Community Power Development

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Outline

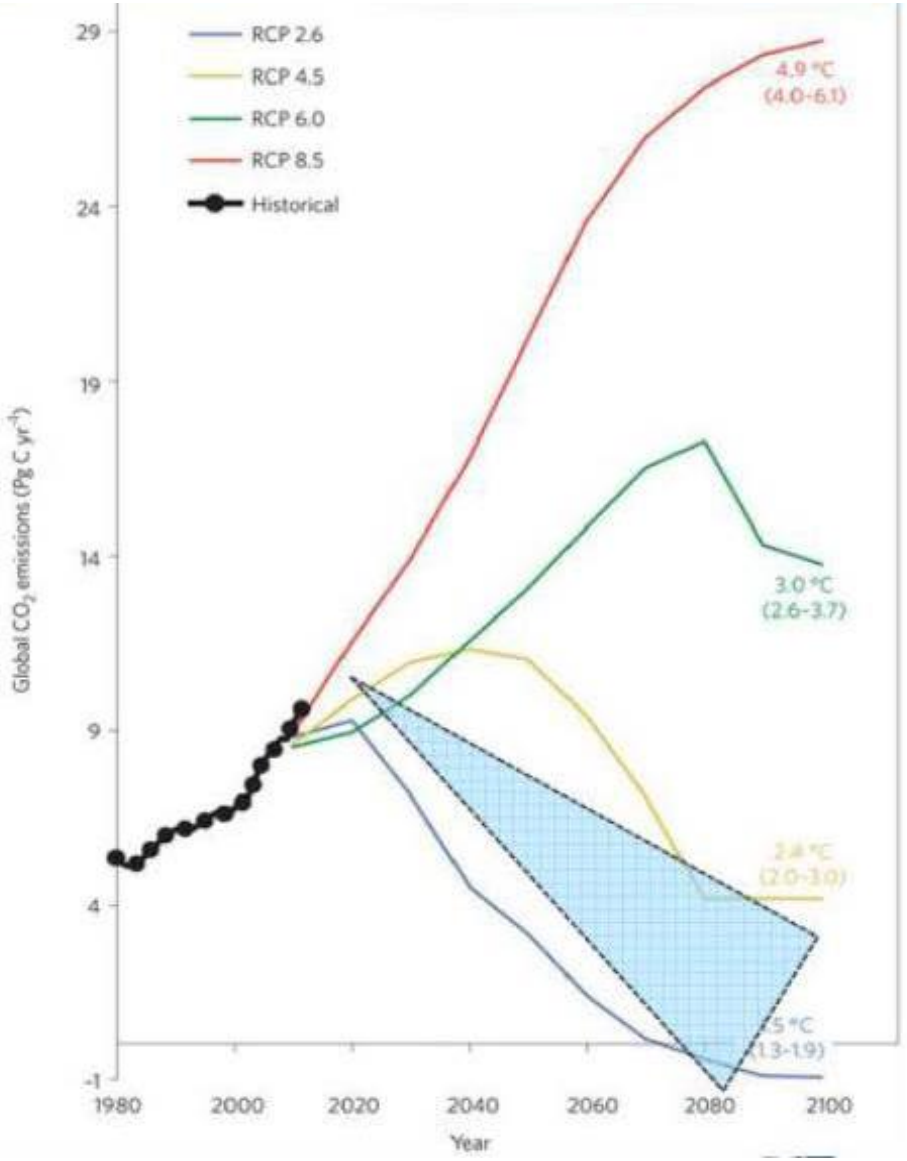
- Implications of Paris Agreement
- Global trends of Renewable Energy
- Renewable Energy in Japan
- What is Community Power
- Benefits and challenges of community power
- Japanese experiences
- Lessons learnt and some suggestions

Implications of Paris Agreement

COP21 & Paris Agreement

The Paris Agreement : Set Huge Ambition

- Global goal of keeping warming between 2° and 1.5° C (Art. 2)
- Global peaking "as soon as possible" (Art. 4.1)
- Achieve balance of emissions and sinks by second half of century (Art. 4.1)
  - Excludes solar radiation management
- Global stocktake on progress towards these goals every 5 years from 2023 (Art. 14.1 and 2)

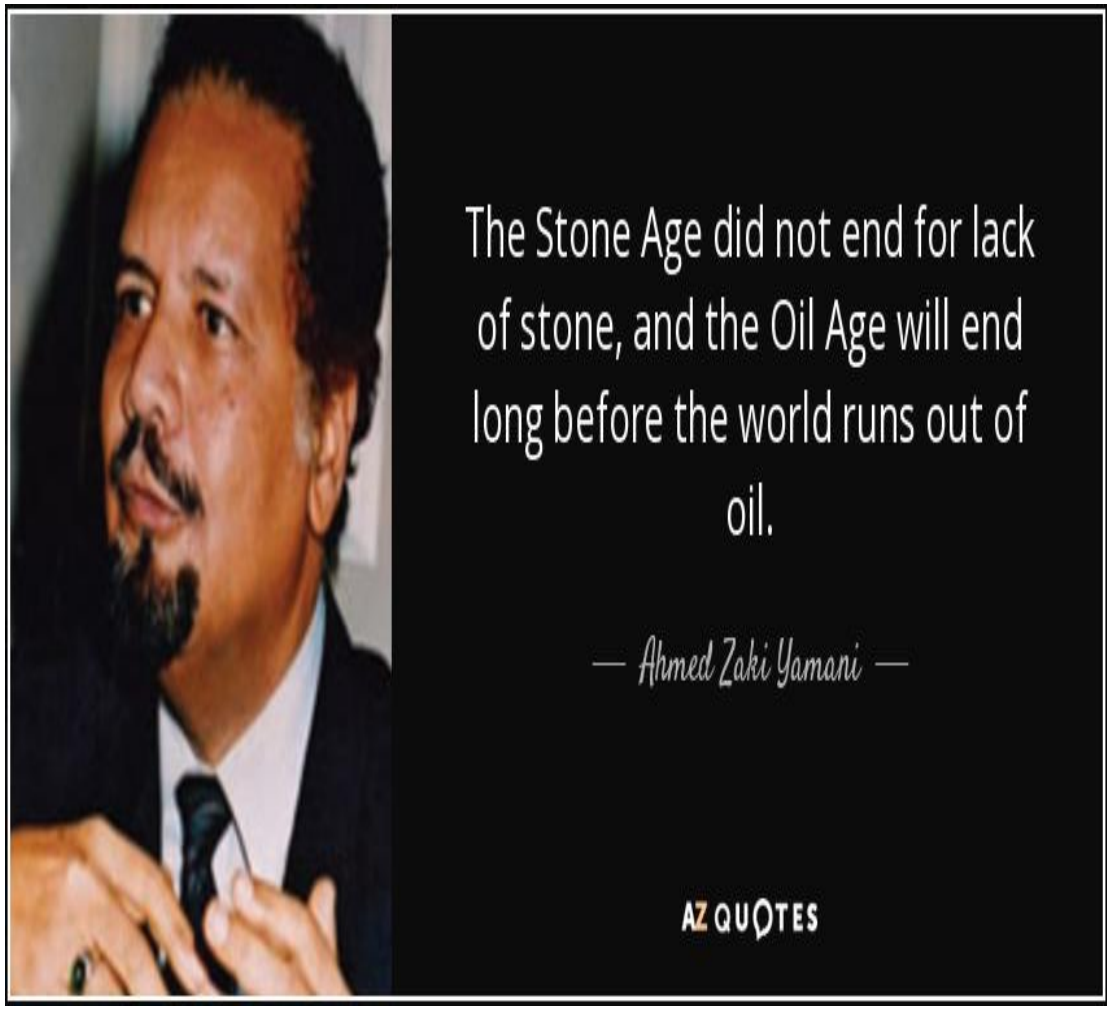


End of Fossil fuel based civilization!

