Country Report of Japan

The 17th FNCA Ministerial Level Meeting

November 30, 2016

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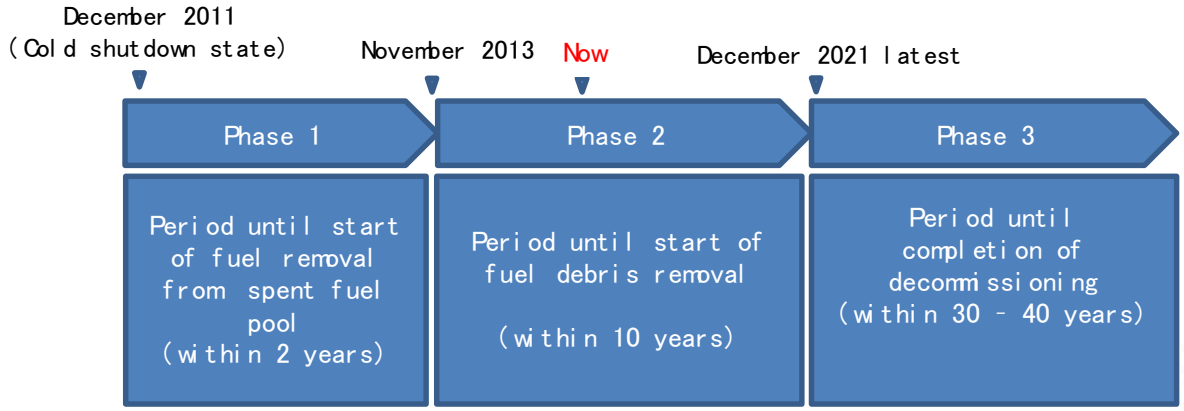
1. Nuclear Energy (Power use)
- Follow-up of Fukushima Nuclear Accident (on-site) -

- Mar 2011: Fukushima nuclear accident occurred.
- Dec 2011: The "Mid-and-Long-Term Roadmap towards the Decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station" was established.
- Jun 2015: The Roadmap was revised.

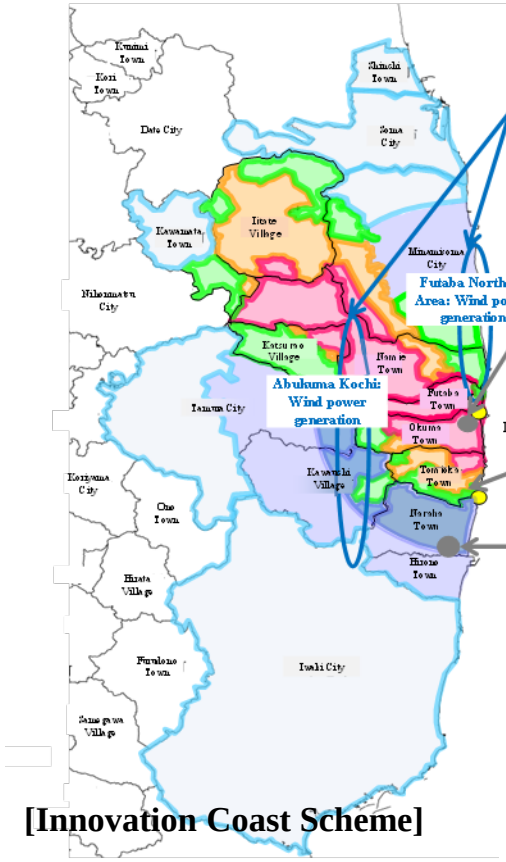


- The Landside Impermeable Wall (Ice Wall) to prevent the inflow of groundwater into reactor buildings began freezing in March, 2016

[Land-side impermeable walls utilizing the frozen-soil method]

Follow-up of Fukushima Nuclear Accident (off-site)

- Evacuees of Fukushima：165,000 (May 2012) → 84,000 (Sept 2016)
- Promote the ” Innovation Coast Scheme” to create a new industry centered on cutting-edge technologies for decommissioning and robotics, to facilitate efforts for revitalization of local communities.



