

مستقبل توليد الكهرباء بالطاقة النووية



مستقبل توليد الكهرباء بالطاقة النووية

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5		
7		1
9		2
12		3
16		4
18	LWR	
19	HWR	
20	AGR	
21	FBR	
22		5
24		6
29		7
32		8
38		9
45		10
48		11
53		12

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(%)	(%)	(%)	
47	25	28	
13	44	43	
14	84	2	

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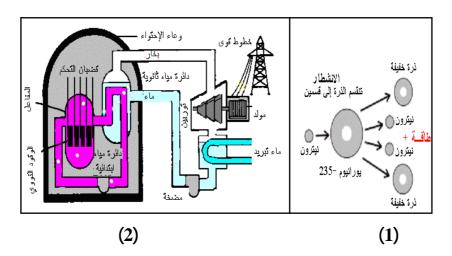
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(2)

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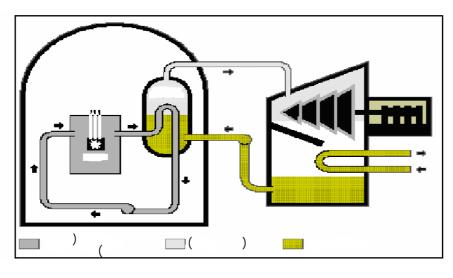
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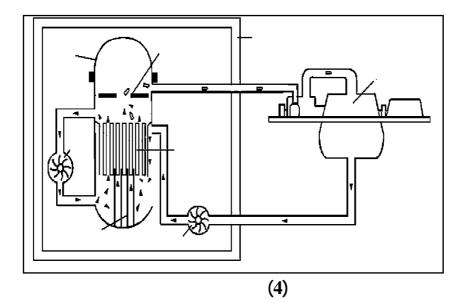
· : •

: LWR (3) PWR (4) BWR

%5 3 235-

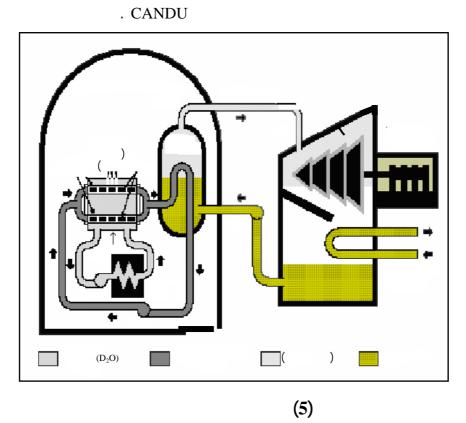


(3)



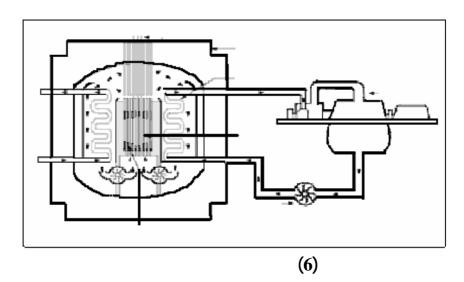
: HWR

%0.7) (238- %99.2 235-

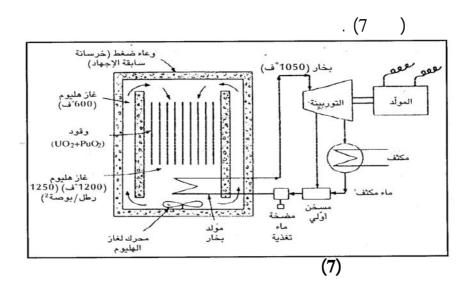


: AGR

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: **FBR**



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	*			
264	242	UO_2		
				(PWR)
92	81	UO_2		(BWR)
26	11	U () UO ₂	CO ₂	(AGR)
38	19	UO_2		
				'CANDU' (PHWR)
17	13	UO_2		(RBMK)
3	1	UO ₂ PuO ₂		(FBR)

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1960 - 1950

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%28	863,000	
%15	472,000	
%14	437,000	
%10	298,000	
%8	235,000	
%6	197,000	
%4	131,000	
%3	104,000	
%3	103,000	
	3,107,000	

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(U₃O₈) %80

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 (UO_2) (U_3O_8) $.(UF_6)$

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2 %0.7 235-238- %85 .%5

235-. 238.

