

Damage of Fukushima Nuclear Accident and a new compensation scheme

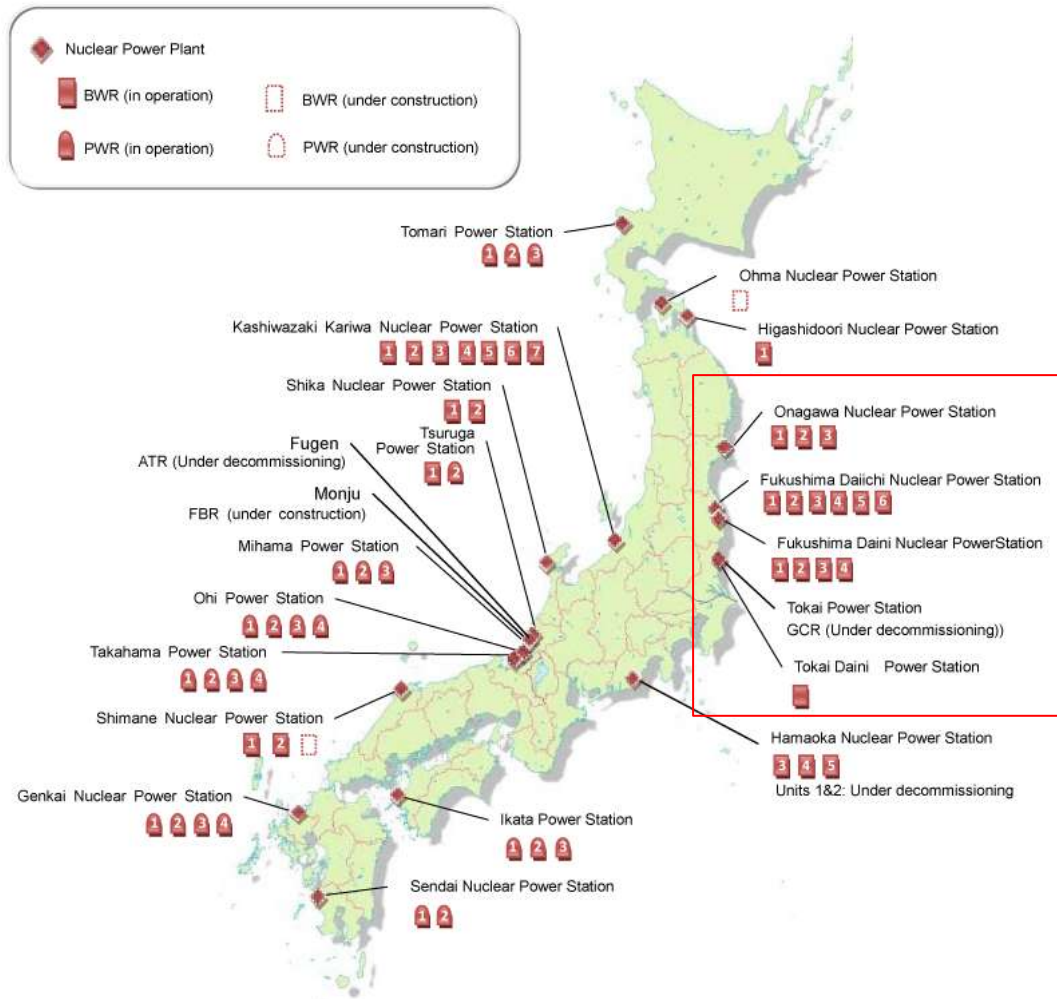
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What happened in Fukushima



- 3.11 2011
 - Huge tsunami hit nuclear power plants on the east coast of Japan.
 - The Fukushima nuclear accident has brought a huge impact on the regional society of the eastside of Japan.

What is the Fukushima Accident?

