

“Invisibility” damage
caused by the accident at
the Fukushima Daiichi
Nuclear Power Plant



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Friends of the Earth Japan

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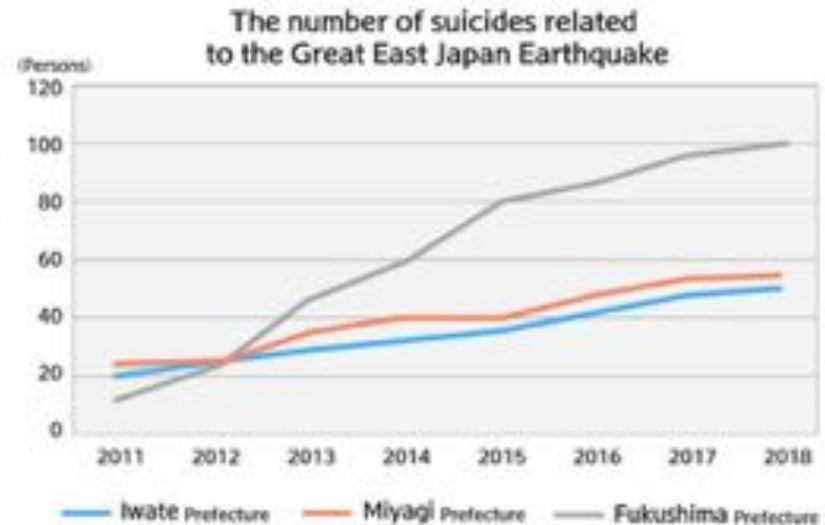
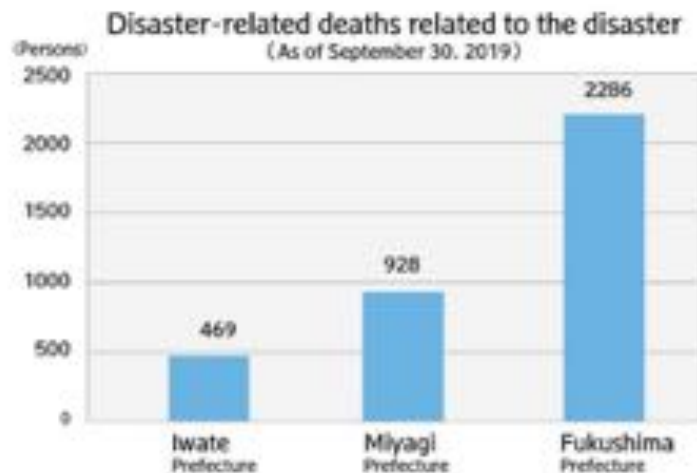
- "invisibility" nuclear accident damage
- Lifting and Returning Evacuation Areas
- desperate evacuees
- thyroid cancer in children
- a radioactive substance that is scattered

Current Situation of the Nuclear Accident with No Resolution in sight

- many evacuees, poverty
- Lost "Furusato – home town", communities, relationship with nature
- loss of one's vocation
- harsh reality facing returnees
- Dispersed radioactive material, unforeseen disposal of decontaminated soil, and increasing amounts of contaminated water
- health concerns and health hazards
- ecosystem impact...

- Disaster related deaths ... 2,267 in Fukushima Prefecture
- a person suffering from mental and physical problems in a prolonged evacuation
- Those who were killed by themselves ... more than 100.

Earthquake-related deaths and suicides



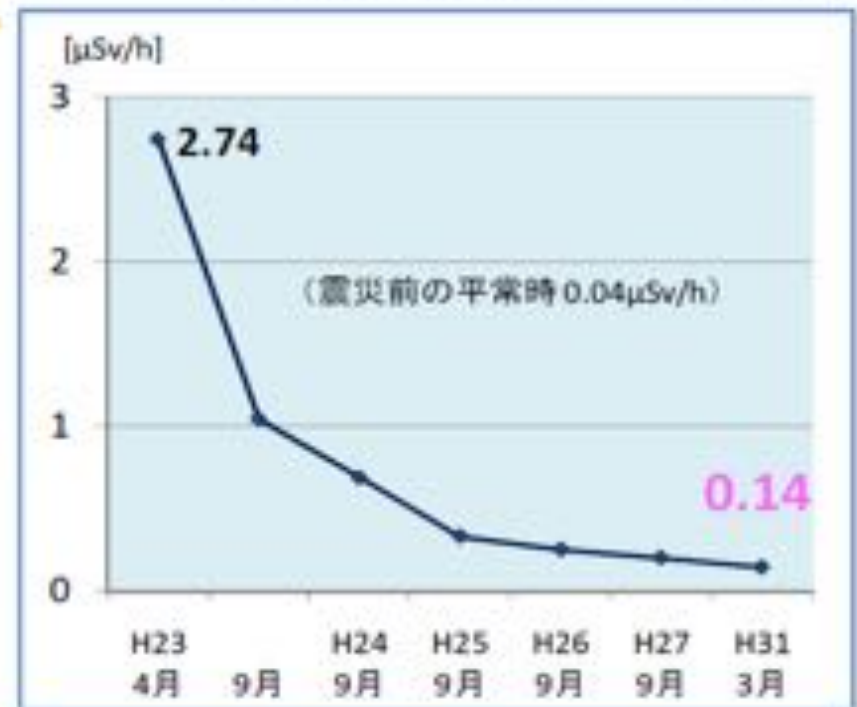
Source: Changes in the number of suicides related to the Great East Japan Earthquake
(Ministry of Health, Labour and Welfare)

