

Asia Clean Energy Forum 2018 @ Manila  
Deep Dive Workshop

Opportunities and Models for Early-Stage and Community-Based Renewable Energy Project  
Finance, and Discussion of Additional Barriers to Unlocking Project Capital at Scale

# ”Experiences and Lessons from the Community-based Renewable Energy Development in Japan”

May 8, 2018  
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Institute for  
Sustainable  
Energy  
Policies

**isep**

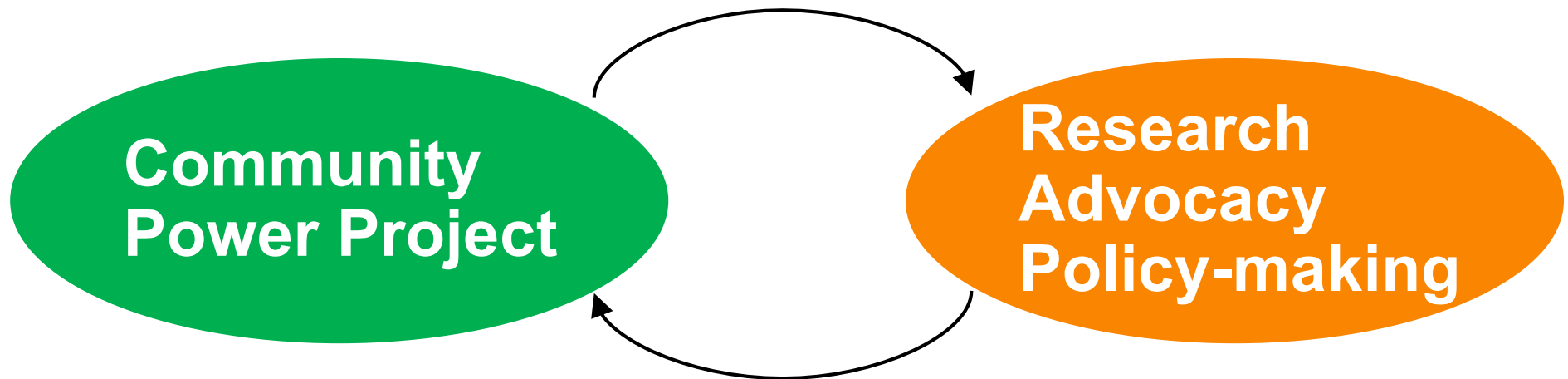
認定NPO法人

環境エネルギー政策研究所

# Institute for Sustainable Energy Policies(ISEP)

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Non-Profit organization in Japan since 2008



Citizen-based  
Finance

Solar Sharing  
Projects

Proposal for FIT  
Law

Joint Finance  
by Local Banks

Network of RE  
Communities

Consensus-  
making Process







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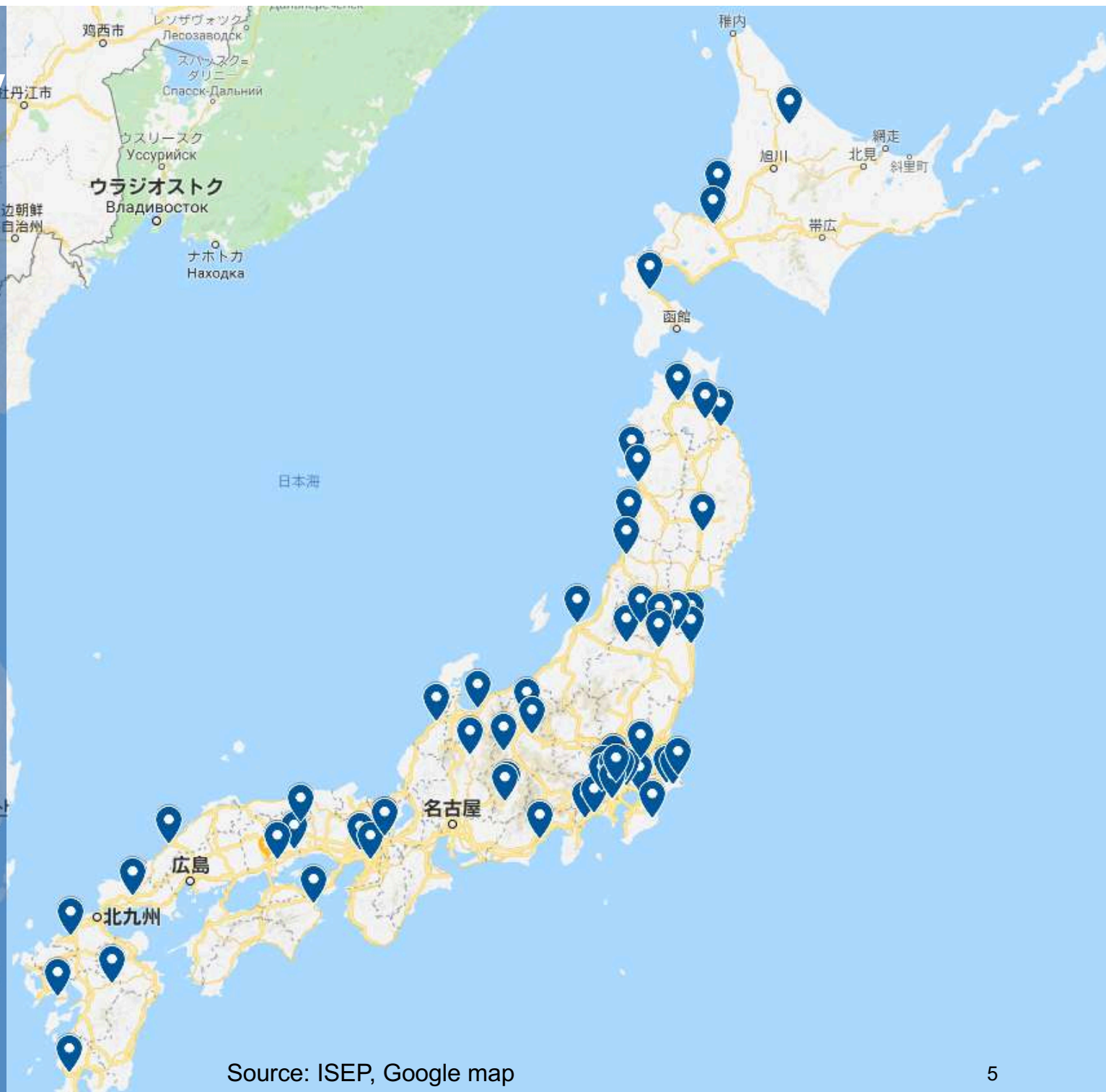
1. RE projects with community-based finance in Japan

2. Niigata projects as best practice

3. Lessons learned from successes and failures

# Community Power Projects in Japan

Total >90 MW  
PV: 60MW  
Wind: 29MW



# Community Power Projects in Japan before 2011



Hokkaido  
Tohoku  
2001-

Toyama  
2011-

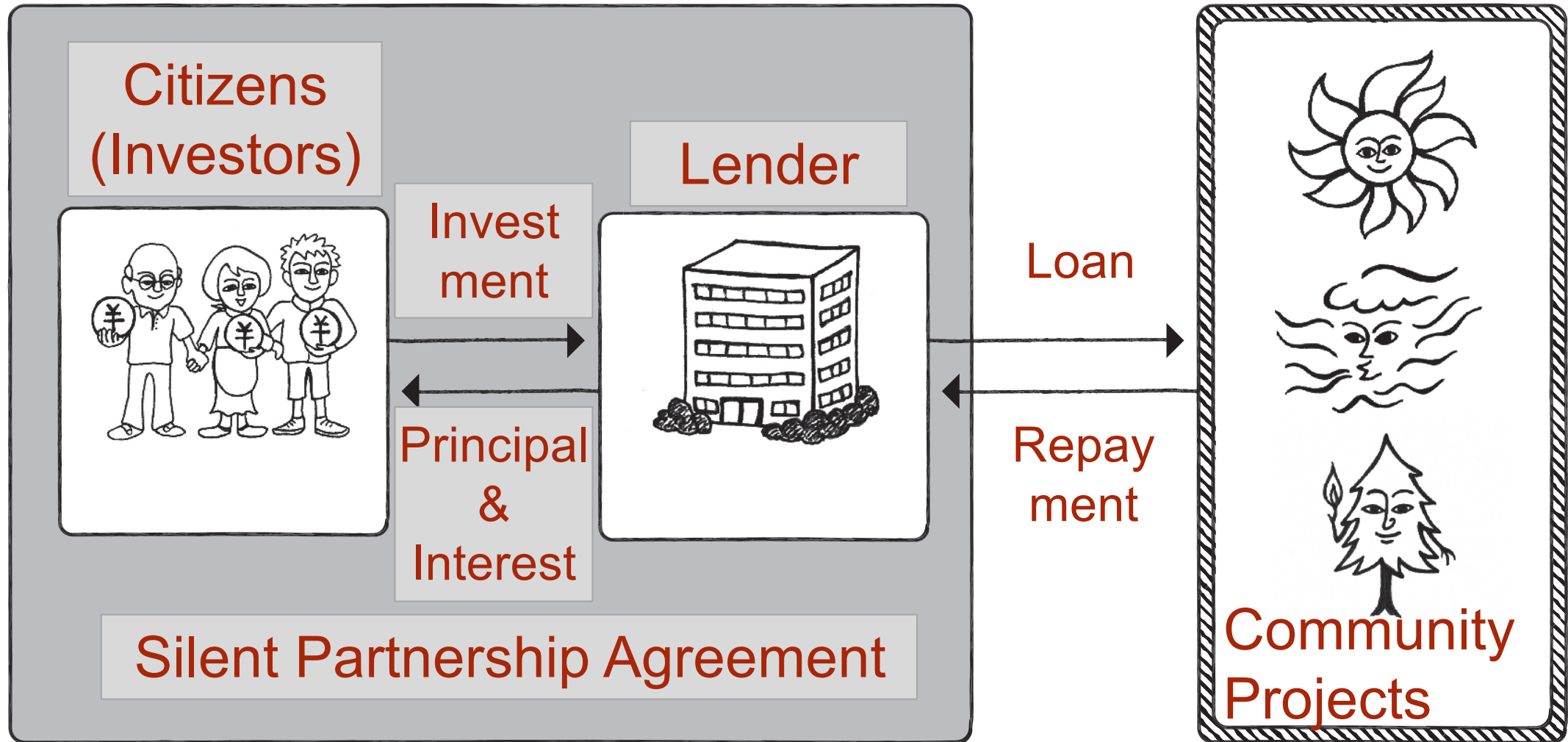
Iida city  
2005-







# Citizen-based Investment Scheme





# Characteristics of Citizen-based Finance

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Bank loan

Citizen-  
based  
Finance

Equity

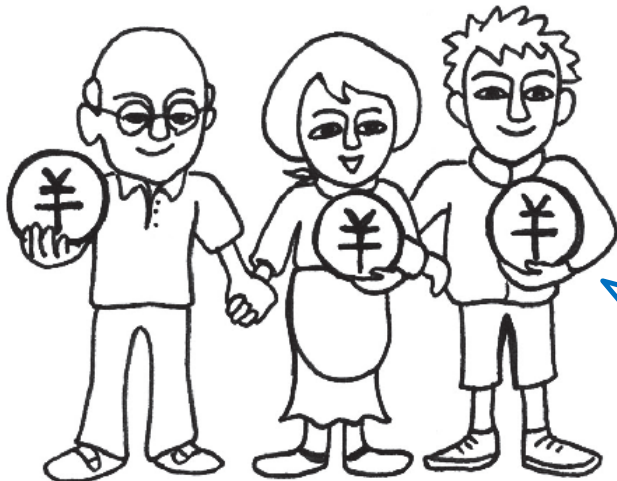
- Subordinated loan
- No voting right for Investors (silent)
- Small investment (typically \$500-5,000)
- Flexible (period, terms of repayment)
- Participation and ownership by citizen

# Motivation of Citizens

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✓ Environmental awareness  
(and action!)