 (UO_2)

75 1000

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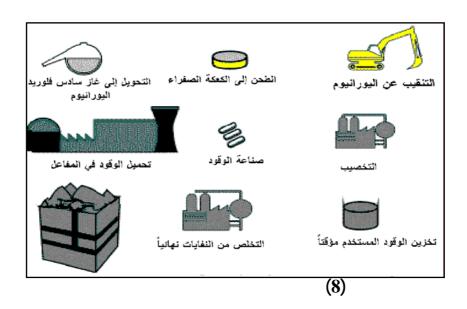
. 18

0.5

235- %96 %3 %1 238- %1

. MOX

. 2010



: 2001

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(64) %56

: 2020

. 2020

2050 : (4)

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62,000	62,000	62,000	2000
106,500	83,300	60,233	2020
283,000	177,000	52,000	2050

8

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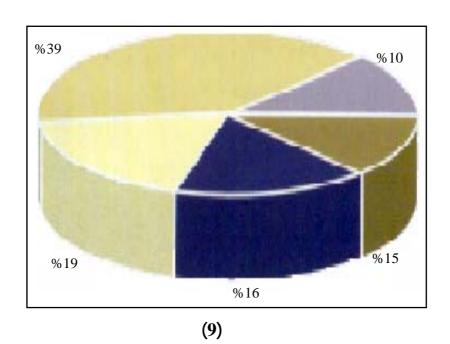
2005	2005		2005		2005		2005 20				2005		2004		
									%						
140	0	0	0	0	692	1	935	2	8.2	7.3					
55	0	0	0	0	0	0	376	1	39	2.2					
1163	0	0	0	0	0	0	5728	7	55	44.9					
311	0	0	1245	1	0	0	1901	2	3	11.5					
345	1000	1	0	0	0	0	2722	4	42	15.6					
1796	0	0	2570	4	515	1	12080	17	15	85.3					
1352	15000	19	8000	8	1900	2	6587	9	2.2	47.8					
474	1900	2	0	0	0	0	3472	6	31	26.3					
0	600	1	0	0	0	0	0	0	0	0					
540	0	0	1600	1	0	0	2656	4	27	21.8					
10431	1600	1	0	0	0	0	63473	59	78	426.8					
3708	0	0	0	0	0	0	20303	17	32	158.4					

2005	2005								2005		2005		2005			2004	
274	0	0	0	0	0	0	1755	4	34	11.2							
351	13160	24	0	0	3638	8	2993	15	2.8	15							
0	2000	2	0	0	0	0	0	0	0	0							
125	2850	3	950	1	950	1	0	0	0	0							
0	1200	1	0	0	0	0	0	0	0	0							
8184	0	0	14782	12	866	1	47700	55	29	273.8							
0	0	0	950	1	950	1	0	0	0	0							
3011	0	0	9200	8	0	0	16840	20	38	124							
290	0	0	0	0	0	0	1185	1	72	13.9							
237	0	0	0	0	0	0	1310	2	5.2	10.6							
112	0	0	0	0	0	0	452	1	3.8	3.6							
57	0	0	300	1	0	0	425	2	2.4	1.9							
90	1995	3	0	0	655	1	655	1	10	5.1							
3409	9375	8	925	1	3600	4	21743	31	16	133							
373	840	2	0	0	0	0	2472	6	55	15.6							

2005		2005 2005					2005		2005			2004	
128	0	0	0	0	0	0	676	1	38	5.2			
356	125	1	0	0	0	0	1842	2	6.6	14.3			
1622	0	0	0	0	0	0	7584	9	23	60.9			
1536	0	0	0	0	0	0	8857	10	52	75			
595	0	0	0	0	0	0	3220	5	40	25.4			
0	4500	3	0	0	0	0	0	0	0	0			
1531	0	0	950	1	0	0	13168	15	51	81.1			
2409	0	0	0	0	0	0	11852	23	19	73.7			
22397	0	0	0	0	1065	1	97838	103	20	788.6			
0	2000	2	0	0	0	0	0	0	0	0	•		
68,357	58,145	73	41,472	39	17,431	23	367,684	440	16	2618.6			

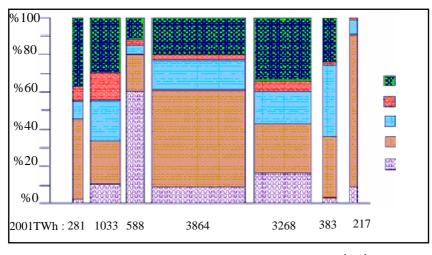
31 440 368,000 . %16

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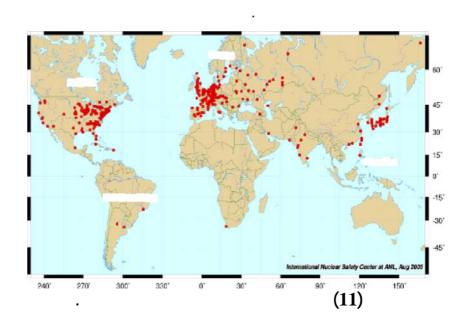


