



## World Federation of Scientific Workers International Symposium

**A solution for energy, our key to survival:  
a view from Russia**

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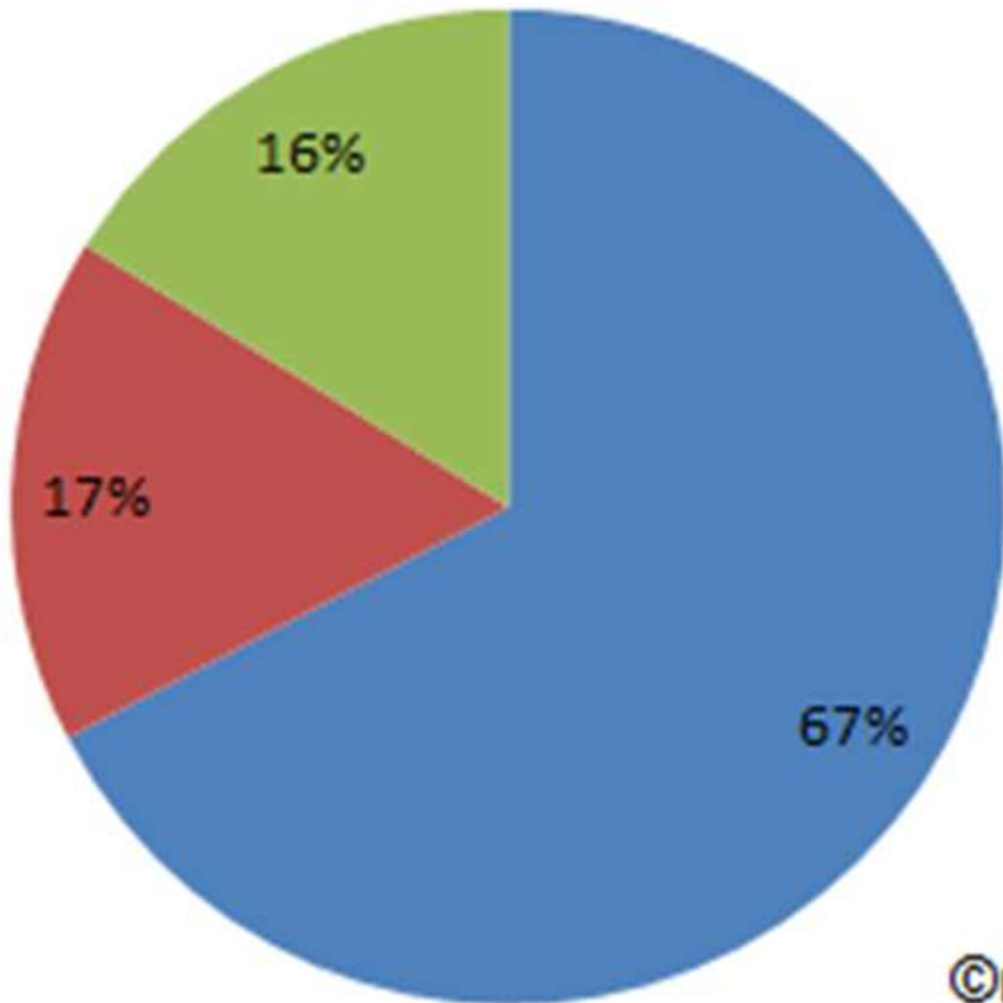
**12-th of May, 2015, Barcelona**

# 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

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In compare with  
Spain & Italy ~3%

# What think studets about dangerous nuclear energy?

Event	Real number of victims	Estimation of students
 <p><b>Hirisima</b></p>	Immediately 210,000	300,000
	Later from 86572 hibakusi – 421 dead	750 ,000
 <p><b>Tchernobyl</b></p>	Immediately 31	40 ,000
	Later (liquidators and local citizens) $\approx$ 60	250 ,000
 <p><b>Fukusima</b></p>	OK	?