Nine years after the nuclear accident Air dose rate decreases

◆放射線量の推移

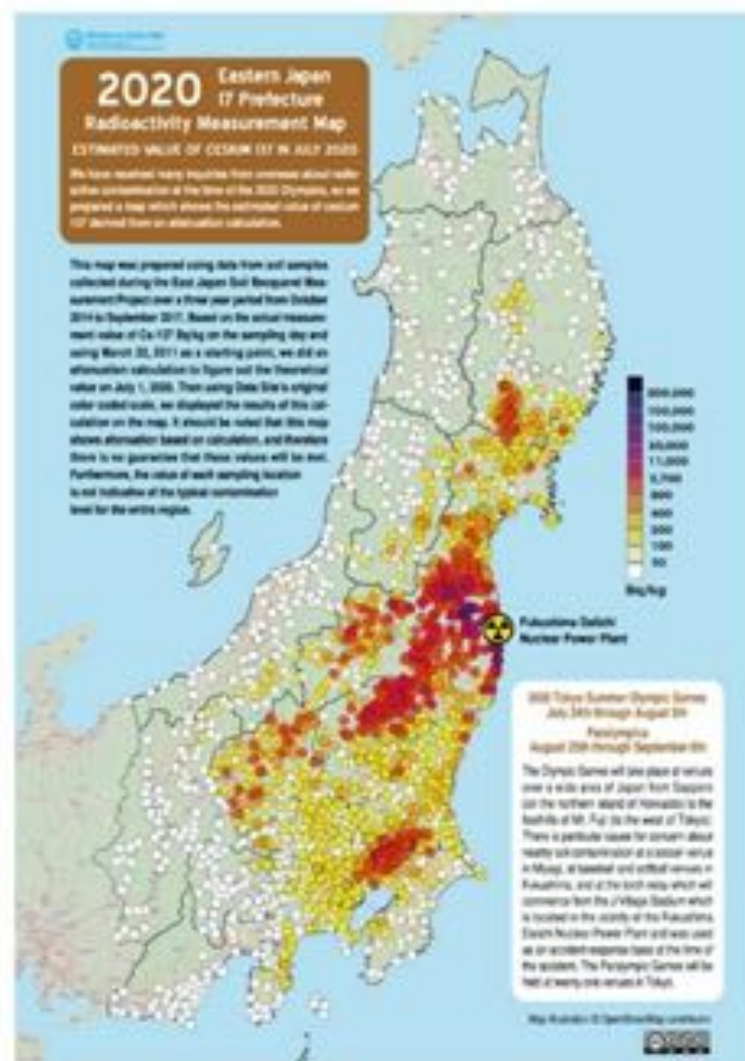
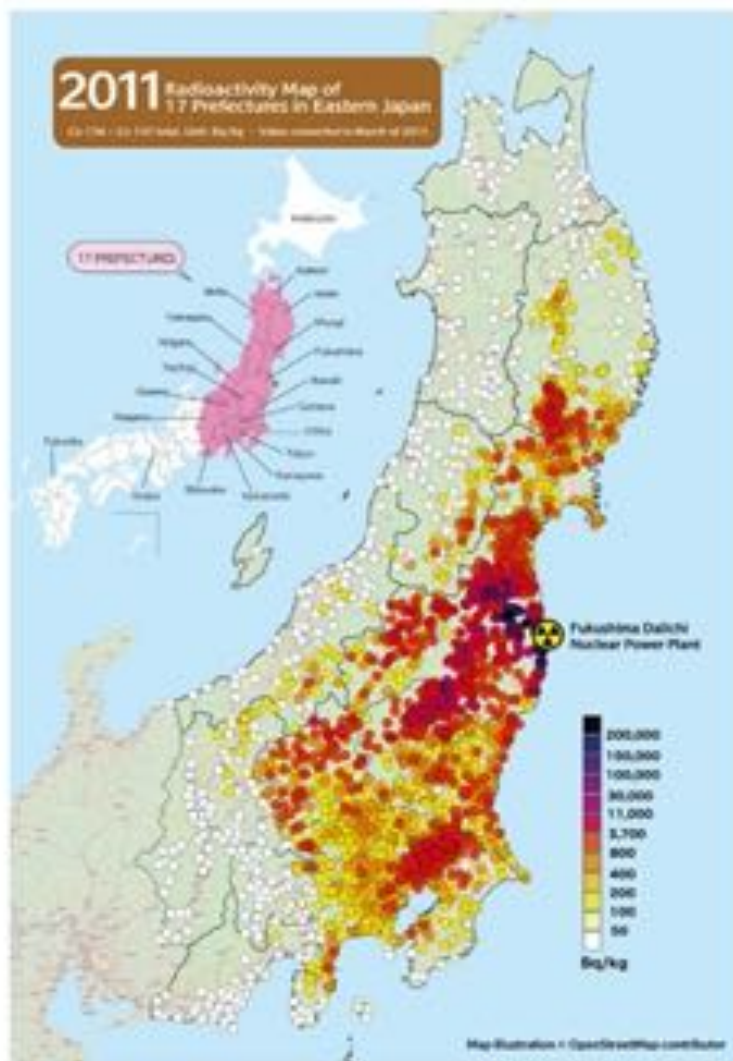
| | 福島市 | 会津若松市 | いわき市 |
|-------------|------|---------------|---------------|
| 震災前の 平常時 | 0.04 | 0.04 ~0.05 | 0.05 ~0.06 |
| 平成23年4月 | 2.74 | 0.24 | 0.66 |
| 9月 | 1.04 | 0.13 | 0.18 |
| 平成24年3月 | 0.63 | 0.10 | 0.17 |
| 9月 | 0.69 | 0.10 | 0.10 |
| 平成25年3月 | 0.46 | 0.07 | 0.09 |
| 9月 | 0.33 | 0.07 | 0.09 |
| 平成31年3月 | 0.14 | 0.05 | 0.06 |

単位: $\mu\text{Sv/h}$ (マイクロシーベルト/毎時)

