Chance for young nuclear professionals
in Slovenske Elektrarne, member of Enel Group

International Conference
on Human Resource Development for Nuclear Power
Programmes: Building and Sustaining Capacity

Jozef Zlatnansky, Director of IMS & Nuclear Oversight
Vienna, 12 to 16 May 2014

Slovenské elektrárne

The Company

VISION

To be the **safest**, **most reliable**, **efficient and competitive** producer of electricity creating value for our customers, shareholders and employees

PRODUCER

SE produces electricity and heat. It is the largest power generating company in Slovakia and one of the largest in Central and Eastern Europe

MISSION

To achieve **the highest levels of safety and performance** through excellent execution, continuous improvement and teamwork

OPERATOR

SE operates 34 hydro, 2 nuclear and 2 thermal power plants, owns directly 4.993 MW of gross capacity and controls 5.739 MW of gross capacity

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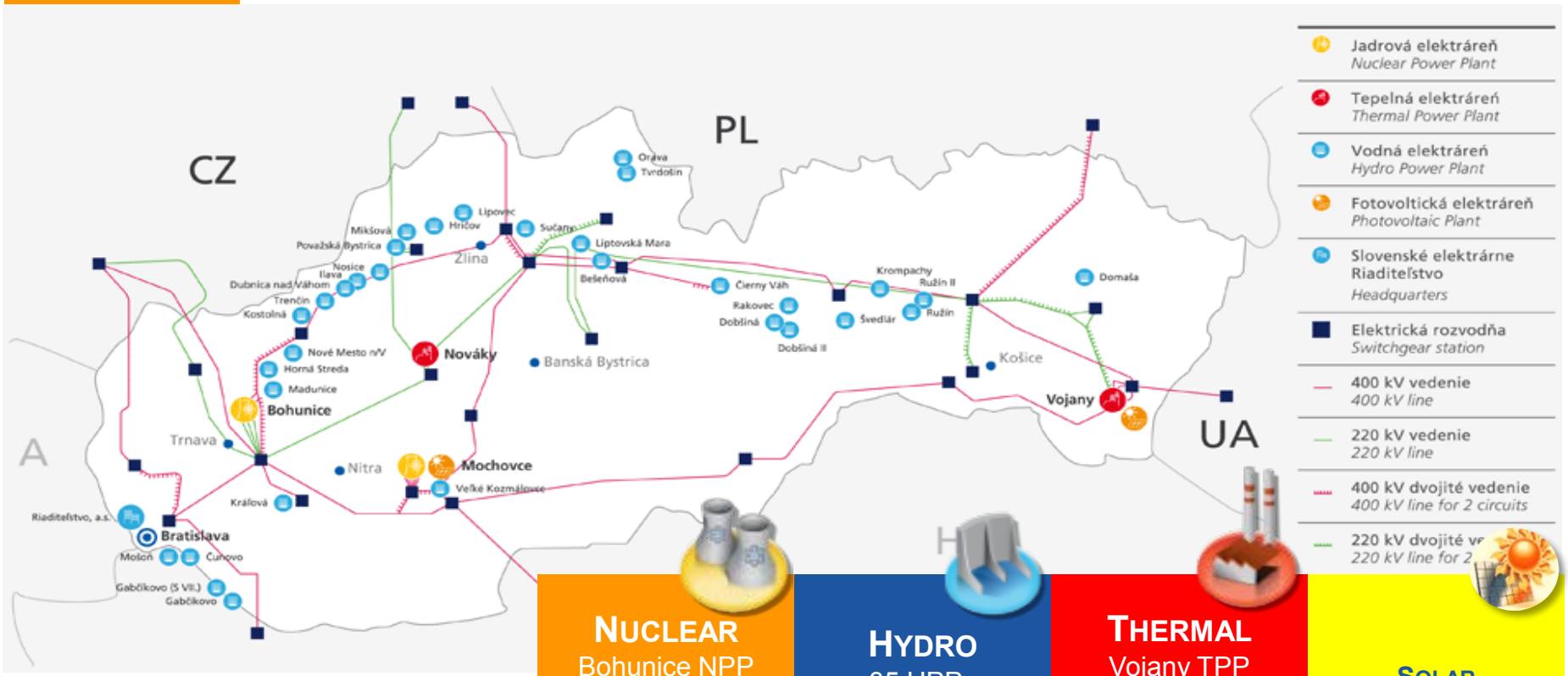
SE Production Portfolio



