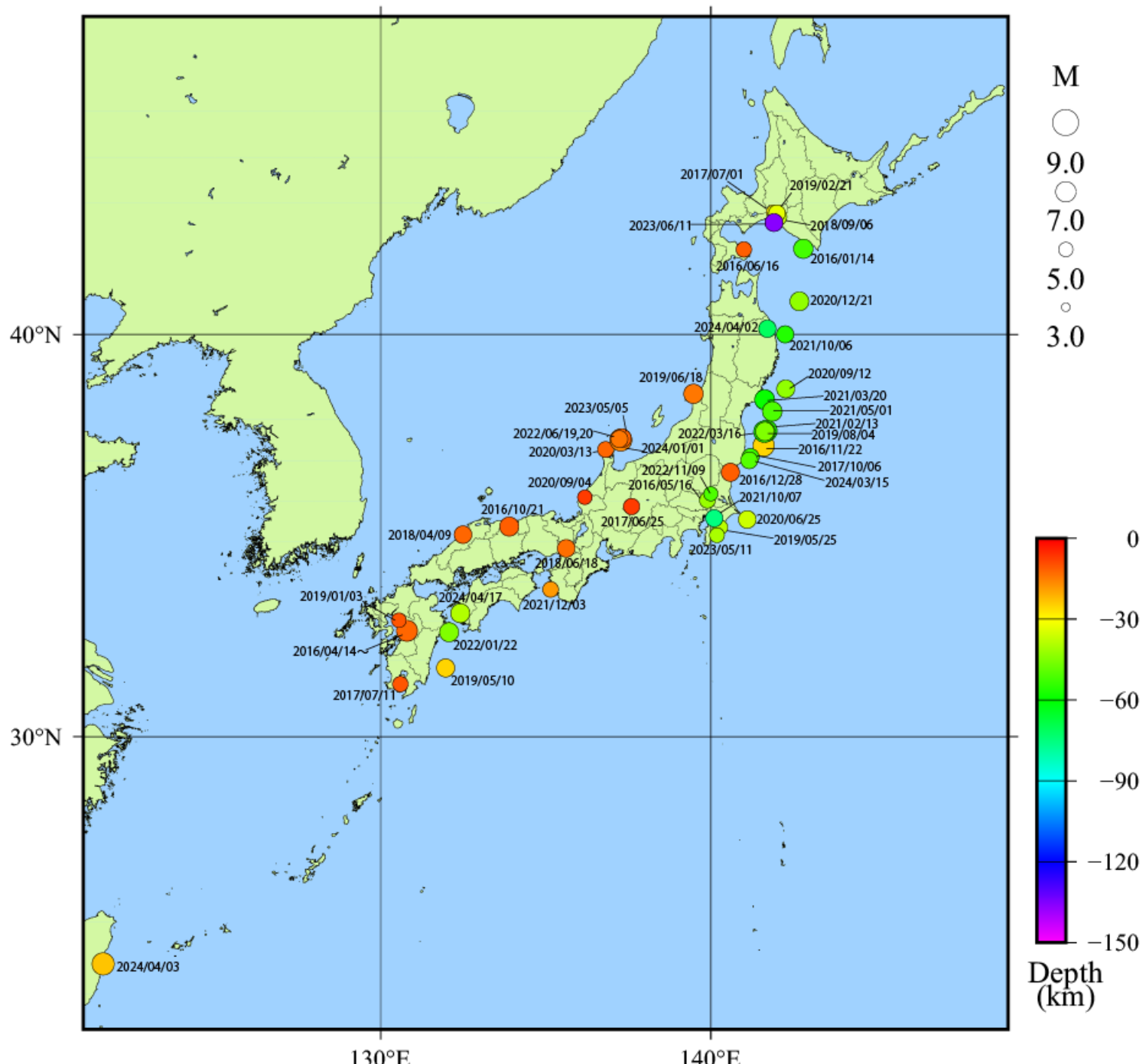