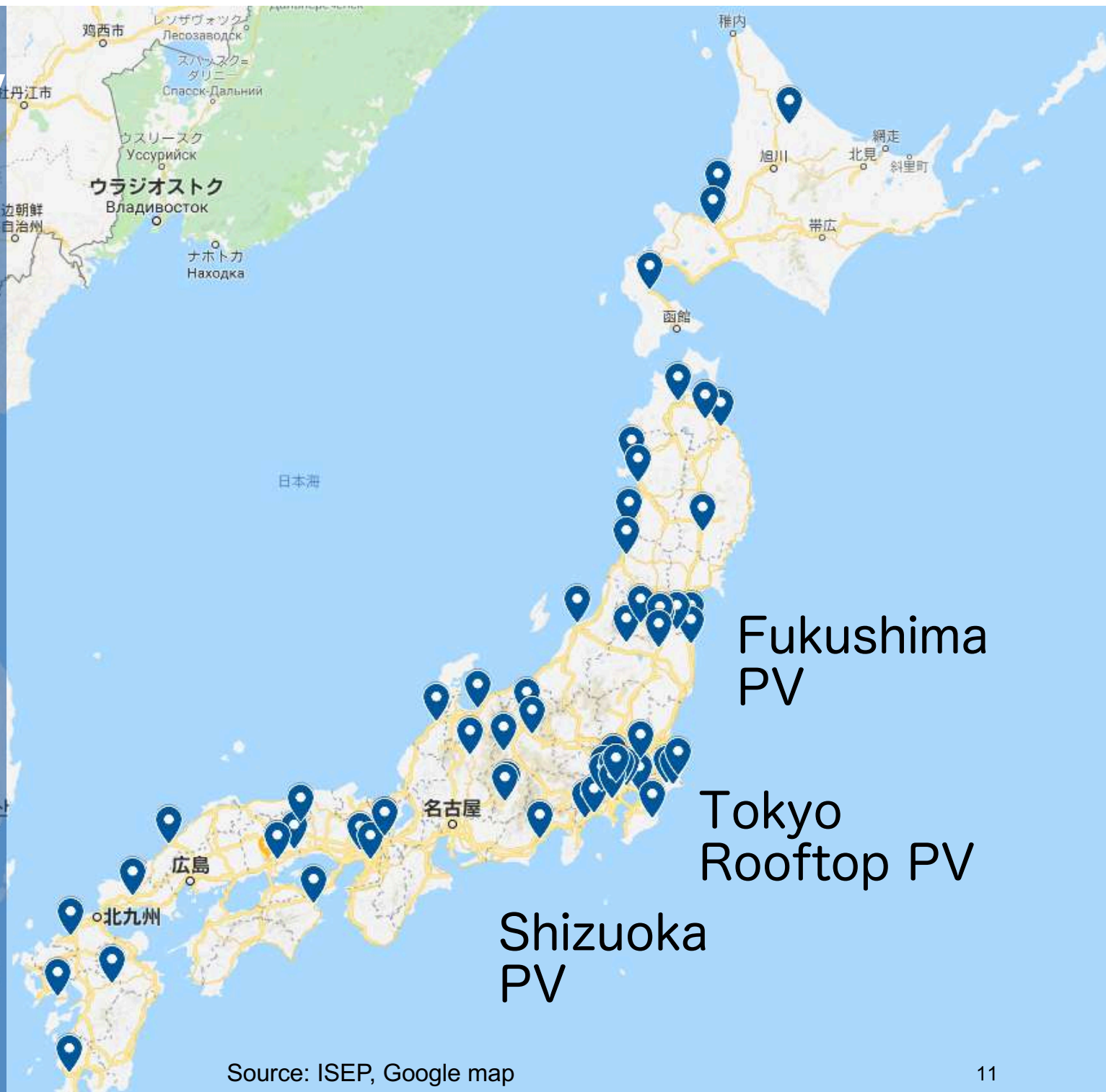
✓ Ownership to energy project  
(My RE facility!)

✓ Economic benefit  
(not large, but it's not donation!)

Source: Who Invests in "Community Wind"? - Comparative Research of Investing Community Wind in Japan - Makoto NISHIKIDO and Yasushi MARUYAMA

# Community Power Projects in Japan

Total >90 MW  
PV: 60MW  
Wind: 29MW





# Aizu Denryoku in Fukushima with Local Sake Brewery Owner



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2 MW PV by Local Owners











# 1st World Community Power Conference in Fukushima in 2016



600 participants from 20 countries  
2nd Conference in Mali in Nov. 2018



# Tomiooka Solar Projects in Fukushima

30 MW PV by Local Owners

Source: Community Power Initiative Website



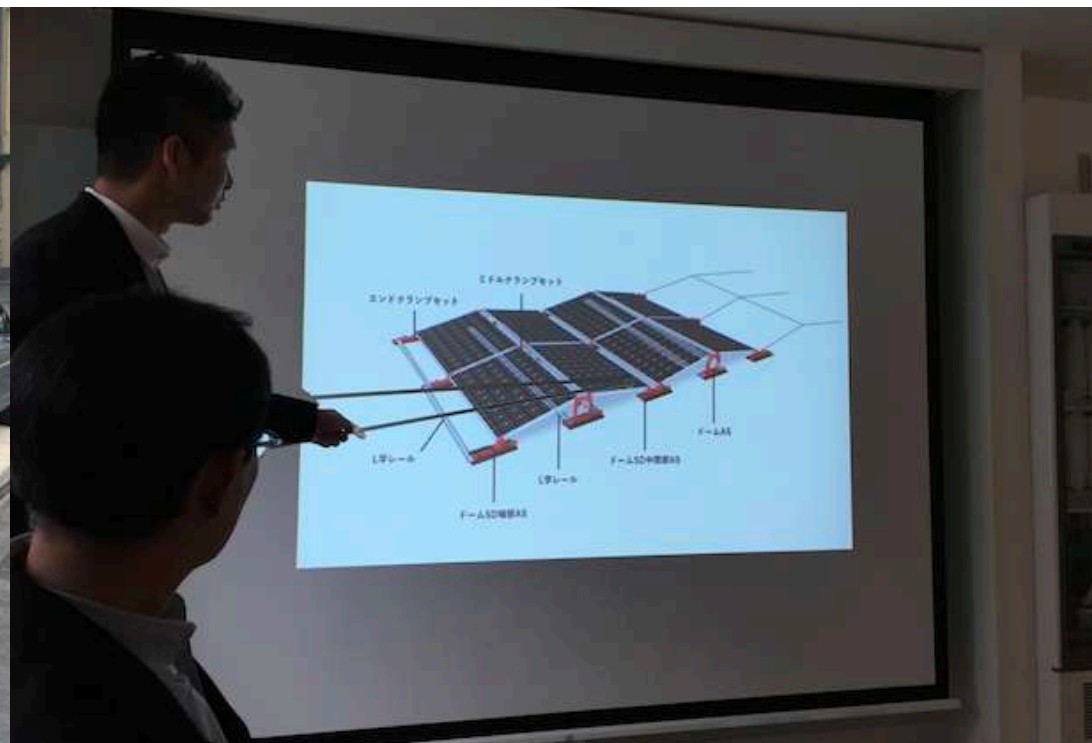
# Tokyo PV Project

A man in a dark suit and glasses is kneeling on a rooftop, leaning against a solar panel. The rooftop is covered with several rows of dark blue solar panels mounted on metal frames. In the background, a dense urban landscape of Tokyo is visible, with various apartment buildings and skyscrapers under a clear blue sky. The scene is brightly lit, suggesting a sunny day.

“Do It Ourselves”

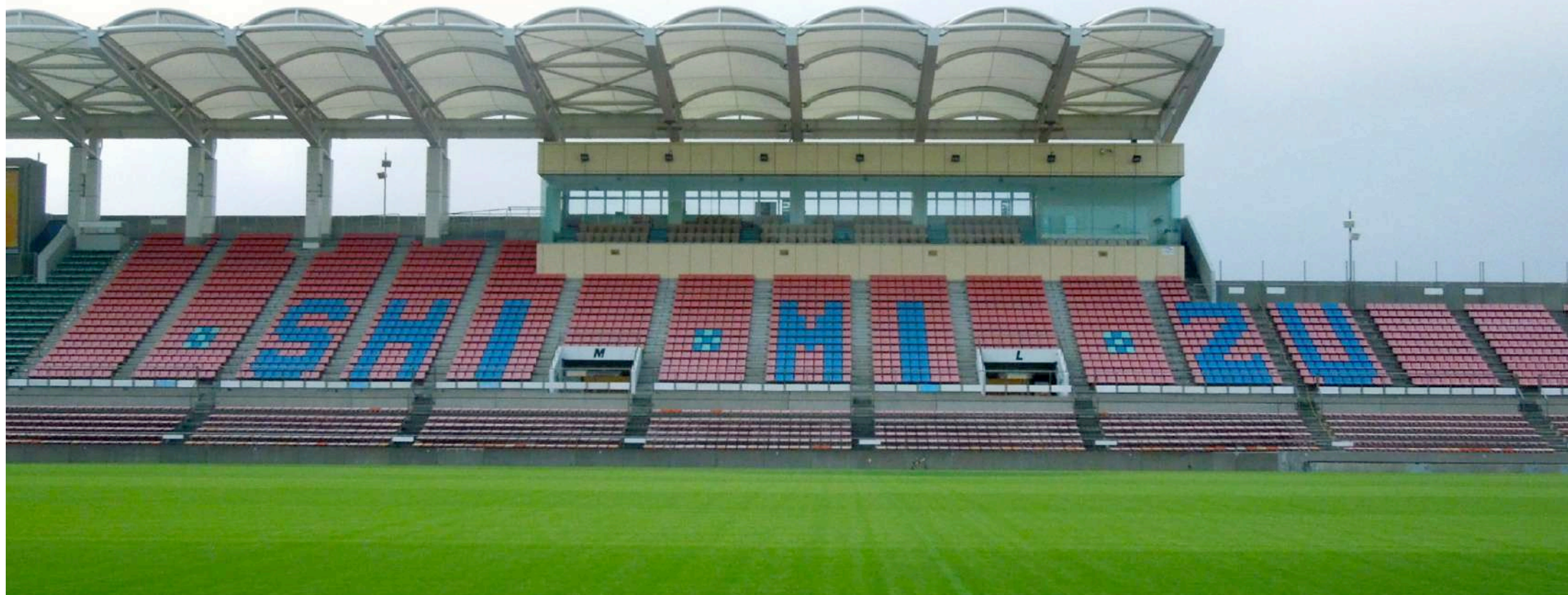
In the foreground, on the flat concrete rooftop surface, there are various items including a blue water bottle, a pair of orange-handled pliers, a white plastic bag, and some coiled white cables. The solar panels are arranged in a grid pattern, and the man is positioned near the top left of the array.