- Multiple disaster
 - tsunami / earthquake disaster
 - + radioactive exposure and contamination by an accident
- Accident of multiple reactors
 - meltdown of reactor No. 1, 2 and 3
 - 4 spent fuel pools
- Severe accident in a highly populated area
 - Population
 - Fukushima prefecture: 2 million
 - Tokyo metropolitan area: more than 30 million

Reports on the Fukushima Accident

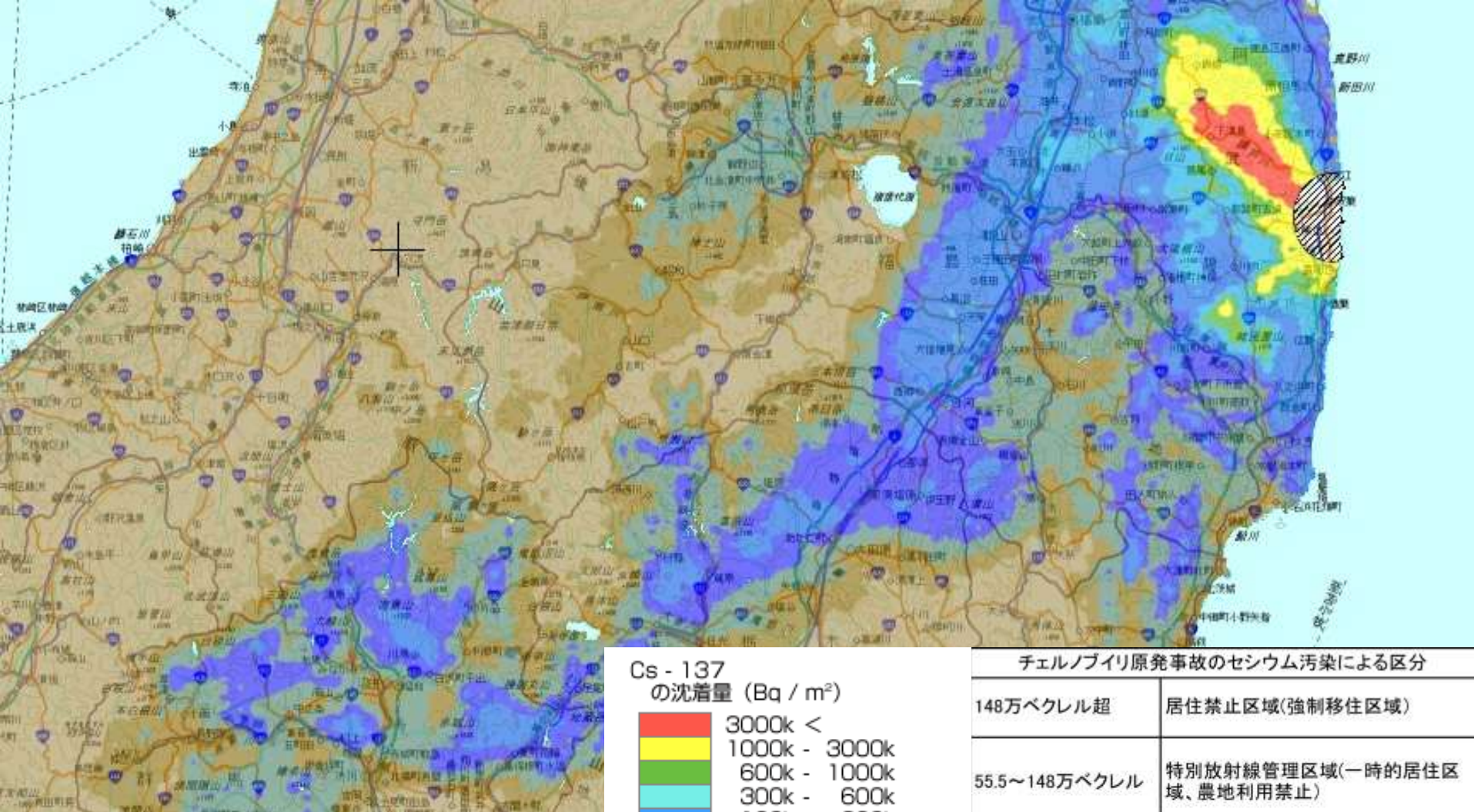
- Reports submitted to IAEA by the Government
 - June 2011
 - September 2011
- Report by TEPCO
 - June 2012
- Report by the Fukushima Nuclear Accident Independent Investigation Commission appointed by the National Diet of Japan
 - July 2012
- Report by the Investigation Commission appointed by the Cabinet
 - July 2012
- Other reports by independent groups
 - March 2012 by the Independent Investigation Commission on the Fukushima Nuclear Accident
 - to be published in 2012 by the Atomic Energy Society of Japan