- 2℃ target= Net zero goal (sources = sinks) by 2nd half of century＝Net zero CO2 emission society

  ⇒Massive transformation by 2050 –

- Carbon disruption⇒ disruptive innovation for a new society
  - creating new shared social values
  - sharing economy and new business model
  - marginal cost zero society


The Stone Age did not end for lack of stone, and the Oil Age will end long before the world runs out of oil.
— Ahmed Zaki Yamani —
AZ QUOTES


We are the first generation to be able to end poverty, and the last generation that can take steps to avoid the worst impacts of climate change.
Future generations will judge us harshly if we fail to uphold our moral and historical responsibilities.
Ban Ki-moon
Secretary-General
United Nations

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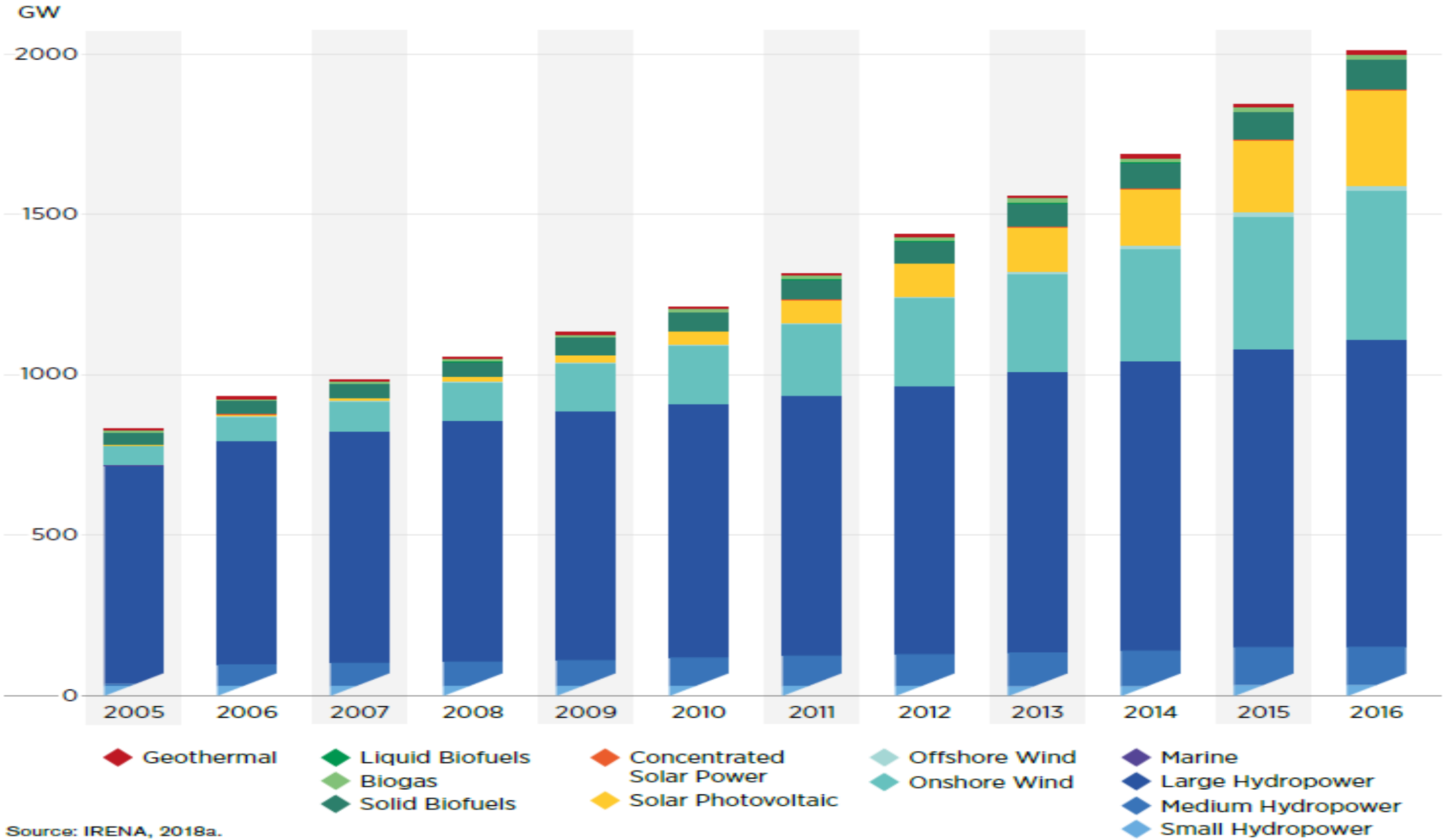
Global Trends of Renewable Energy

Rapid expansion of RE

- Wind power generation capacity: 59GW⇒540GW （2005 ⇒ 2017, 9 times)
- Solar power generation capacity: 9GW⇒400GW(2007 ⇒ 2017, 44 times)
- Global Investment for RE generation(excl. large hydro) (2015）: 286 bil US$ (6 times of 2004)
- Global Investment for Fossil Fuel generation： 130bil US$ (less than half of RE)
- Cost reduction of RE（2010⇒2016）:Solar（70%）、land-based wind（18%）

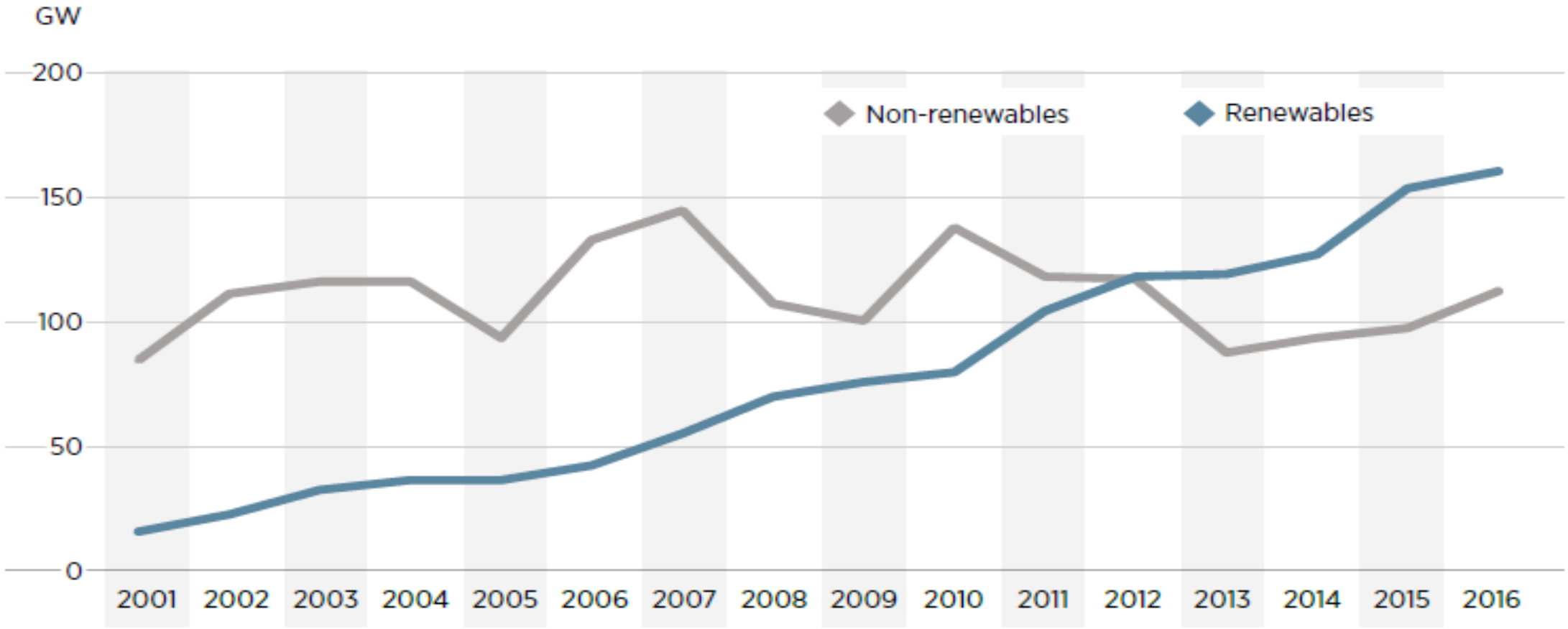
Figure 4.4. Trends in renewable installed capacity, by technology, 2005-16