# Shizuoka PV Project



Energy Issue  
in the Local Context







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1. RE projects with community-based finance in Japan

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# Niigata

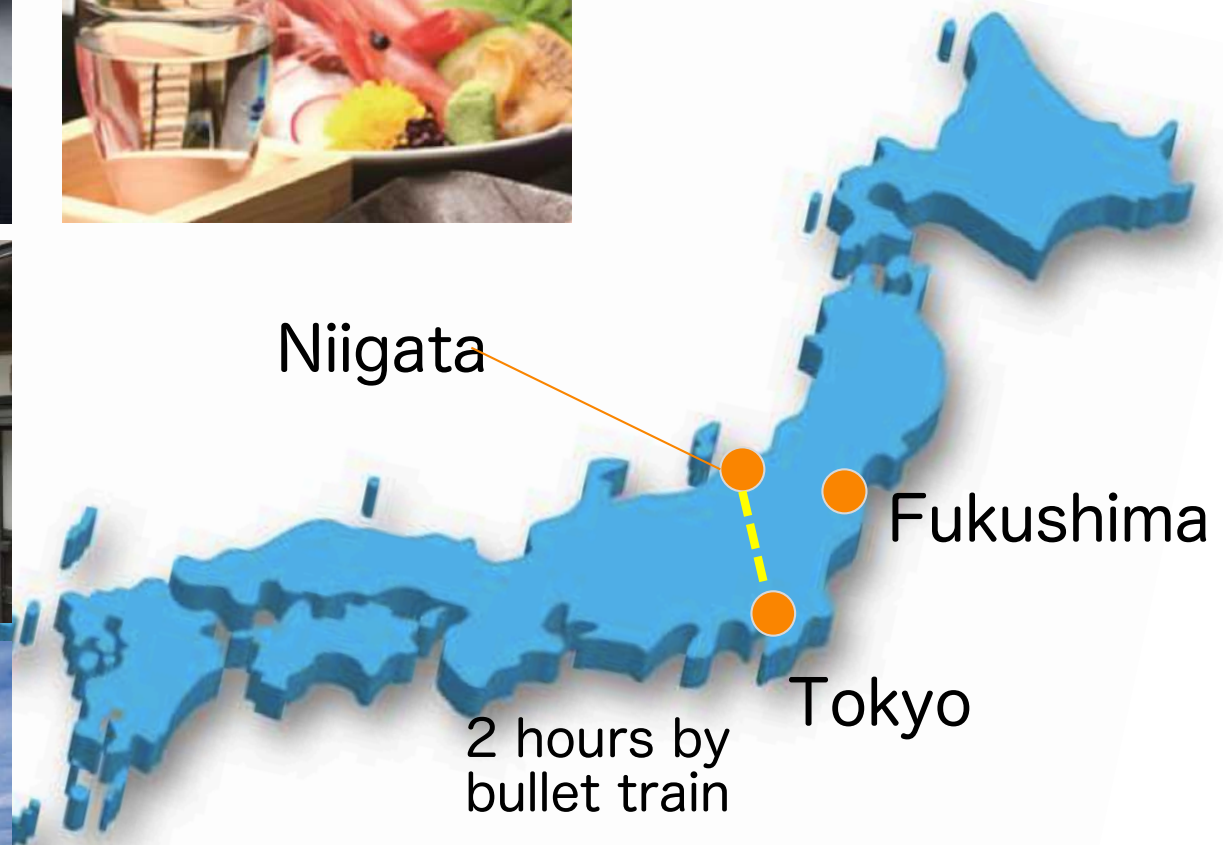
Rice, Sake,  
Seafood



Historic Area



Kashiwazaki-  
Kariwa  
Nuclear Plants



## Why is Niigata Project best practice?

- Local leader and dedicated members
- Effective Cooperation with Local Gov.s
- Interesting Finance Scheme