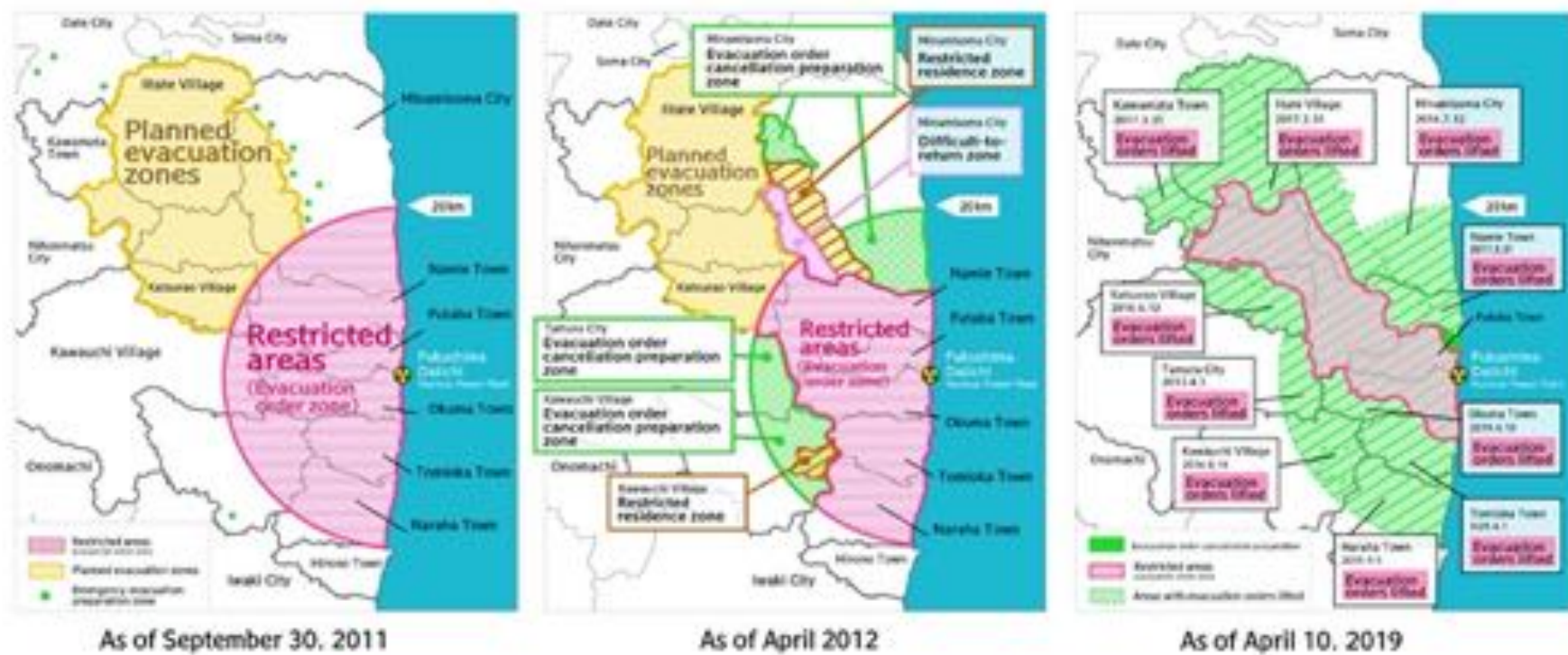


【出典】福島県災害対策本部(暫定値)

Soil contamination in Eastern Japan 2011 to 2020



Chronology of areas under evacuation orders



Source: Fukushima Prefecture "Transition of evacuation designations"
<http://www.pref.fukushima.lg.jp/info/sanritsu/2019-04-10.html>

Comparison of responses to the Fukushima and Chernobyl nuclear accidents

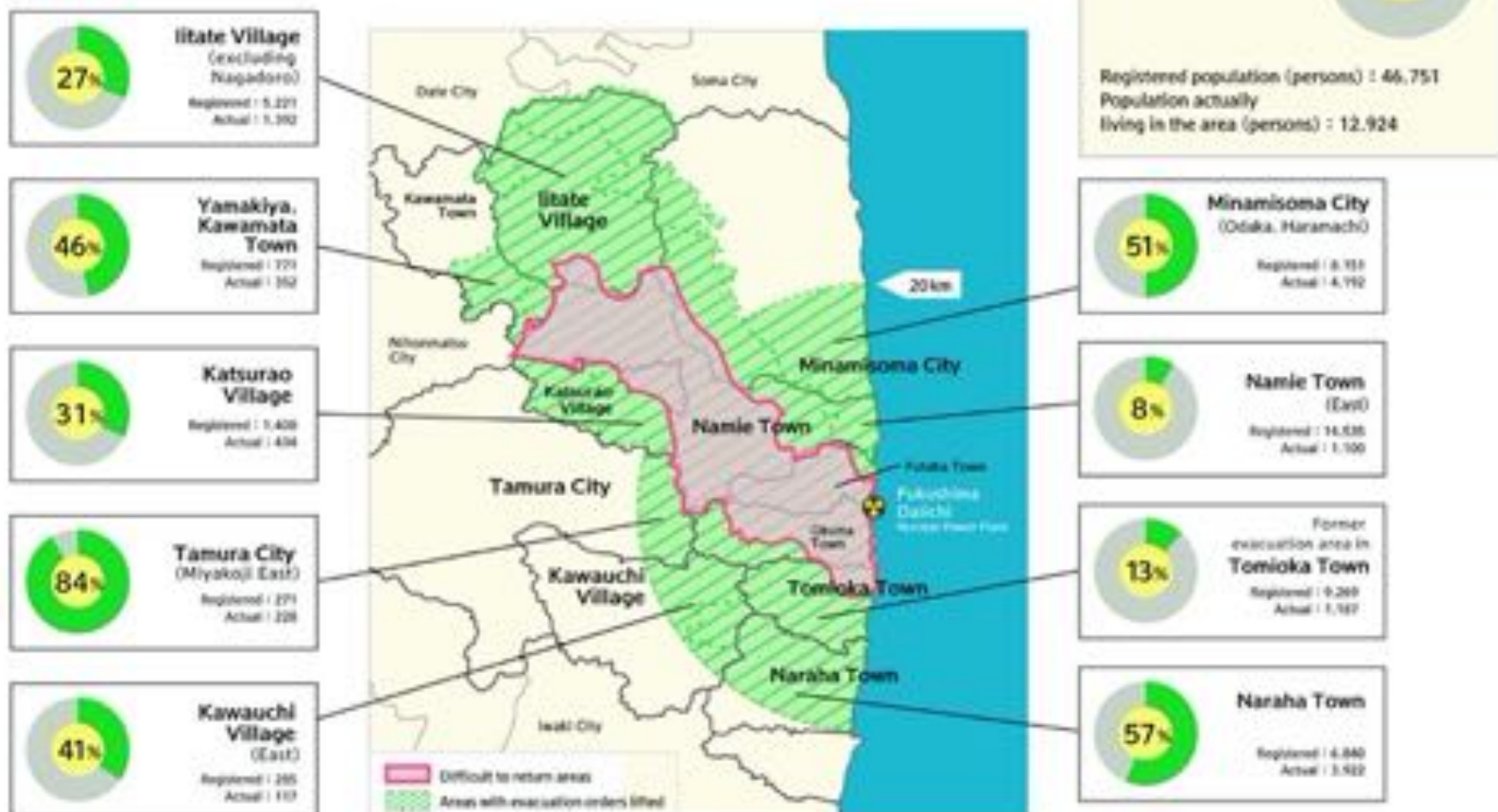
| | Eligible under the Chernobyl Act Ukraine, Belarus, Russia | Fukushima Daiichi Nuclear Accident Japan |
|---|---|--|
| Mandatory evacuation | mSv/yr or greater Cesium 137 concentration 555,000 Bq/m ² or greater*1 | 20 mSv/yr or greater No standard for soil contamination |
| Right to resettle | 1 to 5 mSv/yr Cesium 137 concentration 185,000 to 555,000 Bq/m ² | None |
| Monitoring Social and economic benefits | Below 1 mSv/yr *2 Cesium 137 concentration 37,000 Bq/m ² or greater | None |
| Recuperation programs | 3 weeks recuperation annually National government program | None |