Source: IRENA, 2018a.
Note: GW = gigawatts.

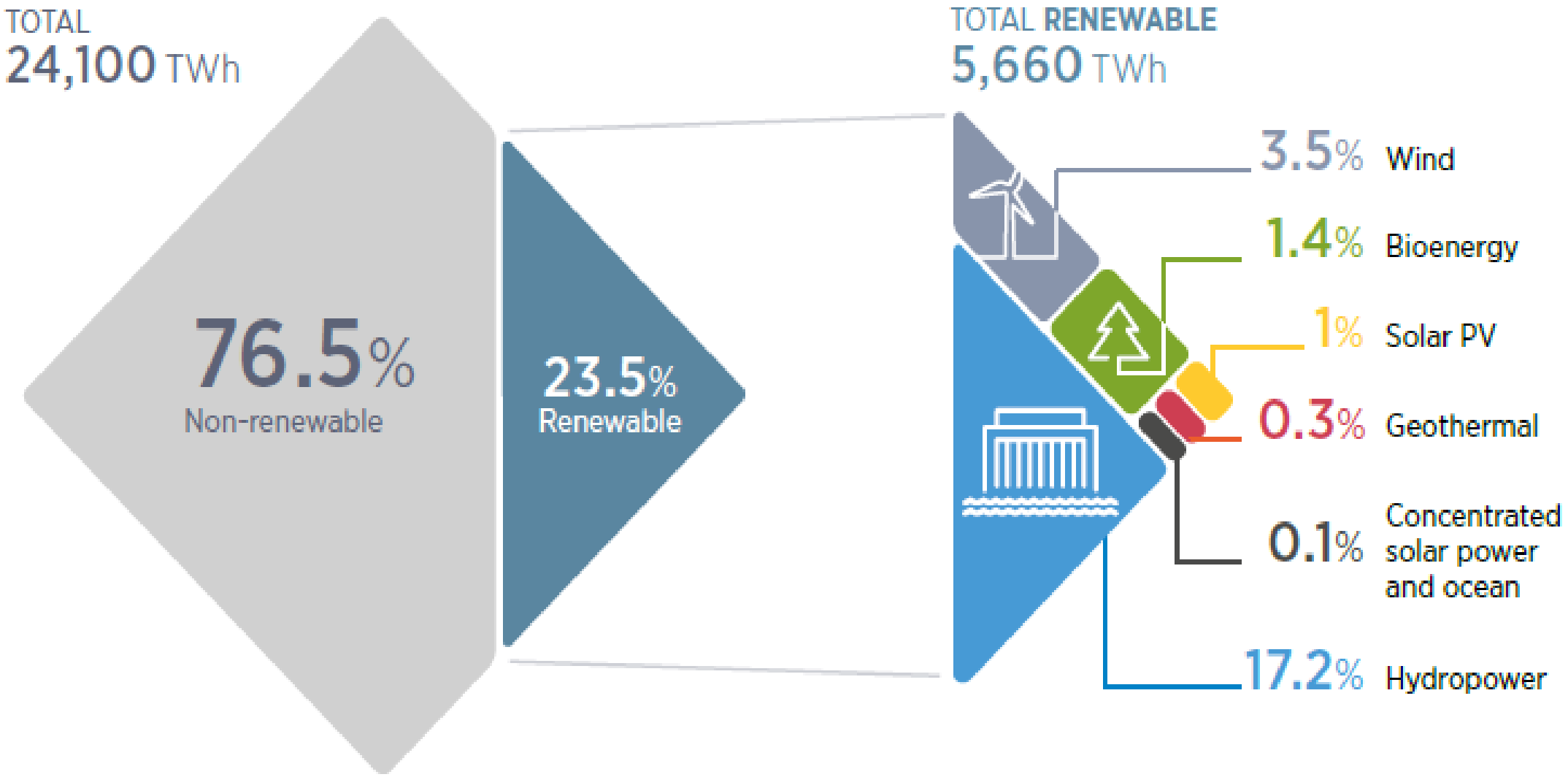
Renewables represented almost 60% of the capacity added worldwide in 2016. In fact, renewable power capacity installations have exceeded those of non-renewable capacity since 2012 (Figure 4.3).

