

ISOE INFORMATION SHEET

EUROPEAN DOSIMETRIC RESULTS FOR 2012

ISOE European Technical Centre - Information Sheet No. 57

This ISOE Information Sheet presents the average annual collective doses per reactor (PWRs, VVERs, BWRs) for the period 2010-2012 in the European countries participating in ISOE.

Eight German reactors were stopped mid-2011 and no more counted as operational reactors in 2012: 4 PWRs (Biblis A and B, Neckar 1, Unterweser) and 4 BWRs (Brunsbüttel, Isar 1, Krümmel, Philippsburg 1). This situation had an impact on the average annual dose per reactor for this country: for the PWRs, it was divided by 2 compared to 2011 (0.23 man·Sv in 2012, 0.43 man·Sv in 2011); for the BWRs it was nearly multiplied by 2 compared to 2011 (0.58 man·Sv in 2012, 1.07 man·Sv in 2011).

Regarding PWR reactors, the average collective dose decreased going from 0.64 man·Sv per reactor in 2011 to 0.58 man·Sv per reactor in 2012 (see Table 1).

In 2012 the average annual collective dose per reactor for all PWRs and VVERs decreased slightly from 0.58 man·Sv in 2011 to 0.53 man·Sv in 2012.

Regarding BWRs, the average annual collective dose per reactor has also decreased in 2012 with a value at 0.74 man·Sv compared to 0.96 in 2011 (see Table 2).

The evolution of the 3-year rolling average annual collective dose, which provides a better representation of the general trend in dose, shows a decrease of the averages for PWRs and BWRs and an increase for VVERs (see Tables 3 and 4).

Regarding VVERs, the Czech Republic and Slovak Republic present the lowest 3-year rolling average annual collective dose per reactor in 2010-2012 with

respectively 0.12 man·Sv and 0.16 man·Sv per reactor, followed by Hungary (0.47 man·Sv per reactor) and Finland (0.67 man·Sv per reactor) (see Figure 1).

For European PWRs, the data per country show that with respect to the 3-year rolling average annual collective dose for 2010-2012, five main groups can be distinguished (see Figure 2):

Belgium, United Kingdom:

around 0.3 man·Sv per reactor,

Germany, The Netherlands, Spain, Switzerland:

around 0.4 man·Sv per reactor,

Slovenia:

around 0.6 man·Sv per reactor,

France:

around 0.7 man·Sv per reactor,

Sweden:

around 0.8 man·Sv per reactor.

The 3-year rolling average annual collective dose per reactor for BWRs are quite similar in Germany, Spain and Sweden around 0.9 man·Sv per reactor. Finland is presenting the lowest value with 0.43 man·Sv per reactor and Switzerland the highest value with 1.27 man·Sv per reactor (see Figure 3).

For further information on the evolution of collective doses in different countries, please refer to the Country reports in ISOE Annual Report published on the ISOE website (www.isoe-network.net).

Table 1. PWRs average annual collective dose per reactor by country from 2010 to 2012

Country (Number of reactors)	Average annual coll. dose per reactor (man·Sv)		
	2010	2011	2012
PWR Group:			
Belgium (7)	0.30	0.37	0.33
France (58)	0.62	0.72	0.68
Germany (7*)	0.61	0.43	0.23
Netherlands (1)	0.62	0.28	0.33
Slovenia (1)	0.85	0.07	0.88
Spain (6)	0.33	0.50	0.47
Sweden (3)	0.46	1.43	0.54
Switzerland (3)	0.53	0.36	0.43
United Kingdom (1)	0.27	0.54	0.04
PWR Sub-Total (87**)	0.57	0.64	0.58
Czech Republic (6)	0.12	0.12	0.12
Finland (2)	0.81	0.36	0.84
Hungary (4)	0.37	0.59	0.45
Slovak Republic (4)	0.17	0.14	0.17
VVER Sub-Total (16)	0.28	0.27	0.31
All PWR Group (103***)	0.52	0.58	0.53

* Germany: 11 reactors in 2010 and 2011;
7 reactors in 2012.