[Innovation Coast Scheme]

Abukuma-Hamadori Area Wind Power Generation Scheme

Robot Development and Demonstration Base

Radioactive Material Analysis and Research Facility(Okuma Town)

Collaborative Laboratories Building, Collaborative Laboratories for Advanced Decommissioning Science(CLADS) (Tomioka Town)

Floating Offshore Wind Farm Demonstration Project

Naraha Remote Technology Development Center(Naraha Town)

Other major projects

[Agriculture, forestry and fisheries industry] Various projects are to be carried out and Fukushima Prefecture considers concrete measures therefor.

Overall information on Japan‘s energy supply

1. Self-Sufficiency

20% (2010) → 6% (2016)

Raise to close to 25%(2030)

Leverage RE and nuclear energy (generated domestically)

2. Electricity Cost

Home use +25%
Industry use +38%
(2010 → 2013)

Lower cost by2-5% from current levels

Utilize inexpensive sources:

- Nuclear energy
- coal-fired thermal

3. CO2 Emissions

+7.9%(2010→2013)

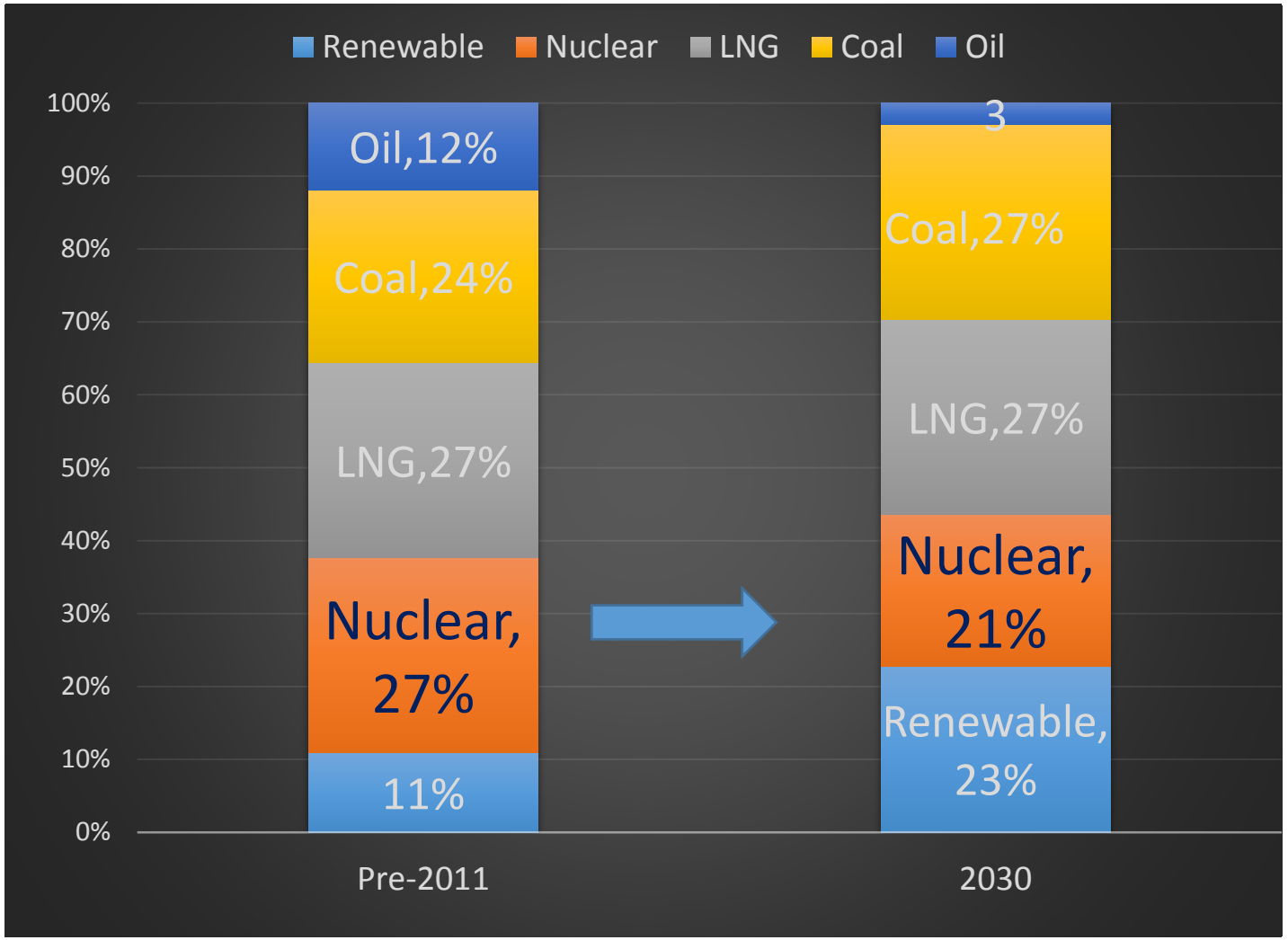
26% reduction*
(2013→ 2030)

