

22.351 Systems Analysis of the Nuclear Fuel Cycle
Spring 2003
Problem Set #2

Consider three reactor types, a current large PWR, a CANDU fueled with slightly enriched U (SEU), and a small modular pebble-bed HTGR, having the following characteristics:

	<u>PWR</u>	<u>PBMR</u>	<u>CANDU- SEU</u>
MW(e)	1150	114	881
MW(th)	3411	265	2798
FUEL ENRICHMENT, w/o U-235	4.5	8.0	1.20
DISCHARGE BURNUP, MWd/kg	50	80	19.75
FUEL MGT	3-BATCH	CONTINUOUS ON-LINE REFUELING	

- (a) Compare their uranium and separate work utilization: MWd(e)/kg U_{NAT} and MWd(e)/kg SWU for an enrichment plant tails of 0.3 w/o.
- (b) Explain why the PBMR fuel cycle might be expected to be (and is or is not) superior to the PWR and/or CANDU.