NUCLEAR
Bohunice NPP
1010 MW
Mochovce NPP
940 MW

HYDRO
35 HPPs
2 399 MW

THERMAL
Vojany TPP
880 MW
Nováky TPP
518 MW

SOLAR
2 MW

Nuclear: Excluding the decommissioned Bohunice V1 units (1&2) which are not owned by SE
Thermal: Including 4x110 MW installed off-line capacity at TPP Vojany II
Hydro: Including run-of-the-river plant VEGA (746,4 MW) which is operated by SE but owned by Vodohospodarska vystavba; Hydro fleet consist of pumped storage and run-of-the river plants
As of Dec. 2013

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Slovakia & Slovenske Elektrarne

- Four units in operation
- Two new units under construction
- Three units in decommissioning

✓ *More than 55 years experience with nuclear*

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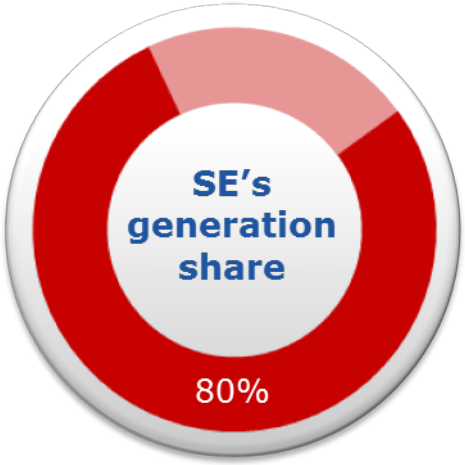
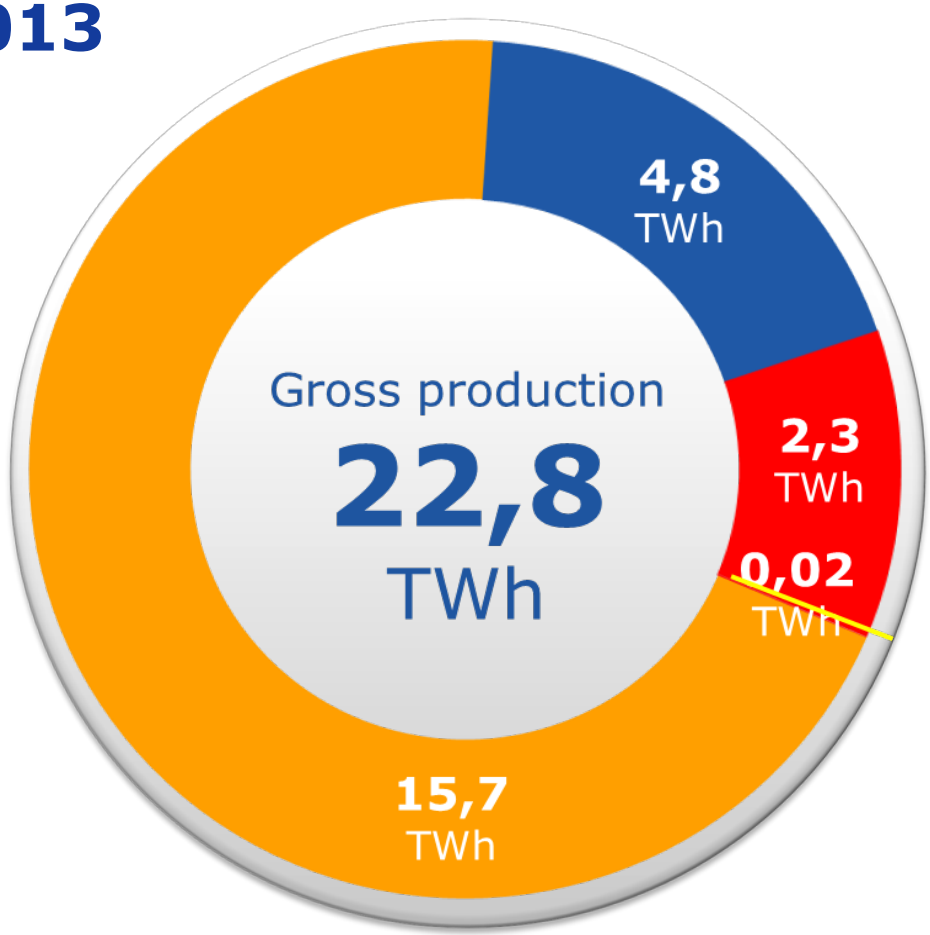
SE Production 2013





NUCLEAR	HYDRO	THERMAL	SOLAR
69.95%	20.68%	9.37%	0.01%

As of Dec. 2013

Thermal: ENO and EVO co-fire biomass (wooden chips) with a goal to gradually reach the share of 20% in EVO and up to 30% in ENO

Hydro: including VEGa

Nuclear Professionals & Opportunities

Main areas and opportunities for young nuclear professionals :

- ***Further increase of safety of NPPs in operation and***
- ***Construction of two new NPP units***

- ***Safety and efficiency of NPP decommissioning and radwaste treatment***

- ***CENTA and R&D***

- ***Prototype of gas cooled fast-breader reactor– ALLEGRO***

Gas-cooled fast reactor (GFR) is one of the Generation IV reactor concepts and represents one of the three European candidate for fast reactor types.