** PWR: 91 reactors in 2010 and 2011;
87 reactors in 2012.

*** All PWR Group: 107 reactors in 2010 and 2011;
103 reactors in 2012.

Table 2. BWRs average annual collective dose per reactor by country from 2010 to 2012

Country (Number of reactors)	Average annual coll. dose per reactor (man·Sv)		
	2010	2011	2012
BWR Group:			
Finland (2)	0.45	0.48	0.36
Germany (2*)	0.88	0.58	1.07
Spain (2)	0.52	2.05	0.25
Sweden (7)	0.93	1.07	0.67
Switzerland (2)	1.25	1.07	1.49
All BWR Group (15**)	0.86	0.96	0.74

* Germany: 6 reactors in 2010 and 2011; 2 reactors
in 2012.

** All BWR Group: 19 reactors in 2010 and 2011;
15 reactors in 2012.

Table 3. PWRs 3-year rolling average annual collective dose per reactor by country

Country	Average annual coll. dose per reactor (man·Sv)		
	2008-10	2009-11	2010-12
PWR Group:			
Belgium	0.35	0.34	0.33
France	0.66	0.68	0.67
Germany	0.76	0.69	0.42
Netherlands	0.38	0.38	0.41
Slovenia	0.55	0.52	0.60
Spain	0.45	0.52	0.43
Sweden	0.65	0.94	0.81
Switzerland	0.45	0.42	0.44
United Kingdom	0.29	0.38	0.28
PWR Sub-Total	0.62	0.64	0.59
Czech Republic	0.13	0.13	0.12
Finland	0.65	0.51	0.67
Hungary	0.38	0.47	0.47
Slovak Republic	0.18	0.17	0.16
VVER Sub-Total	0.27	0.27	0.29
All PWR Group	0.57	0.58	0.55

Table 4. BWRs 3-year rolling average annual collective dose per reactor by country

Country	Average annual coll. dose per reactor (man·Sv)		
	2008-10	2009-11	2010-12
BWR Group:			
Finland	0.50	0.51	0.43
Germany	1.03	0.82	0.85
Spain	1.11	1.63	0.94
Sweden	1.06	1.14	0.89
Switzerland	1.18	1.16	1.27
All BWR Group	1.01	1.03	0.86

Figure 1. Evolution of the VVERs 3-Year Rolling Average Collective Dose per Reactor by Country

