Tomorrow's nuclear leaders

Tokyo, 24 April 2013
JAIF Annual Conference

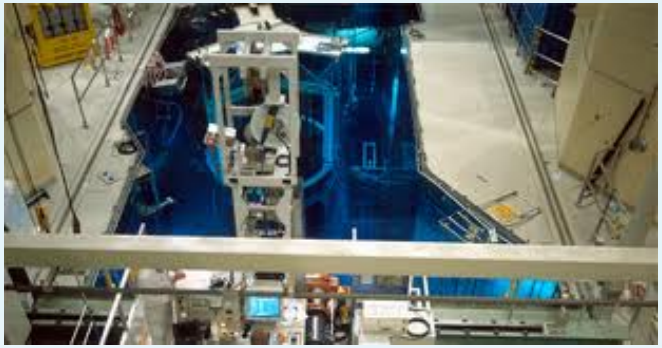
Agneta Rising
WNA Director General

World Nuclear Association

My Background: Industry

VATTENFALL 1980-2012

Nuclear Safety and Environment



Nuclear Business Development

Nuclear Communication and Governmental Appointments

Environmental Audits of Uranium Mines

My Background: International Organisations

Board Member

President

Member of INSAG

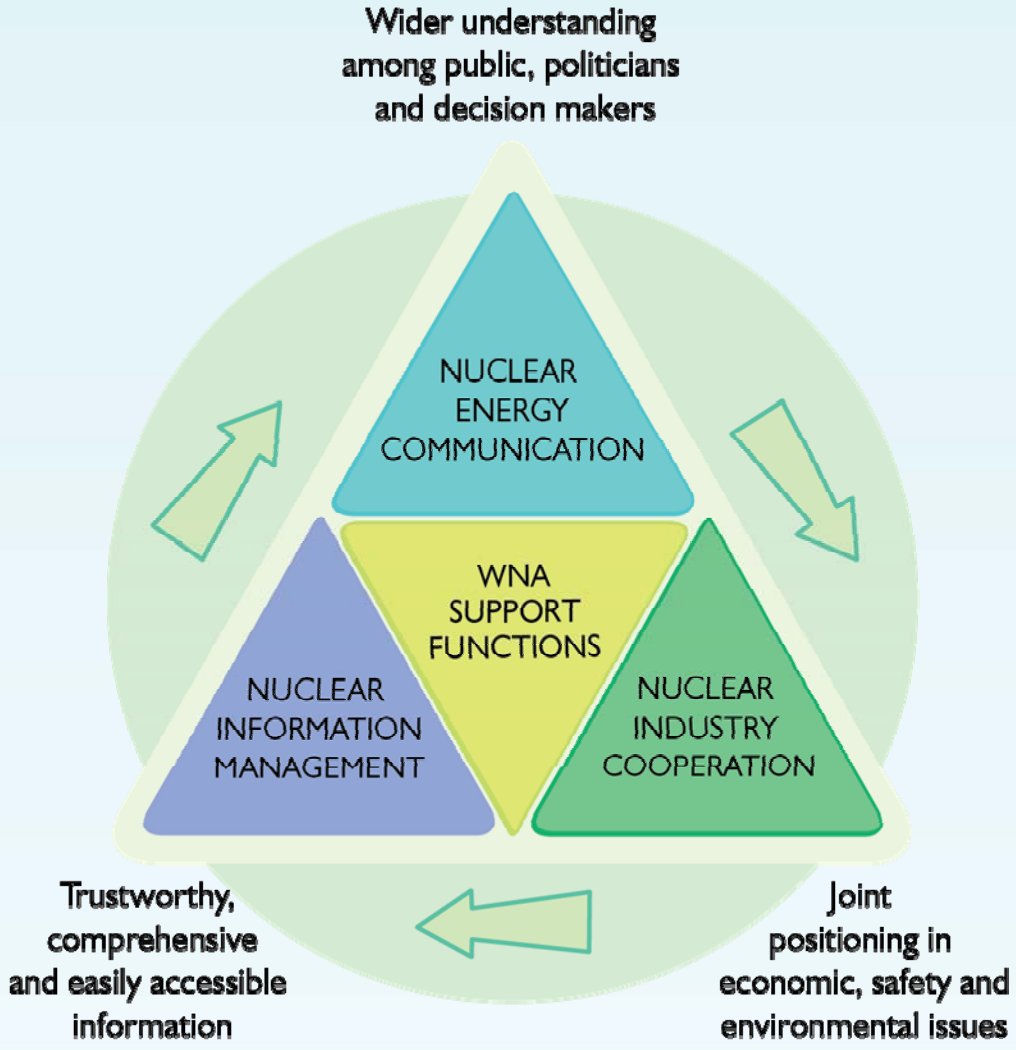
Last Chairman

First Chairman

President and Co-founder

Member of Commission On Environment and Energy

New WNA Strategic Direction

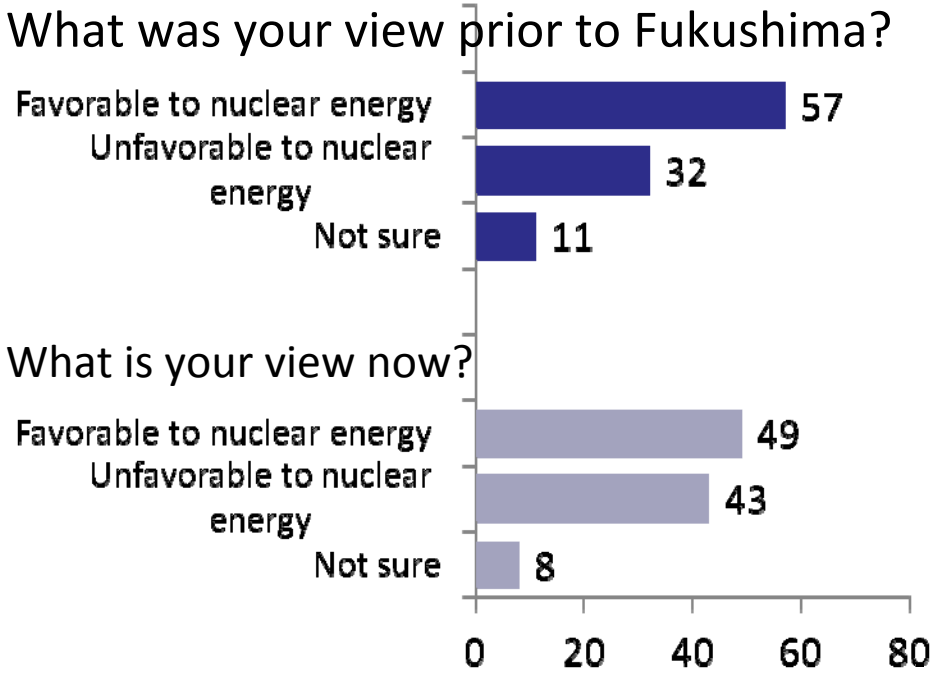


How the world experienced the Fukushima nuclear accident – 1

The Fukushima nuclear accident caused a global media storm. Initially coverage was divided between the natural disaster and the plant. Soon however the emphasis was solely on developments at the nuclear plant .