*1 For Russia, 1,480,000 Bq/m² or greater *2 For Ukraine, 0.5mSv/yr or greater



Are people returning home?

Return rate in areas where evacuation orders have been lifted



As of December 31, 2019 or January 1, 2020.
For Namie, as of November 29, 2019, For Tomioka, as of December 11, 2019

通行制限中

この先
帰還困難区域につき

通行止め

原子力災害現地対策本部



complex feelings of the residents

"We want to protect what we have built up from our ancestors. I want to go home."

"Houses are being torn down one after another in the neighborhood. Is this really "reconstruction"?"

"Considering the effects of radiation, I don't think it's an environment where children can live. But I want to go back to Tomioka where I have a lot of memories."

Evacuees being "invisibility"

- Fukushima Integrated Plan (Revised December 2012) ... "0 evacuees by 2020" as a Goal
- End of assistance and early return policy
- Evacuees from Fukushima Prefecture : 164,865 (May 2012) → 37,299 (July 2020) (7,580 people in Fukushima Prefecture *, 29,706 people from other prefectures)
- Some evacuees are not included in these numbers.
- Example) In Fukushima Prefecture ... evacuees from outside the evacuation zone, those who acquired their own houses, those who moved into public housing for reconstruction, etc. are not included.

Evacuees



Sources (in Japanese)

Status updates of damage from the Great East Japan Earthquake

Fukushima's path towards reconstruction Ver.26, p3

<https://www.pref.fukushima.lg.jp/uploaded/attachment/362626.pdf>

The government has terminated housing support for evacuees, practically forcing them to return home.

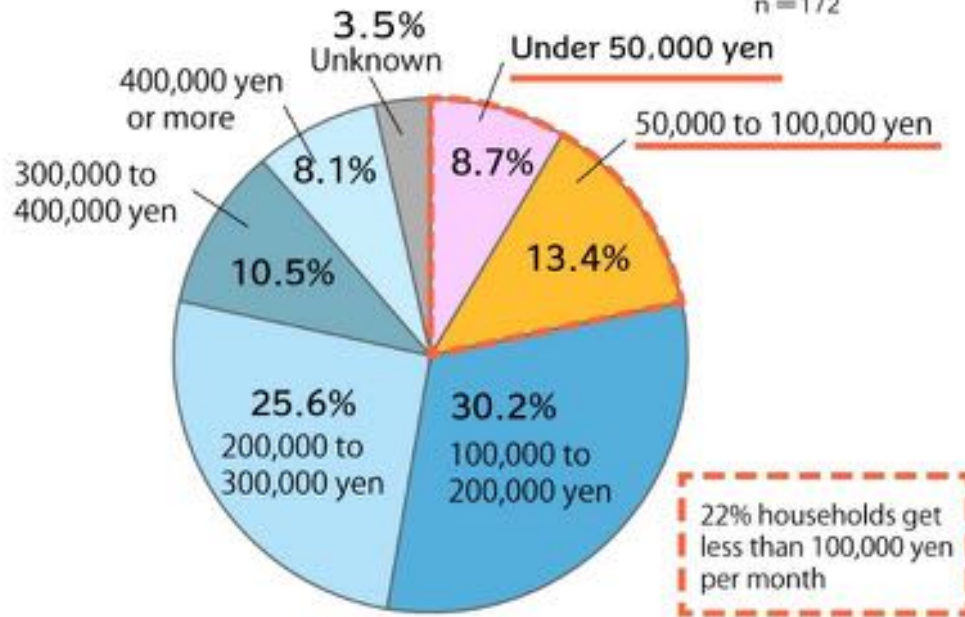
- March 2017 ... Housing for the evacuees outside the evacuation area was discontinued → 80% chose to continue evacuation → Even the evacuees who became impoverished
- March 2019
 - ...Discontinuance of rent support for low-income evacuees
 - ...Termination of continuous residence for national public servants
- Discontinuation of the provision of temporary housing and rental housing in the former Evacuation Area
- March 2020...Discontinuation of the provision of temporary housing and rental housing to “difficult-to-return” zones

Fragmentary information suggests the distress of evacuees

Monthly household income

Evacuees living in Tokyo who came from outside areas under evacuation orders to Tokyo (so-called "voluntary evacuees")

n = 172



[Evacuees living in Tokyo who came from outside areas under evacuation orders]

- 22% of households earning 100,000 yen or less a month
- More than 50% of households with less than 200,000 yen

Source (in Japanese): Tokyo Metropolitan Government "Results of survey for evacuees from Fukushima Prefecture, for which the provision of temporary housing was ended at the end of March 2017" (October 2017)

Verification by Niigata Prefecture

[suffering of life as a refugee]

"Grief and conflict over the loss of one's hometown" 70% or more

"economic burden" ... 79% of Evacuees living outside the Area

Reasons for the increased financial burden ...