Figure 4.3. Renewable and non-renewable power capacity additions, 2001-16



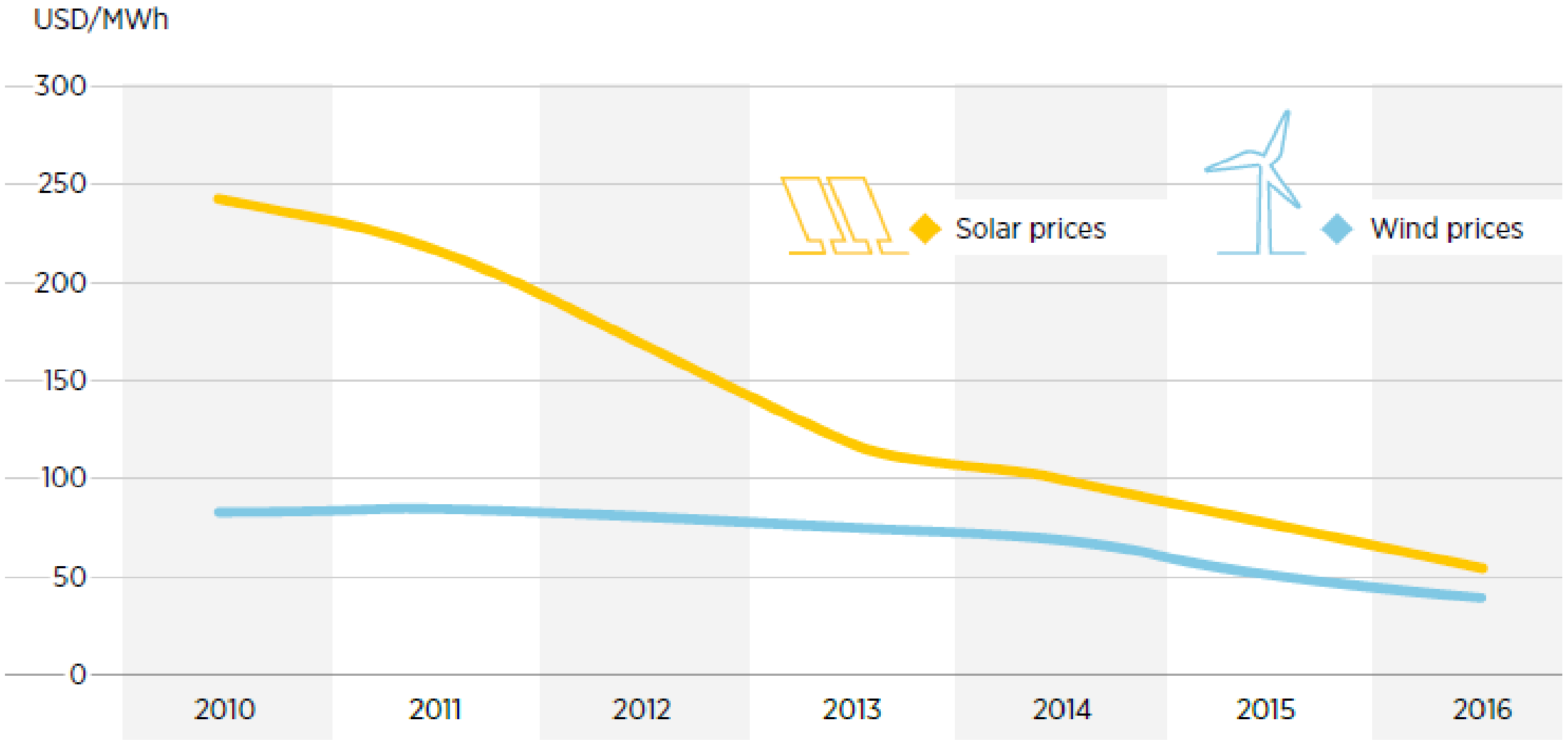
Sources: IEA, 2017 and IRENA, 2018a.
Note: GW = gigawatts.

Figure 4.2. Global electricity generation by source, 2015



Source: IRENA, 2017a.
Note: TWh = terawatt hours.

Figure 4.7. Average global prices resulting from solar PV and onshore wind auctions, 2010-16



Source: IRENA, 2017b.
Note: MWh = megawatt hours.

Renewable Energy in Japan

2011.3.11

- The Great East Japan Earthquake

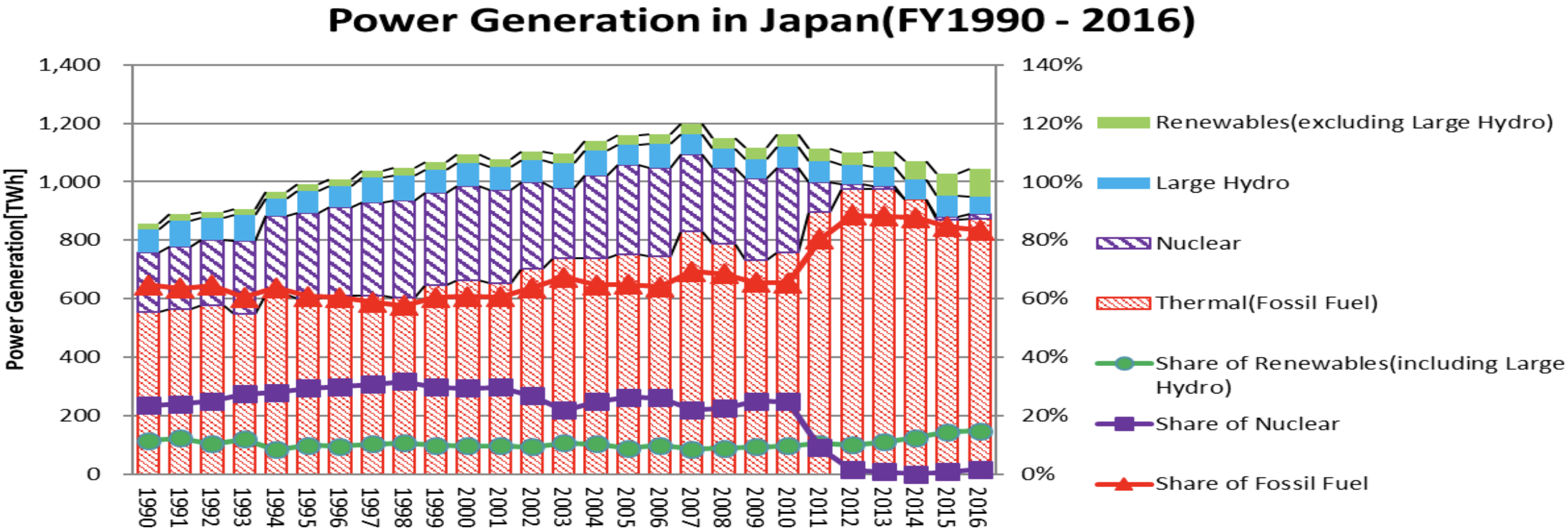
- Fukushima Daiichi (F1) nuclear power plant accident

2012.7.1

- Introduction of Feed-in Tariff (FIT)

Current energy mix in Japan

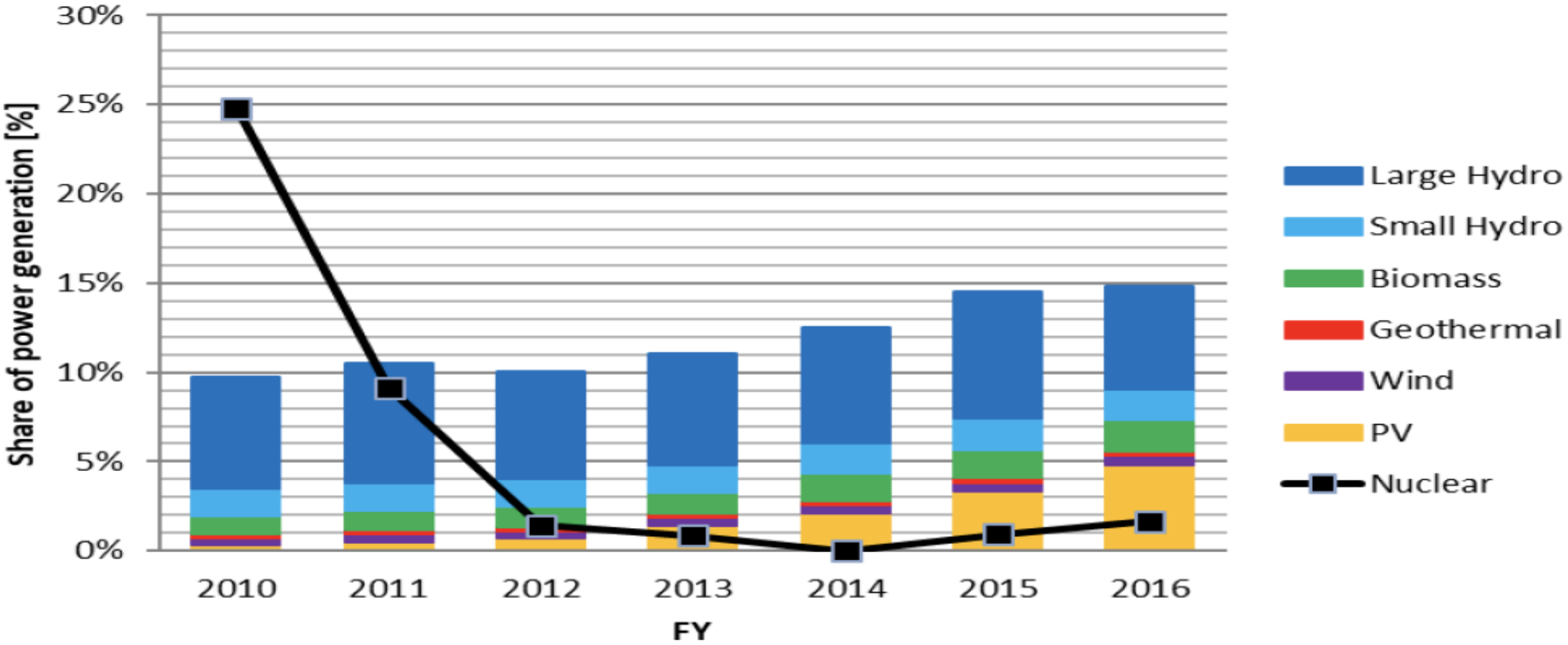
- Decrease of energy consumption, increase of coal, LNG and renewables