What is the Damage of Fukushima Nuclear Accident

1. Environmental damage
 - Severe radioactive contamination
 - Radiation exposure
 - Human health risk
2. Loss of human dignity
 - home
 - community (towns and villages)
 - culture
 - occupation
 - livelihood
 - family separation
3. Huge economic loss

Discharge of radioactive materials to the environment

	Fukushima		Chernobyl
	Nuclear Safety Commission of Japan	TEPCO	
Total (I 131 equivalent)	770 peta Bq (10 ¹⁵)	900 peta Bq	5200 peta Bq



Amount of radioactive Cs-137 deposited into soil

Approximately 8,000 km² is contaminated

チェルノブイリ原発事故のセシウム汚染による区分	
148万ベクレル超	居住禁止区域(強制移住区域)
55.5～148万ベクレル	特別放射線管理区域(一時的居住区域、農地利用禁止)
18.5～55.5万ベクレル	高汚染地域(居住権を持つ居住区域)
3.7～18.5万ベクレル	汚染地域

Source : the Ministry of Education, Culture, Sports, Science and Technology, Map of radiation dose. (<http://ramap.jaea.go.jp/map/map.html>)

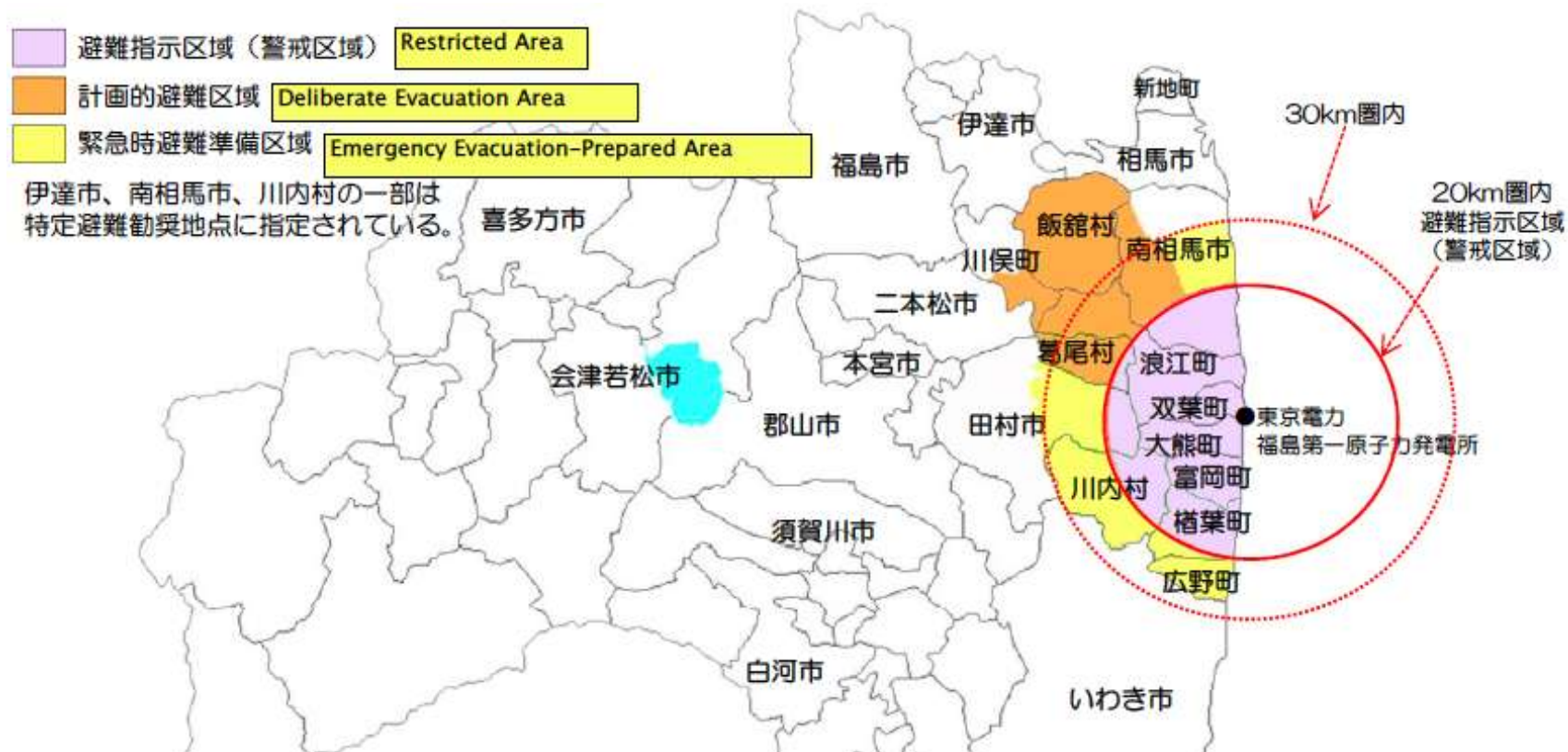
Evacuees of the Fukushima Accident

(as of 22 Sep 2011)

	Evacuation by the instruction of the national government	“Self evacuation”	Total
Evacuees to inside Fukushima prefecture	70,817	23,551	94,368
Evacuees to outside Fukushima prefecture	29,693	26,776	56,469
Total	100,510	50,327	150,837

Source: “Data on self-evacuation,” the 18th meeting of the Dispute Reconciliation Committee for Nuclear Damage Compensation, 6 December 2011.

Evacuation Areas (until 10 August 2012)



Restricted Area	within 20km radius
Deliberate Evacuation Area	possibility of accumulated dose reaching 20mSv within one year after the accidents