How the world experienced the Fukushima nuclear accident – 2

Outside of Japan this led to a public backlash against nuclear power just about everywhere – and protests in many countries



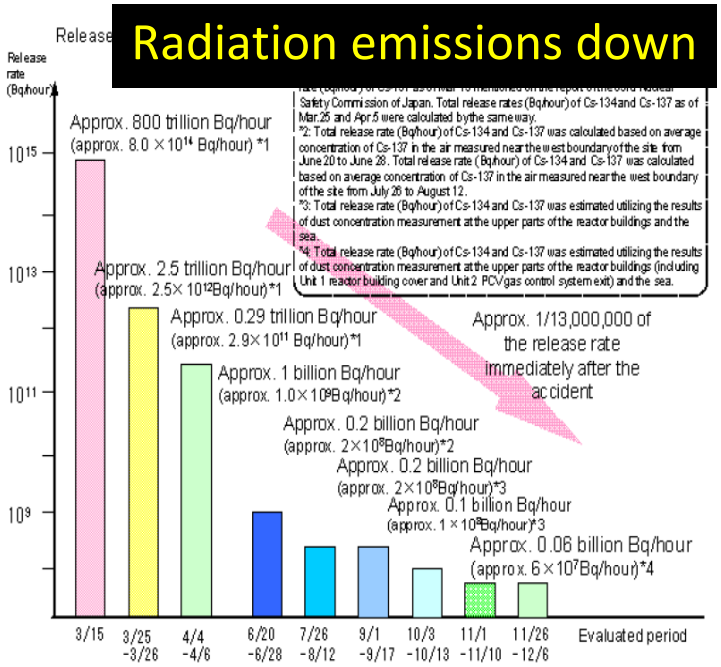
Poll: 47 countries Source NEI – WIN Gallup international March-April 2011

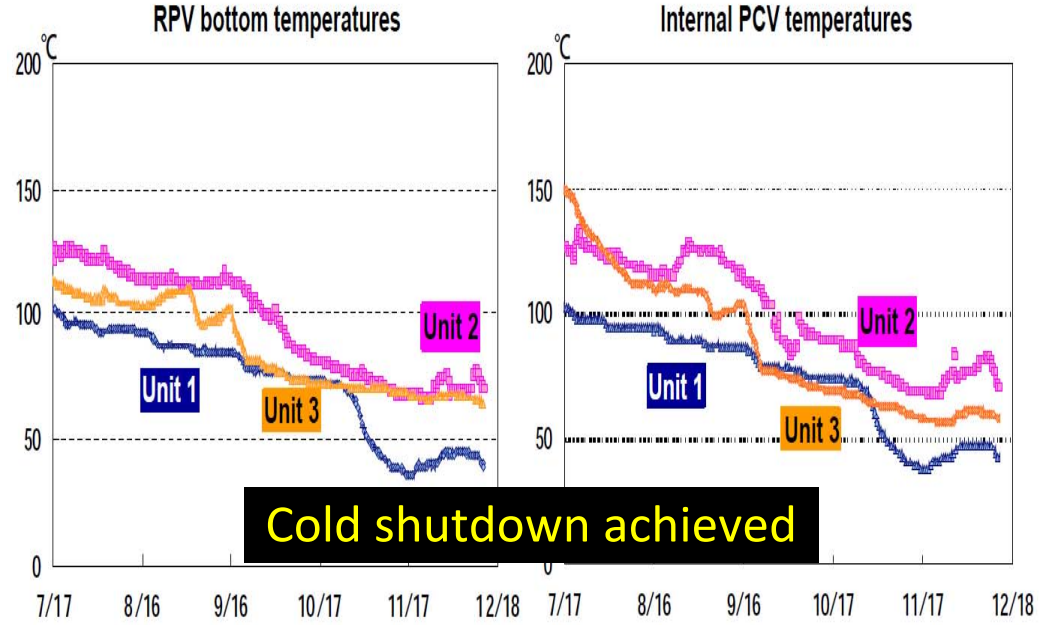
How I experienced it

As a radiation professional, it was disappointing to see so much unnecessary fear caused – even by those who should have known better.

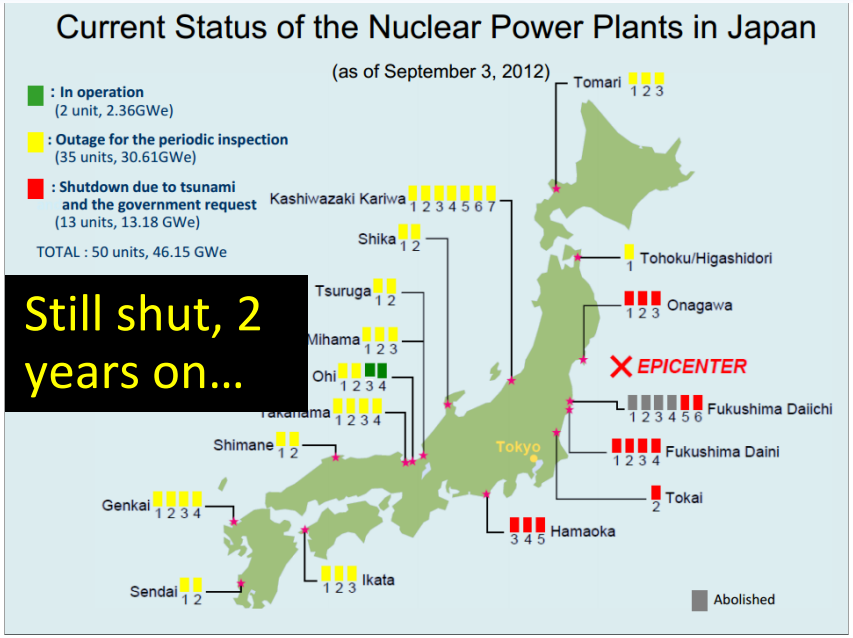
I realised that fundamentally we had failed to communicate effectively on radiation risk