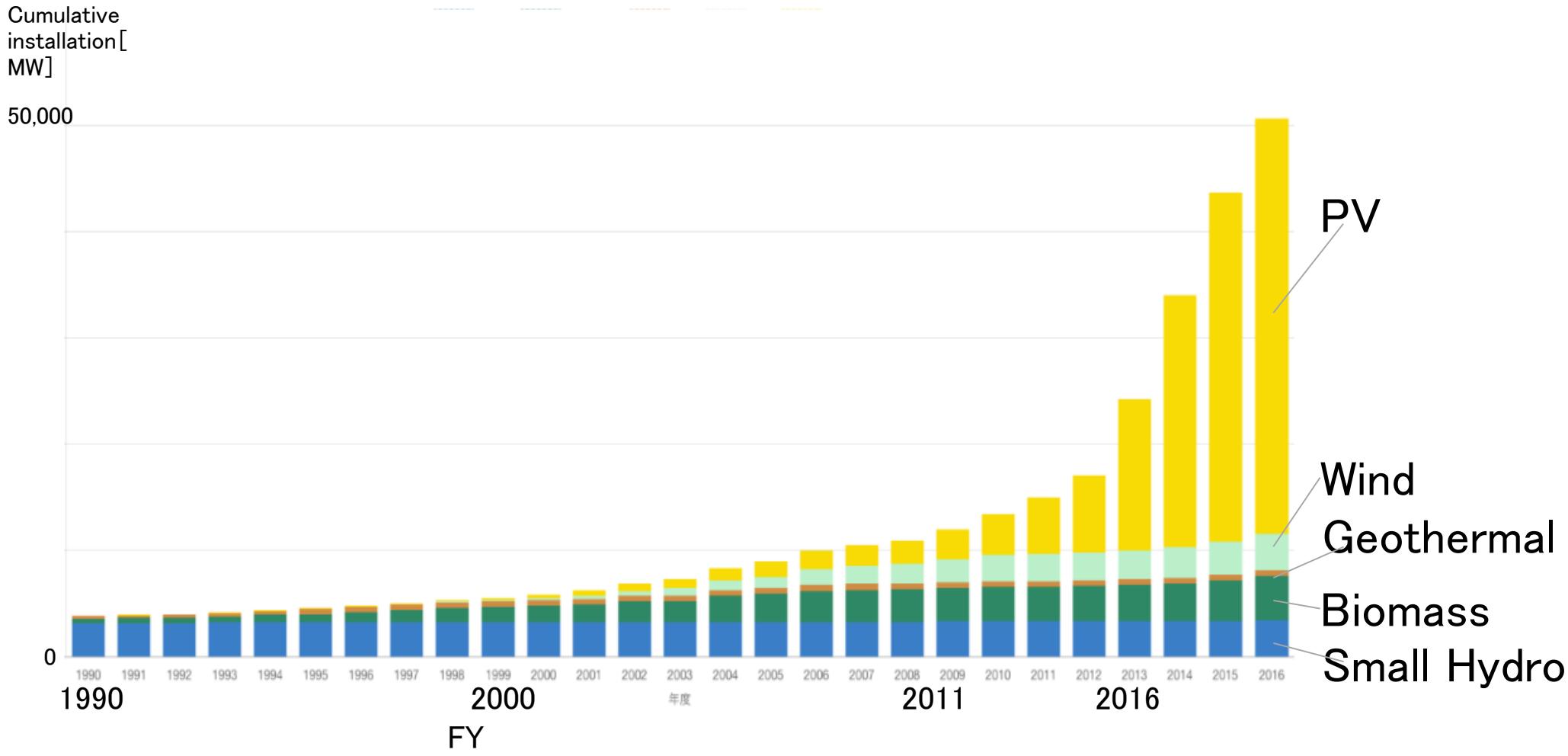
Increase of renewables in Japan

FIT has worked well, particularly for PV

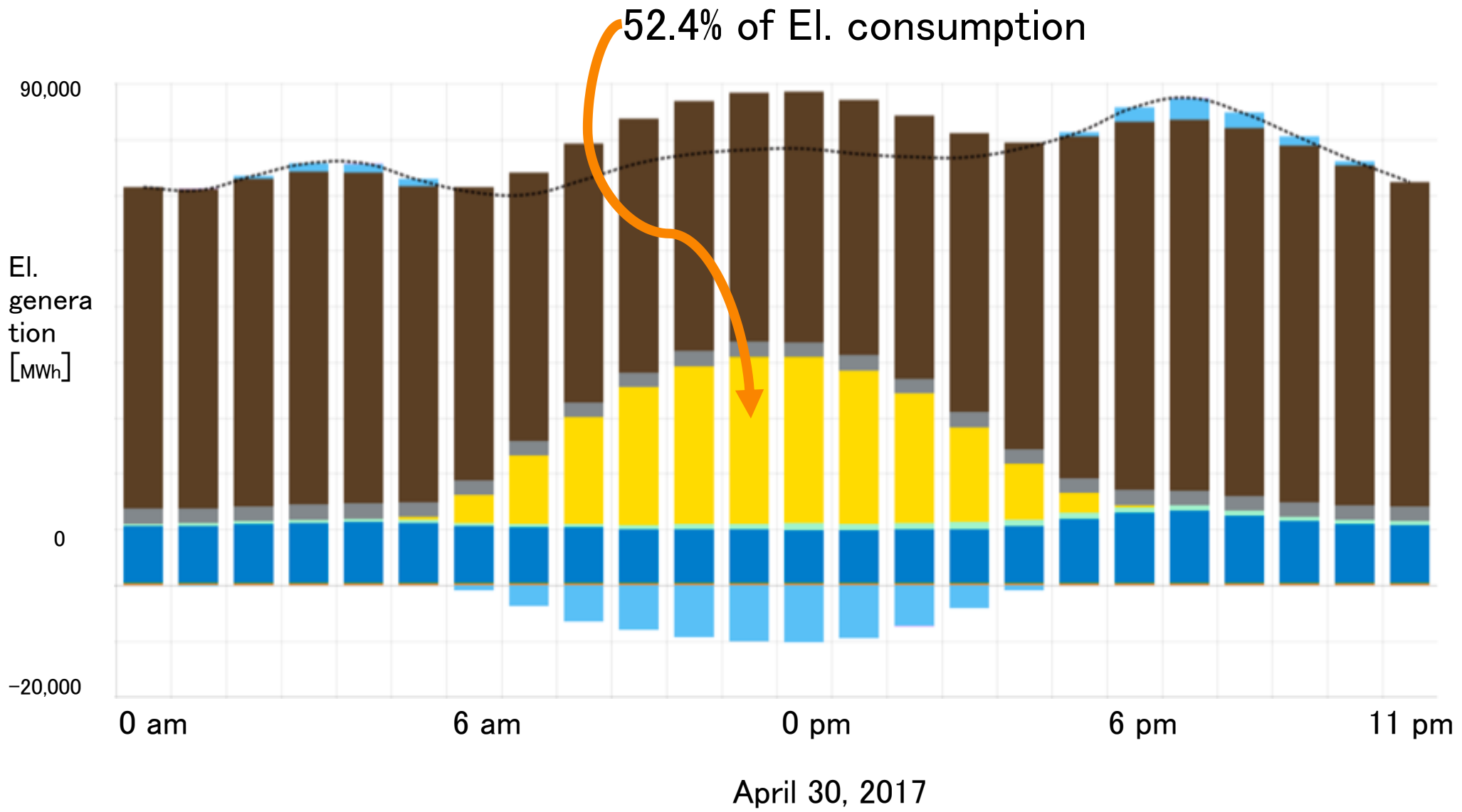
2011 Fukushima Daiichi nuclear accident. 2012 Introduction of FIT