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Nuclear Professionals in SE

Slovenske Elektrarne *member of Enel Group*:

- 4.500 employees
- 2.650 in nuclear island as a core staff
- 350 in construction site + (*around 10.000 in direct or indirect supply chain)*
- Average age in nuclear area: 47 years

Challenge: Succession planning & support of young nuclear professionals

We are a multinational company...

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Capacity Building and Challenges in SE

Main elements are :

- Continuous human resource development
- Education and training (dedicated presentation on training)
- Knowledge management
- Network within Enel Group, at the national and international level

Main challenges:

- Attract young generation to nuclear sector
- Potential loss of knowledge and experience
- Succession planning and its implementation

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Human Resource Developmet

Programmes on different levels:

- Group level – includes also mobility programme
- Company level (Slovenske Elektrarne)
- Divisional level
- Unit level

Development Programmes & international activities :

- IAEA workshops, scientific visits, topical meetings, „cost-free" experts
- *WANO activities including on job training in WANO PC,*
- *INPO training activities for future managers*
- *Others*

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Education and Training

SE Vision in Nuclear Training:

- Inevitable part of day-to-day work of NPP employees
- Tool for management and improvement of company performance
- Tool for knowledge retention inside company

Training is as important as other power plant activities or is an important part of the culture and core business

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Young Generation of Nuclear Professionals

WELCOME INFORMATION	WELCOME TRAINING	WELCOME SUPPORT
✓ ***1st Day in SE, a.s.***	✓ ***Induction training***	✓ ***Mentoring / On the job training***
	✓ ***JET International***	

1st Day in SE, a.s. *– Initial/basic information about company and opportunity for questions. The training is focused on safety culture, internal procedures, HR issues, benefits , and opportunities, trainings, ICT information, etc.*

Induction training *– Within the period 3-6 months an "Induction training" is organized with the aim to introduce the company processes to the newly hired employees. Young recruits are included in to the* ***JET International programme*** *(defined criteria).*

Mentoring / On the job training *– Internal training led by the superior of the new recruit enabling the employee to integrate into the organization and his/her new position effectively.*

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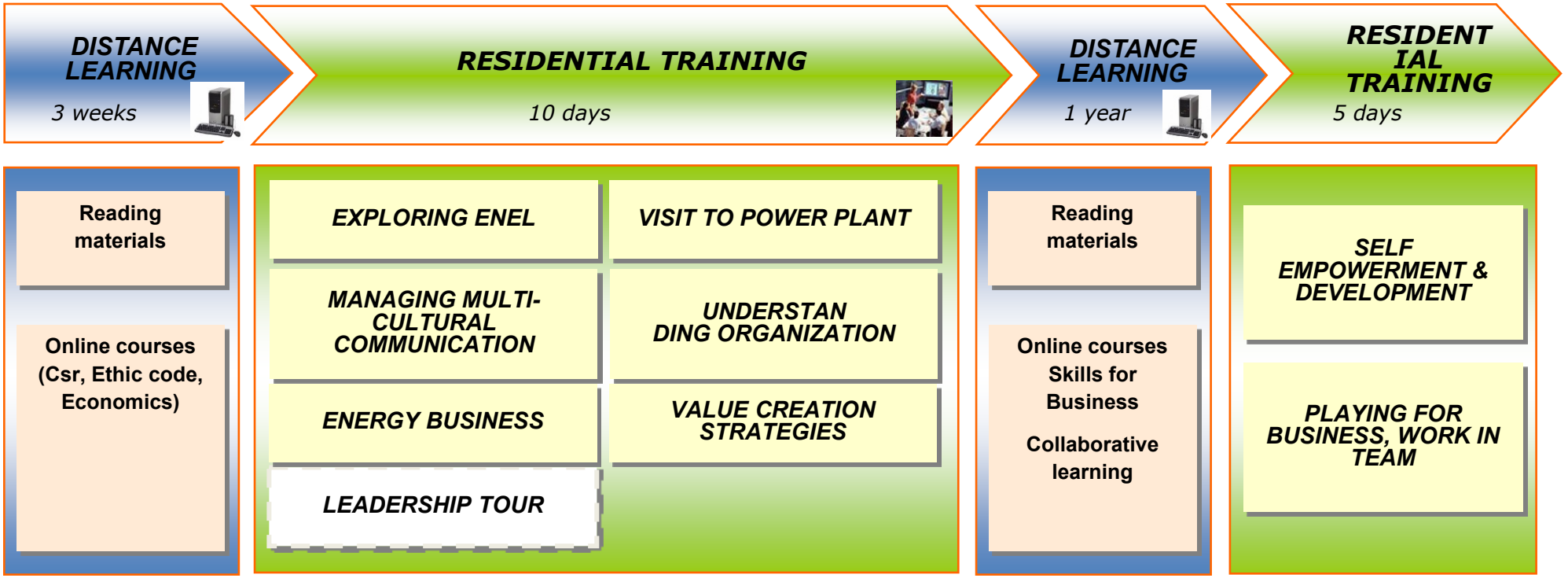
JET for young professionals