Japan you've come so far –

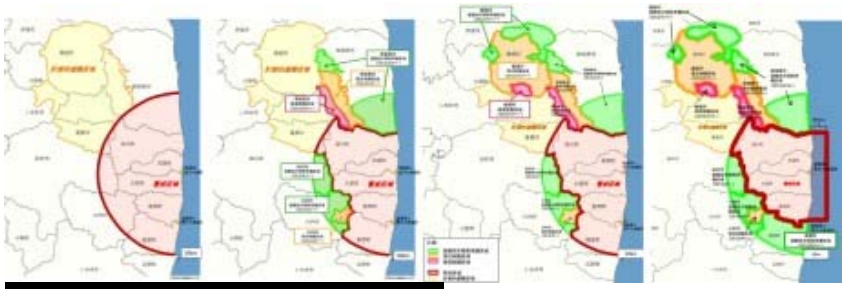




…but the road ahead is long

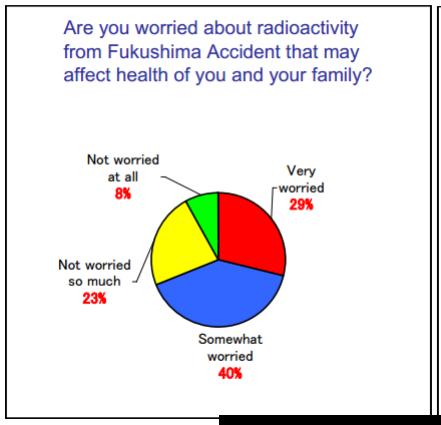


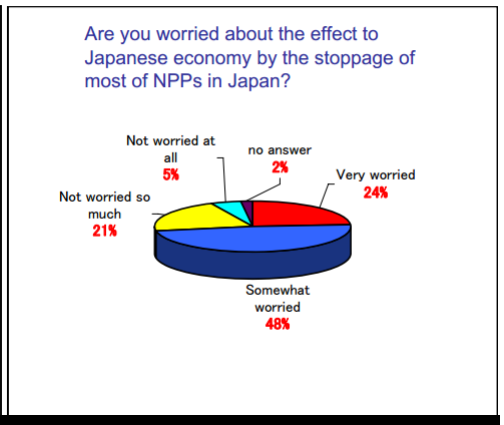
Still shut, 2 years on…



Who is returning?

Public Opinion Survey by Yomiuri Newspaper on March 4, 2013





Opinion – what does it mean?

The fundamental challenges facing Japan are no longer technical ones. They are social and political in nature.

They require philosophy.

They require communication.

Long-term development based on experience, realities and facts

Every country which has experienced a serious reactor accident is today committed to nuclear power development

UK. Windscale fire 1957, Today:

16 reactors in op.

19GWe planned

USA. Three Mile Island 2 1979. Today

103 reactors in operation

3 under construction

Ukraine. Chernobyl 4 1986. Today

15 reactors in operation

2 under construction

A lesson from Chernobyl:

Radiation doses

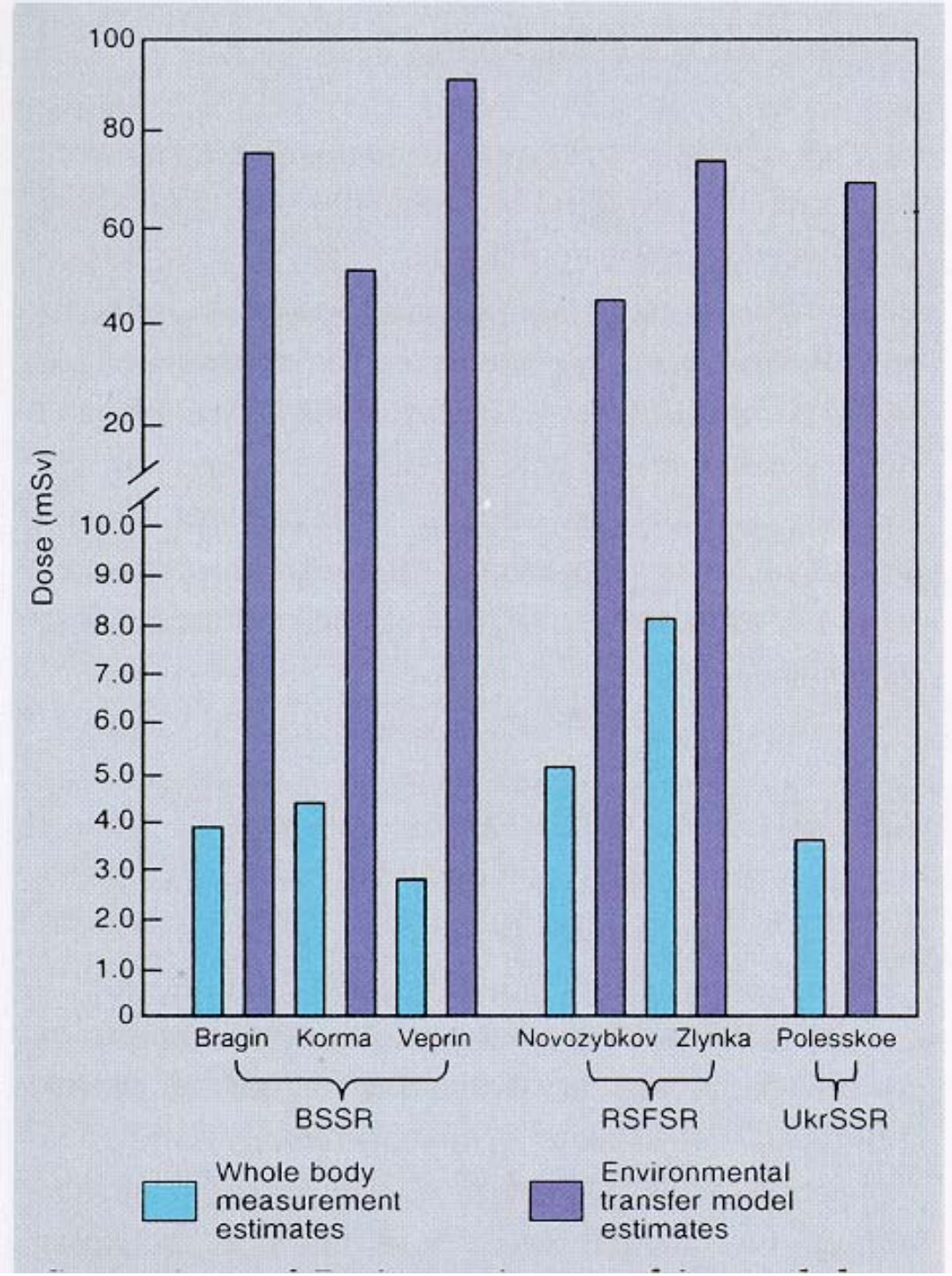
measured

in vivo

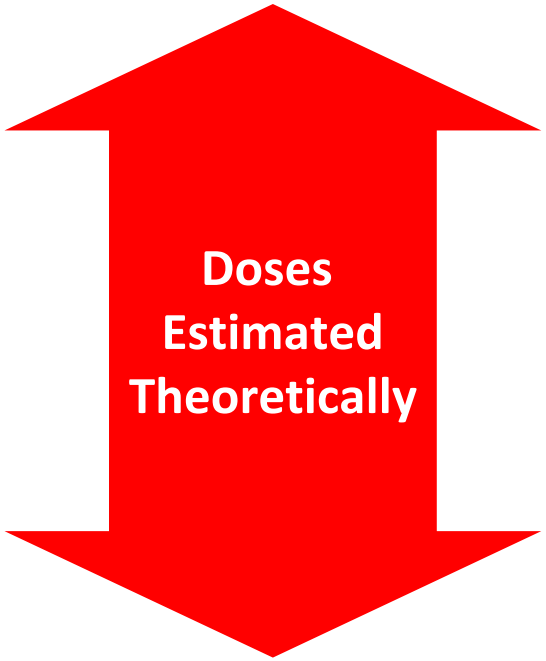
were much lower than

doses theoretically

estimated.



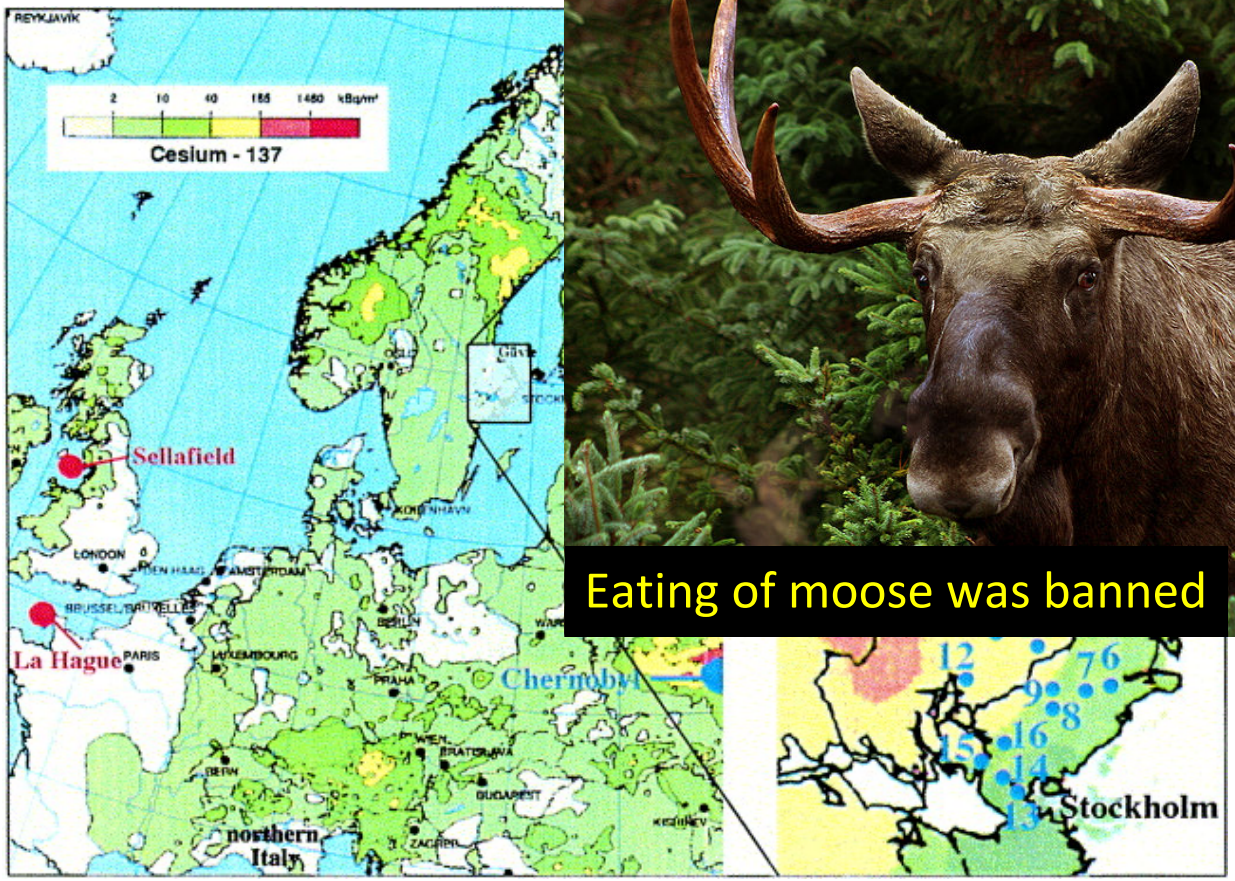
Natural radiation background dose and Fukushima accident doses



	annual dose mSv/year	Natural Background
Few people In few areas ⇒	~100	VERY HIGH
Many people In many areas ⇒	~ 10	TYPICALLY HIGH
Majority of people around the world ⇒	~ 2.4	AVERAGE
	~ 1	MINIMUM