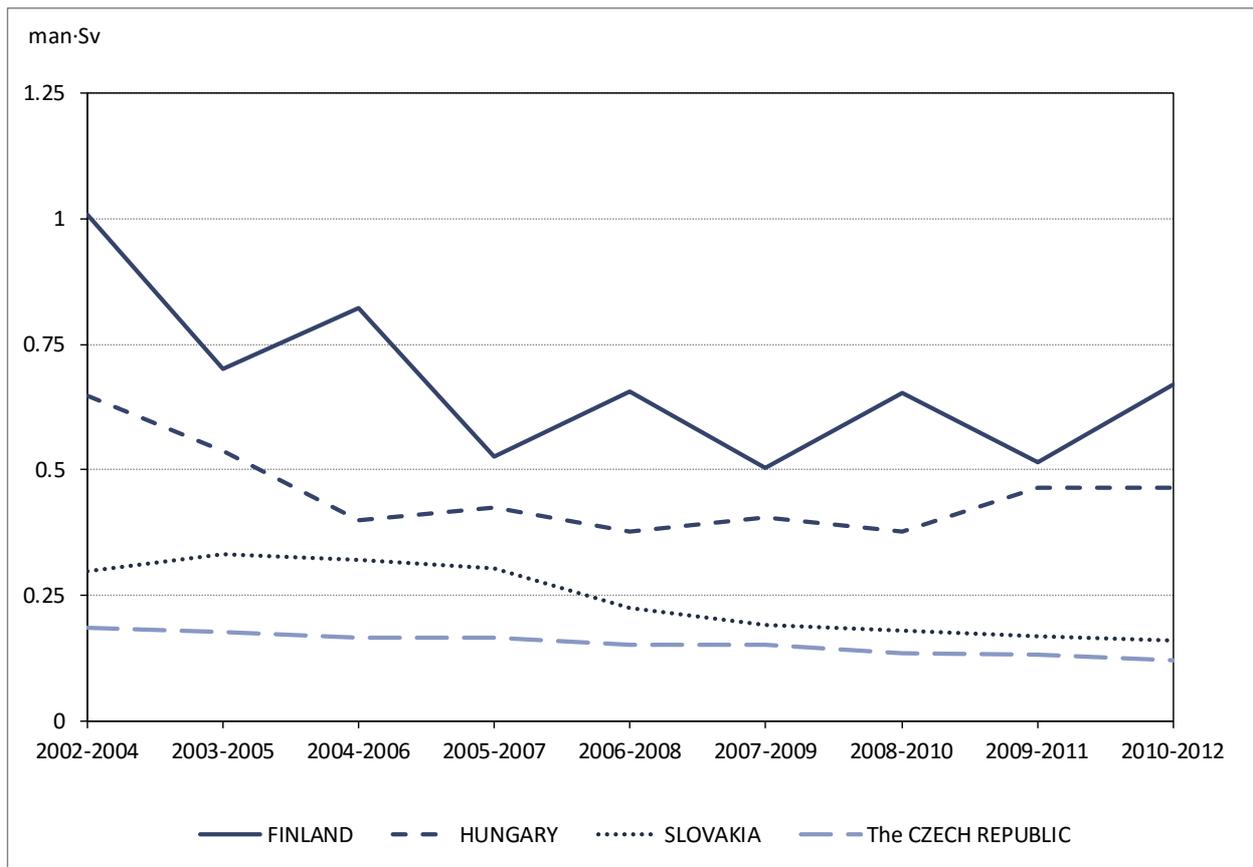


Figure 2. Evolution of the PWRs 3-Year Rolling Average Collective Dose per Reactor by Country