Emergency Evacuation- Prepared Area	within 30 km radius

High school students lost their own classrooms.



Is Fukushima the worst case?

There existed a critical situation in the wake of the accident.

- Examples
 - Risk of severe exposure of radiation (several Sv/h) within the plant site unless TEPCO succeeded in ventilation of reactor cores.
 - an inner informal fax letter of the Nuclear and Industrial Safety Agency on 12 March 2011
 - Possibility of compulsory evacuation within a radius of 170 km and voluntary evacuation within a radius of 250 km in case of a collapse of a spent fuel pool of the reactor No.4.
 - estimated on 25 March 2011 by Dr. Shunsuke Kondo, the chairperson of the Atomic Energy Committee.
- All information was kept secret for several months.

Key features of a nuclear accident

1. Incomparable scale of damage
 - material term
 - monetary term
2. Continuity and prolongation of damage
3. Complete destruction of a community and regional economy



Source: Oshima and Yokemoto (2012), *Damage of the Fukushima Nuclear Accident and Compensation*, Otsuki Shoten, in Japanese

Nuclear policy after Fukushima

- Many committees have established regarding nuclear and energy policies since the accident.
- Policy and measures regarding nuclear power were and to be formulated.

Policy

- The new Energy Basic Plan is to be formulated by the Cabinet in September 2012. *Nuclear 0 % scenario?*
- The new Framework for Nuclear Energy Policy is under discussion by the Japan Atomic Energy Commission (AEC).