My personal experience Chernobyl and Sweden

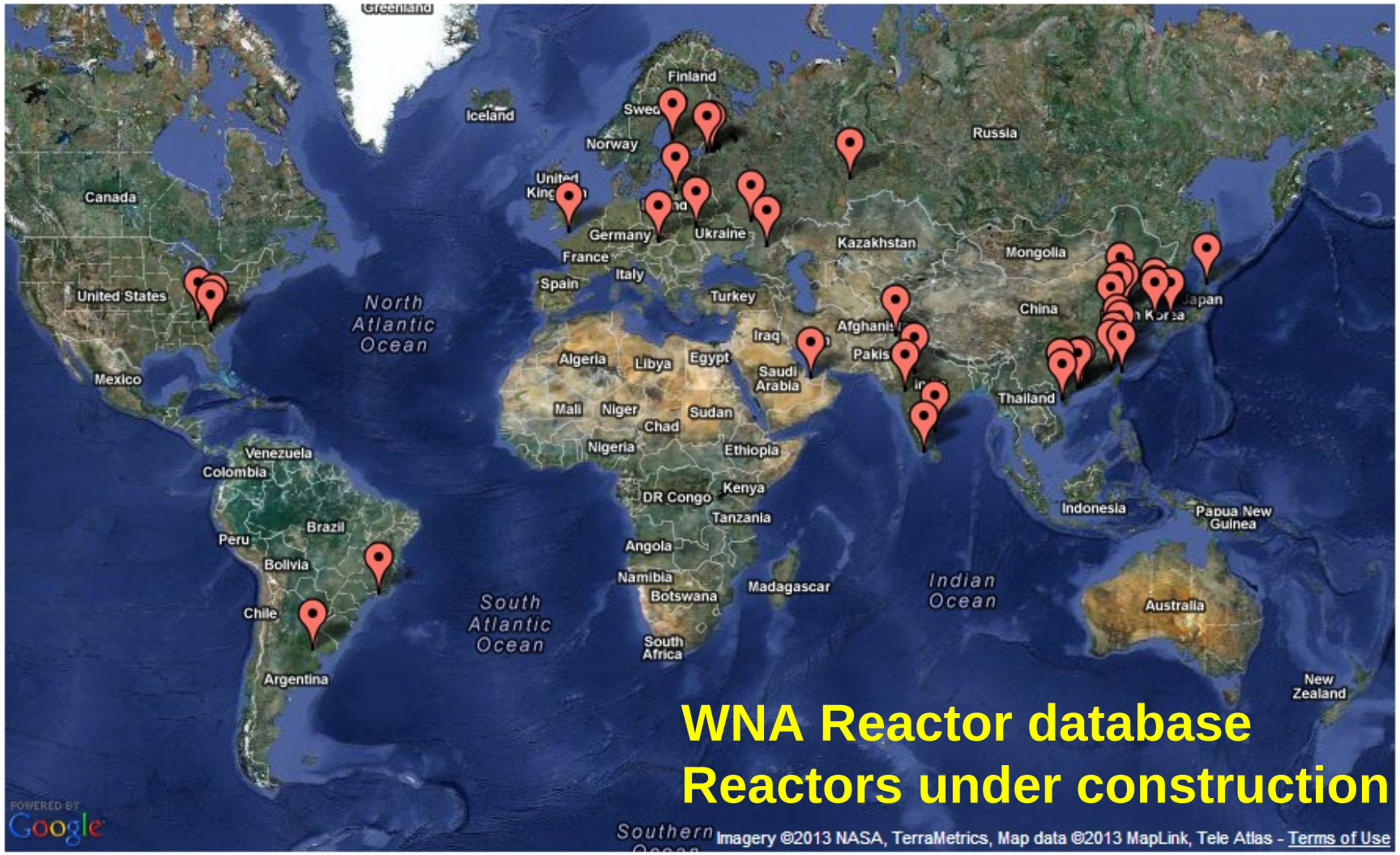
Radiation covering Europe (left) and part of Sweden (right)



Eating of moose was banned

Nuclear set to growth:

Nuclear new build around the world



Based on increasing public and policy support globally

Countries representing over 50% of the world's population still support nuclear. **Only one country has decided to phase-out.**

Existing nuclear countries which support new nuclear (no phase-out) : **Argentina. Armenia, Brazil, Bulgaria, Canada, China, Czech Republic, Finland, France, Hungary, India, Iran, Japan, Mexico, Netherlands, Pakistan, Romania, Russia, Slovakia, Slovenia, South Africa, south Korea, Spain, Sweden, Taiwan, Ukraine, United Kingdom, USA**

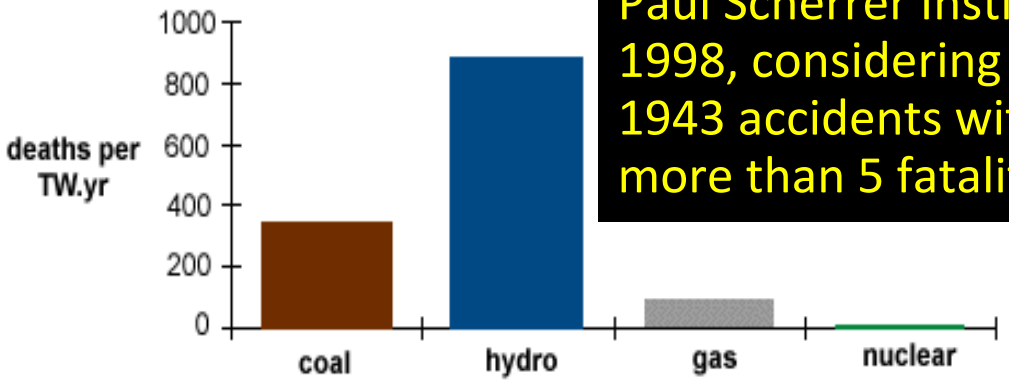
Existing nuclear countries with moratoria/life restriction: **Switzerland, Belgium**

Existing nuclear countries with Shutdown and phaseout: **Germany**

Thinking about providing for Britain's future energy generation needs, which of the following do you support the MOST? – YouGov poll Feb 2013

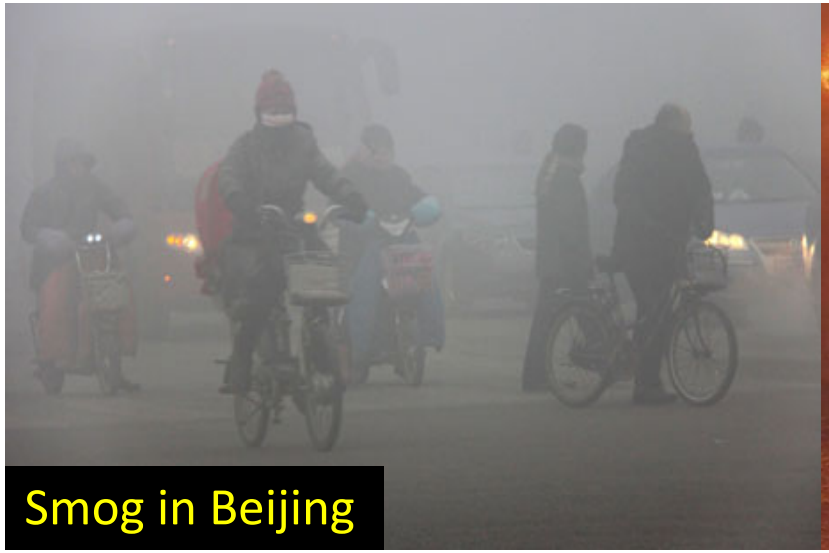
Nuclear	26%
Wind	18%
Tidal/Wave	18%
Solar	16%
Gas	5%
Coal	2%
None	1%
Don't know	14%

Not only because it's safe



Paul Scherrer Institut 1998, considering 1943 accidents with more than 5 fatalities