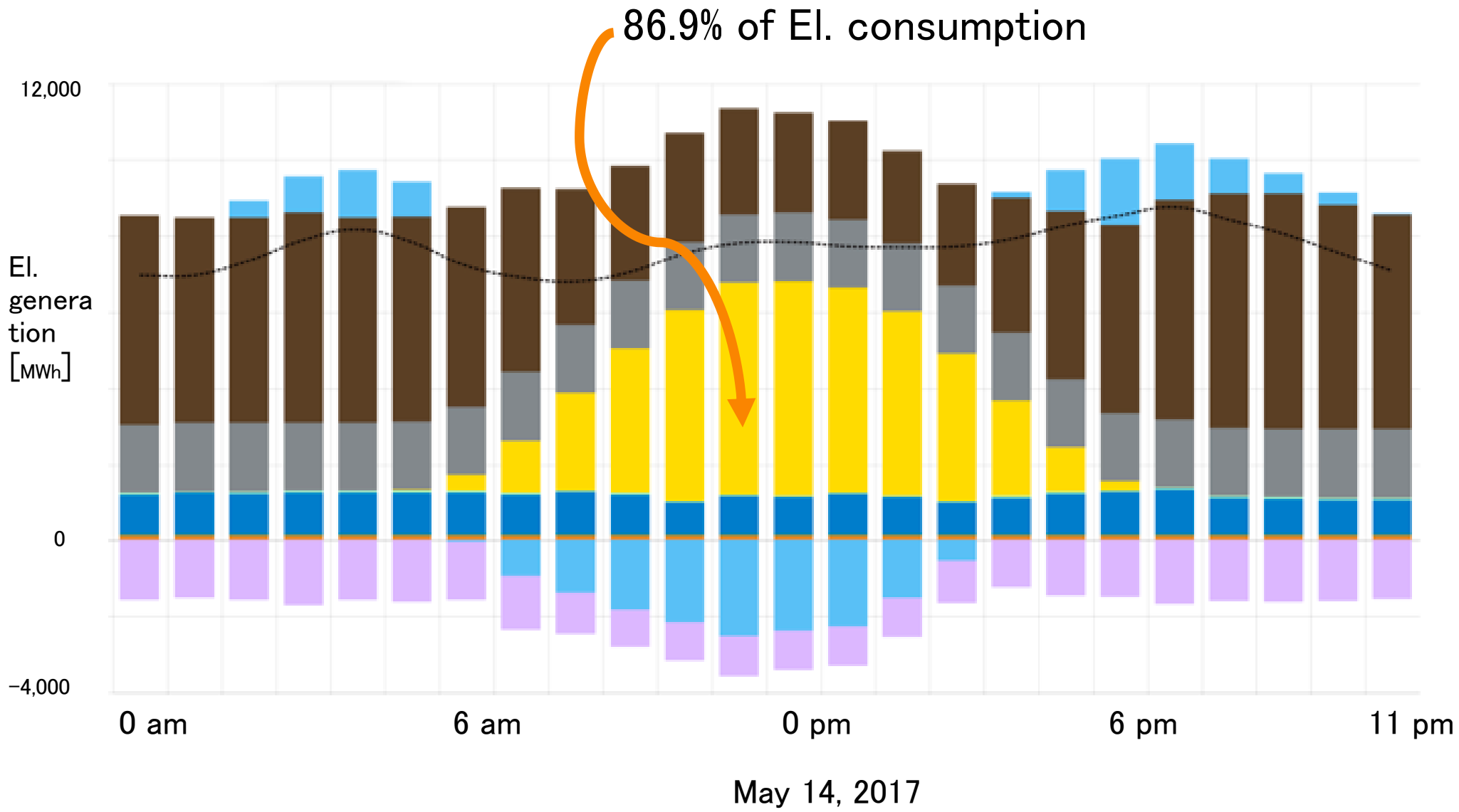
Rapid Increase of PV after introduction of FIT and 3.11 in 2011