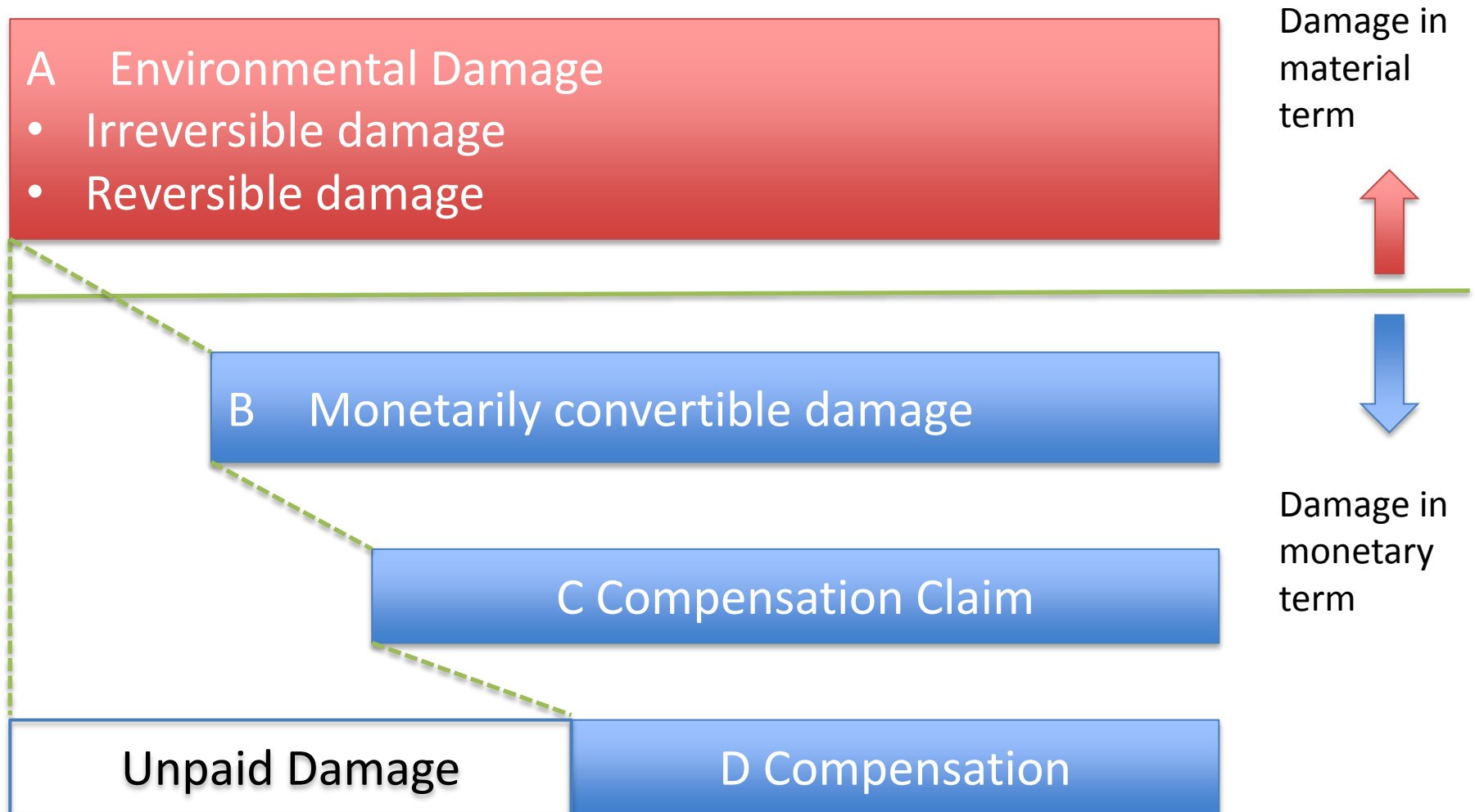
New scheme and organizations

- New regulatory bodies will be established in September 2012.
- A new scheme for compensation of nuclear damage was established in August 2011.