See Youtube video for Niigata Tour in Aug. 2018  
<https://youtu.be/kruqIDPKOf4>





Start-up Meeting in Sep. 2014

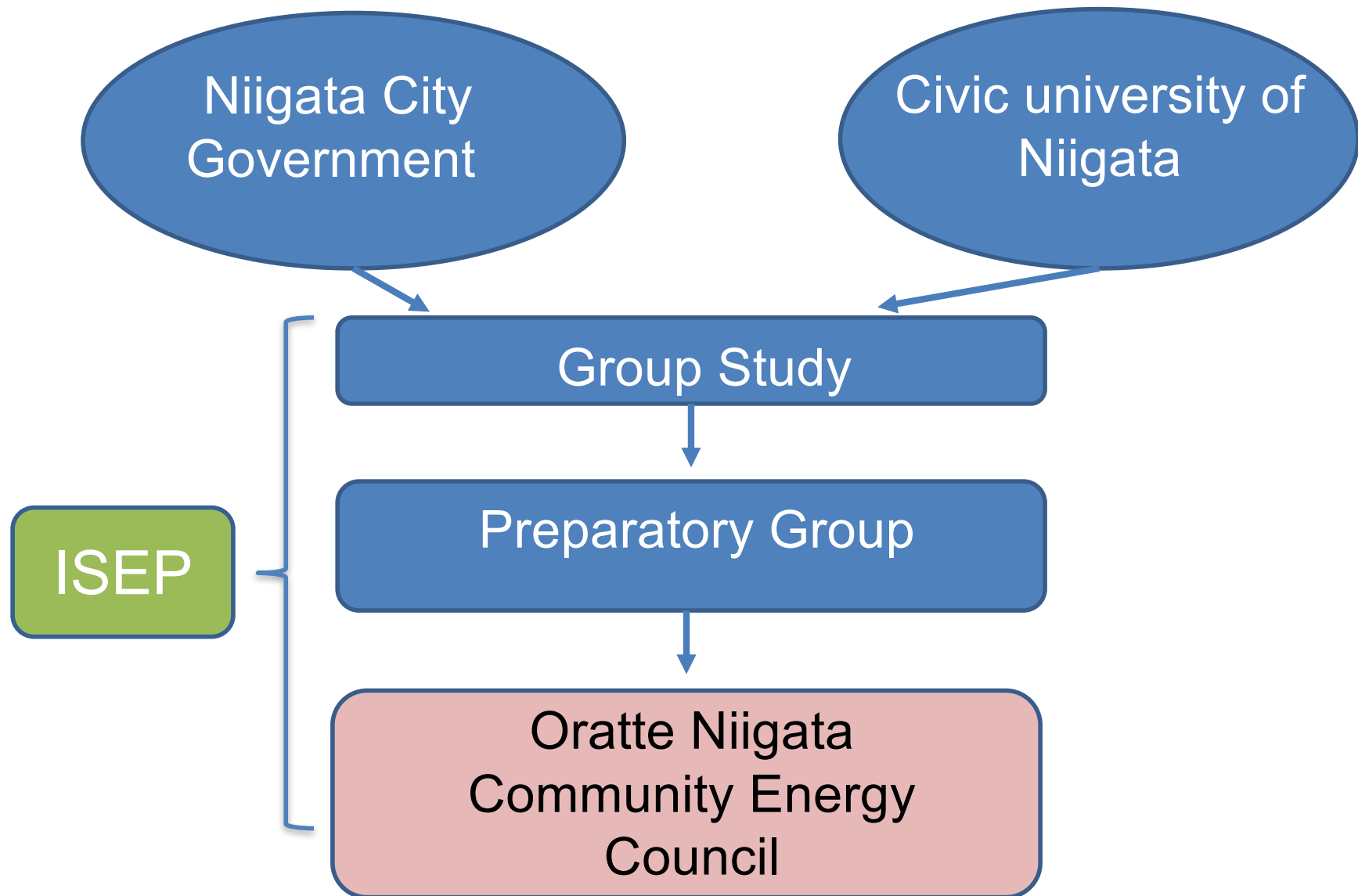




Meeting by the Oratte Council Members

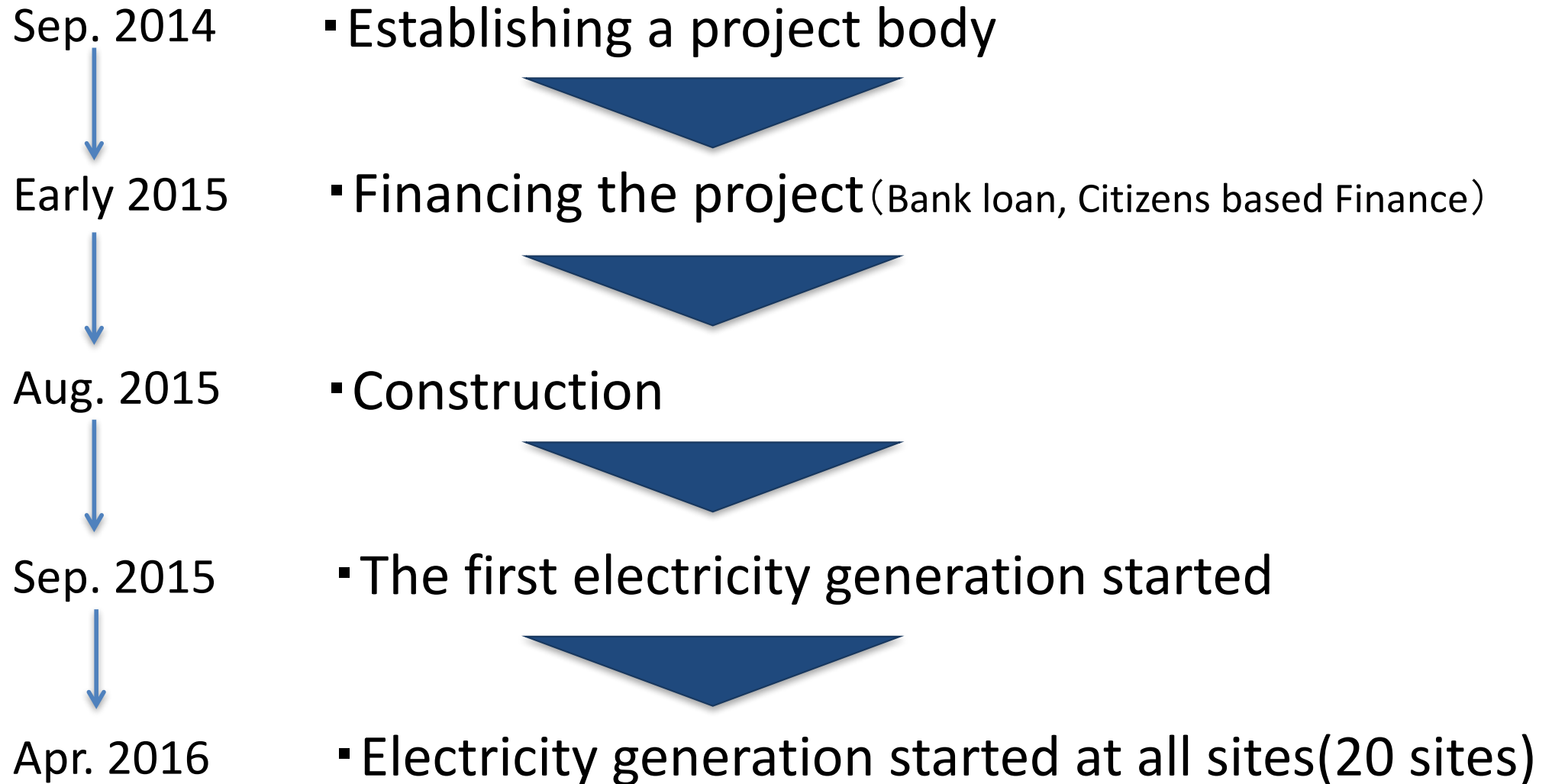


## Beginning of "Oratte(We) Niigata Project" in 2014



## Steps before the project started

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# Cooperation with the City of Niigata

Partnership agreement with the city of Niigata on August 18, 2015

“Partnership agreement for promoting a sustainable low carbon city planning”

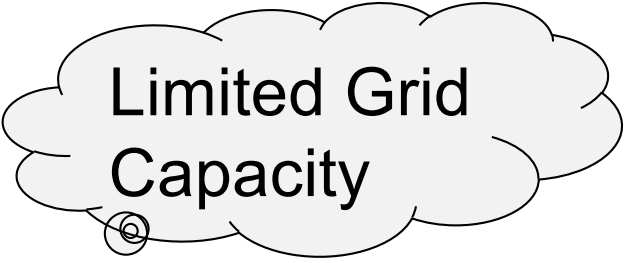


- City agrees to lend 4 lands and 7 facility rooftops without charge.
- Oratte agrees to promote environment education on RE and CC
- Additional credibility to civic organization



# Three barriers for Start-up

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## Limited Grid Capacity

- The grid operator suddenly announced that there is no more grid capacity for large PV project (more than 50kW)
- This scrapped the originally planned



## Fundraising

- At the beginning, zero funding
- They couldn't get any subsidy



## Bank Loans

- No experience of RE project for local banks
- Low credibility of civil organization
- Multiple and tough negotiation with a local bank



# PV Sites of Oratte Niigata Project (50-80kW)

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City Hall  
Joint Project



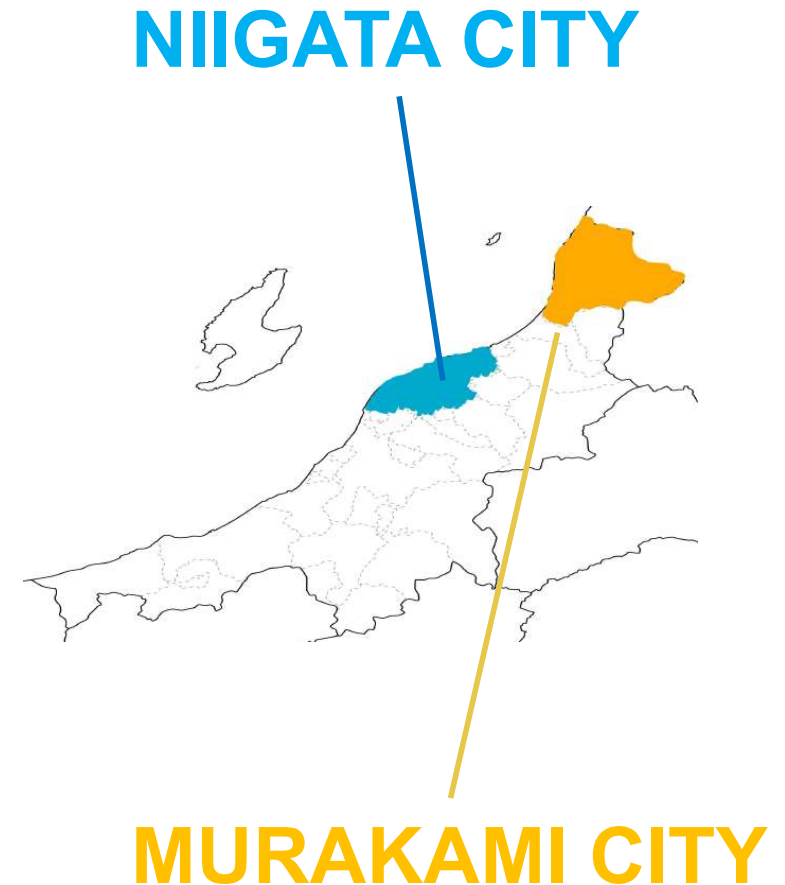
Site in Masuoka  
Private Project



Sewage Treatment  
Plants  
Joint Project



PV on former pig  
farm



# Solar Power Plants in the first Phase in 2015-2016

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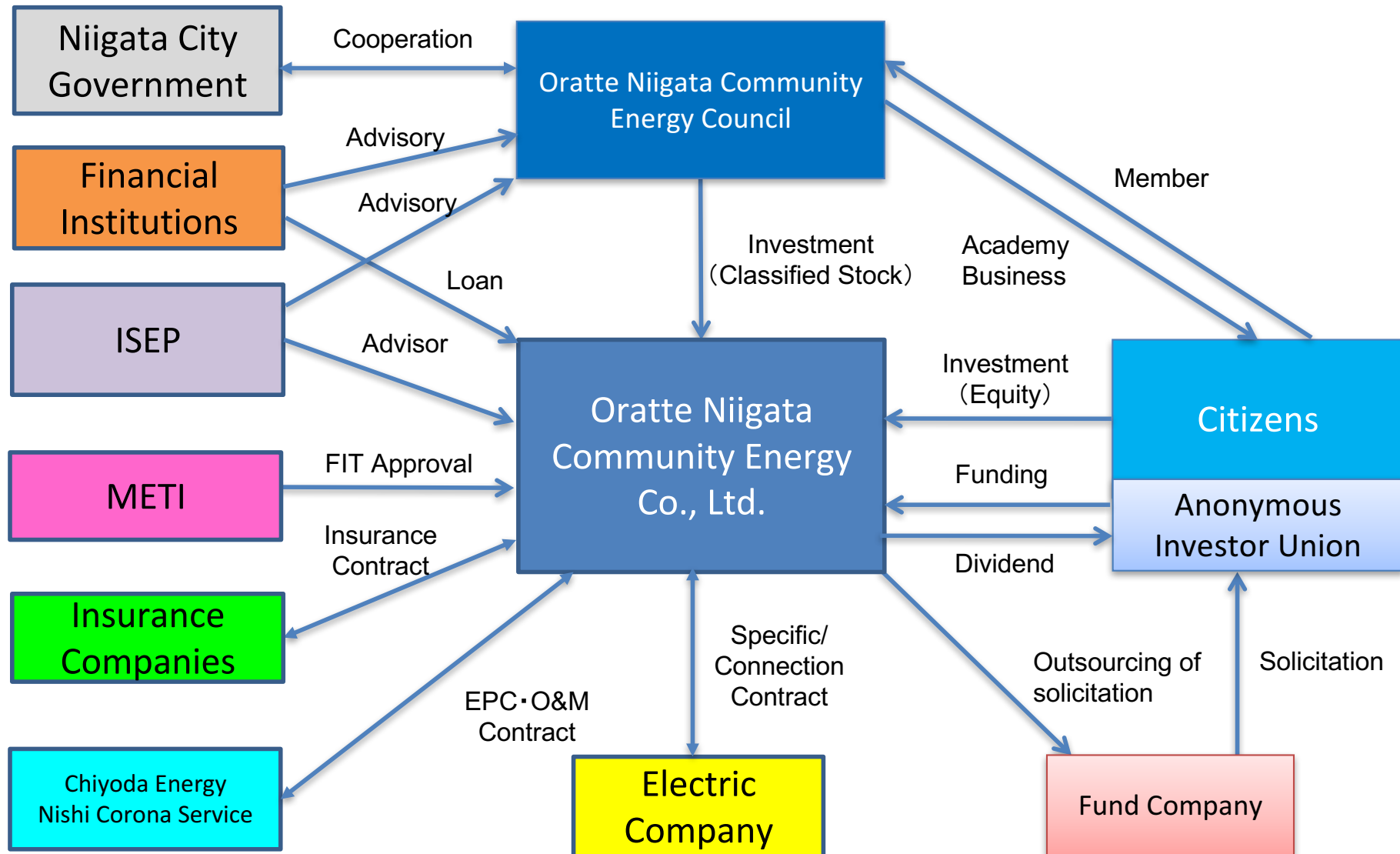
Project Overview (20 sites, Total capacity 892kW)

	Joint Project with Niigata city	Private Projects
Total Capacity	11 projects 554kW	9 projects 338kW
Expense	About 270 million JPY	