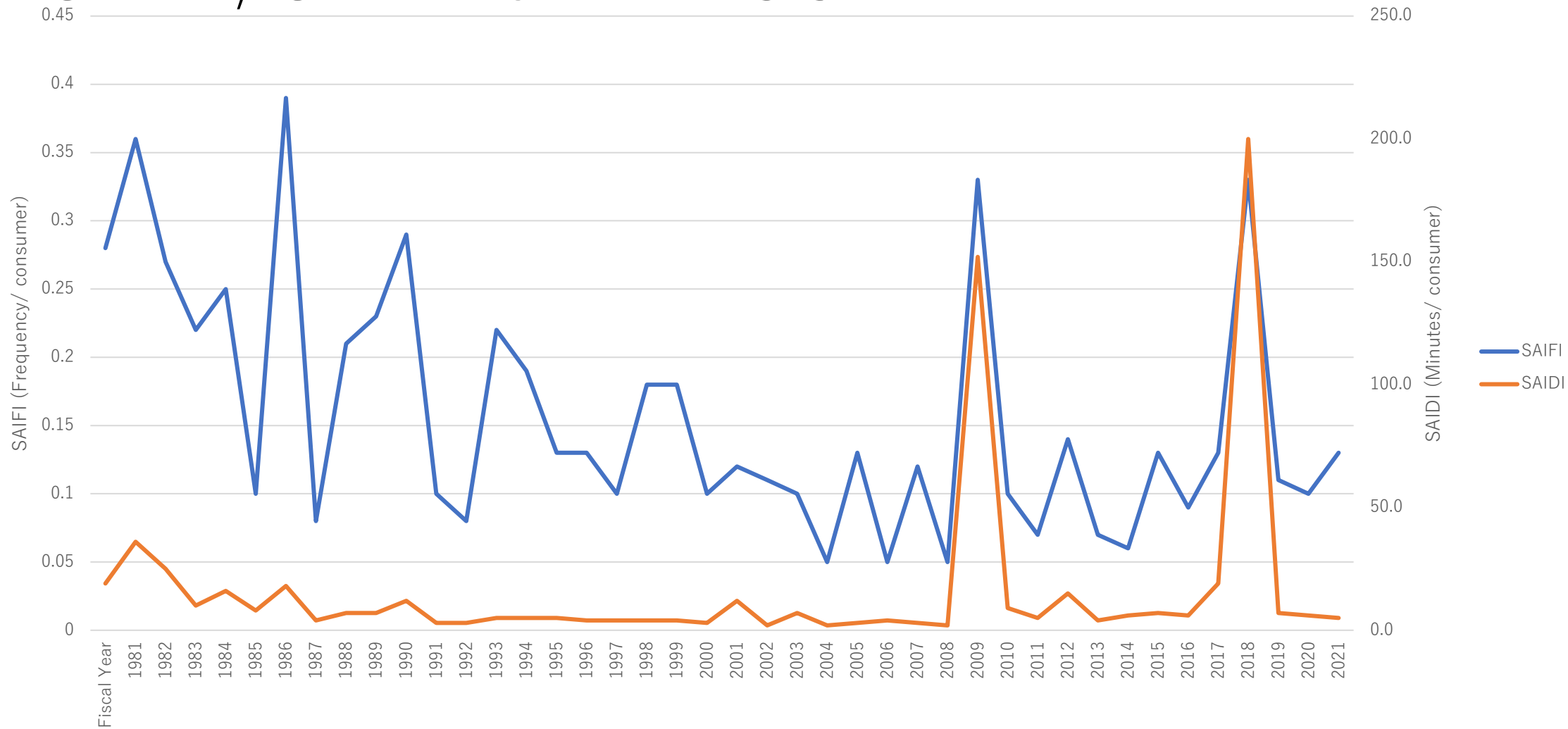