*a comparable with EU and the US

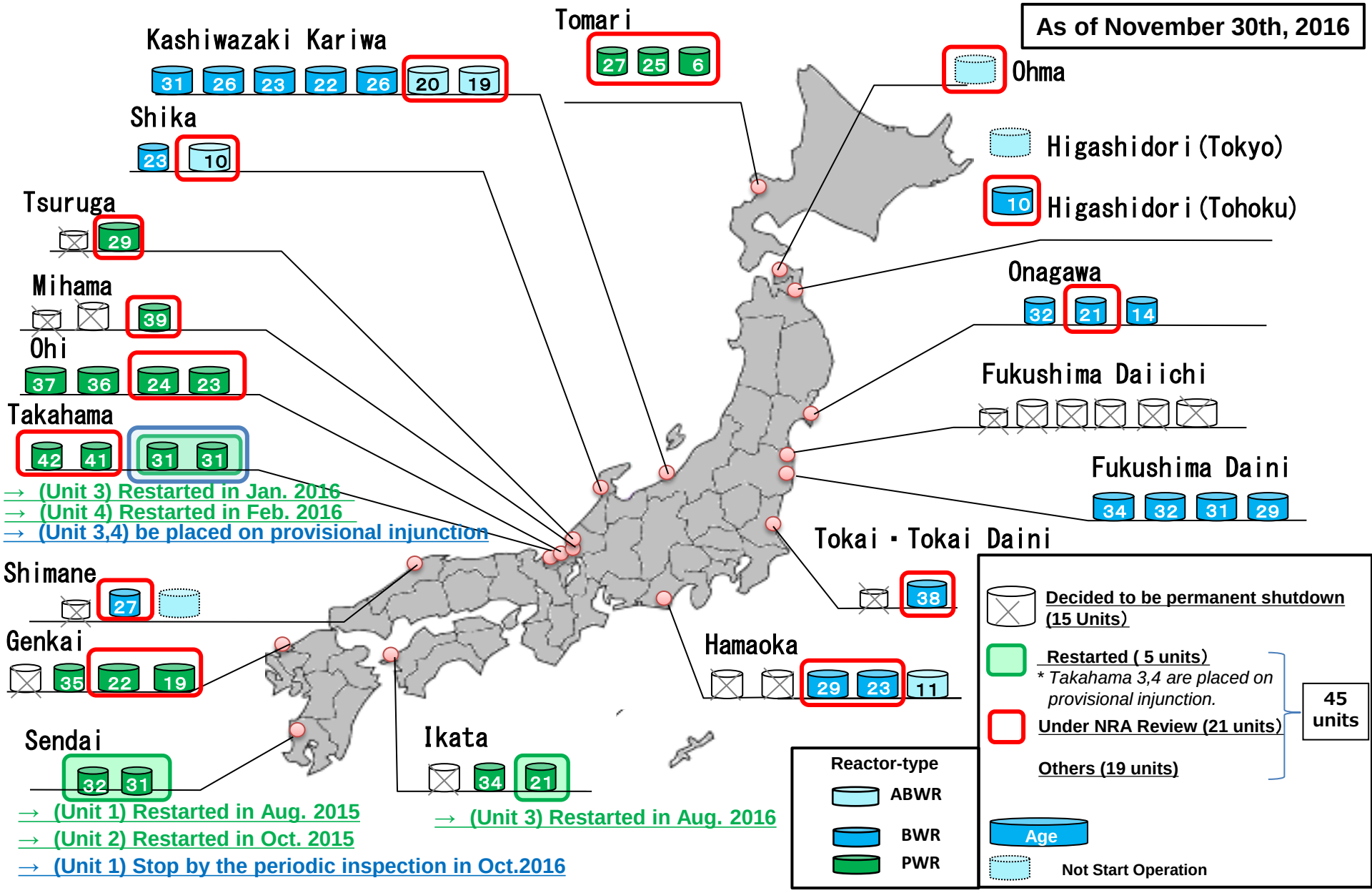
Utilize RE and nuclear. (no CO2 emission)