The alternatives to nuclear are far more dangerous – even including accidents

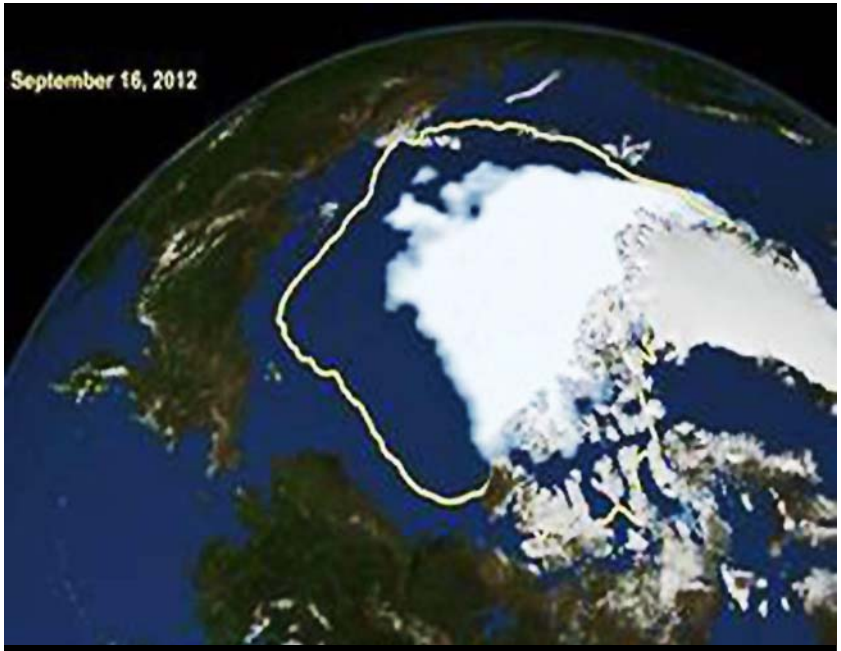


Smog in Beijing

Chiba refinery fire

But because it's essential…

Climate change. A problem which nuclear, with its low CO2, is key to solving



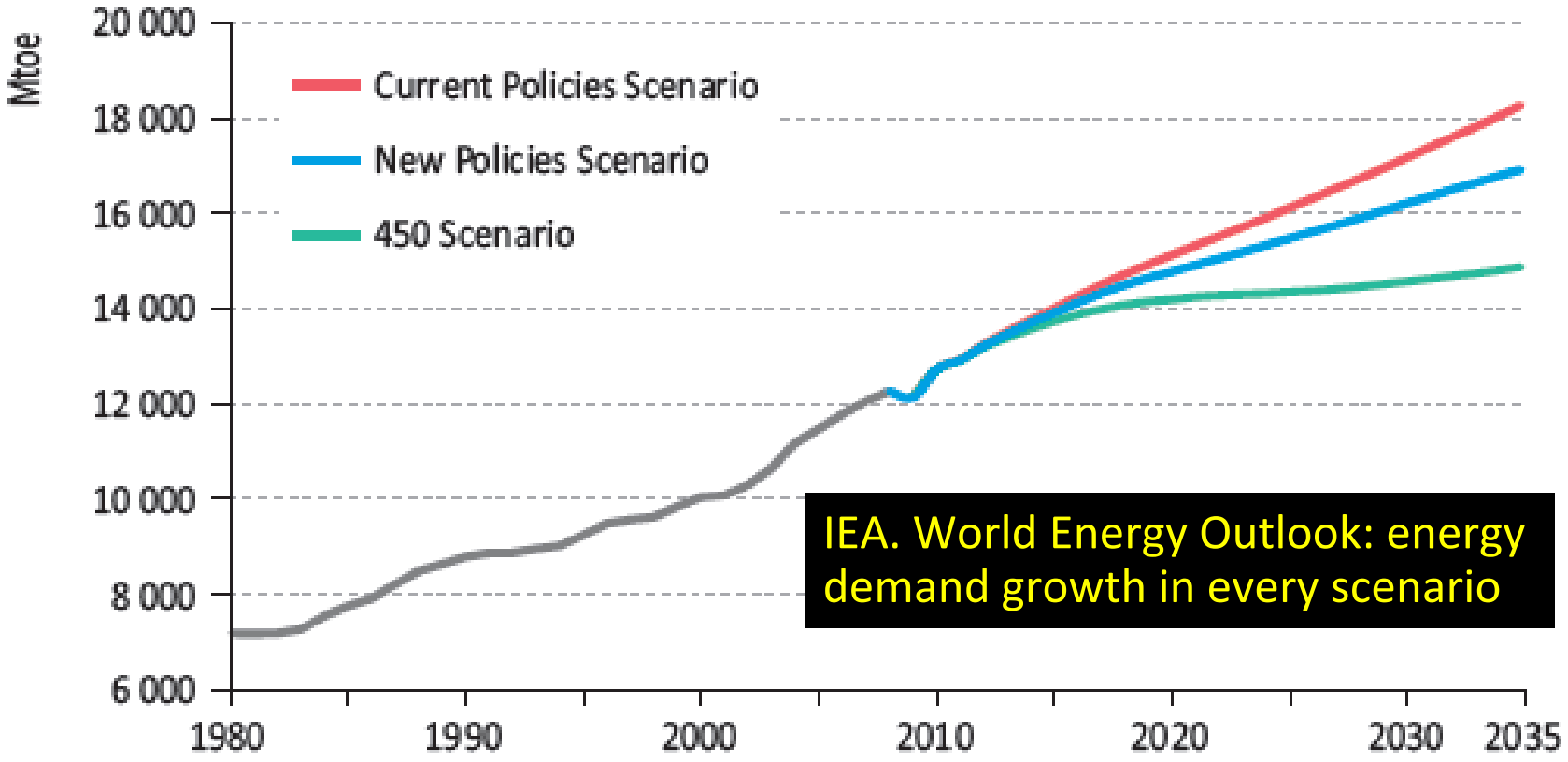
Record arctic summer ice melt in 2012. Source: NASA

Energy Security. Affects many, but nuclear's low fuel costs make it a solution

India blackouts affect 650 million. Source: Graphic news

…and it's growing in importance

Figure 2.1 ● World primary energy demand by scenario



IEA. World Energy Outlook: energy demand growth in every scenario

This not only Japan should know…

In the two years since the accident, with the majority of reactors still shut, Japan has witnessed a surge in fossil fuel imports – especially LNG. This has been a large factor in turning Japan's trade balance negative