"Transportation expenses for visits" ...

"Increase in food and energy costs associated with double living"

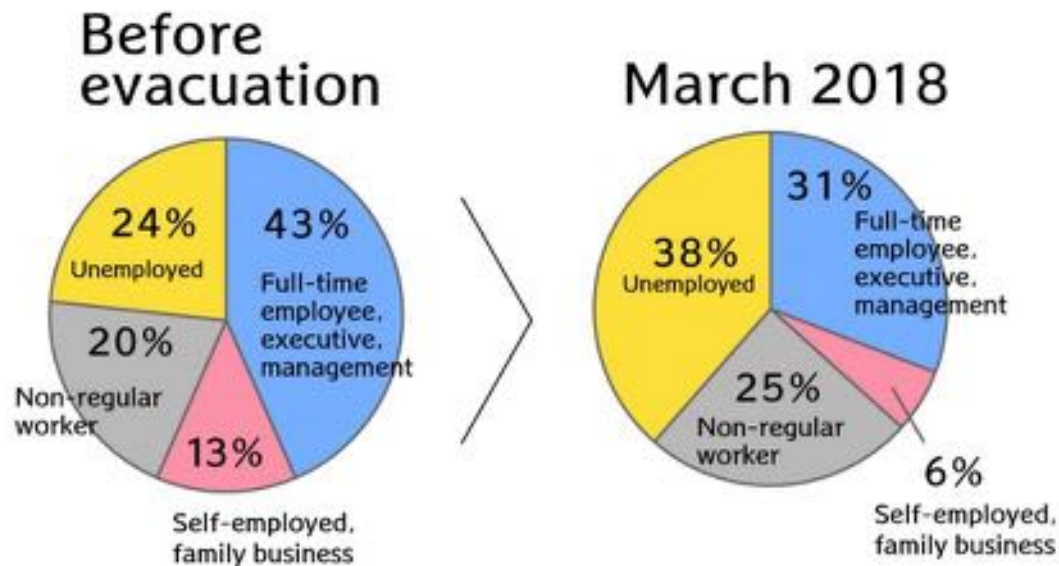
Verification by Niigata Prefecture

[change from before evacuation]

The number of people in the household decreased.

The number of regular employees, self-employed workers, and family workers decreased, while the number of non-regular workers, including part-timers and part-timers, and unemployed workers increased.

The average monthly household income decreased by 10.5 thousand yen.



Cases of consultation by evacuees to "co-operative center for evacuation"

- As living conditions have become worse, it is difficult to pay rent. I've run out of money.
- I wanted to move into public housing provided by the local government, but gave up due to the strict requirements.
- I am a mother who evacuated with my child. The divorce proceedings are currently underway. I am under medical treatment. If the divorce is not confirmed, the husband's income will be calculated, which exceeds the income requirement, and I will not be able to receive public assistance.
- Although I applied for public assistance, it was difficult to receive it due to various reasons such as living as evacuees (because of double life with Fukushima, keeping a car to take care of my parents in Fukushima. I'm afraid my child will be bullied, so I want to find a house near where I don't have to change schools..).

What's driving the refugees?



Many cases of thyroid cancer

| | Target vs.actual examinees | Confirmed or suspected cases (A) | Confirmed by surgery (B) | Male : Female ratio of A note1 | Ration of 1mSv or greater external aonng respondents to basic survey note 2 |
|-----------------------------------|--|----------------------------------|--------------------------|--------------------------------|---|
| 1 st round (2011~2013) | Target : 367,649 Actual 300,473人 (Ratio 81.7%) | 116 | 101 | 1 : 2.0 | 29% (19 of 65 respondents) |
| 2 nd round (2014-2015) | Target : 381,244 人 Actual 270,544人 (Ratio 71.0%) | 71 | 54 | 1 : 1.2 | 58% (21 of 36) |
| 3 rd round (2016~2017) | Target : 336,670人 Actual : 217,921 (64.7%) | 31 | 27 | 1 : 1.4 | 36% (4 of 11) |
| 4 th round (2018~) | Target : 294,240 Actual : 180,570 (61.4%) | 21 | 13 | 1 : 0.9 | 82% (9 of 11) |
| Exam when turning 25 years old | Target : 66,637 Actual : 5,578 (8.4%) | 7 | 4 | 1 : 2.5 | — |
| Total | | 246 | 199 | | |

Source: Prepared by FoE Japan from reports by the Fukushima Prefecture to August 2020

Note 1: The male:female ratio was 1:7.8 for thyroid cancer for youth at Noguchi Hospital, Kuma Hospital, and Ito H

Note 2: For the overall basic study, over 1 mSv the ratio was 37.8% (n=465,999)

Opinions of Fukushima Prefecture Health Survey Committee...

"The prevalence of thyroid cancer is several tens of times higher than that estimated from the incidence statistics of thyroid cancer known in the regional cancer registry."

"When the detection rates of malignancy or suspicion of malignancy were simply compared by region without considering gender, age, etc., in full-fledged inspections (second test), the percentages were highest in 13 municipalities including evacuation areas, followed by Nakadori, Hamadori, and Aizu region."

"There is no association between radiation exposure and thyroid cancer detected by full thyroid examination (second test)."