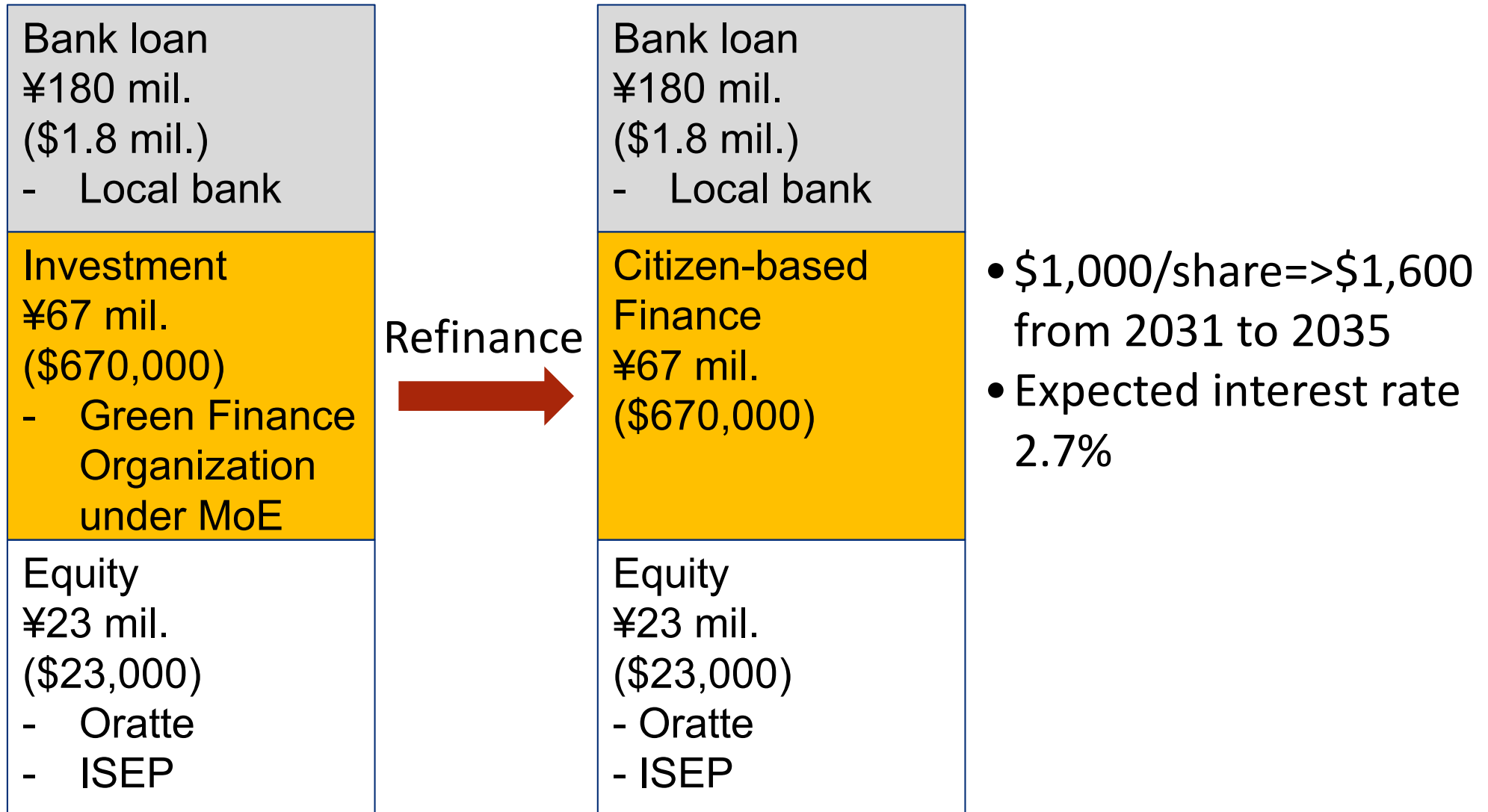


# Scheme for Oratte Project



# Finance scheme for the 1st Project in 2015

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# Solar Power Plants in the second Phase in 2017-2018

Project Overview (23 sites, Total capacity 1,275kW)

	Joint Project with Niigata city and Murakami city	Private Projects
Total Capacity	7 projects 440kW	16 projects 835kW
Expense	About 262 million JPY Jonan Shinkin: ¥237m.= \$2.4 m.(91%) Niigata Shinkin: ¥24m.= \$ 240,000.(9%)	



# Finance scheme for the 2nd Project in 2017-2018

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Bank loan  
220 mil. Yen

- Jonan credit bank  
¥237m (\$2.4m)
- Niigata credit bank  
¥24m (\$ 240,000)

Equity  
¥2m (\$ 20,000)



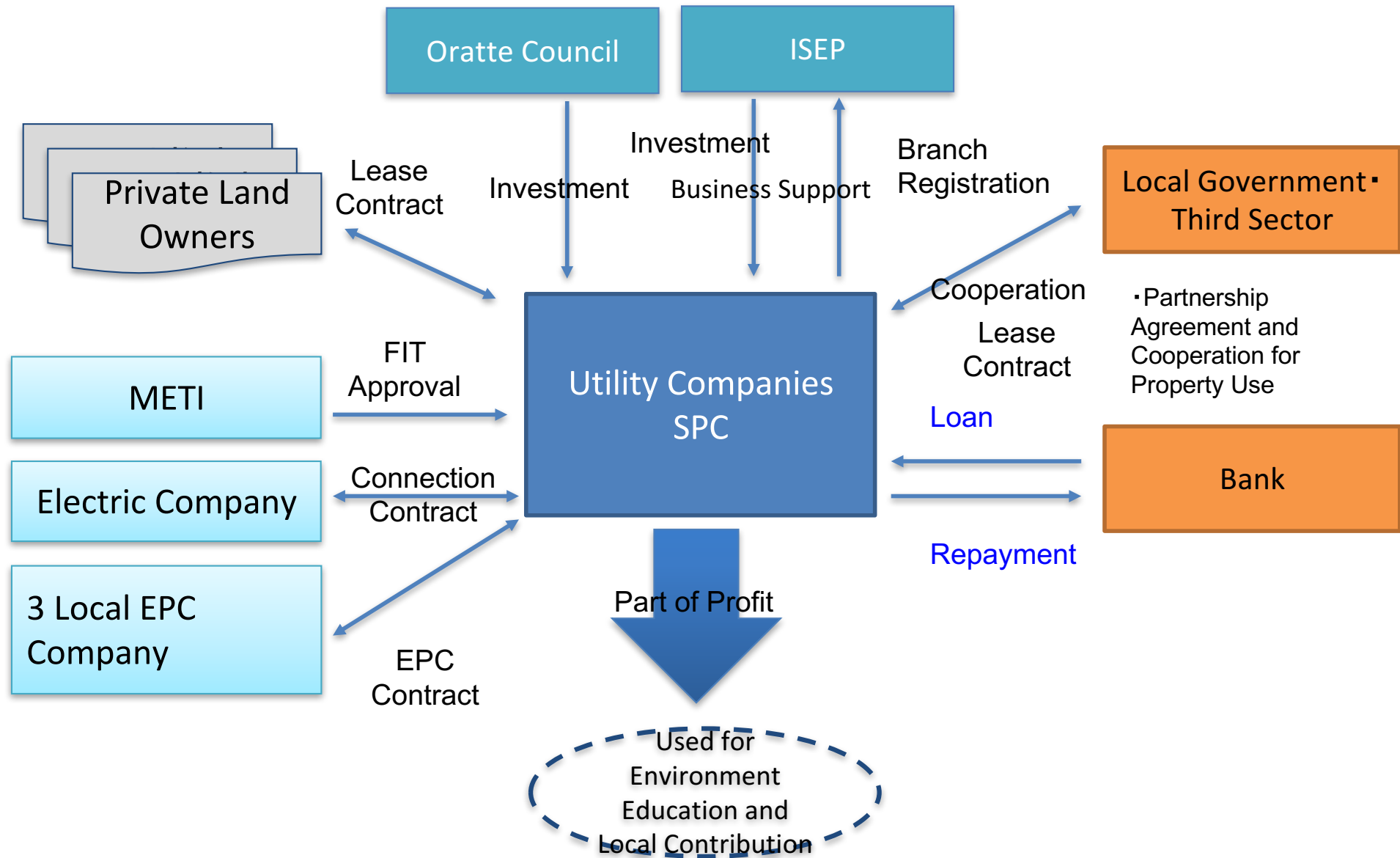
Jonan credit bank

- Tokyo-based credit bank
- High motivation for RE projects
- Able to finance companies in Tokyo
- Orate set up branch in ISEP's office

└─▶ Orate set up branch in ISEP office



# Scheme for Oratte Project Second Phase



# Lessons learned from Oratte Niigata Project

- “Why did we succeed?” (by President of Oratte company)
  - ✓ ISEP supported Oratte from the beginning.
  - ✓ Oratte can learn from successful cases through ISEP network
  - ✓ Every members was non-expert.
  - ✓ All members faced same direction.
  - ✓ Oratte didn’t take only economic benefit, but also benefit for community
  
- Local Contribution
  - ✓ Environmental Education at elementary schools
  - ✓ Festival
  - ✓ Collaboration with local organization for the historic area



# Future Plan of Oratte Project

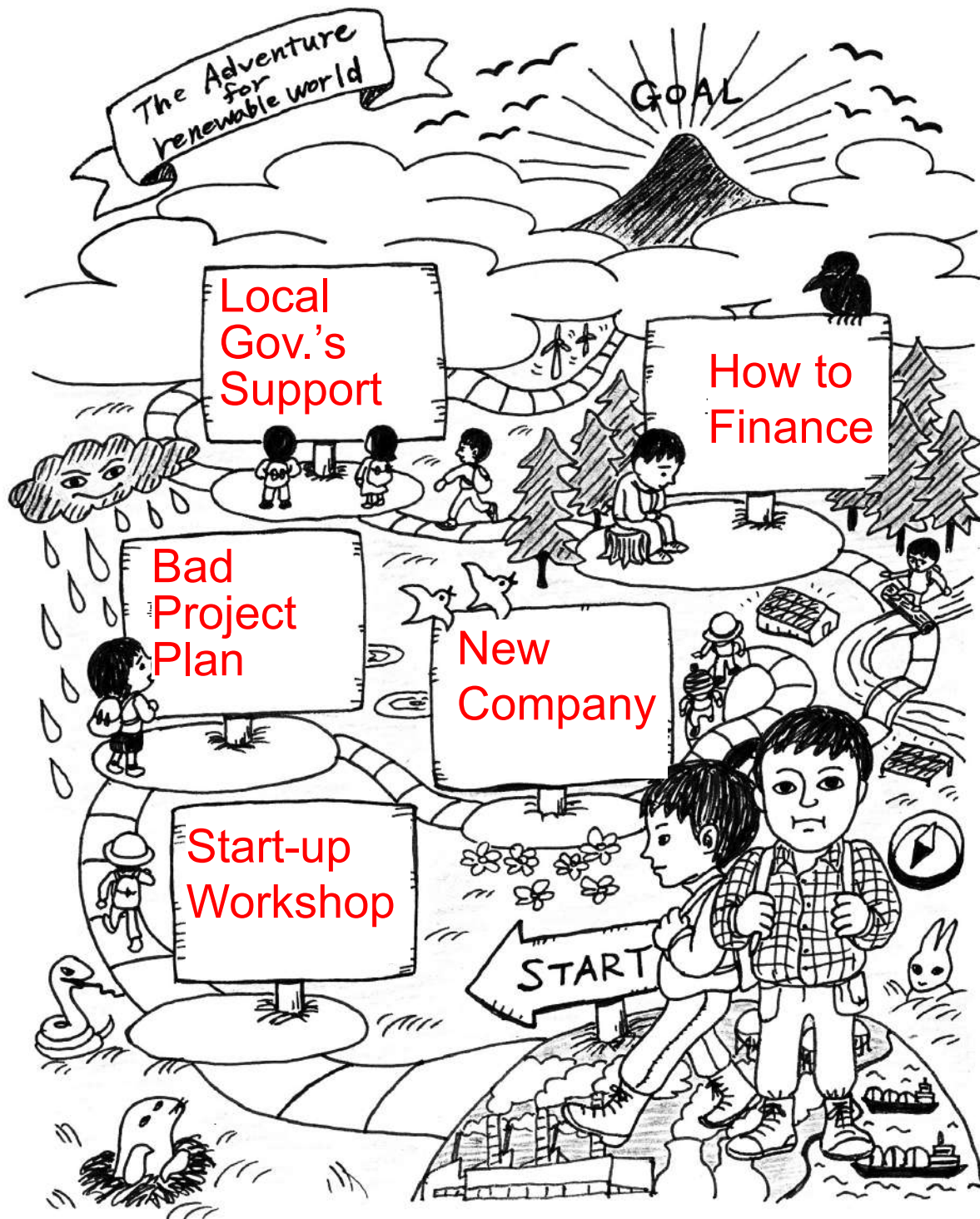
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- ✓ Solar sharing on agricultural land
- ✓ Rooftop PV installation without FIT
- ✓ Wind repowering with a local government
- ✓ Small biogas with local farmers
- ✓ Biomass heating by rice husk with Danish Companies
- ✓ And more local contribution



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No Support from  
Local Gov.