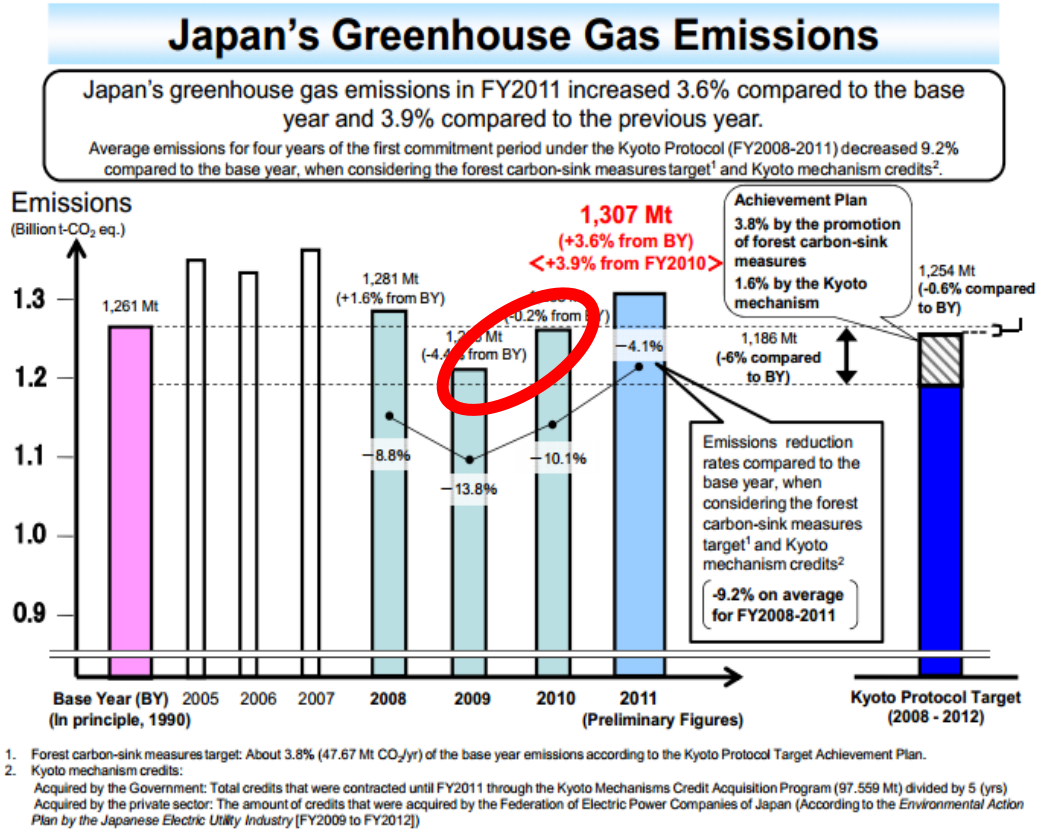
Prov.	Exports Value	Percent Change	Imports Value	Percent Change	Balance Value	Percent Change
2008	81,018,088	-3.5	78,954,750	8	2,063,338	-80.9
2009	54,170,614	-33.1	51,499,378	-34.8	2,671,236	29.5
2010	67,399,627	24.4	60,764,957	18	6,634,670	148.4
2011	65,546,475	-2.7	68,111,187	12.1	-2,564,712	-
2012	63,747,572	-2.7	70,688,632	3.8	-6,941,060	170.6

Japan, Ministry of Finance and Trade figures (millions of yen)

Very few low carbon energy sources around…

The increased reliance on fossil fuels has also destroyed any hope Japan had of meeting its Kyoto protocol objectives

Who wants to guess what the GHG figures for FY 2012 will be?

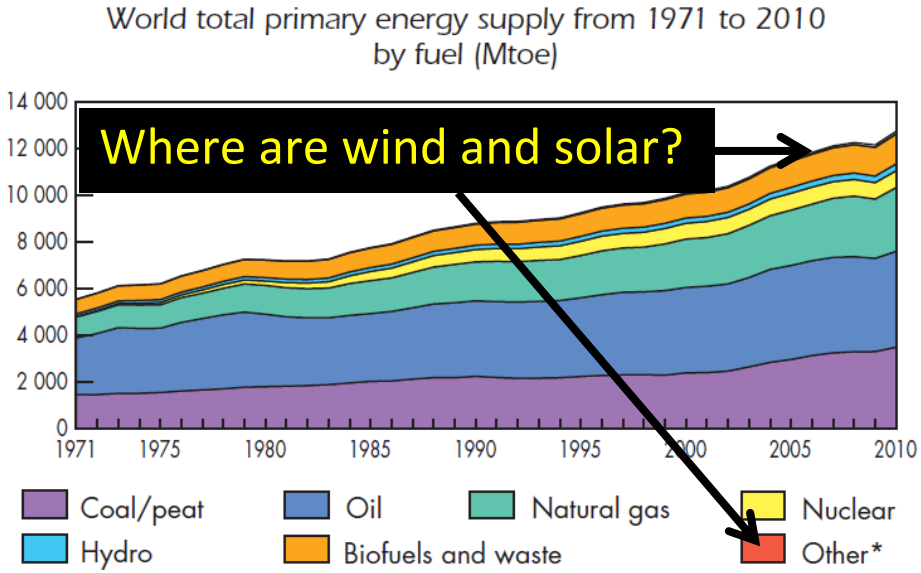


1. Forest carbon-sink measures target: About 3.8% (47.67 Mt CO_2/yr) of the base year emissions according to the Kyoto Protocol Target Achievement Plan.
2. Kyoto mechanism credits:
   Acquired by the Government: Total credits that were contracted until FY2011 through the Kyoto Mechanisms Credit Acquisition Program (97.559 Mt) divided by 5 (yrs)
   Acquired by the private sector: The amount of credits that were acquired by the Federation of Electric Power Companies of Japan (According to the *Environmental Action Plan by the Japanese Electric Utility Industry* [FY2009 to FY2012])

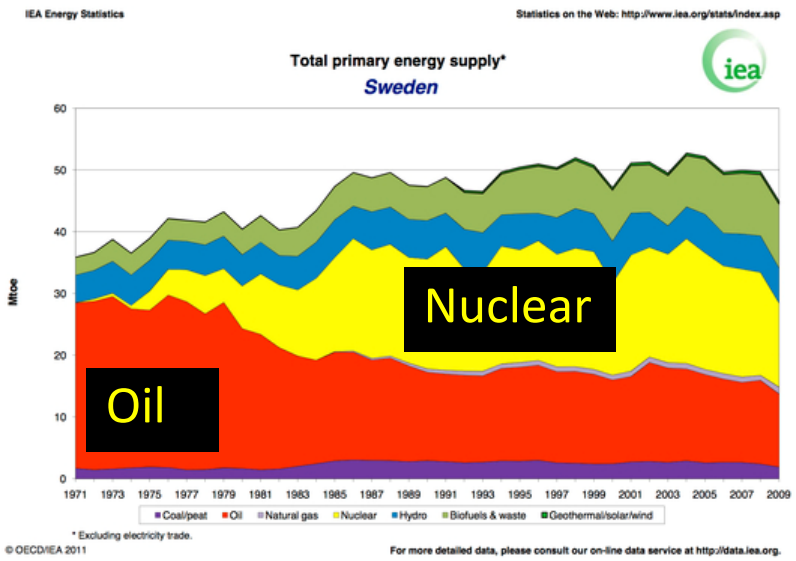
Figure 1 Japan's national greenhouse gas emissions

Japan Ministry of Environment

Renewables can't do it all – and there is extensive experience from trying



IEA key statistics



IEA country statistics - Sweden

Despite over 20 years of expansion wind and solar power make a tiny contribution to world energy requirements.