Why “nuclear damage” and a “compensation scheme” are important

- Challenges to an existing liability scheme
 - An existing compensation scheme was entirely ineffective in Japan.
 - International limited liability scheme will lead a catastrophic impact to victims and a nation in case of a severe accident.
 - 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy
 - 1963 Vienna Convention on Civil Liability for Nuclear Damage
 - Convention on Supplementary Compensation for Nuclear Damage
- Impact to renewables
 - An existing liability scheme is a hidden subsidy to nuclear power.
 - Nuclear power acquires additional artificial competitiveness, that causes overuse of nuclear power.

Damage and Compensation



How much is the damage?

billion yen

Compensation to victims (estimated)*	temporary damage		2,618.4
	damage of the first year		1,024.6
	damage of the second year		897.2
	damage from the third to fifth year		1,345.8
Termination of the accident *	Fukushima daiichi reactors No.1 - 4	till 31 March 2011	147.845
		thereafter (estimated)	1,151
	Fukushima daiichi reactors No.5-6 (partly estimated)		385.125
Monetary Loss by suspension of building new reactors (No.7 and 8)			39.4
Restoration *	decontamination		unknown
Administrative cost *	National government (fiscal year of 2011 and 2012)		1,085.9
	Local authorities		unknown
Total			8,695.23 (=85 billion euros)

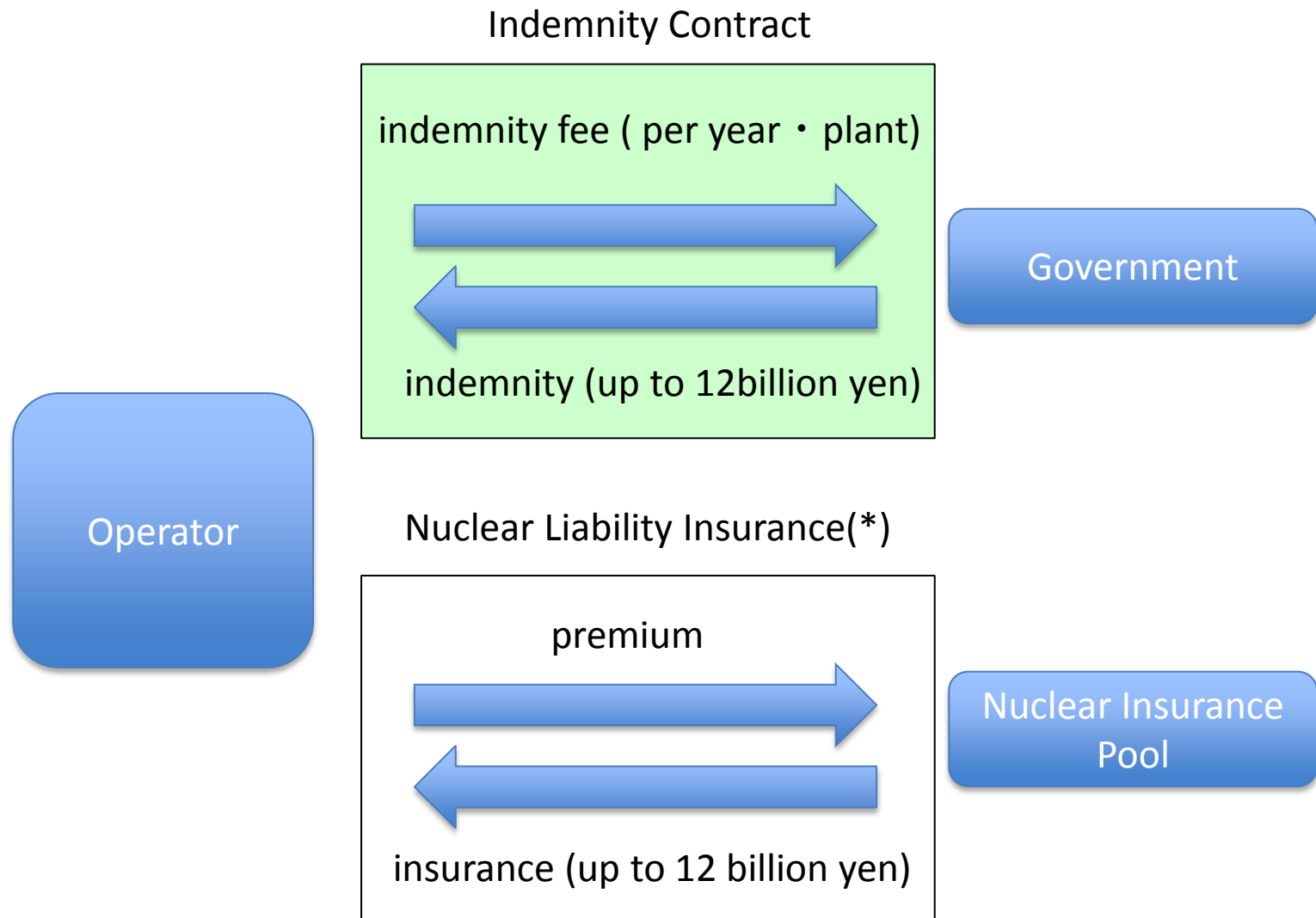
* TEPCO is liable for all costs caused by the accident.