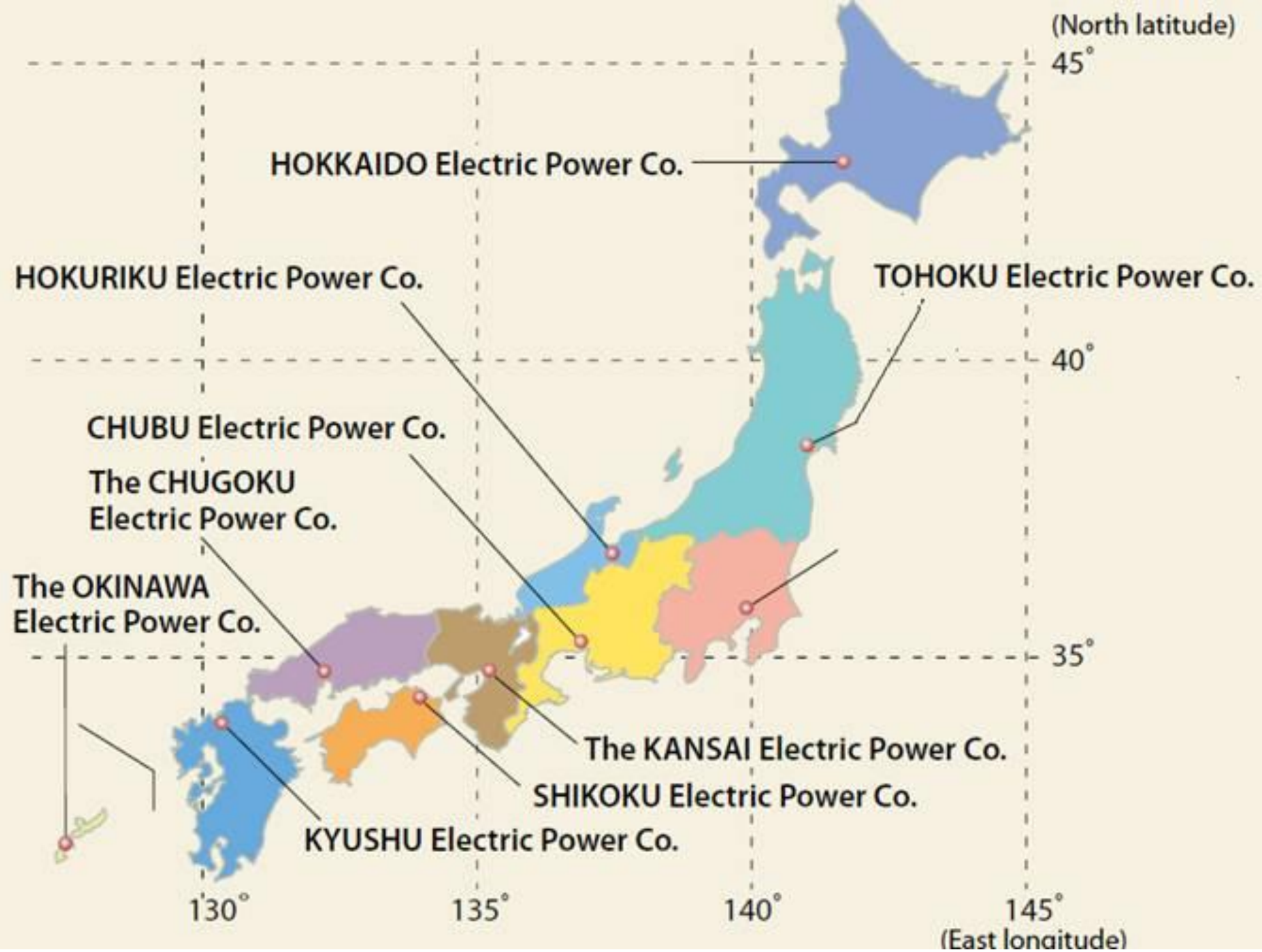
Typhoon
after 2016



Earthquake
magnitude 5.0 or
more after 2016

SAIFI, SAIDI of TEPCO





Contents of Initiatives for disaster

1. Understanding the Situation and Dissemination of Information
2. Disaster prevention and early recovery through enhanced collaboration
3. Strengthening the Resilience of Power Network
4. Securing alternative power supply and fuel until restoration
5. Strengthen resilience by enhancing inter-regional interconnection lines and distributed power sources, etc.

Disaster Countermeasures

1, Understanding the Situation and Dissemination of Information

Government		TEPCO
Institutional measure	Financial measure	
<ul style="list-style-type: none">- Providing information to municipals	<ul style="list-style-type: none">- System development for centralized management of information	<ul style="list-style-type: none">- Utilizing drone, Helicopter- Large number of patrol personnel from initial stage- System development for management of recovering schedule

2, Disaster prevention and early recovery through enhanced collaboration

Government		TEPCO
Institutional measure	Operational measure	
<ul style="list-style-type: none">- Obligation to develop Disaster Coordination Plan- Consolidation of restoration methods- Mutual financial aid system	<ul style="list-style-type: none">- Collaboration with ministries- Utilization of EVs as power source	<ul style="list-style-type: none">- Prioritizing temporary restoration- Joint training with other utilities- Strengthening of cooperation with municipals and communication companies etc.