Highest share of RE in Japan on 11 am, April 30, 2017

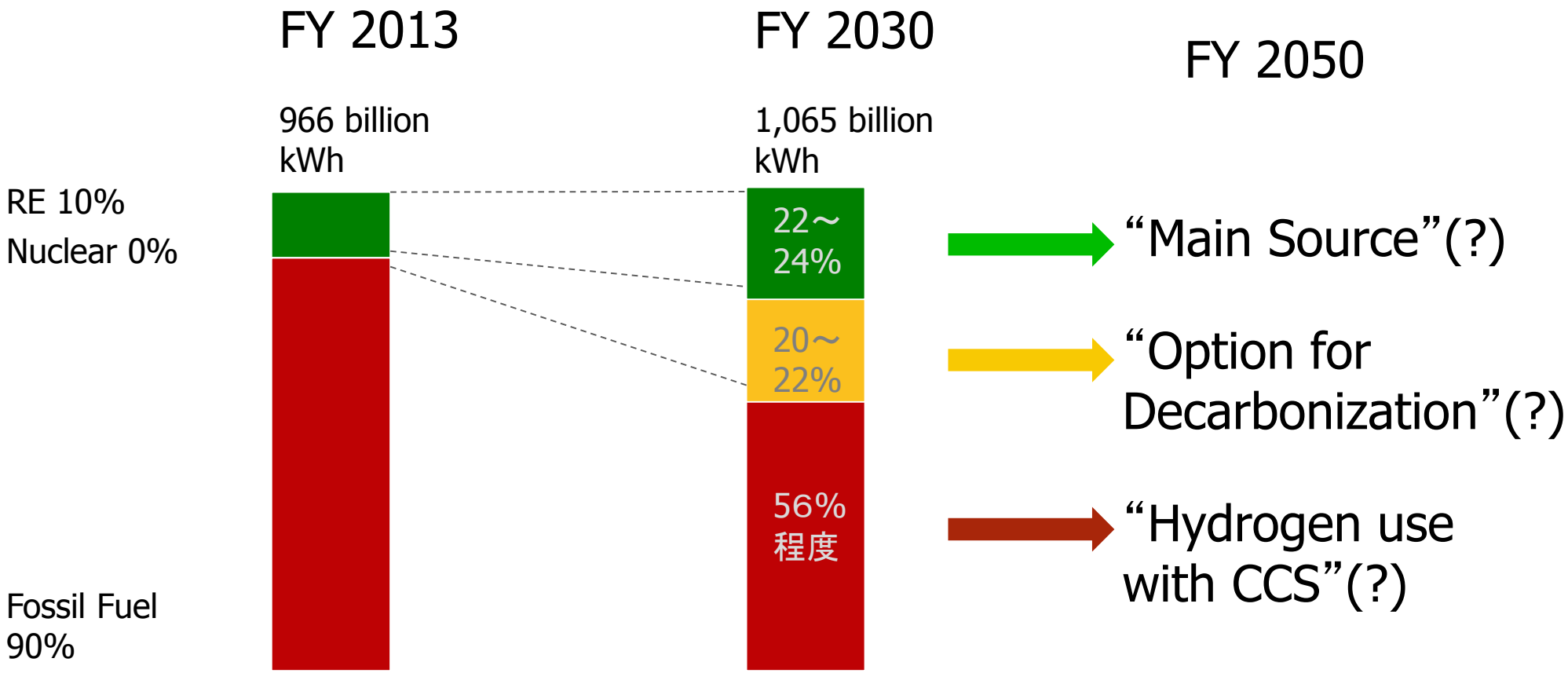


Highest share of RE in Kyushu on 11 am, May 14, 2017



Share of RE in electricity generation in 2030 and 2050?

Gov. set target of 22–24% of RE share in 2030 but unclear target for 2050, just “Main Electricity Source”



Long-term energy supply and demand outlook (FY 2015, 2018)

Committee for Energy affairs (FY 2018)

What is Community Power?

Community energy is the economic and operational participation and/or ownership by citizens or members of a defined community in a renewable energy project (IRENA2018)

Background of community power

- Existing power generation
  - centralized
  - monopoly or large company
  - large scale funding
  - national government
  - economic efficiency, stockholders' interests

- Community power
  - distributed & renewable
  - SME, local organizations, NPOs
  - community fund, crowd funding
  - local government
  - social & public benefits, local benefits

Three basic principles of community power

Community energy is any combination of at least two of the following elements:

- Local stakeholders own the majority or all of a renewable energy project.
- Voting control rests with a community-based organization.
- The majority of social and economic benefits are distributed locally.

source: Community Power Working Group of the World Wind Energy Association (WWEA, 2011), supported by the Community Energy Group of the Coalition for Action.

Benefits of community energy

- added value for the region through the establishment of a new economic sector, job creation and a local identity
- increase in actor diversity resulting in shared decision-making and increased transparency in planning and construction
- integration of citizens into sustainable economic processes
- lower energy prices
- acceleration of energy access and general renewable deployment rates
- technology and business model innovation

Implementation challenges

- Regulatory challenges

  - lack of access to the energy market and discrimination against smaller investors.
  - regulatory changes such as changes in tariff structure

- Financial challenges

  - communities' capacity to raise equity and their lack of access to third-party finance

- Unclear legal definition and lack of awareness

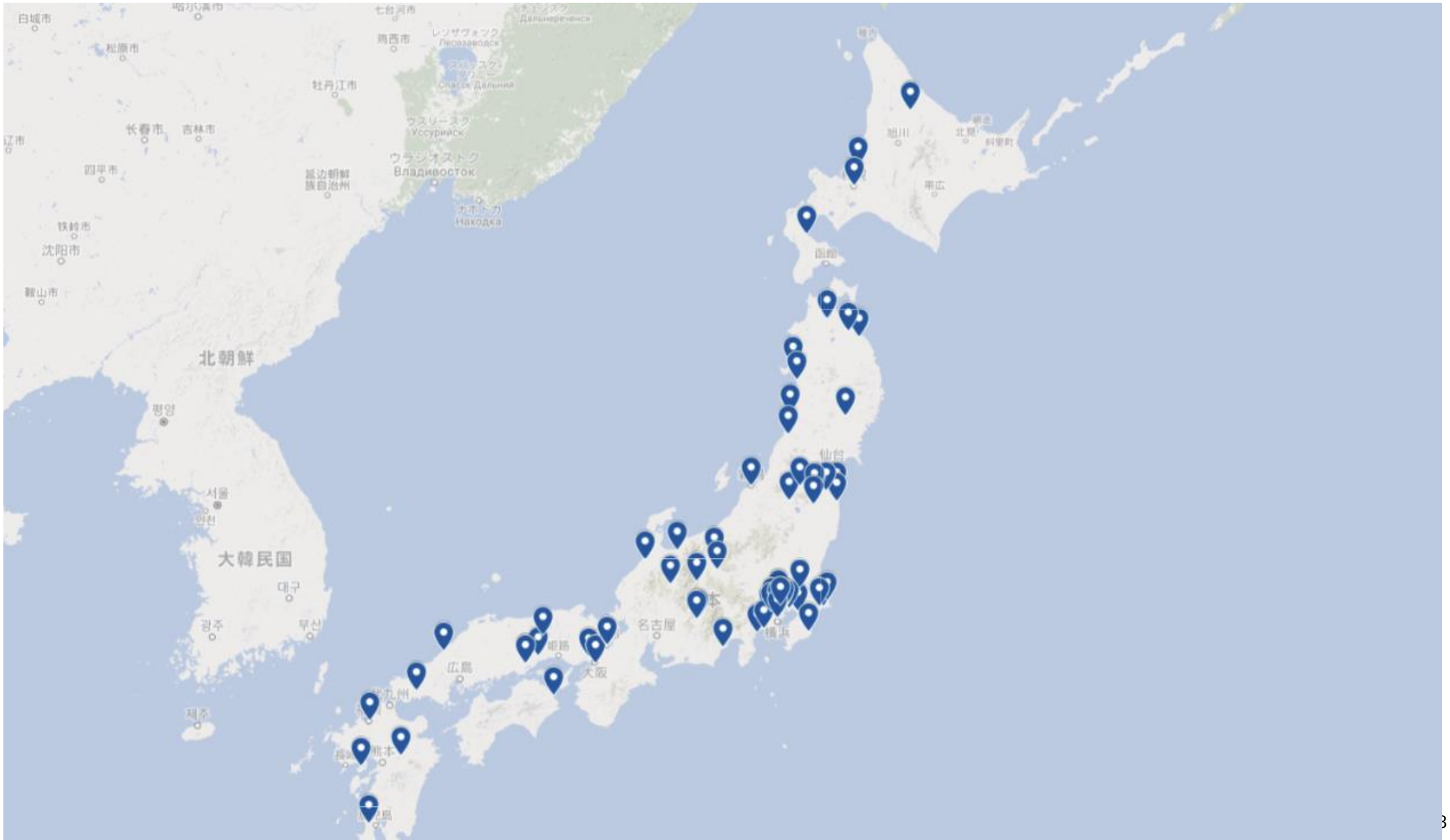
  - Lack of a clear and widely agreed legal definition of community energy and a low awareness together comprise a third challenge to the widespread adoption of this approach

- Cultural barriers

  - Democratic decision-making and shared ownership are common practice in some countries. In others, these are challenging practices due to historical events and societal characteristics.

