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World Federation of Scientific Workers International Symposium

A solution for energy, our key to survival:

a view from Russia

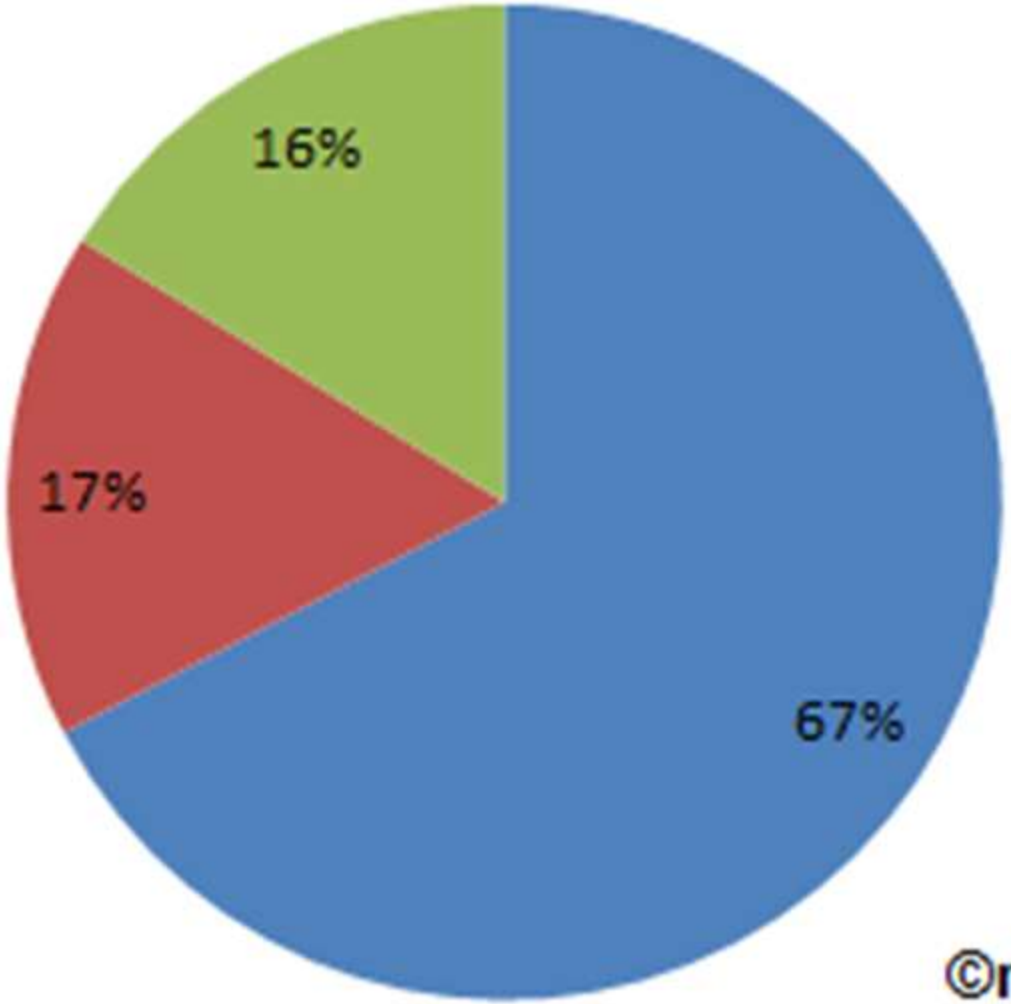
Vyacheslav Vdovin, Russia, Institute of Applied Physics & Lebedev Physical Institute of the Russian Academy of Sciences, Professor of Nizhny Novgorod State Technical University, Deputy Chairman TUERAS, Vice president WFSW

12-th of May, 2015, Barcelona

outline

- Current Structure of Energy System
- Fears & Myths
- Real Prices & Dangers
- Prospects and Plans: a combination of Renewable and Tradition
- The role of scientific community: researches and education

Energy of Russia



Total 1050 M KW/h

Coal & oil

Nuclear

Hydro

Solar, wind, bio, geothermal
<0.1% each
In compare with Spain & Italy ~3%

What think studets about dangerous nuclear energy?

Event	Real number of victims	Estimation of students
 Hirisima	Immediately 210,000	300,000
	Later from 86572 hibakusi – 421 dead	750 ,000
 Tchernobyl	Immediately 31	40 ,000
	Later (liquidators and local citizens) ≈ 60	250 ,000
 Fukusima	0K	?