Optimize efficiency of coal-fired thermal

Projected Energy Mix (2030)



Nuclear Power Plants in Japan



Important Issues for coming years

Nuclear fuel cycle:

- Promotes a nuclear fuel cycle for effective utilization of resources and reduction of HLW. Electric utilities aim to use MOX fuel in 16 – 18 reactors.

Plutonium utilization:

- Remains committed to the policy of not possessing reserves of plutonium of which use is undetermined on the premise of peaceful use of plutonium.

Monju (FBR):

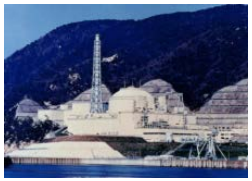
- While maintaining nuclear fuel cycle policy as well as efforts on fast reactor related R&D activities, strictly reviews the role of the Monju which may lead to possible decommissioning. (due end 2016).

Nuclear waste management (selection of final disposal sites)

- Promotes activities spearheaded by the national government, such as proposals of scientifically promising sites.

2. Nuclear sciences and application(Non-power use)
-Japan's Nuclear R&D Activities-

(1) R&D on nuclear fuel cycle and high-level radioactive waste disposal



FBR "Monju"

Horonobe & Mizunami URL(Underground Research Laboratory)

(2) R&D for decommissioning of Fukushima Daiichi NPS, TEPCO

Collaborative Laboratories for Advanced Decommissioning Science(CLADS)

(3) Nuclear safety research

NSRR (Nuclear Safety Research Reactor)

STACY (Static Experiment Critical Facility)

(4) Nuclear science and engineering research

HTTR (High Temperature engineering Test Reactor)

Establishment of the National Institutes for Quantum and Radiological Science and Technology (QST)

Outline

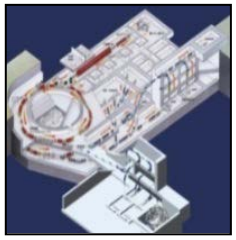
- Recently, the quantum science research becomes more important from the view point of the infrastructure which could contribute to the innovation.
- Based on JAEA Reform, JAEA decided to transfer nuclear fusion and quantum science to another organization.

【NIRS】

National Institute of Radiological Sciences

1) Radiological research for medical use (e.g. clinical research using the Heavy Ion Medical Accelerator)

2) R&D of radiological effect on human body etc.



Heavy particle beam

【a part of JAEA＊】

＊Quantum Beam Division, Nuclear fusion Division

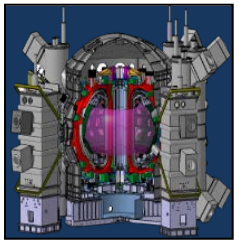
1) Quantum science research (e.g. R&D of material science using quantum beam)

2) Nuclear fusion research (e.g. control to the plasma state by superconductivity technique)

