



# Farming photovoltaics

~Solar Sharing~



# Corporate Profile



千葉エコ・エネルギー株式会社



株式会社 アスソラ  
earthsolar

- Name: Chiba Ecological Energy, Inc.
- Location: 2-15 Yayoi-cho, Inage-ku, Chiba City, Chiba
- CEO: Takeshi Magami
- Founded: Oct. 2012
- Service:
  - Initial project development
  - Project development support
  - Obtain expert's report
  - Procuring material and construction

- Name: earthsolar, Inc.
- Location: 5-14-12 Shinjuku, Shinjuku-ku, Tokyo
- CEO: Tomohiro Yamazaki
- Founded: Apr. 2022
- Service:
  - Develop non-FIT renewable energy projects
  - Support installment of renewables
  - Optimize energy utilization

# What's Farming photovoltaics (FPV)?



- It is **agriculture/electricity double cropping system** dubbed “power generation system on farms”.
- Unlike conventional PV facility, PV panels are set up 3-4 m above the ground to generate electricity to enable farming underneath.
- In March 2013, Japanese government allowed erecting poles on agricultural lands to set up PV panels but mandating continuous farming underneath.



# Strategic Energy Plan



➤ In order to realize the renewable energy target of Strategic Energy Plan by 2030, solar is the only available option

		(FY2019 ⇒ previous energy mix)	Energy mix in FY2030 <b>(ambitious outlook)</b>		
<b>Energy efficiency improvement</b>		(16.55 million kl ⇒ 50.30 million kl)	<b>62 million kl</b>		
Final energy consumption (without energy conservation)		(350 million kl ⇒ 377 million kl)	350 million kl		
<b>Power generation mix</b> Electricity generated: 1,065 TWh ⇒ Approx. 934 TWh	<b>Renewable energy</b>	(18% ⇒ 22-24%)	<div style="border: 2px solid red; padding: 5px; display: inline-block;"><b>36-38%</b></div> <small>※If progress is made in utilization and implementation of R&amp;D of renewable energy currently underway, 38% or higher will be aimed at.</small>		
	<b>Hydrogen/Ammonia</b>	(0% ⇒ 0%)			
	<b>Nuclear</b>	(6% ⇒ 20-22%)		<b>20-22%</b>	(details of renewable)
	<b>LNG</b>	(37% ⇒ 27%)		<b>20%</b>	<div style="border: 2px solid red; padding: 2px;">solar 14~16%</div>
	<b>Coal</b>	(32% ⇒ 26%)		<b>19%</b>	wind 5%
	<b>Oil, etc.</b>	(7% ⇒ 3%)		<b>2%</b>	geothermal 1% hydropower 11% biomass 5%
<b>( + non-energy related gases/sinks )</b>					
<b>GHG reduction rate</b>		(14% ⇒ 26%)	<b>46%</b>		
			Continuing strenuous efforts in its challenge to meet the lofty goal of cutting its emission by 50%		