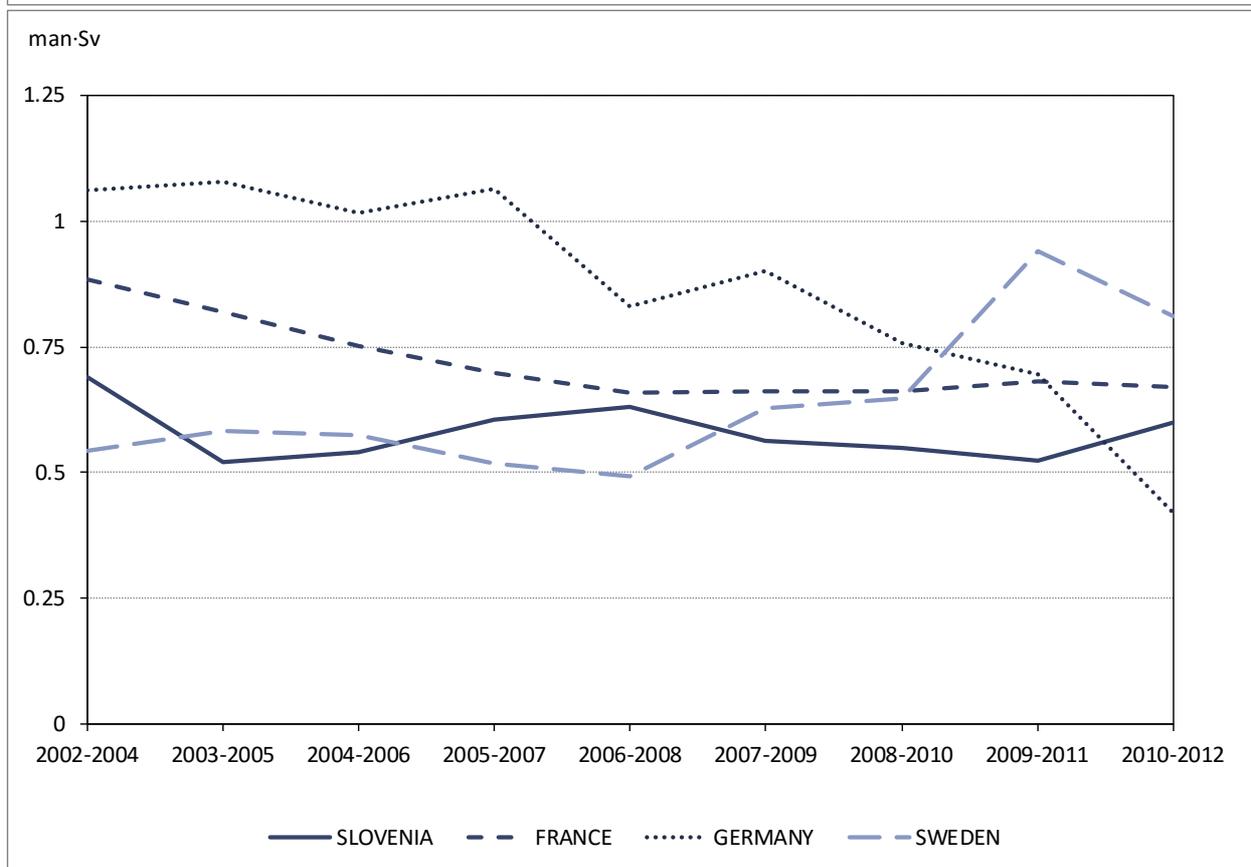
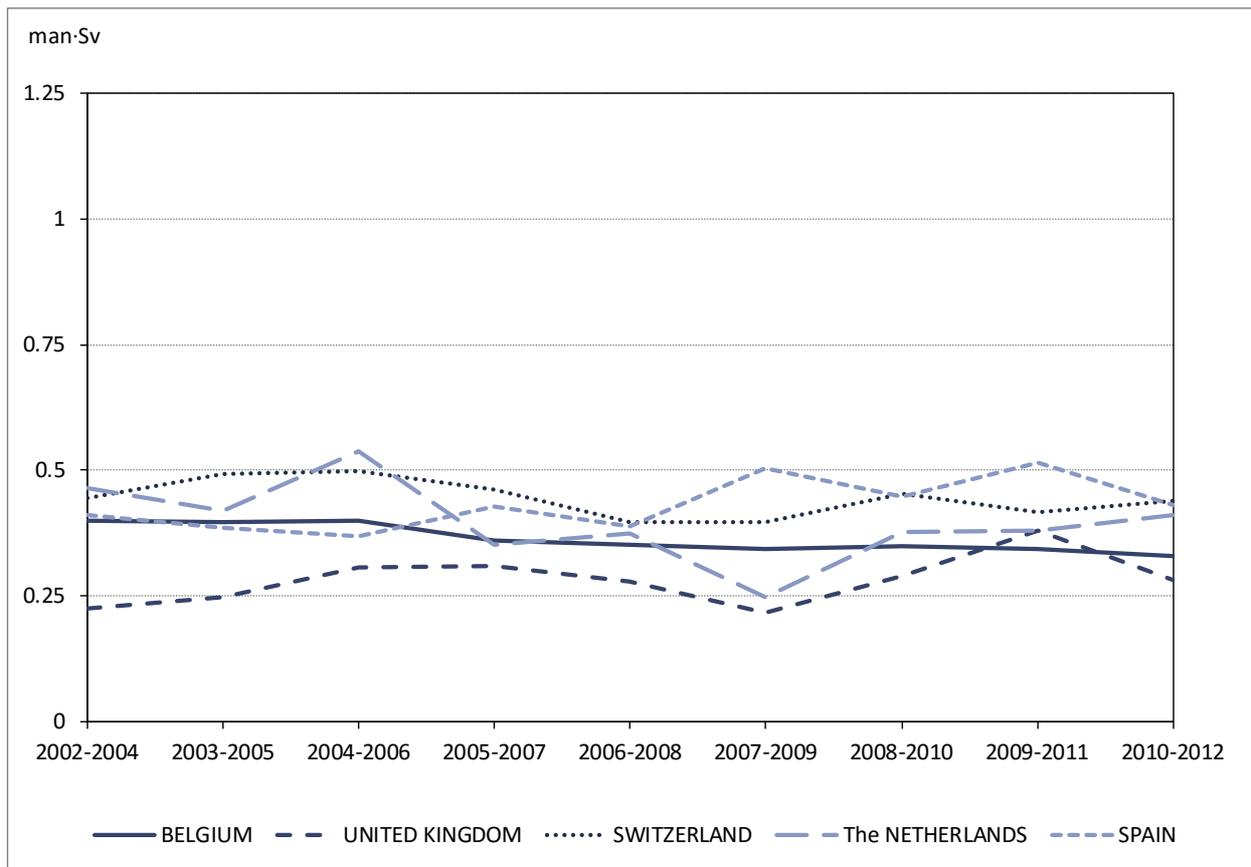


Figure 3. Evolution of the BWRs 3-Year Rolling Average Collective Dose per Reactor by Country

