula for RPEs
- To introduce a European training passport as an instrument for the implementation of the mutual recognition of RP training in different countries.

# 2-4. Knowledge Management ENEN Website and Database

## ➤ ENEN Website

<http://www.enen-assoc.org>

## ➤ NEPTUNO Database (Aug 2004)

<http://www.neptuno-cs.de/>

E&T courses by ENEN Members

## ➤ A *new* ENEN Database (to be opened in autumn 2009)

- E&T courses
- Master program
- PhD topics
- Opportunities (scholarship, fellowship, internship, job opportunities)

provided by ENEN Members and Partners

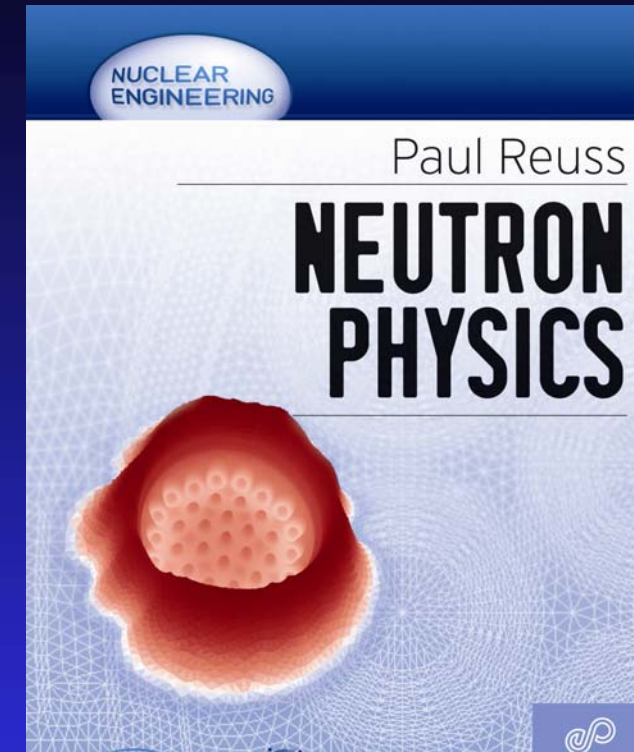




# 2-4. Knowledge Management

## ENEN publications

- First text book published under ENEN as a deliverable of ENEN II project
  - 18 chapters, 670 pages including exercises and solutions
  - mainly for students, young professionals and researchers
- CD-ROM with multimedia presentations for the general public
- CD-ROM with multimedia courses Nuclear Engineering



### INTRODUCTION TO NUCLEAR ENERGY

**The nuclear fuel cycle**

The nuclear fuel cycle deserves a special mention, because its possible variations and particularities are of special interest. The cycle is referred to the whole process followed since the Uranium mineral is extracted in the mines to when the radioactive waste coming from fission in power plants is correctly administered.

The collage includes: a uranium mine, a yellow enrichment cascade, a fuel fabrication plant, a reactor core, a spent fuel pool, and a diagram of the nuclear fuel cycle. The diagram shows the flow from uranium mining to enrichment, fuel fabrication, reactor core, spent fuel pool, and finally to waste management or reprocessing.

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Figure 51, 52, 53, 54, 55, 56 and 57 - Images of the nuclear fuel cycle

## 2-5. ENEN Events

# Dialogue between ENEN and Employers

- to exchange views and information regarding European and international programs and future plans
- to discuss the development of a European framework for mutual recognition in nuclear E&T, such as a “European training passport”, and of a common vision for cooperation beyond the EU

1. Special Event “Industry Views on International Cooperation in Nuclear Education and Training” in Prague, 6 March 2008

- EDF, E.ON, Suez-Tractebel, Westinghouse
- FORATOM

2. Post-FISA 2009 Workshop “Integration of nuclear education and training: common needs, EU vision and implementation instruments” in Prague, 25 June 2009



## 2-5. ENEN Events

# 1<sup>st</sup> pan-European Recruitment Event

- In Brussels, 4-5 December 2009
- Supported by the EC and the ENEN
- Expected to participate
  - European major industries
  - 200 students over EU and the Russian Federation
- Contents
  1. Workshop/panel discussion
  2. Interviews for job opportunities, internships and fellowships

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The poster features a blue background with a stylized atomic symbol and a map of Europe. The text is in white and orange. The top right corner has the 'careers in europe group' logo with the website 'www.careersineurope.com'. The main title is 'AtomiCareers in Europe' in orange. Below it, the text reads 'The most exclusive pan-European recruitment event in the Global Nuclear Industry'. A central orange box lists the event's benefits. At the bottom, there is a call to action to apply before October 31st and the website 'www.careersineurope.com'. Logos of sponsors and partners are listed at the very bottom.

careers in europe group  
www.careersineurope.com

\* Brussels 4 - 5 December 2009  
**AtomiCareers in Europe**

The most exclusive pan-European recruitment event in the Global Nuclear Industry

AtomiCareers in Europe is more than an ordinary recruiting event:

- Have in depth face-to-face interviews with leading international recruiters at this exclusive invitation-only event
- Attend workshops on nuclear related topics developed by participating companies
- Network with top managers, recruiters, nuclear associations and candidates from all over Europe
- Free accommodation and travel support for 200 candidates

Apply before October 31<sup>st</sup>  
[www.careersineurope.com](http://www.careersineurope.com)

Sponsors:  
EDF ENERGY, EnBW, Westinghouse

Partners:  
ENEN, IAEA, EUROPEAN COMMISSION, EUROPEAN UNION

# 3. Future perspectives

# 3-1. ENEN Perspectives



## *Education & Training*

- Expand the scope from nuclear engineering to **all nuclear disciplines**, including radiation protection, radiochemistry, radioecology, waste management and geological disposal
- Consolidate its **activities in the training** area required by the industry and regulatory organisations
- Promote **international mutual recognition of professional training** for some key functions in nuclear industries, regulatory bodies and nuclear applications
- Expand the membership from **universities and research centres to the industry and regulatory organisations**
- Expand its activities **beyond Europe**

## 3-2. EU Council, 1-2 December 2008



*Adopted the conclusions which refer explicitly to the ENEN and to other FP6/FP7 initiatives originated by the ENEN*

- The Council **welcomes** the existence within the European Union of coordinated teaching and training leading to qualifications in the nuclear field, provided notably by the ENEN.
- The Council hopes that, with the help of the EU, ENEN and its members will **continue to develop the coordination** of nuclear education and training in Europe.
- The Council insists that **the appropriate conditions** must be created for **mutual recognition of nuclear professional qualifications** throughout the European Union.
- The Council encourages the Member States and the Commission to establish a "**review of professional qualifications and skills**" in the nuclear field for the European Union, which would give **an overall picture** of the current situation and enable appropriate solutions to be identified and implemented.

## 3-2. European Council of December 2008

It also emphasizes the need of additional efforts for

- **reinforcing** the teaching of basic scientific prerequisites in preparation for energy-related occupations
- **developing** generally the provision of programs in different languages specifically geared to energy-related and especially nuclear-related occupations
- **assessing ways** of attracting more European and non-European students to those programs by improving the competitiveness of scientific and technical careers
- **equipping** European universities and institutions involved in nuclear-related teaching programs
- **extending** the network of institutions and universities offering this type of teaching and ensuring mutual recognition
- **improving** the visibility of European nuclear training which constitutes a world level reference
- **making available** common European technical documentation and teaching materials

# THANK YOU FOR YOUR ATTENTION

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