Disaster Countermeasures

3, Strengthening the Resilience of Power Network

Government		TEPCO
Institutional measure	Financial measure	
<ul style="list-style-type: none">- Reviewing the standard of tower- Promoting distributed grid system- Adopting the revenue cap system for T&D utilities	<ul style="list-style-type: none">- Promoting underground distribution system- Promoting captive power in important facilities	<ul style="list-style-type: none">- Promoting underground distribution system- Reviewing tower renovation plan

4, Securing alternative power supply and fuel until restoration

Government	
Institutional measure	Financial measure
<ul style="list-style-type: none">- Securing fuel for power supply cars- Diversification of LNG procurement sources- Transshipment terminals and storage bases in Asia by JOGMEC- Fuel procurement by JOGMEC in the event of emergency	<ul style="list-style-type: none">- Deployment of lorries for emergency delivery to captive power and power supply car

Disaster Countermeasures

5, Strengthen resilience by enhancing inter-regional interconnection lines and distributed power sources.

Government

Institutional measure

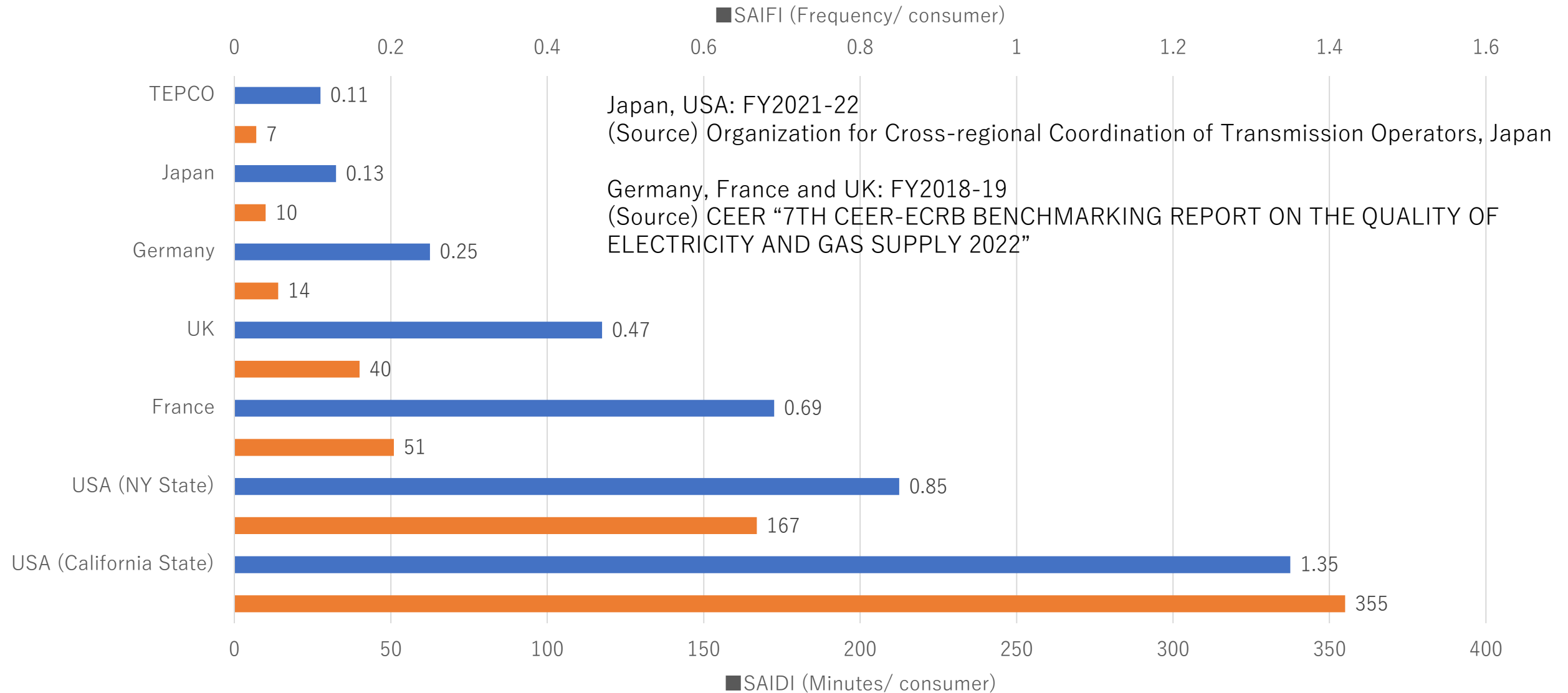
- Legalize the government's involvement in wide-area system development planning
- →Introducing a nationwide support mechanism for the cost of strengthening inter-regional interconnection lines
- Defining "electric power distribution business"