The objective of JET training for young professionals is to develop the necessary knowledge and skills to understand companys expectations and to help them to better understand their future roles.

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Programme for young nuclear professionals

Postgraduate programme on nuclear safety:

- safety systems, accidents and incidents, legislation, human factors, safety culture, electrical, chemical and material aspects, radioactive waste management, operation of nuclear installations, radiation protection,…
- Visits to NPPs: Gösgen, Leibstad, Labs: NAGRA - Grimsel Test Site, Mont Terri Underground Rock Laboratory, ZWILAG - Würenlingen, ENSI Brugg ...
- **Thesis and final exam after two semesters**

Lecturers:

- Professors from Universities, VUJE
- Regulators
- SE managers
- Foreign experts

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Cooperation on National level

Committee for Cooperation with Universities **to promote and cover additional needs in training for young nuclear professionals**

Main roles:

- Propose, implement and evaluate training needs & processes in SE
- Support R&D activities and support universities and projects
- Organize trainings and workshops on specialized nuclear topics
- Assess the best bachelor, diploma and doctoral thesis from the energy field

Committee consists of:

- Eight *managers and specialists* from SE different departments
- Four external experts *(professors)* from different Slovak universities

The Committee aims also at the attractiveness of technical sciences for young generation

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Young Generation of Nuclear Professionals

- **Scholarships** SE awarded students with 50 scholarships amounting some 66.500 € in 2013/2014

- With the **„Aurel Stodola Award“ are awarded best three students** students from Slovak universities – thesis focused on energy and power generation. The financial support amounts to 9.000 €.

- **„Academic – Industrial partnership”** SE managers, our company as invited **lecturers at universities**

- **Internships –** regular support of students on long-term basis

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Aurel Stodola Award

Science and technology week in Slovakia, **Play Energy**, Scientia Pro Futuro, Amavet: **Festival of science**, **Physics on wheels**, **STUBA Green Team**, e-formula, High School Science Project Olympiad on Environment – **GENIUS**, **Conferences** such as APCOM, ENERGETIKA, Students science conference, etc.

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Initiative: „Physics on wheels“
CERN, Labs in Germany & NPPs

Ten best students from STUBA + five young nuclear professionals from company –SE, sponsored by SE

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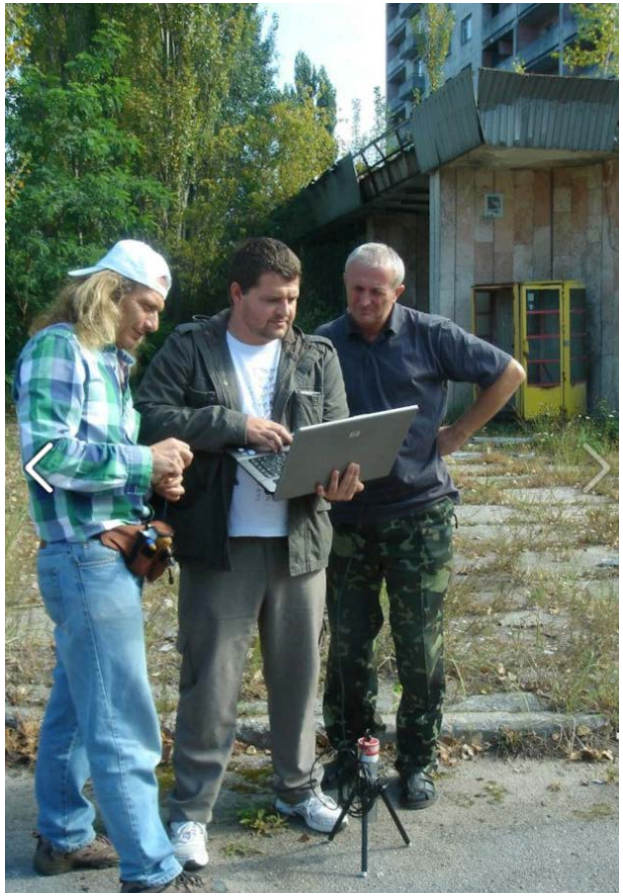
Technical visits to NPPs, Conferences

