

International
Nuclear
Fuel
Cycle
Evaluation

X28007453

INFCE

INFCE/DEP/WG.1/89

DIAGRAMMATIC REPRESENTATION OF ECONOMIC FACTORS AFFECTING THE NUCLEAR FUEL
CYCLE STRATEGY WITHIN THE EUROPEAN
COMMUNITY

16 May 1979

DIAGRAMMATIC REPRESENTATION OF ECONOMIC FACTORS AFFECTING
THE NUCLEAR FUEL CYCLE STRATEGY WITHIN THE EUROPEAN COMMUNITY

1. The position of the economic threshold between LWR once-through and LWR uranium and plutonium recycling, U_{OT} , depends strongly on the scale of development of the reprocessing and LWR plutonium fuel fabrication industries. Due to the economy of scale that these industries will enjoy within the large nuclear market of the European Community, it is envisaged that the value of U_{OT} will lie between 20 and 35\$/lb U_{3O8} , when LWR fuel is reprocessed on an industrial scale. This situation could materialise gradually within the European Community after 1985-90*.
2. The fast reactor premium is mainly a function of time depending strongly on the development effort and on the installation rate once series ordering commences. Depending on the particular situation existent within individual Member States, it can decrease quickly or it can remain rather high over an extended period of time. This explains why, for some countries there is no incentive to recycle uranium and plutonium in LWR and why for others, on the contrary, uranium and plutonium recycle in LWR is considered attractive for some time to come.
3. The area between U_{OT} and Q_{BT} represents a transition region, where thermal recycle of uranium and plutonium in LWR co-exists with the industrial development of the fast breeder reactors.
4. The European Community has to import 80% or more of the uranium needed to fuel its nuclear power capacity. Nuclear fuel reprocessing together with recycle of the recovered plutonium and uranium has the potential to reduce the uranium needs of the Community some 20 to 25% during the near term period 1990-2000 and in the longer term (after 2000) with the gradual introduction of fast breeder reactors to decrease sharply the need to import uranium. This illustrates the high economic value assigned to fuel reprocessing within the European Community.

* The value of U_{RT} is negative and the value of U_{OR} is around 80\$/lb U_{3O8} .

DIAGRAMMATIC REPRESENTATION OF ECONOMIC FACTORS
AFFECTING THE NUCLEAR FUEL CYCLE WITHIN THE EUROPEAN COMMUNITY