Financial measure

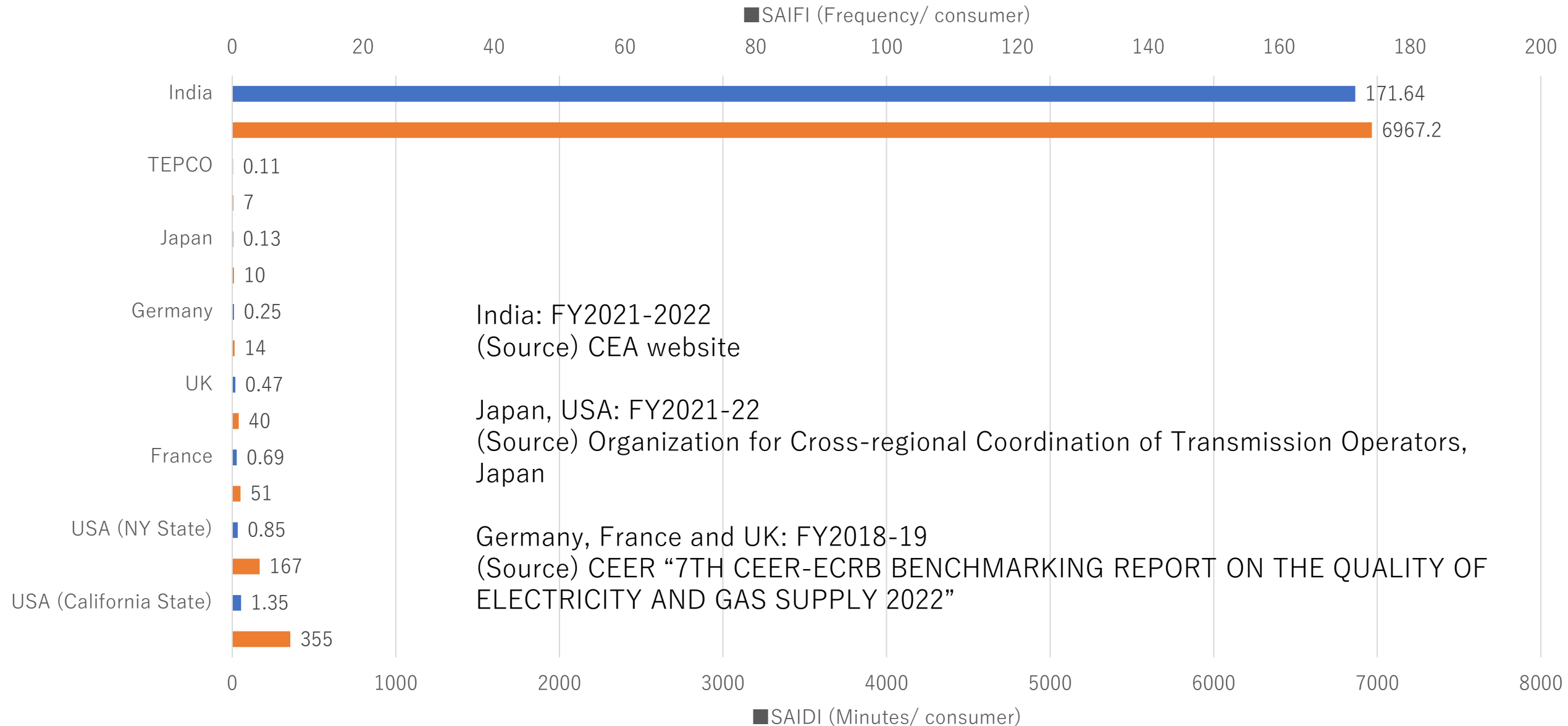
- Expand introduction of distributed power sources such as renewable energy to the region

