

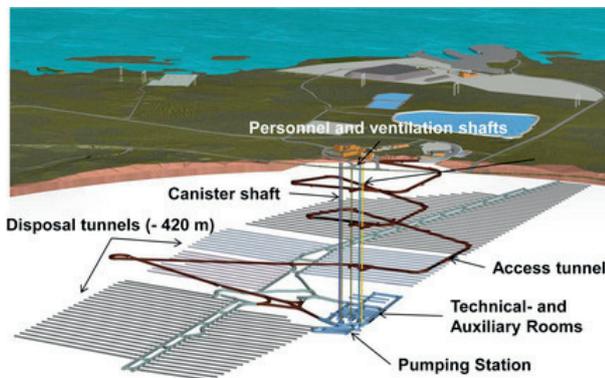
## The nuclear industry's significant contribution to non-proliferation



One third of Europe's electricity and two thirds of its CO<sub>2</sub>-free electricity is generated from nuclear energy. Without it, security of energy supply and low-carbon economy goals are unachievable. And yet some citizens still wrongly assume that civil nuclear power plants produce nuclear weapons. Legitimate concern about proliferation is quite different from unfounded fear based on insufficient knowledge. The nuclear industry is totally committed to promoting the peaceful uses of nuclear energy and non-proliferation.

While it is technically possible for a commercial nuclear reactor to manufacture the material needed to produce a nuclear weapon, in reality the safeguards in place make it impossible for it to do so.

## Different technologies

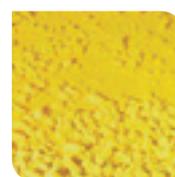
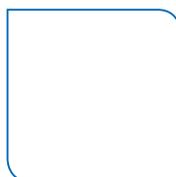


*The layout of the Final repository for spent fuel on the Olkiluoto Island in Finland. (photo: Posiva Oy).*

The technology used for generating electricity is very different to that used for producing nuclear weapons. A nuclear power plant is designed to produce the former, not the latter. However, two phases of the nuclear fuel cycle are undoubtedly sensitive to the risk of proliferation - uranium enrichment and the reprocessing of spent fuel. The nuclear industry is totally focused on ensuring that proliferation during either phase is not

feasible. In accordance with the Non-proliferation Treaty (NPT) and the Euratom Treaty, nuclear power plants are rigorously scrutinised and subject to the strictest possible international control and supervision. Nuclear fuel for a power plant is manufactured by enriching the U-235 isotope of natural uranium until it accounts for between 3%-5% of the total (the other 95-97% is made up of the U-238 isotope). To make a nuclear bomb the U-235 isotope would need to be enriched until it accounted for 90% of the total. Enrichment cannot be carried out in a nuclear power plant.

A nuclear power plant is not designed to reprocess the plutonium derived from spent fuel in order to manufacture weapons. Only specially-designed facilities can do this and the few that exist in the world are, like nuclear power plants, very strictly controlled by national safeguards authorities, international bodies like the International Atomic Energy Agency (IAEA) and Euratom inspectors. Furthermore, the plutonium derived from spent "mixed oxide fuel" (MOX) is practically unusable for military purposes.



# Shared responsibility

Nuclear power plants are not responsible for proliferation, but the nuclear industry is fulfilling its fundamental duty to prevent the raw materials and technology needed to make bombs from falling into the wrong hands and to help governments, regulators and the IAEA to promote best practices with regards to safety and security. In addition, vendors that sell nuclear technology to countries that have opted to operate nuclear power plants for the first time play an important role in advising them on how a strong security culture contributes significantly to the cause of non-proliferation.

One example of promoting best practices is the creation of the World Association of Nuclear Operators (WANO), in 1989, which maximises the safety and reliability of nuclear power plants worldwide. The European Safeguards

Research and Development Association (ESARDA) brings together the industry, research institutions and regulatory bodies with a view to improving safeguards and coordinating non-proliferation activities. The industry also works actively within the European Nuclear Energy Forum's (ENEF) Subgroup on Non-Proliferation to achieve common goals. Shared responsibility and multilateral cooperation strengthens the global non-proliferation regime.

Furthermore, since December 2010, the IAEA has been managing a centralised reserve for storing low-enriched uranium, in Angarsk, Russia. When a member country decides to stop enriching uranium, the IAEA will lend their support by supplying them with the low-enriched uranium they need to maintain their operations.

*A typical MOX fuel assembly for a commercial nuclear reactor*



*Mox pellets, an efficient recycled fuel*



*Uranium ore concentrate*

"The Agency has a key role to play in ensuring that the expansion of nuclear power takes place in an efficient, responsible and sustainable manner. We offer advice in many areas, including on how to put the appropriate legal and regulatory framework in place and how to ensure the highest standards of safety and security, without increasing proliferation risks."  
*Yukiya Amano; Director General of the IAEA*

# Self-regulating

The nuclear industry is also strictly self-regulated. An example of this is the increasing use of "black-box" tamper-free technology developed by the manufacturers of enrichment equipment. This technology cannot easily be misused for illegal or malicious purposes. The industry does a lot more, however, than simply support black box technology. It is investing a lot of time and resources into developing tomorrow's proliferation-resistant technology in order to further reduce the risk of proliferation. As the global nuclear revival continues, so too does industry's role in promoting non-proliferation.