„Young Nuclear Generation“ is part of the Slovak Nuclear Society and member of European Nuclear Society supported by SE

Examples: Visits to Germany, Slovenia, Czech, Hungary, Ukraine, Slovakia, Austria



Centre for Research and development

In 2010 „Centre for Research and development“ was established in SE to support R&D activities

R&D Activities 2014

- Seismicity- research
- PSA for seismicity (FUK)
- Extreme events -meteorology (FUK)
- Erosion, Corrosion
- R & D within ENEL GROUP
- SF_6 – ecological disposal
- Calculations for nuclear island

Industrial Research Centre for operating lifetime of selected components of power plants

05/2012
10/2014

Achieved results:

- New material invented for **coal mills** are currently in operation for **more than 2000 hours** (800 hours original lifetime)
- Advanced system to control leaks of tubes for various heat exchangers (more accurate and less time demanding)

Competence center for new materials, progressive technology and energy

08/2011
11/2014

New system and software for **corrosion – erosion** calculation and prediction secondary lifetime pipelines and valves (customization and validatation for SE needs|

Vision

- Center of excellence for nuclear area
- Cooperation with universities and Slovak Academy of Science (e.g. Horizon2020, ALLEGRO project, NUGENIA)

CENTA - new opportunity for training and R&D

- **CENTA – Centre for Nuclear and Accelerator Technologies and Training at Comenius University in Bratislava**
- Another opportunity for young nuclear professionals and international community for research development and training

- State of the art tandem accelerator laboratory for
  - ❖ Ion Beam Analysis (IBA)
  - ❖ Accelerator Mass Spectrometry (AMS)
  - ❖ Low-energy Nuclear Physics

Applications in:

- **nuclear reactions – fission and fusion reactors, astroparticle physics**
- **Environmental sciences – radionuclides around NPPs, dating**
- **material sciences – construction materials for advanced nuclear reactors**
- **and for education and training**

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Via Bona Slovakia 2013

SE has been awarded by VIA BONA Award thanks to its long-term programme "**Energy for the Country"** which the Company has been implementing since 2008 as a programme complementing SE everyday safety operations and its long-term business & development plan

Energy for Life: charity and philanthropic activities;
Energy for Nature: environmental protection and biodiversity preservation;
Energy for Education: **support and development of education;**
Energy for Culture: development and protection of cultural values;
Energy for Sport: prevention, healthcare and development of sport activities.

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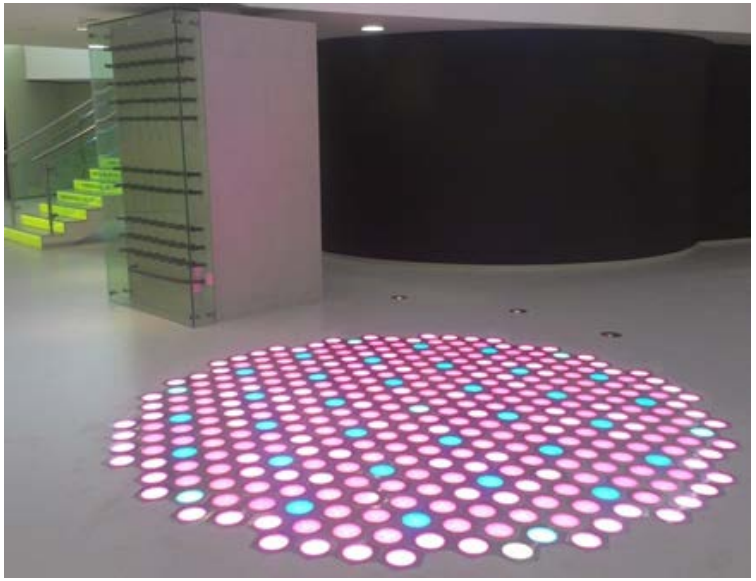
Conclusion

- Human resources are key assets for nuclear organization
- Knowledge of nuclear technology be managed as a resource
- Support of young nuclear professionals is our commitment

New Centre opened in Mochovce in 2014



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THANK YOU

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