Tcutomu Yamaguchi the double victim

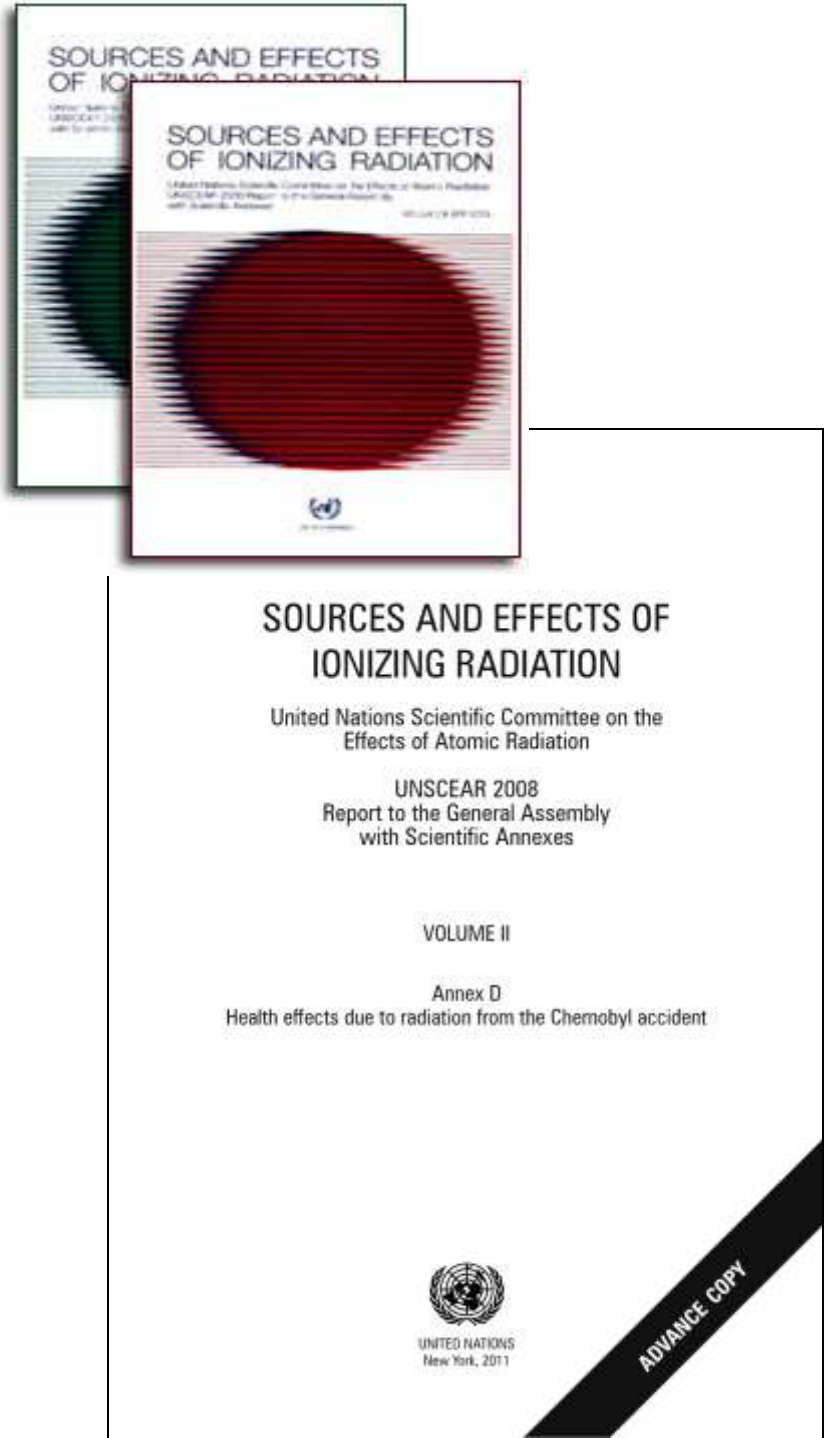






NSI RAS 3.11.1988 г.