Efforts of power utility

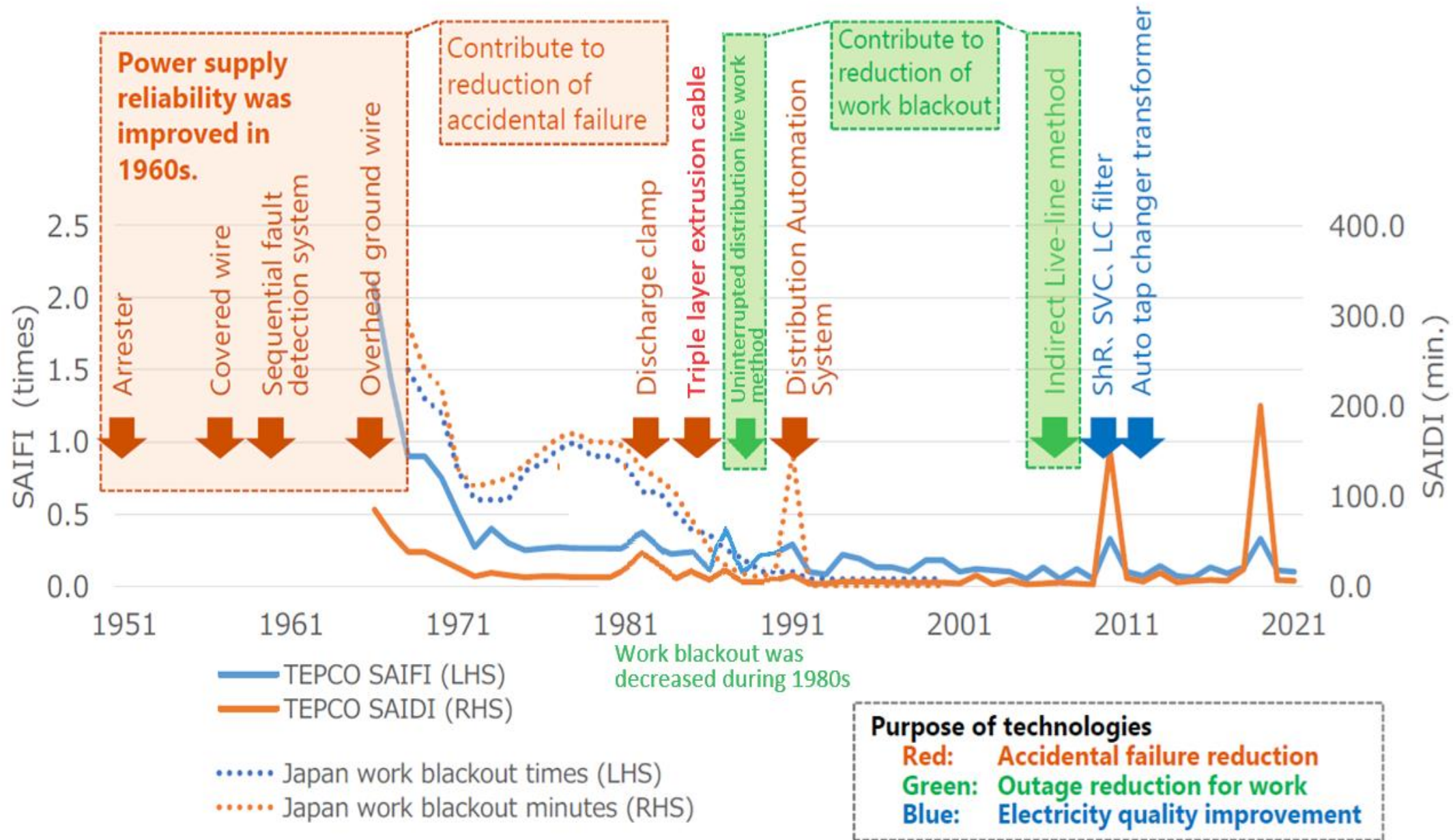
International comparison of SAIDI & SAIFI



International comparison of SAIDI & SAIFI



History of TEPCO PG Distribution Reliability improvement



Past Record of Large Scale Outage in TEPCO

Case 3: East Japan Earthquake

The date and time: 14:46, 11th Mar. 2011 (Fri.)