The best performing countries combine nuclear power and renewables to reduce fossil fuel consumption

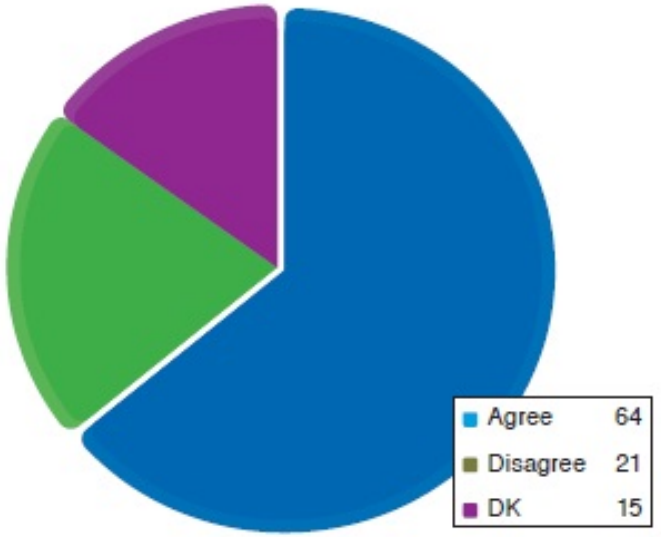
Put nuclear back into perspective

Nuclear power only makes sense in the context of our energy choices. Risks must be put in perspective and benefits shown

We want easily accessible energy at the push of a button:

1.affordable
2.reliable
3.environmental quality

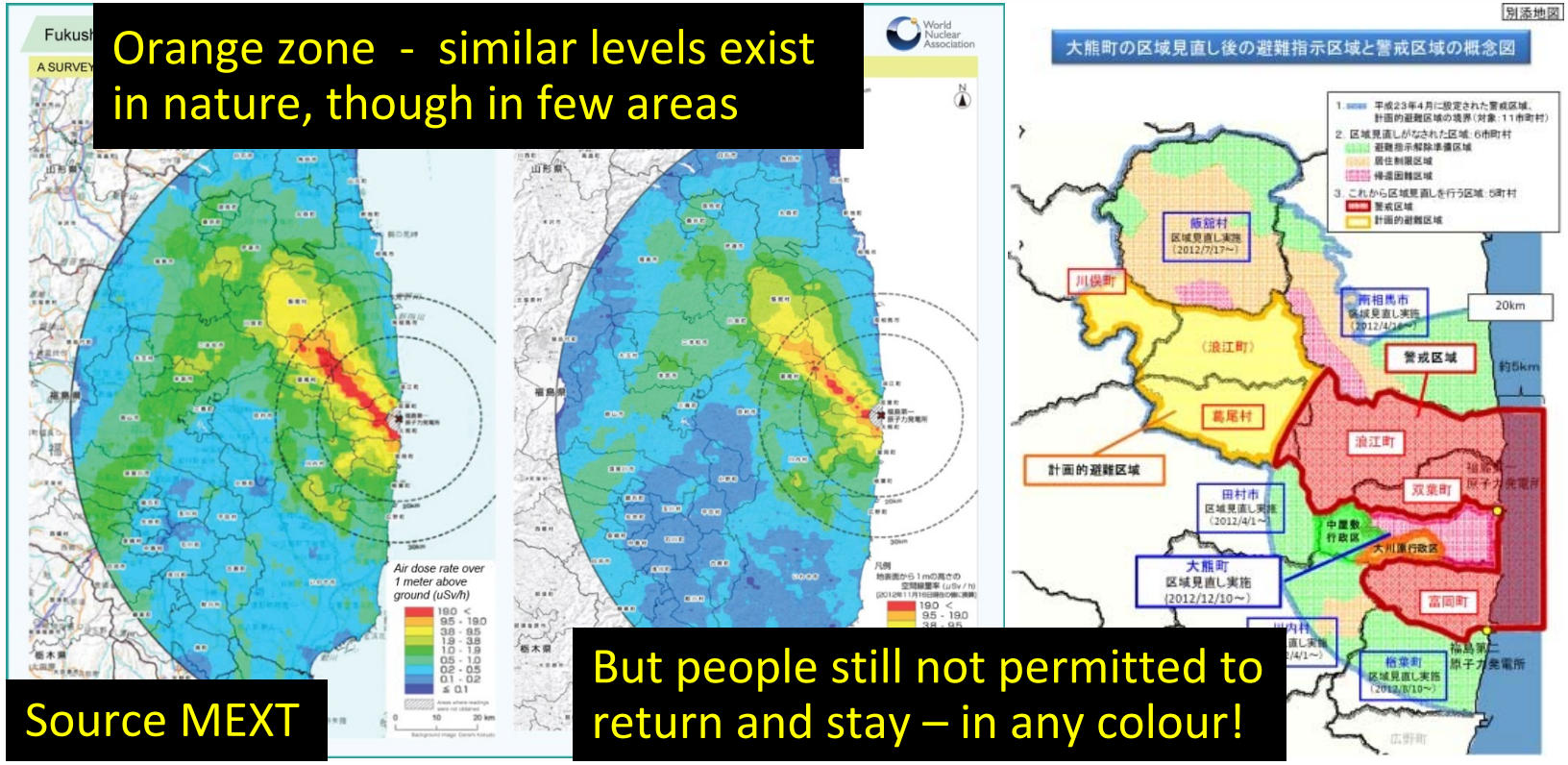
We need all energy sources. But there are not many energy sources that meet all three conditions.



Source - Eurobarometer 2008

Agree/disagree: The use of nuclear energy enables European countries to diversify their energy sources

Allow people the possibility to go back



Radiation dose rates are half what they were one year ago.

There are no observed effects at most levels now indicated

Compare this to legal activities – e.g. eating meat or riding bikes

Restoring trust in professionals

The nuclear industry and radiation experts must do their part.

But the media must avoid fearmongers. **They cause real health consequences.** Look at the pictures, who do you trust?

UNSCEAR

UNSCEAR on Chernobyl:

- 30 workers dead from radiation
- Increase in thyroid cancers among children. Few fatalities
- No demonstrated increase in cancer in public further to the thyroid cancer among children.

"However there were widespread psychological reactions to the accident, which were due to fear of the radiation, not to the actual radiation doses"

"A new Greenpeace report has revealed that the full consequences of the Chernobyl disaster could top a quarter of a million cancer cases and nearly 100,000 fatal cancers."

Neighbouring property to my summer house