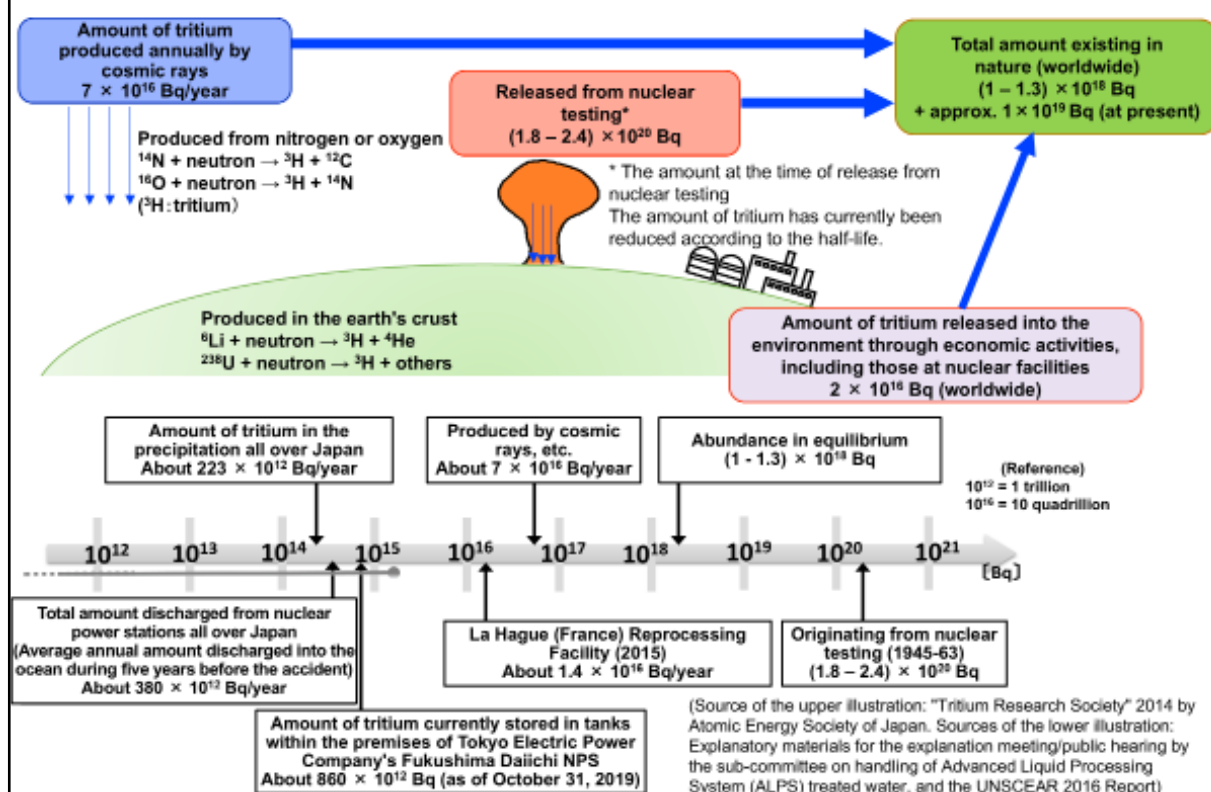


## Amount of Tritium Existing in the Environment



Tritium ( $^3\text{H}$ ) is a radioisotope of hydrogen (with a half-life of about 12.3 years) and emits weak radiation ( $\beta$ -particles) (p.79 of Vol. 1, "Characteristics of Tritium").

In nature, about seventy quadrillion ( $7 \times 10^{16}$ ) Bq of tritium is produced annually by cosmic rays, etc. on earth. In the past nuclear testing (1945 to 1963), tritium of  $1.8$  to  $2.4 \times 10^{20}$  Bq was released. In addition, tritium is discharged daily from facilities such as nuclear power stations around the world and the annual amount of tritium released from nuclear power stations around the world is  $2 \times 10^{16}$  Bq. Before the Tokyo Electric Power Company (TEPCO)'s Fukushima Daiichi NPS Accident, the annual amount of tritium released from nuclear power stations all over Japan was  $380 \times 10^{12}$  Bq (which is the average annual amount discharged into the ocean during the five years before the accident). Abundance in equilibrium (abundance when generation and disintegration<sup>1</sup> stay in equilibrium) in the environment is estimated to be  $1$  to  $1.3 \times 10^{18}$  Bq, and the current abundance of tritium derived from nuclear testing and released from nuclear facilities, etc. is estimated to be  $1 \times 10^{19}$  Bq. The released tritium exists mostly as hydrogen that makes up water molecules and it is also contained in water vapor in the atmosphere, rainwater, sea water and tap water. The annual amount of tritium contained in the precipitation in Japan is estimated to be about  $223 \times 10^{12}$  Bq.

1. The phenomenon wherein a radionuclide emits radiation and transforms into a different nuclide (p.10 of Vol. 1, "Parent and Daughter Nuclides"). Tritium transforms into helium through disintegration.

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