QST

Ion beam

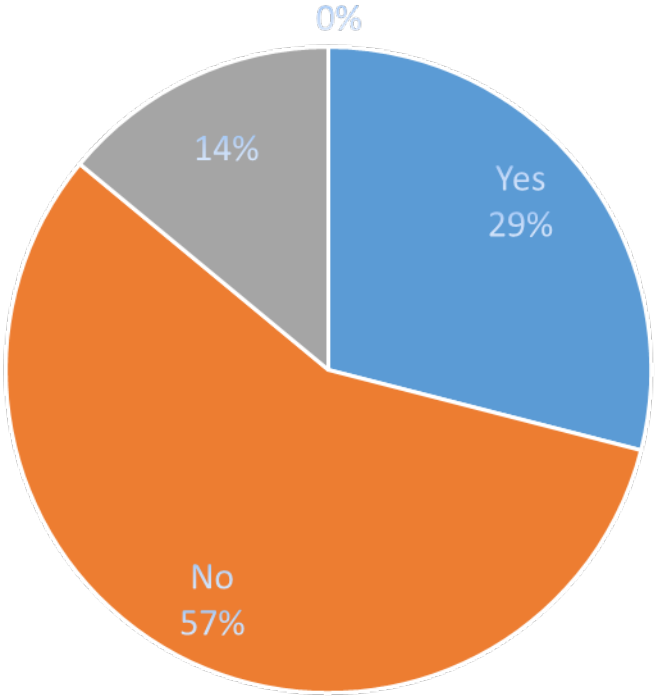
Laser



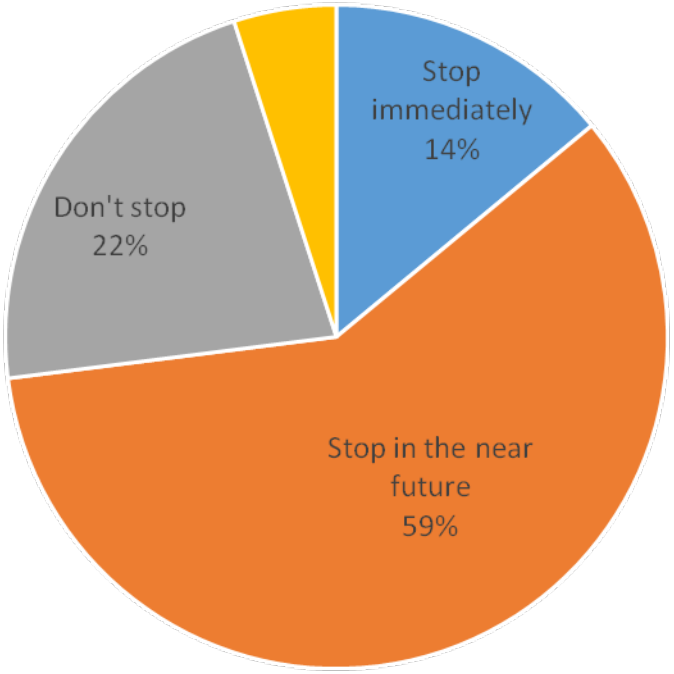
Nuclear fusion

3. Stakeholder Involvement
- Public opinion toward nuclear-

Do you support restart of NPP?



How should NPPs be in the future?



Source: The Asahi Shinbun newspaper Oct 15-16, 2016

Efforts to Rebuild Public Trust in Nuclear Power -Status of public communication-

125 times of PR events took place throughout Japan in 2016.

in Energy White Paper

- Promote understanding in consumption/nuclear power plant areas:
  - Symposium, publication on energy policies

- Grass-roots PR activities based on objective/scientific facts:
  - 218 lectures with 13,700 attendees
  - Learning programs for schools at 12 sites with 4500 attendees


Workshop for community opinion leaders

- Building networks with "community opinion leaders":
  - Workshops x 22 with 280 attendees
  - Support for NPO activities x 22
  - Seminars for educational communities x 36 with 1,100 attendees

- PR activities of "final disposal of HLW:
  - Symposium x 9 cities
  - Briefing sessions for local government x 45 prefectures


Nationwide symposiums "Think Together Now about Geological Disposal"

Improvement of nuclear knowledge base

- JAEC's initiative to increase public understanding of nuclear energy -

・G7 Ise-Shima Leaders' Declaration states "it is also crucially important to engage the public in science-based dialogue and transparency to inform policymaking."

Approaches :
1) public relations and interactive dialogue
2) building knowledge-based Information network by internet which helps people trace a certain information

improvement of the latter approach
- connect scattering information together and improving retrieval function of internet
- offering explanations for public of scientific basis and objective facts, many of which lack in Japan.

Increasing public understanding of nuclear energy

Information hierarchy

Layer1(Information for general public)
Simple and easy-to-follow general information

Layer2(Bridging information)
explanation for general of scientific basis

Layer3(Information for expert)
Reports and training materials

Layer 4 (scientific basis and objective facts)
Research result, scientific report

Thank you