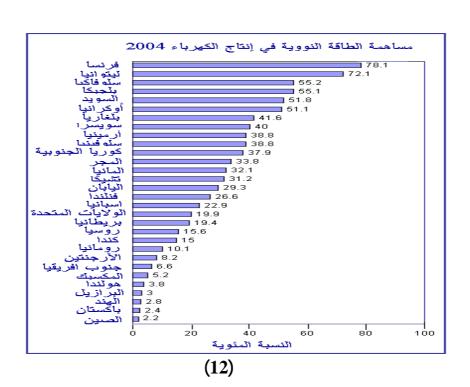
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%70 . %31

(6) UO_2

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360	\$ 45 x 8	U_3O_8			
60	\$ 9 x U 7				
450	\$ 105 x SWU 4.3				
240					
US\$ 1110					

315,000

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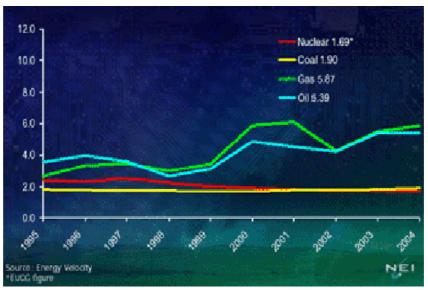
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2002 2.4 1.2 2.7

4.8

(13) 2004

5.39 5.87 1.9 1.69 /



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12500

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200-25 130 70

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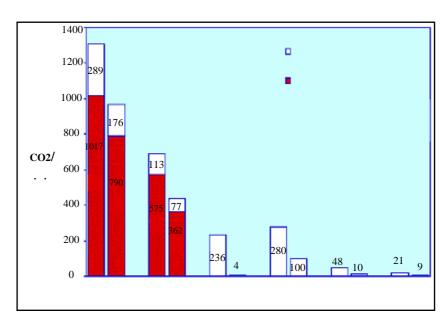
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0	2249	1672	1135	
0	13	12	0.1	
0	6	4	1.7	

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%40 25 43



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(8) 2002 1997

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2002	2001	2000	1999	1998	1997
37500	36200	35200	32900	30800	25500
6254	5900	5515	5469	5200	4780
10363	7866	7637	7415	7015	6563
21454	20629	19836	19073	18165	16561
12065	11491	10800	10093	97050	92228
7	2	0	2		
18383	17425	16453	15397	14485	12931
30100	30035	29160	29160	29160	29160
9480	9116	8765	8600	8600	8400

2002	2001	2000	1999	1998	1997	
30737	29273	27463	26962	25753	22860	
10977	10454	9977	9989	9684	9144	
72446	67080	64500	60532	57106	52779	
6497	6308	6124	5946	5634	5281	
175	168	160	150	155	161	
2433	2251	2164	2108	1991	2021	
9400	9040	8700	8000	7800	6900	
260	250	250	240	230	230	
9522	9245	8932	8630	7917	7325	
15580	14793	13942	13265	12453	11770	
370	360	355	350	340	333	
3408	3216	2968	2718	2501	2296	
47645	45631	43595	41407	39021	36317	

(9)

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2003	2002	2001	2000	1999	1988	
49450	46856	43172	39944	37126	33392	
7715	7278	6779	6297	5955	5773	
9224	8955	8528	8256	7990	7609	
29515	28517	27159	26368	25600	23379	
149767	144702	133674	126191	119015	114624	
29543	28013	26712	25217	22819	21159	
34000	33863	32251	31900	31563	30945	
11160	10733	10222	9735	9271	8427	
34105	33112	31536	30617	29725	28175	
14329	13778	13122	12678	12250	11915	
88855	83003	75759	73311	67981	62336	
7988	8127	7544	7375	7081	6742	
200	200	190	180	150	120	
1620	1591	1515	1450	1388	1375	
10320	9912	9450	8915	8410	8182	
280	274	261	250	240	238	
10680	10375	9881	9510	9152	8885	
16388	15757	15007	14570	14150	13745	
538	499	476	451	455	442	
4096	3769	3644	3414	3136	2904	
52110	50504	47968	46115	44162	42633	

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