A cause of outage:

East Japan area was suffered from devastating earthquake (Magnitude 9.0), which resulted in many amount of P/Ss trips and destruction of network facilities.

Interrupted power:

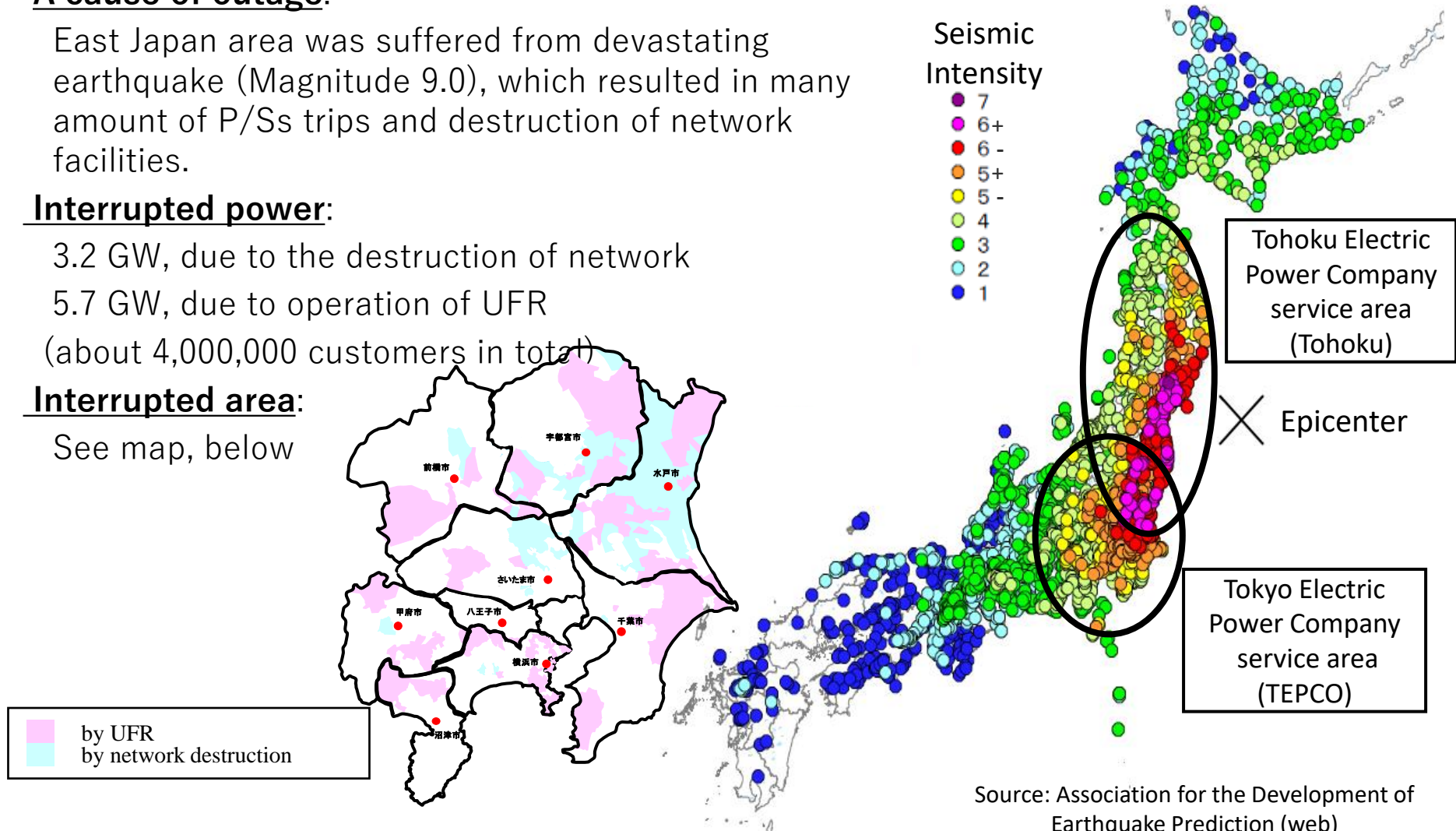
3.2 GW, due to the destruction of network