METI/6<sup>th</sup> Strategic Energy Plan

# FPV's Potential



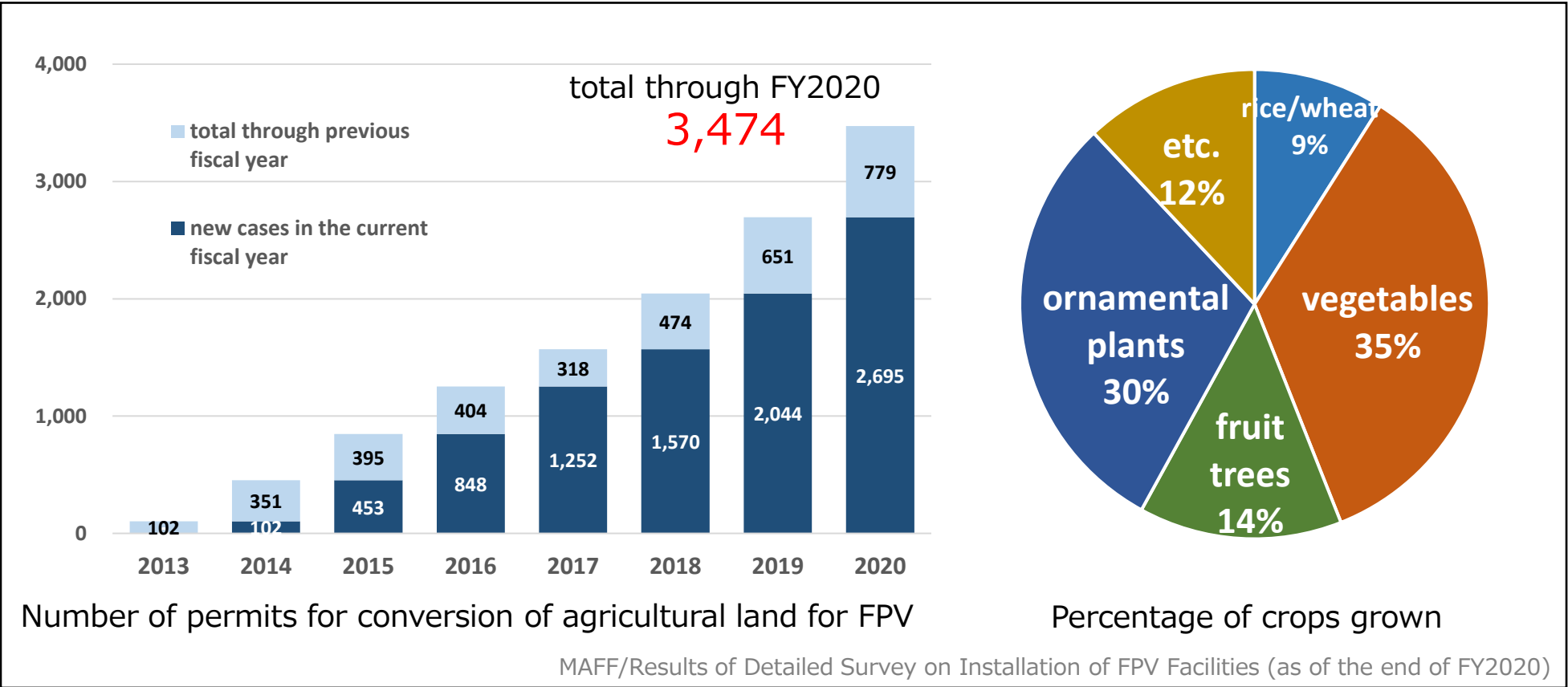
➤ Utilizing agricultural land (4.4 million hectares in Japan), we will contribute to expand renewable energy and food production

- **5% of agricultural land** in Japan (220,000 hectares, equivalent to agricultural land in the greater Tokyo area) generates 20 GWh by FPV
  - **20% of electricity generated in Japan**
- **10% of agricultural land** in Japan by FPV generates
  - **10% of total final energy consumption in Japan**

# Status of introduction of FPV



➤ Since the Ministry of Agriculture, Forestry, and Fisheries issued a notice on FPV installation in March 2013, **3,474** installations have been completed in Japan by FY2020, with a variety of crops being grown under solar panels.



# What's grown under FPV?



sweet potato



pumpkin



sato-imo(taro)



soybeans



peanuts



rice

**Crops are selected for local climate, soil and shaded rate.**

# 【Project】 Chiba-Okido AgriEnergy #1



- Chiba-Okido AgriEnergy Project aims for fossil fuel free agriculture to achieve sustainable energy and energy generation.
- We are committed to prepare for post-FIT scheme by designing and offering a next-generation farming business model.



<b>Owner</b>	<b>Chiba Eco Energy Inc.</b>
Cultivator	Chiba Eco Energy Inc. Tsunagu Farm Inc.
Location	Okidocho, Midori-ward, Chiba city
Output	625kW
Completion	March 27, 2018
Shaded rate	48%
Crop	Ginger, eggplant, sweet potatoes, garlic, leafy greens, etc.





**Agriculture and photovoltaics coexist**



Tractors and other agricultural machinery can also be used.