Japan's compensation scheme before Fukushima

- Act on Compensation for Nuclear Damage (1961)
 - Principles
 1. Strict liability: a nuclear operator is liable whether or not any fault or negligence can be proven.
 2. Unlimited liability
 3. Exclusive liability: all claims are to be brought against nuclear damage.
 - Financial security

An operator is prohibited from reactor operation unless financial security for compensation of nuclear damage has been provided.

 - Liability insurance;
 - Indemnity contract with the national government



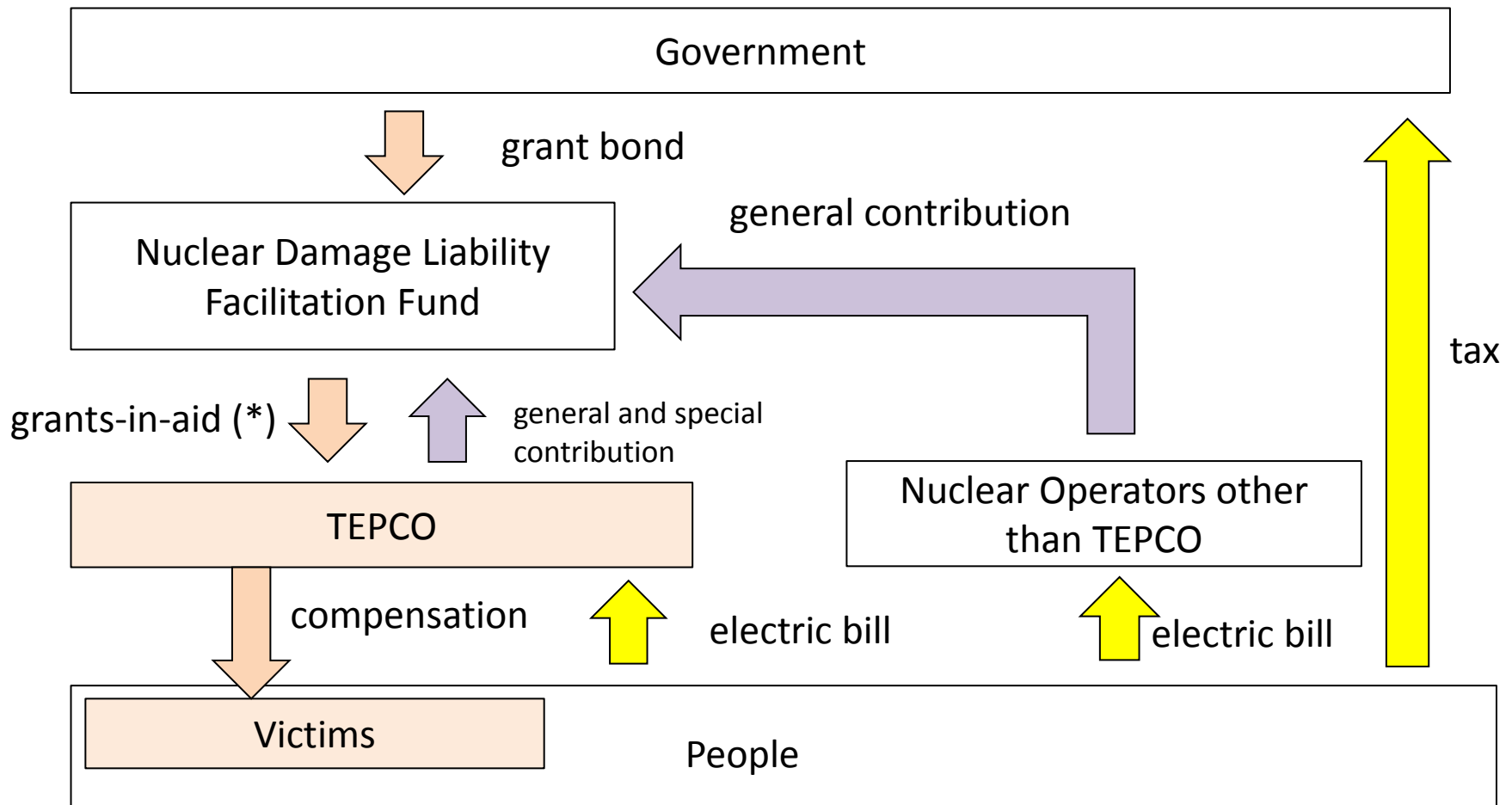
* The insurance doesn't cover damages caused by earth quake and tsunami.

