



## **ABSTRACT**

AREVA has successfully and profitably operated commercial recycling facilities for more than three decades. The demonstrated safety and environmental record of these facilities makes them a model for used-fuel management that continues to be adopted internationally. AREVA's experience demonstrates that deployment of proven state-of-the-art recycling technology can simplify waste management, boost public acceptance of nuclear energy, and recover valuable energy resources – while retaining sufficient flexibility to incorporate longer-term technology developments such as Generation IV reactors.

## **AREVA'S TECHNOLOGY AND DEPLOYMENT DESIGN FOR THE UNITED STATES**

In terms of mass, 96% of used fuel is reusable energy content. AREVA's technology enables the recovery of this valuable energy resource, providing for greater domestic energy security and saving at least 25% of natural uranium resources. If recycled, the amount of U.S. commercial used-fuel currently accumulated could power today's entire U.S. reactor fleet for a period of eight years. Further, extracting these energy resources would result in a 75% reduction in the total high-level waste (HLW) volume necessary for disposal – a crucial benefit that allows for the optimal use of a geological repository, which is a rare and precious asset.

HLW from AREVA's recycling process is specially packed through vitrification, and contains practically no energy value for the current and near-future generation of reactors. The vitrification process results in a waste form with long-term stability that can be safely and cost-effectively stored in simple, compact and low-cost facilities as a reliable interim waste management option.

AREVA's facility design for the United States does not simply replicate facilities in France and Japan. It employs new technologies and engineering improvements, including co-location of facilities that incorporate all necessary safeguards and security measures. Another key innovation, the COEX™ process, confers additional nonproliferation benefits by ensuring that **no pure plutonium is separated at any point within the plant.**

When analyzed in the full context of backend infrastructure, detailed studies have shown that deployment of AREVA's recycling technology would not increase electricity costs, and would confer considerable additional benefits in sustainability, security of energy supply, jobs and public acceptance. With appropriate national policy commitments, private capital can be harnessed to finance a recycling center that garners strong public support and allows for sufficient progress necessary to avoid currently escalating taxpayer liabilities.

## **RECYCLING AND ADVANCED RESEARCH**

There are exciting areas of research into emerging nuclear energy technologies, and this advanced research must proceed. However, it will be decades before Generation IV technologies are ready for commercial deployment, and the United States has a pressing obligation to address our large, and growing, used-fuel backlog. Deployment of state-of-the-art recycling technologies should be the first step in an integrated strategy that supports our light water reactor fleet while retaining the flexibility to support continued research and development of advanced fuel cycles.

## **POLICY OBSTACLES AND OPPORTUNITIES**

At this time, there is no regulatory framework to allow for commercial deployment of recycling facilities, though this framework remains under active development with the Nuclear Regulatory Commission.

A national policy commitment is urgently needed to chart a strategic path for sustainable fuel management. Execution of such a policy commitment requires an effective implementing entity (e.g. FedCorp) insulated from political volatility and able to sustain long-term projects.