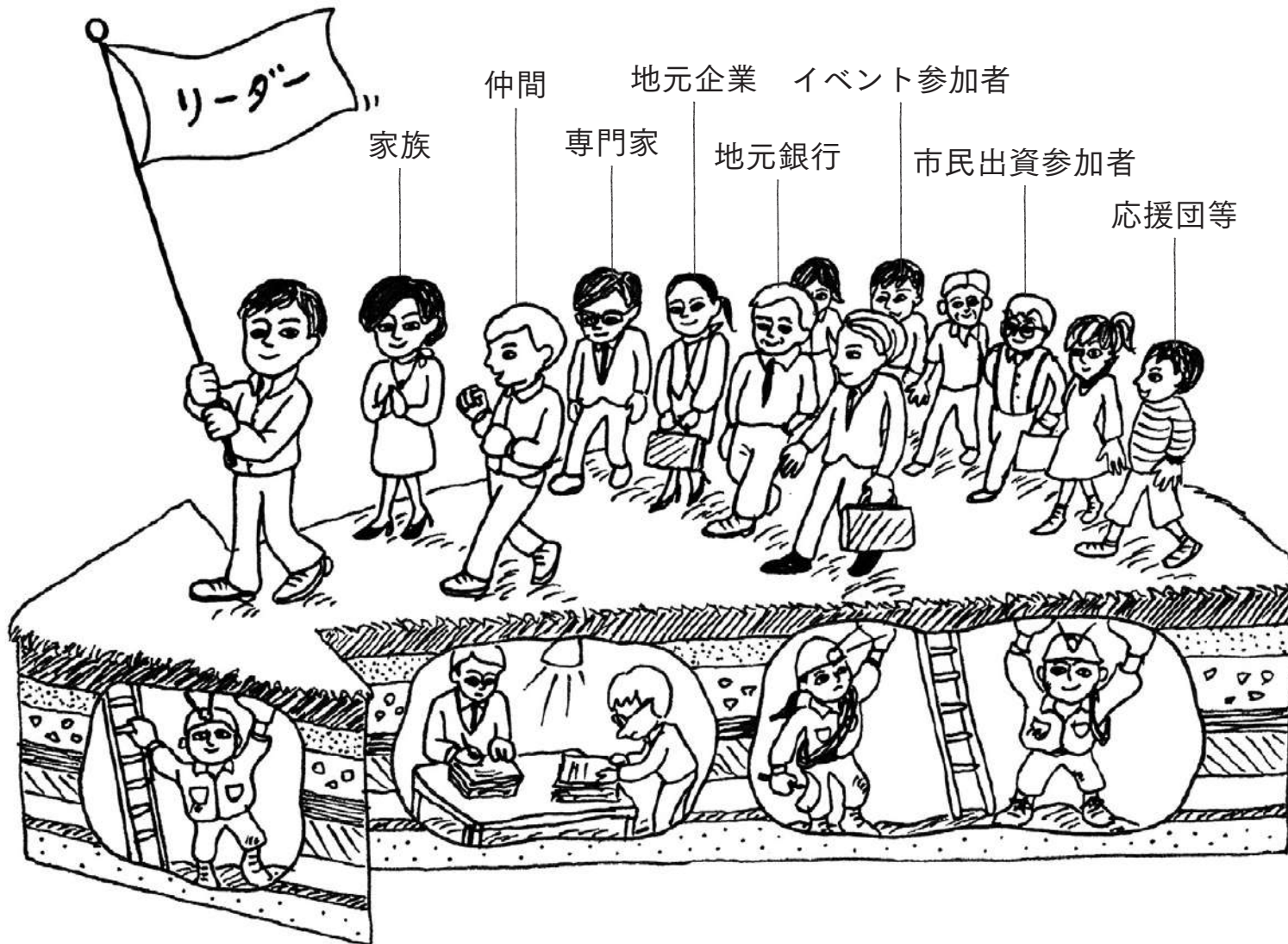
Banks hesitate to  
join

Too Low  
Profitability

No Leader, No  
Supporter

Source: Community Power –Energy  
Can Change Community, ISEP

# Citizens are Main Actors



- Local Leader
- Family & Friends
- Colleague
- Energy Experts
- Local Companies
- Local Banks
- Citizen Investors

Local Gov. staff supports them as the stage crew.



# Barriers for Community-based RE Projects

Limited Grid  
Capacity

Grid  
Connection  
Cost

Curtailment  
without  
Compensation



No incentive  
by FIT policy

Auction for  
large PV

Opposition  
to RE

5 main causes of 64 cases (by March 2017)  
(often multiple causes)

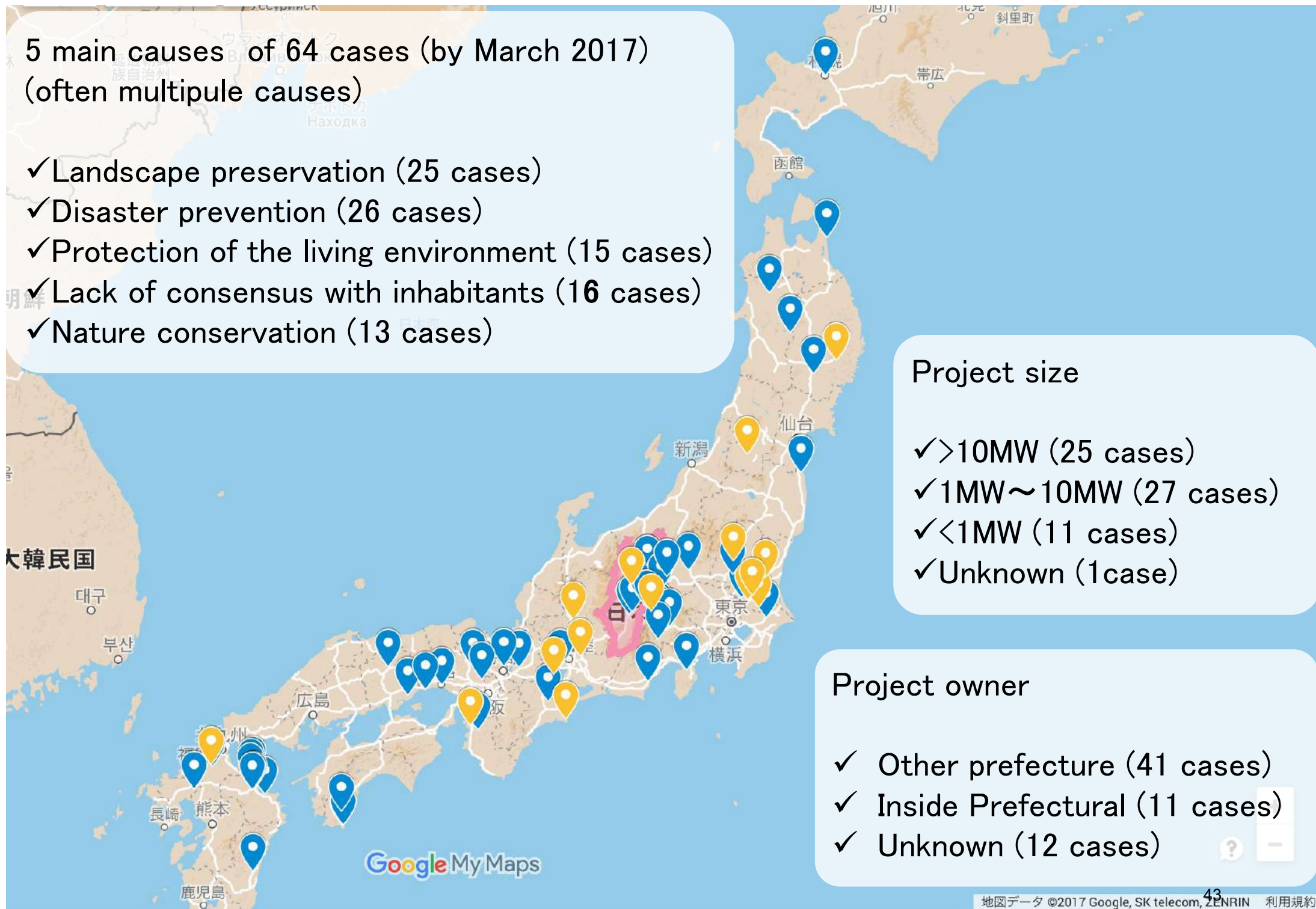
- ✓ Landscape preservation (25 cases)
- ✓ Disaster prevention (26 cases)
- ✓ Protection of the living environment (15 cases)
- ✓ Lack of consensus with inhabitants (16 cases)
- ✓ Nature conservation (13 cases)

Project size

- ✓ >10MW (25 cases)
- ✓ 1MW~10MW (27 cases)
- ✓ <1MW (11 cases)
- ✓ Unknown (1 case)