Japanese experiences

80 Organization of Community Power, total 90 MW



Iida City as pioneer of community RE projects with community finance

Iida's Eco Model City Initiative

About Iida City

Population: Approx. 103,700 (as of Mar. 31, 2016)

Area: 658.66 km² (84% forest)

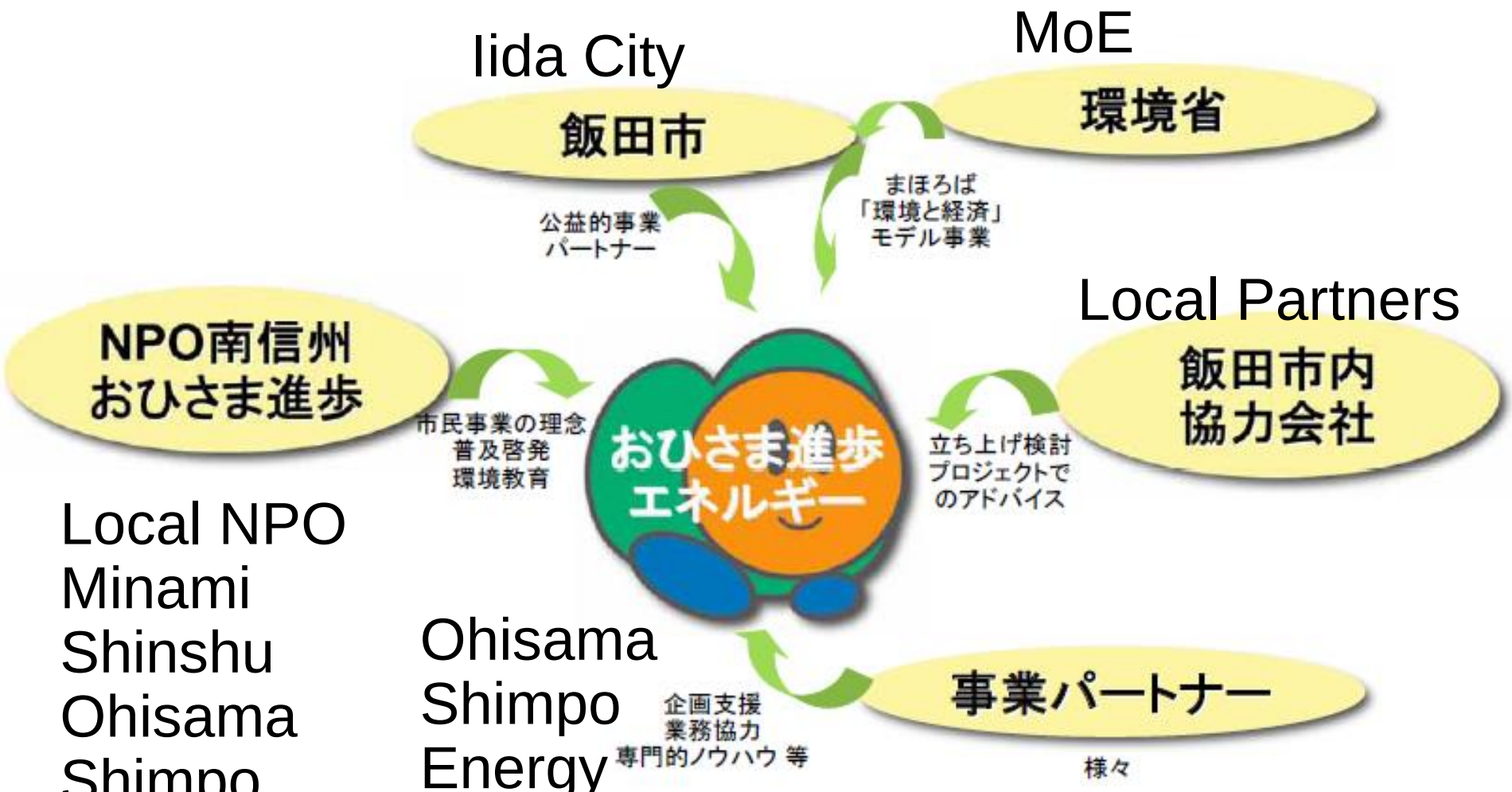
Hours of sunlight per year: 2006.6 hours (2015)

Solar power take-up rate: 8.3% (The end of FY2015)

Iida-city promoted Local RE Projects since 2004

Local NPO and ISEP cooperated citizens investment in PV projects with the help of Iida-city and Ministry of the Environment.

Ohisama Shimpo (Solar Promotion) Energy in Iida city



Regional Environmental Rights Ordinance

Form a closed loop for circulation of economic value within the region by supplying the renewable energy resources that exist therein to the area as energy.

Enhance the environmental value of the entire region by taking maximum advantage of its renewable energy resources for the area's energy supply.

Regional Environmental Rights Ordinance

An ordinance concerning sustainable community building through the introduction of Iida's renewable energy

Residents engage proactively in locally-led renewable energy businesses that create economic and environmental value.

Led by residents, circulate energy and wealth within the region to promote local revitalization from the viewpoint of **energy autonomy.**

Renewable energy resources are closely connected to the residents and land of the region

Define renewable energy resources as the common property of all residents, guaranteeing residents' rights to make use of those resources in community building.

Fosters residents' autonomy in the course of resident-led joint decision-making in the establishment of projects, in areas such as financing, risk management, and what to do with revenue earned.

Iida City will extend support to resident-led renewable energy projects based on the Regional Environmental Rights Ordinance, to propel its Eco-Model City policies forward.

School Solar Power Generation Project Proposed by Junior High School Student Council

Ohisama No. 9 Co., Ltd.

School donates part of profits from electricity sales

Asahigaoka Junior High School Solar Power Project Council

Project Entity

Project accredited under Regional Environmental Rights Ordinance

Iida City

Advice and support

Yamamoto District

Students plan and implement activities with local districts, funded by donations from power sales profits

Igara District

Public-Benefit Dividend Project

(1) School's disaster-preparedness function as designated evacuation center is enhanced by the installation of solar panels with storage batteries.

(2) Installation of a solar panel for environmental teaching purposes next to the science classrooms contributes to students' environmental education.

(3) Donations used for environmental learning and regional activities, led by students and in collaboration with the two districts.

Approval Ceremony and Agreement Signing Ceremony and Commemorative Photograph (Dec. 22, 2015)

Suggestions to promote community power (1)

- Pursue explicit recognition of community power and its benefits
- Encourage citizen participation through community energy
- Develop effective business models for community financed energy projects
- At the global level, international organizations, could include community energy as a priority in their work programs.
- In order to overcome the equity gap, particularly in developing countries, governments could contribute to the development of alternative business models to encourage financial institutions to dispense loans. Public guarantees can play an important role in this area, especially when given by multilateral finance institutions.
- An appropriate international finance institution could establish a facility specifically dedicated to financing community energy projects in developing countries. Such a facility could not only provide loan guarantees, but could also help to overcome the equity gap.

Suggestions to promote community power (2)

- Learning among pioneers and new entrants is one of the keys for community energy's further development.
- Community power: Profits are reinvested to meet the needs of communities: efficiency, poverty, education, job creation!
- Citizens increasingly perceived as prosumers and energy citizens, the driving force behind the low carbon transition
- To achieve more:
- Legal framework more supportive of local communities and jurisdictions (e.g. cities, counties, or collections of both) to generate or procure on the market the electricity to meet their own demands;
- Citizens to become knowledgeable participants and able to exercise their rights in the political, economic and social dimension of energy policy!

References

- IRENA(2018), COMMUNITY ENERGY: BROADENING THE OWNERSHIP OF RENEWABLES
- Iida City: FutureCity Eco-model City,

  http://future-city.jp/en/torikumi/iida/