5.7 GW, due to operation of UFR

(about 4,000,000 customers in total)

Interrupted area:

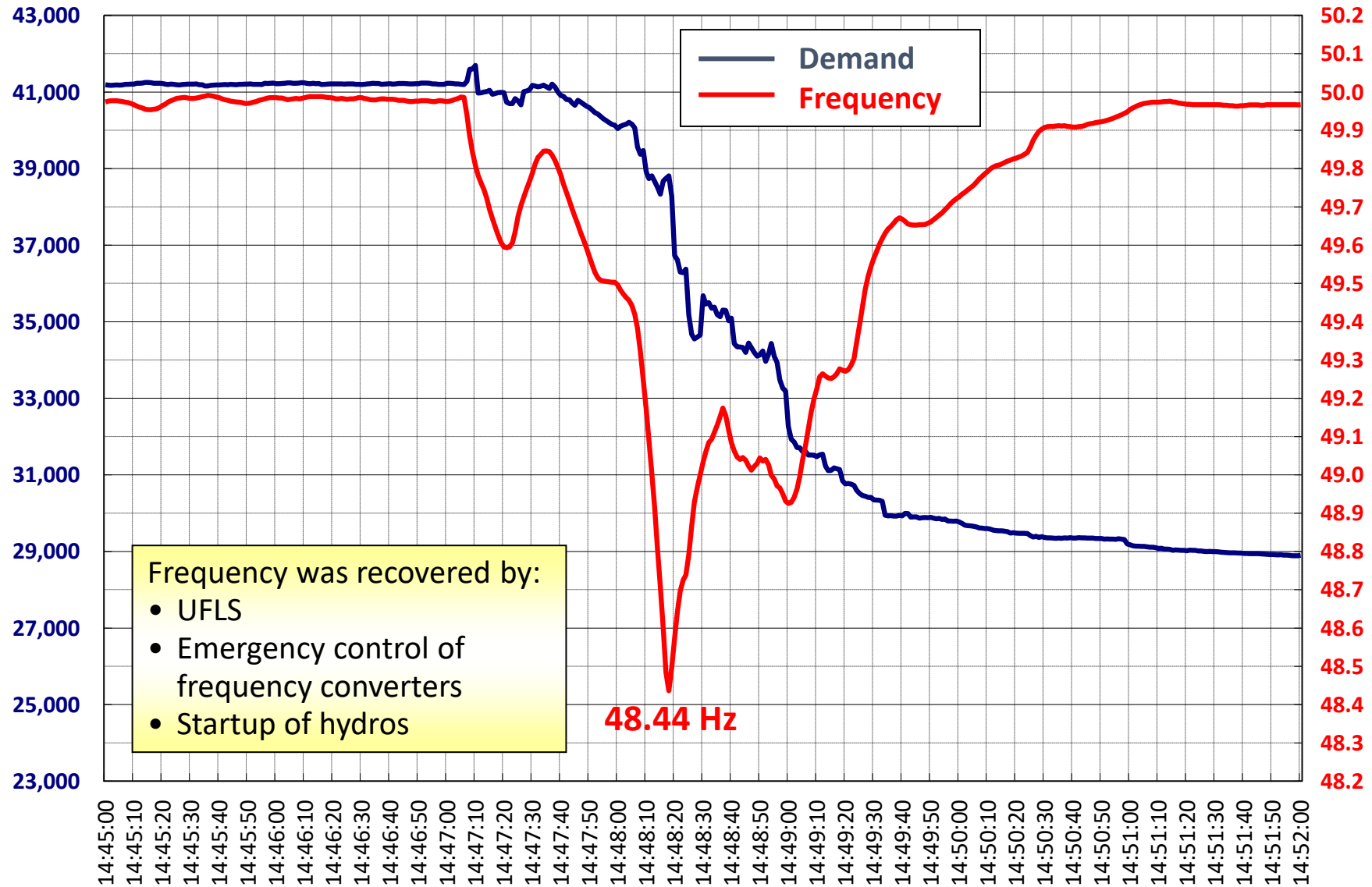
See map, below



Source: Association for the Development of Earthquake Prediction (web)

Frequency Excursion after the Earthquake

Great East Japan Earthquake (At 2:46 p.m. on Mar. 11, 2011)



Restoration of outage after the Earthquake