(Thyroid gland test evaluation subcommittee summarized on August 20, 2019)

Dr. Shinichi Suzuki, a thyroid cancer surgeon at Fukushima Medical University

- Reported 180 cases of childhood thyroid cancer at an international symposium on February 3, 2020.
- 72% had spread to lymph nodes and 47% had spread to surrounding tissues (infiltration)
- All patients required surgery.
- Recurrence occurred in 6%

3.11 fund for Children with Thyroid Cancer



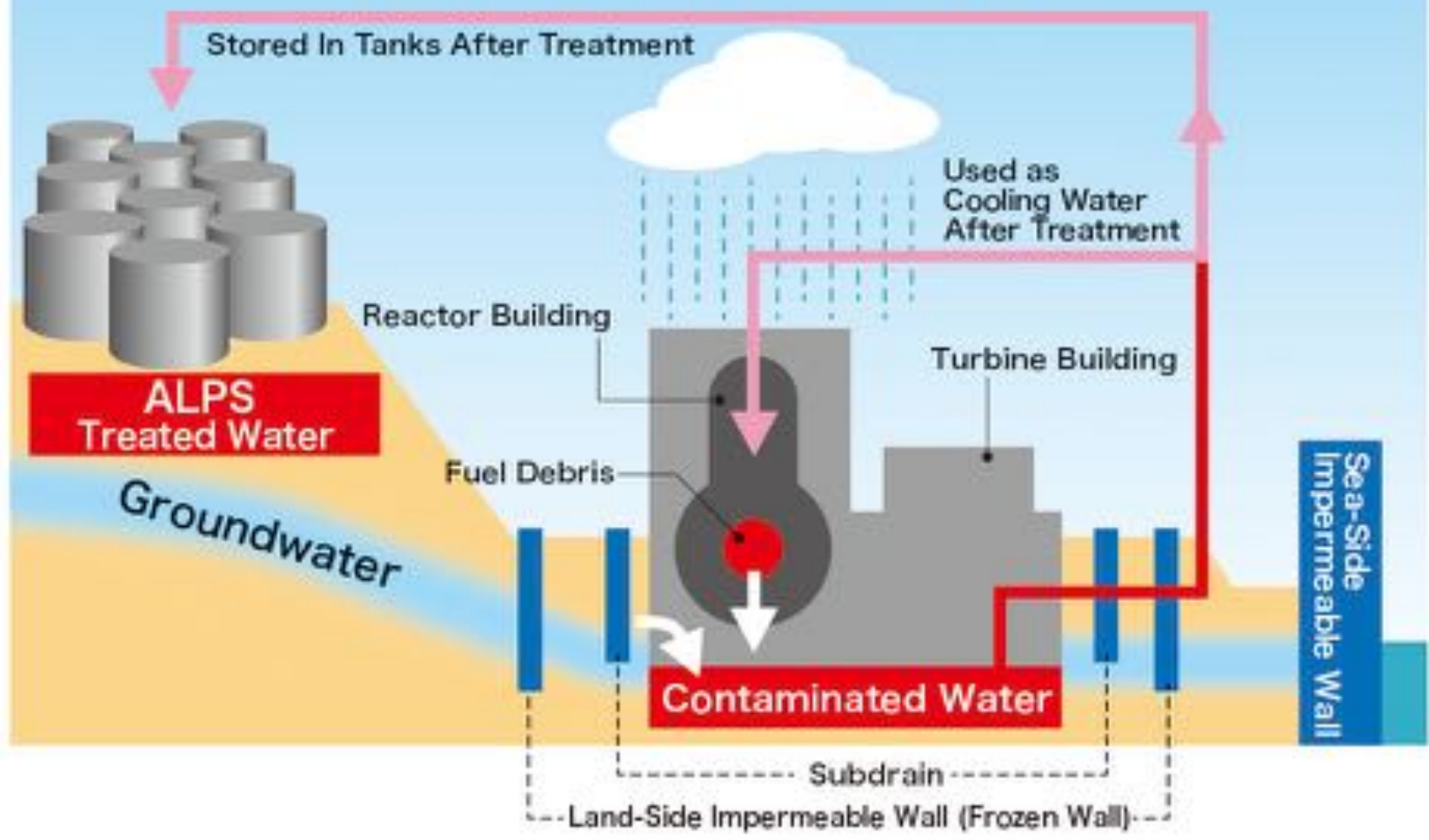
- Private Fund established in July 2016
- Economic support for thyroid cancer families who were 18 years old or younger at the time of the accident in 16 prefectures in eastern Japan
- Between December 2016 and March 2020, grant were paid to 161 people (105 in Fukushima Prefecture, 56 from other prefectures).
- Isotope therapy, recurrence, reoperation, etc.
- Visualization of patients' thoughts through a questionnaire survey