# Tcutomu Yamaguchi the double victim







**РОССИЙСКАЯ АКАДЕМИЯ НАУК**  
**Институт проблем безопасного развития атомной энергетики**

**RUSSIAN ACADEMY OF SCIENCES**  
**Nuclear Safety Institute (IBRAE)**



**NSI RAS 3.11.1988 г.**  
**Acad.L.Bolshov**



SOURCES AND EFFECTS OF  
IONIZING RADIATION

United Nations Scientific Committee on the  
Effects of Atomic Radiation

UNSCEAR 2008  
Report to the General Assembly  
with Scientific Annexes

VOLUME II

Annex D  
Health effects due to radiation from the Chernobyl accident



UNITED NATIONS  
New York, 2011

ADVANCE COPY

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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
CH <sub>2</sub> F	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)

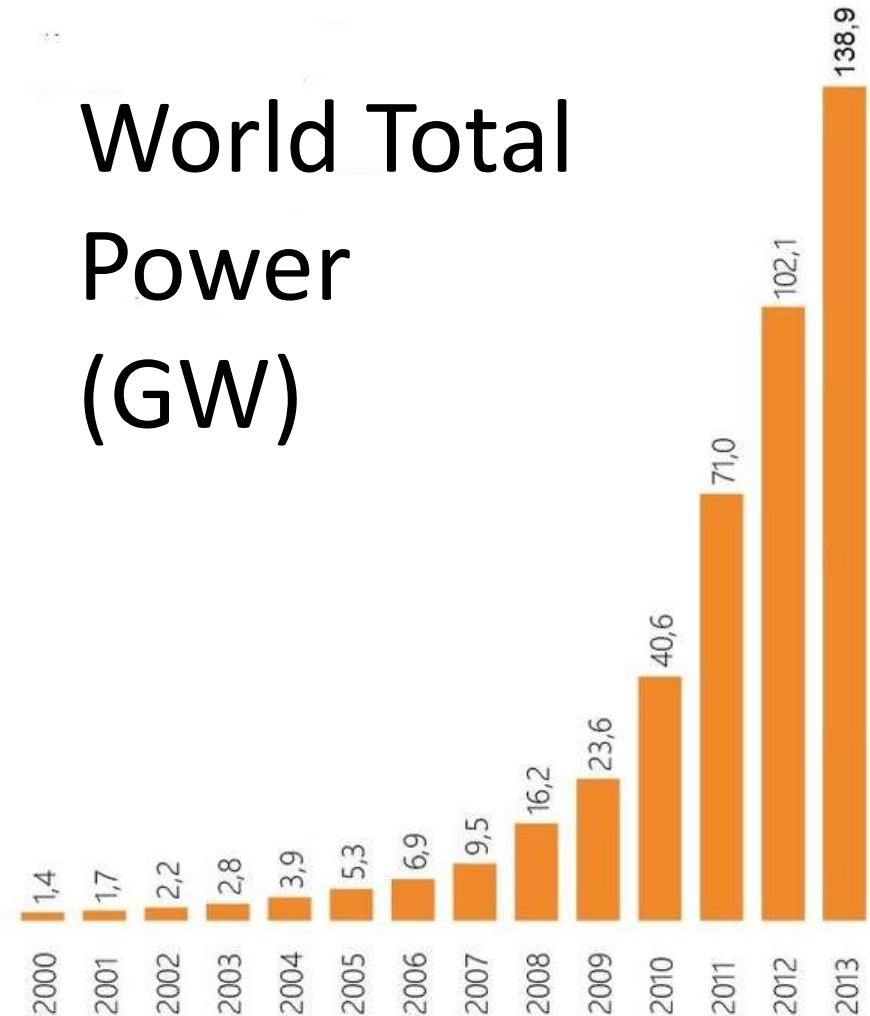
Renewable: Solar, Wind,  
Geothermal, Biogas...

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 make them relatively innocuous and healthy

# Thank you!

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