Producing a wide variety of vegetables





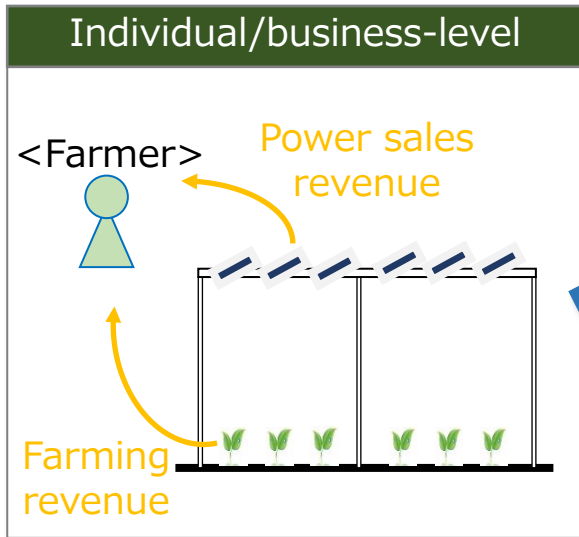
Fruit cultivation on rehabilitated dilapidated farmland



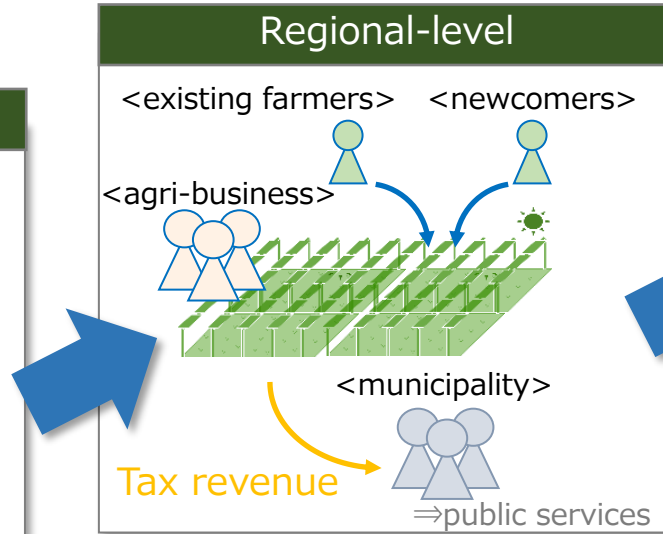
Utilized as demonstration plots and agricultural experience fields.



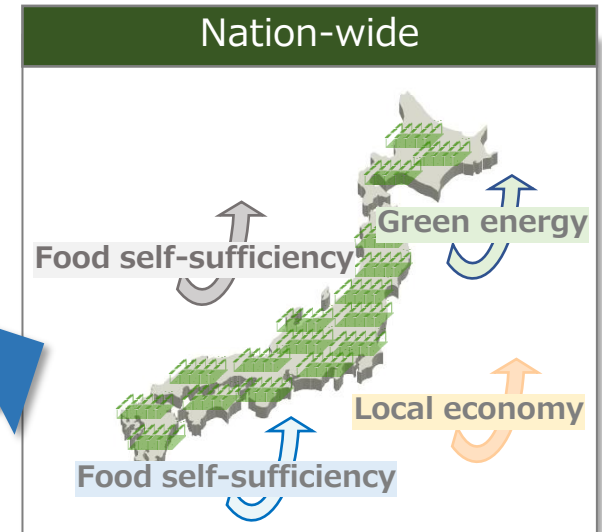
# What Good does FPV do?



- Double cropping (solar / produce) ensures stable income for farmers and boosts their income.
- Having power points on farmland improves farming efficiency.



- Agriculture incorporation /intensification ⇒ vitalize local farming, bring in newcomers, passing down know-hows
- Increased tax revenue lead to better public services ⇒ More people move in and vitalize local economy



Proliferating FPV nationwide can:

- ✓ Improve food self-efficiency
- ✓ Expand green energy, improve energy self-sufficiency
- ✓ Vitalize local economy

# Joint Development of FPV



- Chiba Ecological Energy, Inc. and earthsolar, Inc. jointly develop FPV projects utilizing their expertise on FPV and renewable energy project development



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- Professional advice on FPV
- Agricultural management during plant operation

Project development  
of FPV

# What we can offer



- **Project development support for investor/owner of Japanese FPV**
- **Project management on continuous agriculture under FPV**
- **Input and support for European FPV projects based on expertise and experience on FPV**
- **Technology to withstand natural disasters (typhoon, heavy snow, etc) and verified agricultural data of FPV under various environment**



# What we want



- **European equipment suitable for FPV including solar panel and mounting system**
- **Robot to automate agricultural production**
- **Investor/Owner of Japanese FPV projects**

# Contact



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Thank you for listening.

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