Treated but still contaminated water



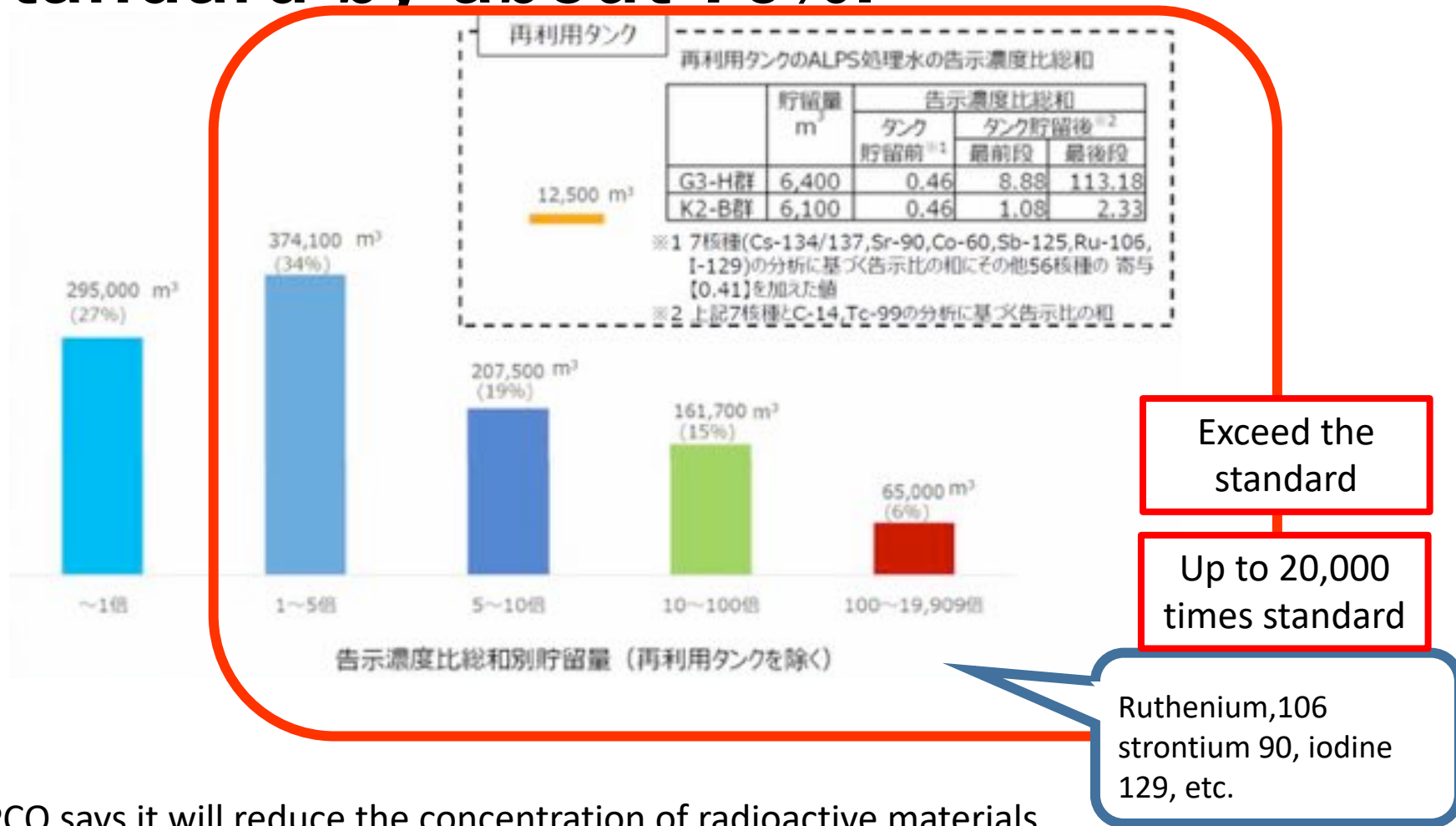
- The site will be filled with tanks by 2022.
- To decide how to dispose by the end of this year

Production of 'Treated Water'



- Approximately 1.2 million m³ of treated contaminated water
- Tritium of about 860 trillion becquerels
 - The Fukushima Dai-ichi NPS released 2.2 trillion becquerels of dioxins into the sea per year in 2010.
 - Liquid emissions from BWRs in Japan: approximately 0.316 ~ 1.9 trillion Bq/year
 - Approximately 18 ~ 83 trillion Bq/year from PWR plants in Japan
 - Some reprocessing plants release one 10000 trillion per year.
- Radioactive materials such as cesium 137, cesium 134, strontium 90, and iodine 129 remain in the treated water, and more than 70% of water containing in tanks radioactive materials exceeds the legal standard.

In addition to tritium, the sum of 62 nuclides and C 14 exceeds the standard by about 70%.



TEPCO says it will reduce the concentration of radioactive materials to within the standard level by "secondary treatment"

Discussions on treated but still contaminated water

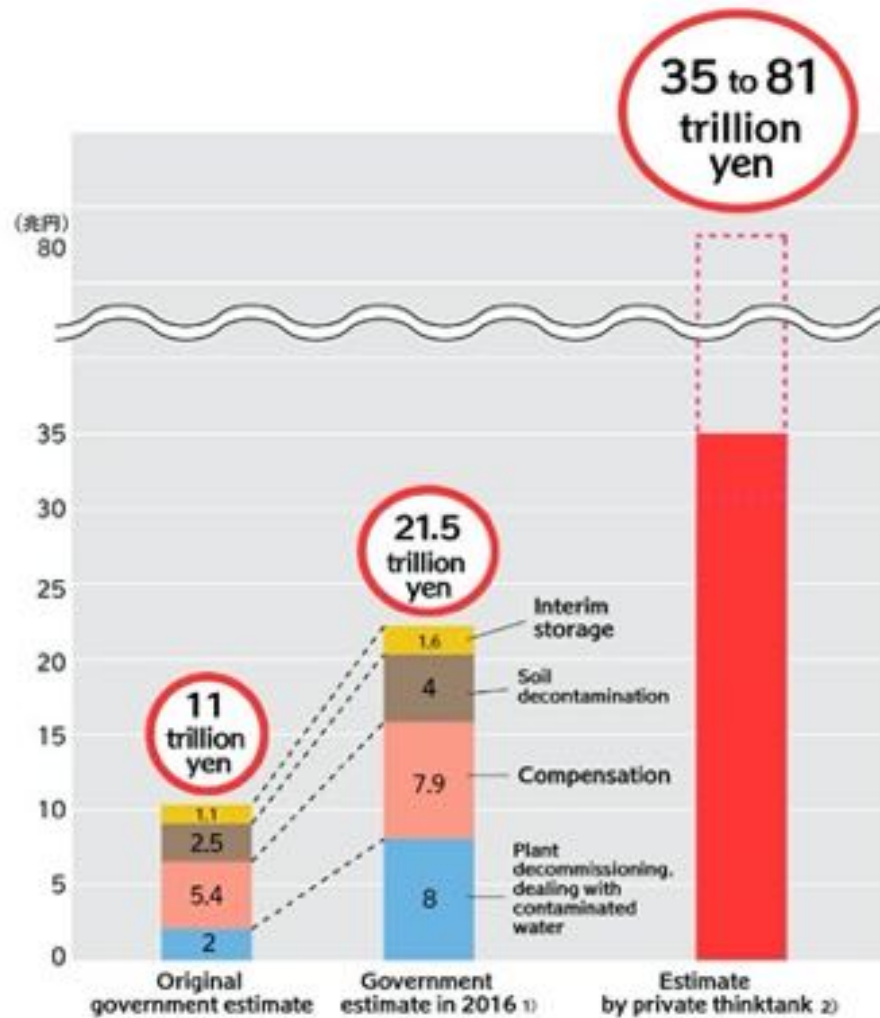
- Proposed by the Citizens' Committee for Nuclear Energy, including engineers and researchers, for the storage of large tanks and the solidification of mortar
- The nuance of tritium "be released in large quantities from nuclear power plants both at home and abroad"
"No common health effects have been reported" => "It's safe."
- At an explanatory hearing held in August 2018, 42 of the 44 people who spoke were against the release.
- Fishers strongly opposed (Fukushima Prefecture, neighboring prefectures, and the whole country)
- 21 municipalities in Fukushima Prefecture expressed their opinions on releasing treated water "opposition" or "be careful."