Project owner

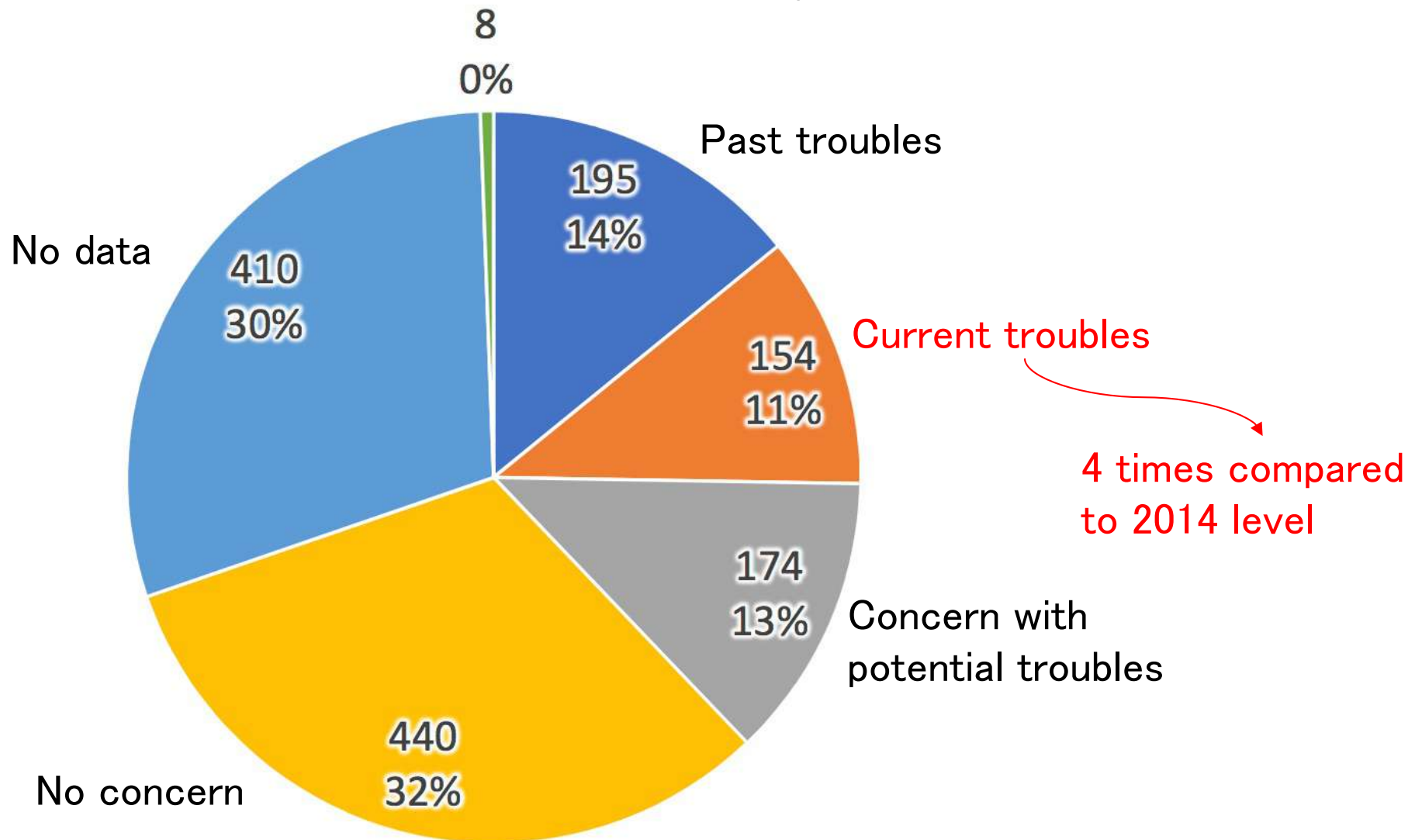
- ✓ Other prefecture (41 cases)
- ✓ Inside Prefectural (11 cases)
- ✓ Unknown (12 cases)

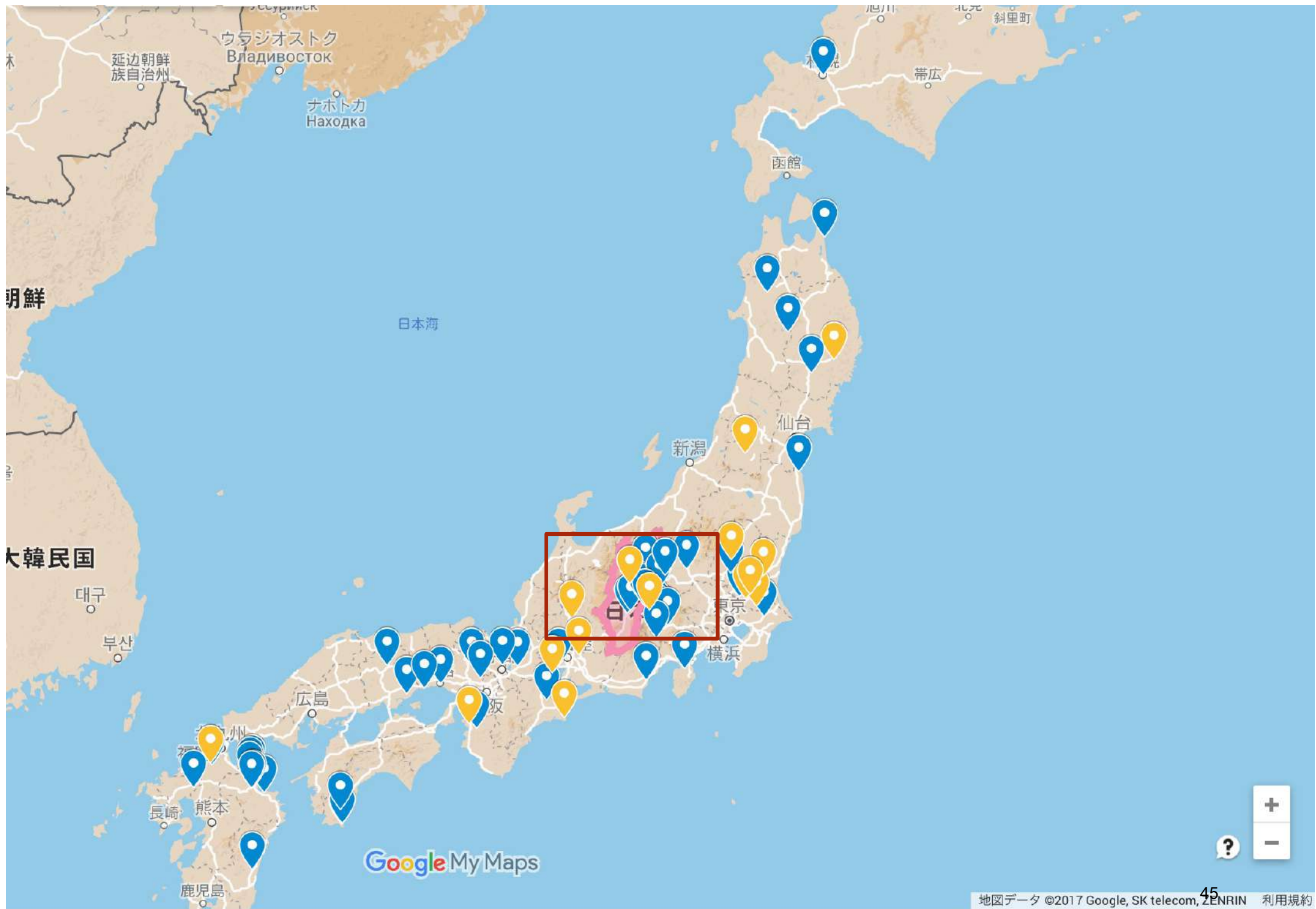




# Troubles with Renewable Energy increased year by year

The questionnaire to municipalities (N=1382, 79%) shows more troubles. Most of them are possibly PV troubles.











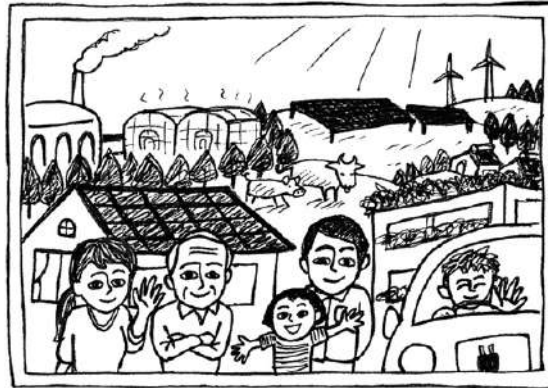




# Vision of the Community, “WHY”

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## Vision of the Community



## Policy Framework



## Networking



Source: Community Power –Energy Can Change Community, ISEP

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## Summery & Recommendation



# Concrete Examples of Renewable Energy Projects with Community-based Finance in Japan

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- RE projects with community-based finance in Japan
  - ✓ Community-based RE projects increased after 3.11 and FIT installation.
  - ✓ Several types of community-based finance schemes developed by ISEP.
  - ✓ RE projects in Fukushima can contribute to revive the communities.
  
- Niigata projects as best practice
  - ✓ Local members and officials have collaborated with ISEP since 2014.
  - ✓ Citizens' investment and local bank loan were arranged for 892kW PV.
  - ✓ Co-financing by urban-local credit banks was arranged for 1275kW PV.
  
- Lessons learned from successes and failures
  - ✓ Legal/social framework for finance is crucial
  - ✓ Community-based finance schemes can increase active participation of local actors, even though they are not always cost-effective.
  - ✓ Local actors can develop successful projects with the help of local officials and the experts.

## Recommendation for key actors

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### 1. Community leaders

- ✓ Building a highly motivated team with key persons in your community.
- ✓ Finding RE/community-based finance experts like ISEP.
- ✓ Presenting a positive vision of your community as well as your organization.
- ✓ Thinking big, starting small, learning fast.

### 2. Community supporters

- ✓ Investing citizens' finance scheme.
- ✓ Making a long-lasting contribution to the projects in your own way.

### 3. Community banks

- ✓ Taking part in the projects from the very beginning.
- ✓ Considering the terms of a loan in light of community benefit.
- ✓ Setting up a new department for community projects.



## Recommendation for key actors

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### 4. Local governments

- ✓ Making maximum use of reliability of the local governments.
- ✓ Providing roofs of public buildings or lands for joint projects.
- ✓ Supporting the projects with policies and programs like a stage crew.

### 5. National government

- ✓ Providing training programs for key actors and guidelines for local banks.
- ✓ Designing an appropriate FIT scheme, especially for small local projects.