Acad.L.Bolshov



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- **UNSCEAR 1988 Report, Appendix to annex G, 'Early effects in man of high radiation doses', Acute radiation effects in victims of the Chernobyl accident;**
- **United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR). Sources and effects of ionizing radiation. 2000 report to the General Assembly, Vol. 2 Effects;**
- **UNSCEAR 2008 Report to the General Assembly. Vol.2 Annex D. Health effects due to radiation from the Chernobyl accident. N.Y., 2011**
- 100 times

Victims and Prices of GW (1969–2000)

Type	*OECD Countries*			*Non OECD*		
	Accidents	Victims	Victims/GW	Accidents	Victims	Victims/GW
Coal	75	2,259	0.157	1,044	18,017	0.597
Coal (China 1994-1999)				819	11,334	6.169
Coal without China				102	4,831	0.597
Oil	165	3,713	0.132	232	16,505	0.897
Gas	90	1,043	0.085	45	1,000	0.111
СНГ	59	1,905	1.957	46	2016	14.896
Hydro	1	14	0.003	10	29,924	10.285
Nuclear	0	0	–	1	31	0.048
Total	390	8,934		1,480	72,324	

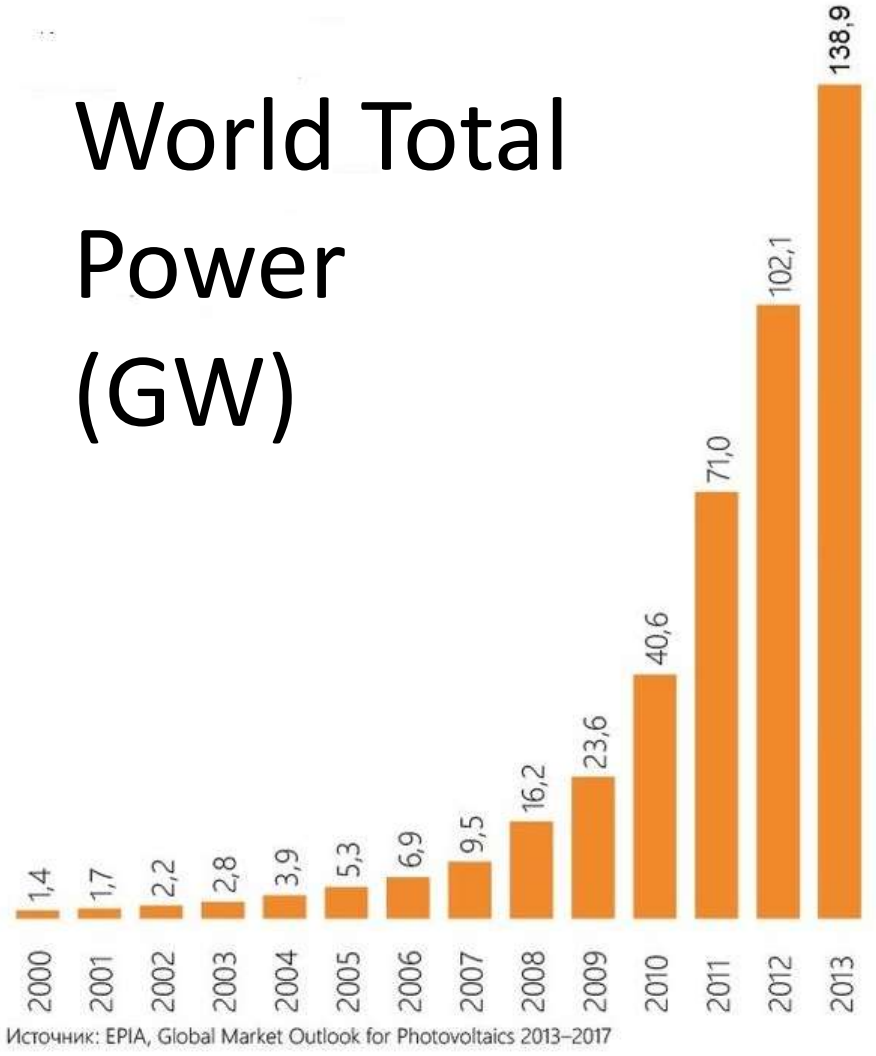
Prospects and Plans: a combination of Renewable and Tradition

Tradition: Oil, Coal, Gas…
Nuclear &Fusion (with great doubts concerned Lunar He3)
Renewable: Solar, Wind, Geothermal, Biogas…
Initially all are SOLAR!

Solar Energy



World Total Power (GW)



Источник: EPIA, Global Market Outlook for Photovoltaics 2013–2017

The role of scientific community:

- Researches & Development… incl. dangers and consequences
- Wide scientific & social discussions
- Education & enlightenment
- Analogies: cars and mobile phones are also quite dangerous things… but we can’t get rid of them…
- Only full scaled technical and regulation measures can made them relatively innocuous and healthy

Thank you!

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