Contaminated soil generated as a result of decontamination



- Contaminated soil generated as a result of decontamination in Fukushima Prefecture is about 14 million m³.
- The Ministry of the Environment announced a policy to "reuse" contaminated soil of 8,000 Bq/kg or less for roads, railways, green areas, disaster prevention forests, seawalls, etc.
- In the Nagadoro area of Iitate Village, a demonstration project is underway to "reuse" contaminated soil for farmland development.

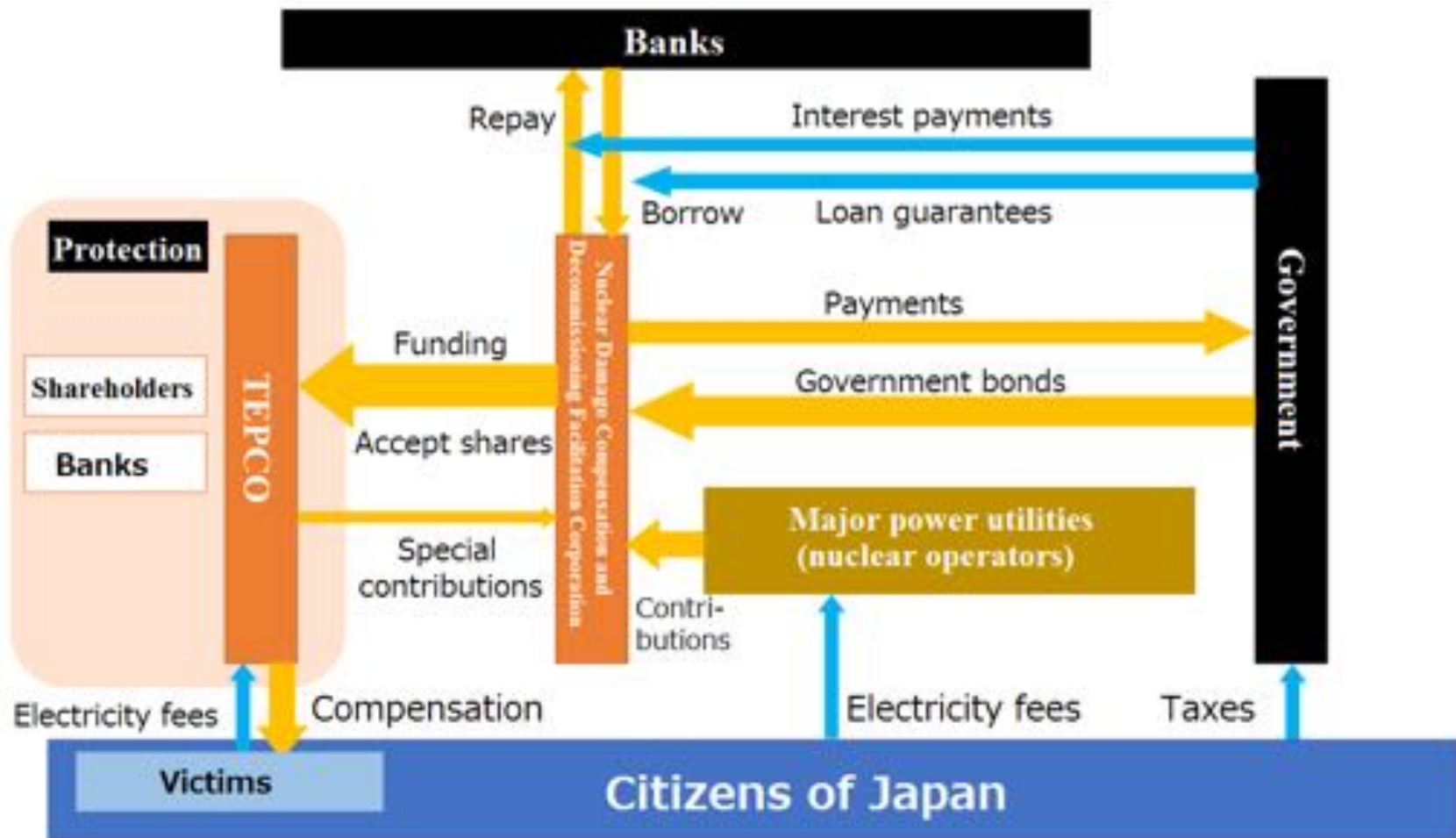
Costs of the Fukushima Daiichi nuclear accident



1) TEPCO reform and 1F Committee (Ministry of Economy, Trade and Industry), December 9, 2016.

2) "Cost of accident estimated at 35 to 80 trillion yen over 40 years." Japan Center for Economic Research, March 7, 2019.

Who ultimately pays the price of a nuclear accident?



Nuclear power is expensive.



- Soaring construction costs
- Costs in the event of an accident
- Nuclear waste disposal ...

->The cost of nuclear power generation in Japan is more than 17.6 yen per kWh. The wholesale price of electricity is about 10 yen.

Conclusion

- The Fukushima Daiichi Nuclear Power Plant Accident Is Not Over
- The damage has been "invisibility"
- The government is trying to diffuse radioactive materials.


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壊れたイチエフは
すぐそこ。

いまだ発令中の
原子力緊急事態宣言。

Illustration Kunihiro Suzuki

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あの事故から私たちは
何をまなんだでしようか？

飯館村の汚染土がはいったフレコンバック
福島県 2017年

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