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Visit to Japan



8 <sup>th</sup> Wed	Arrive in Niigata	
9 <sup>th</sup> Thus.	Morning Talks	<ul style="list-style-type: none"> <li>• Dean Yoshino (ADBI)</li> <li>• Prof. Matsushita (Professor Emeritus, Kyoto University )</li> <li>• Prof. Sasaki. (Niigata University of International and Information Studies)</li> <li>• Niigata City Staff(TBD)</li> </ul>
	Tour in Niigata City	<ul style="list-style-type: none"> <li>• Kurosaki City Hall (Leasing of Public Roofs)</li> <li>• Ground mounted Solar PV on private land</li> <li>• Solar sharing project</li> </ul>
10 <sup>th</sup> Fri.	Tour in Murakami City	<ul style="list-style-type: none"> <li>• Solar PV on top of a former pig farm</li> <li>• Solar PV at the Sewage Treatment Plants (Public Facility)</li> <li>• Small biogas plant by a Local farmer</li> </ul>
	Workshop	<ul style="list-style-type: none"> <li>• Lessons learned</li> <li>• How to make use of it in your country</li> </ul>
11 <sup>th</sup> Sat.	Return to Tokyo	

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## Niigata City



**Kurosaki City Hall (51.8kW)**  
Joint Project



**Site in Masuoka (57.6kW)**  
Private Project



**Solar Sharing (TBD)**  
Private Project

## Murakami City



**PV on former pig farm (46kW)**



**the Sewage Treatment Plants  
(80kW)**



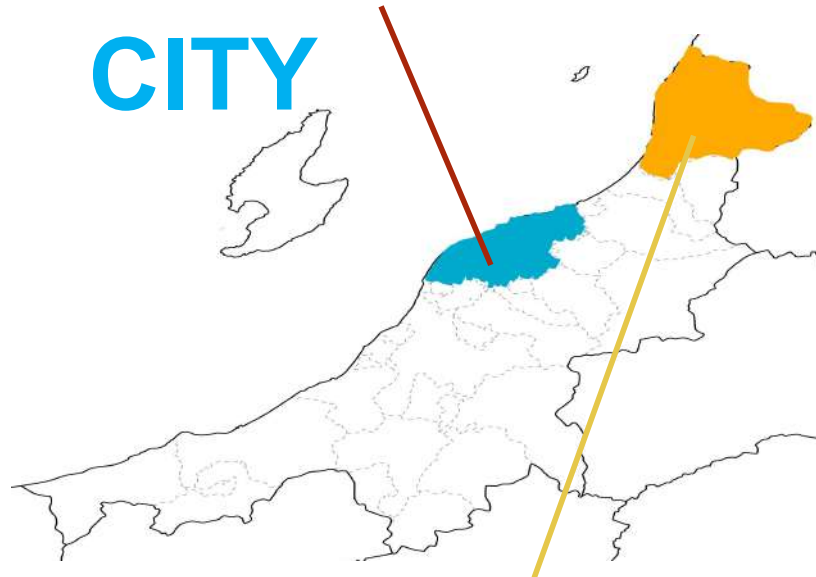
**Small biogas plant in farm  
(option)**







**NIIGATA  
CITY**



**MURAKAMI**





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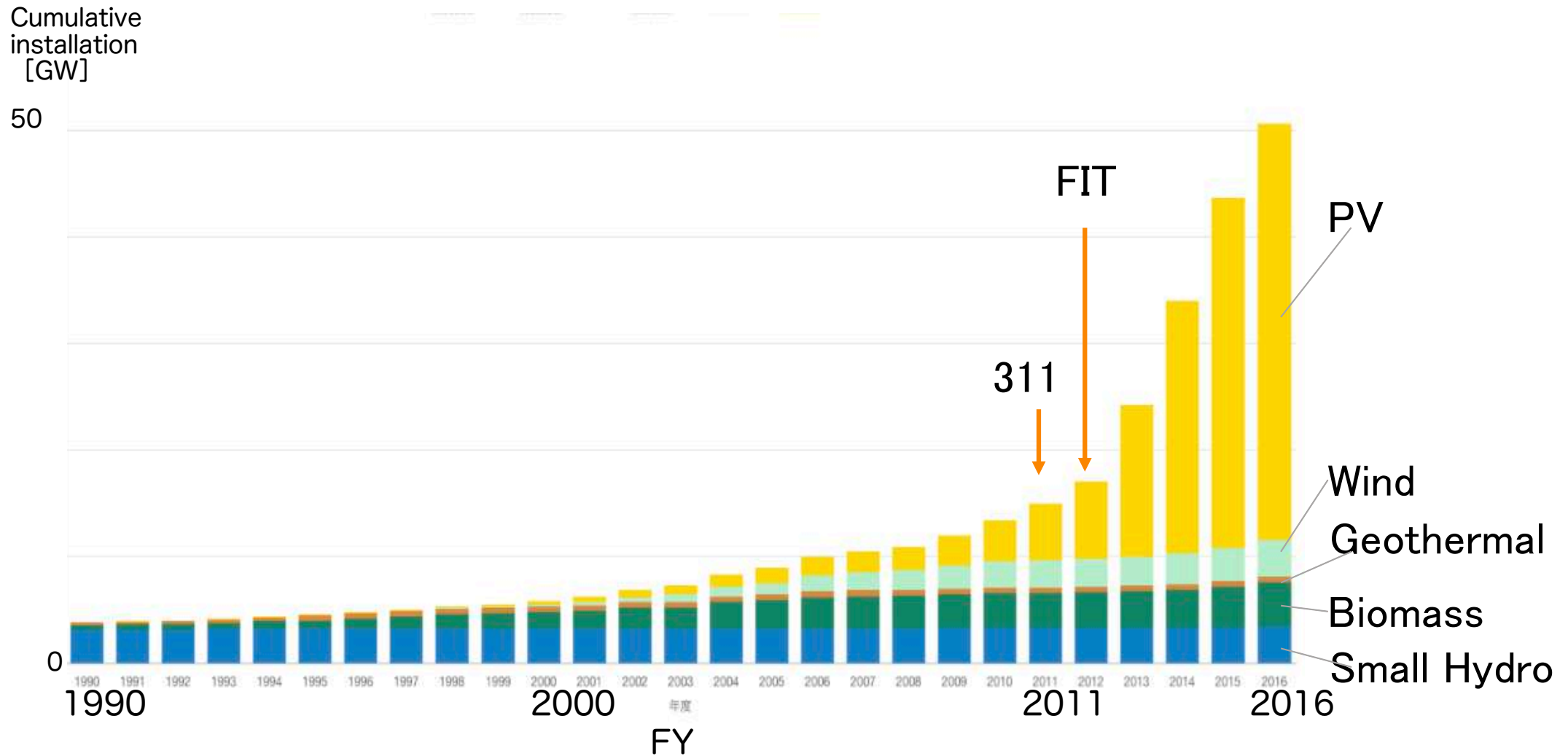
Suppliment

# Business Success Parameter

Parameter	Amount
■ Average Total Revenue for 20 years	¥30 m \$ 300,000
■ Average Sales Revenue for 20 years	¥8m \$ 80,000
■ Average Financial Loss for 20 years	¥18m \$180,000
■ Average Profit for 20 years	¥2m \$20,000
■ Total Cash Balance for 20 years	¥41m \$410,000
■ Average DSCR for 20 years	1.22
■ Project IRR	3.62%



# Rapid Increase of PV after introduction of FIT and 311



## 4 types of policy measures to mega-solar trouble

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Because of lack of national policy, each municipality and prefecture must deal with these troubles .

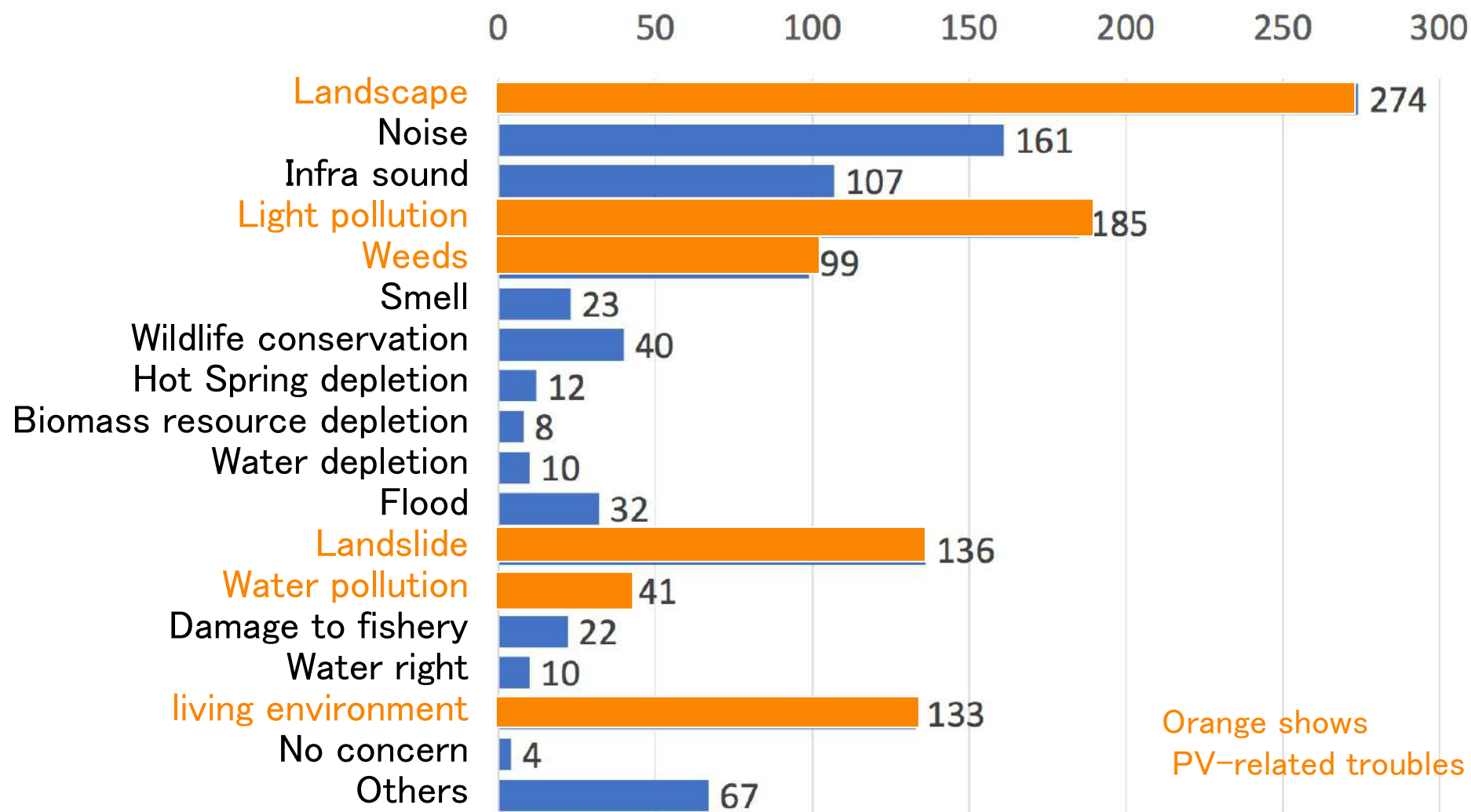
1. Restrictions on solar PV projects (often by landscape preservation bylaw or nature conservation bylaw)
1. Environmental assessment bylaw for large-scale solar PV (ex. More than 15 MW in Nagano prefecture)
2. Mandatory notification before construction work
3. Administrative guidance(Gyosei Shido) or agreement with inhabitants

Some projects reached reconciliation by the mediation by local administration.



# Classification of Troubles

PV-related troubles show high score.



# RE policy by Prefectural Governments

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Several prefectures strongly promote RE policy even though lack of national support including zoning and grid extension.



**Nagano**

- RE capacity for peak demand by 2030
- 35% RE target by 2050
- Hydro, PV



**Fukushima**

- 100% RE target by 2040
- Hydro, Wind, PV and Biomass



**Tokyo**

- Kind of "Stadtwerke"
- Olympic games in 2020?



**Kyoto**

- Renewable Obligation for large buildings since 2012