Compensation scheme before Fukushima

Cause of accident	General accident	Natural disaster, normal operation and delayed damage	Abnormally large natural disaster
Liability of an operator	Strict, unlimited and exclusive liability		Exemption
Financial security	Liability Insurance	Indemnification Contract	None
Financial security amount	120billion (=1.2 billion euros), 24billion and 4 billion yen according to the scale of a facility		
Measures taken by the national government	The government shall give a nuclear operator such aid as is required for him to compensate the damage, when actual amount of damage exceeds the financial security and the government deems it necessary.		Rescue of victims and pollution prevention measures.

Financial security amount is entirely insufficient. Therefore, a new additional compensation scheme was established.

A new compensation scheme



*A "grants-in-aid is not a loan to TEPCO. Therefore TEPCO treats "grants-in-aid" as a "special profit".

A new compensation scheme

- TEPCO is liable for all costs caused by the accident, but TEPCO can not afford to pay by itself.
- The main monetary resource is a grants-in-aid from the Nuclear Damage Liability Facilitation Fund, whose source is a “grant bond” given by the Government.
- The grants-in-aid is not a loan to TEPCO. Therefore TEPCO treats it as a “special profit”.

A new compensation scheme

- TEPCO and other nuclear operators should pay contribution (general contribution) to the Facilitation Fund annually. In addition to this, TEPCO should pay “special contribution” to the Fund.
- By a new ministerial ordinance of the Ministry of Economy Trade and Industry, nuclear operators including TEPCO can pass cost of general contributions to electric consumers.
- Therefore, most of the accident cost is burdened by people. It can be said that this scheme created a new subsidy to nuclear power.
- In addition, monetarily convertible damage is underestimated and compensation to victims is insufficient for rebuilding their life.

Conclusive Discussion

- The Fukushima nuclear accident has brought a huge impact to Japanese society.
- The monetarily convertible damage is estimated to 8.7 trillion yen at the moment.
- The overall picture of the damage is still unclear and monetarily convertible damage is to increase.
- The amount of damage in Fukushima has significance to a nuclear liability regime in the world. It is clear that the international financial security for compensation is insufficient when a severe accident occurs.