Final Report for Activity 1
-Examination and development of a support platform for installation of solar power-
Objective of the activity

In the City of Yokohama, it is necessary to promote the widespread use of renewable energy facilities, especially those for solar power generation, with the aim of realizing a decarbonized society. When introducing solar power generation systems, citizens and local business operators need to collect necessary information for the installation first. However, this information collection stage is already a burden to them as related information is currently not organized.

Thus, we will construct an information platform regarding solar power generation equipment to alleviate the burden.

This platform will be set up on the City of Yokohama’s website to organize and provide information necessary for citizens and local business operators to introduce the solar power generation equipment, such as explanations on how to introduce the equipment, references to installation companies that operate the business in the city, and the procedures and flow regarding the installation.

1 Description of the activity

1.1 Survey of other local governments’ websites

We surveyed the information we should post on the platform based on the websites run by the local governments that have already constructed the platform: Tokyo, Nagano Prefecture, and Nagoya City.

We checked each website and then picked up the site configuration and posted information items to study information to be published on our website.

1.2 Survey of information regarding solar power generation systems

To construct the platform regarding the installation of solar power generation systems, the following information was surveyed.

1.2.1 Installation flow of a solar power generation system

We studied the installation flow of a solar power generation system with reference to the flow posted on the websites of the following entities: the Tokyo Metropolitan Government, the Agency for Natural Resources and Energy, the Japan Photovoltaic Energy Association, Hyogo Prefecture, Panasonic Corp., Smart Tech Co., Ltd., and Denka-kun (Unit Co., Ltd.). We considered the flow items, the order of the items, and the contents of the items for our platform based on the reference information.

1.2.2 Introduction of a solar power generation system

(1) Benefits of the introduction

We surveyed the benefits of installing a solar power generation system from the three viewpoints: electricity cost saving, improvement in disaster response measures (further improvement by the combined use with a storage battery and EV), and global warming countermeasures. Then, we created the draft of the content to be posted.
(2) **Introduction methods**

We surveyed the introduction methods of a solar power generation system including the installation at consumer’s own expense, lease, and PPA (Power Purchase Agreement). We then created the draft of the content.

1.2.3 **Potential information regarding installation of solar power generation systems**

In order to post potential information regarding installation of solar power generation systems (hereinafter referred to as “solar potential”) on the roofs of houses, office buildings, and other structures in Yokohama City, we compared the two online simulation map tools, the Suncle operated by TEPCO Ventures Inc. and the Environmental Insights Explorer by Google LLC.

1.3 **Survey of subsidies related to solar power generation systems**

We collected information on subsidies and subsidy projects by the national government (the Ministry of the Environment and the Ministry of Economy, Trade and Industry) and prefectural governments that can be utilized by citizens and local business operators when they install a solar power generation system.

We collected information on subsidies that fall under the following:

- Subsidies to support citizens of Yokohama City and business operators that have an office in the city.
- The installation of solar power generation equipment is the requirement for receiving subsidies. (Information on subsidies related to EVs, storage batteries, and ZEHs and ZEBs is also collected if their eligibility requirement is to install solar power generation equipment.)
- Subsidy projects that have been implemented in FY2020.
- The installation sites of solar power generation systems are not limited to emergency evacuation areas and other specific buildings.

1.4 **Survey of installation companies of solar power generation systems**

We surveyed installation companies that are engaged in solar power generation system construction on houses and office buildings in Yokohama City.

In order to create a list of installation companies in the city, we selected companies that (1) perform a reliable operation and (2) are engaged in the construction in Yokohama City.

1.5 **Study and creation of the website design**

We studied the design of the website that would post the described survey results above.

In addition, we created the installation flow of a solar power generation system based on the survey results in 1.2.
2 Results of the activity

2.1 Survey of other local governments’ websites

Table 1 lists the information items regarding solar power generation posted on the websites run by Yokohama City, Tokyo, Nagano Prefecture, and Nagoya City.

<table>
<thead>
<tr>
<th>Posted information item</th>
<th>Yokohama City</th>
<th>Tokyo (Coolnet Tokyo)</th>
<th>Nagano Prefecture</th>
<th>Nagoya City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar power generation introduction flow</td>
<td></td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar potential map</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Subsidies</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>List of construction companies</td>
<td>○</td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>List of maintenance/inspection companies</td>
<td></td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Guidelines for introducing solar power generation</td>
<td>○</td>
<td>○*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIT system information</td>
<td></td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>(including the link on the Agency for Resources and Energy)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rooftop leasing business</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Information about storage batteries</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
</tbody>
</table>

2.2 Information regarding solar power generation systems to be posted on the website

2.2.1 Installation flow of a solar power generation system

We selected 13 items from the installation flow of a solar power generation system posted on the websites of the Tokyo Metropolitan Government, the Agency for Natural Resources and Energy, the Japan Photovoltaic Energy Association, Hyogo Prefecture, Panasonic Corp., Smart Tech Co., Ltd., and Denka-kun (Unit Co., Ltd.).

Table 2 shows the outline of each flow item and the source websites.


These flow items for the platform were defined by modifying the selection results as follows:
- “Field survey,” “simulation,” and “estimate” were integrated into one item, “2. Field survey and estimate,” as they are presumed to be implemented in almost the same timing.
- “Grid interconnection application” and “Power interchange contract” were separated as it is necessary, according to the Agency for Resource and Energy’s website to obtain the prior consent on grid interconnection from electric power companies to receive the business plan certification from the national government.¹

|-----|----------------------------------------|--------------------------------------------------------------------------------------------|-------|-----------------------------------|-------------------------------------------|-----------------|----------------|----------------------|---------------------------|
| 1   | Consideration and consultation        | - What is to be checked in advance  
- Information gathering method for consideration  
Ex) Comparing manufacturers’ webpages, product catalogs, etc., and inquiring to contractors | ○     | ○                                 | ○                                          | ○               | ○              | ○                    | –                         |
| 2   | Field survey                          | - What is to be surveyed and necessity of survey  
Ex) Check the surrounding environment, roof size and shape, etc., and study the most suitable system | ○     | –                                 | ○                                          | ○               | ○              | –                    | ○                         |
| 3   | Simulation                             | - Effects to be recognized in advance  
Ex) Annual power generation efficiency and power saving effect | –     | –                                 | –                                          | ○               | –              | ○                    | ○                         |
| 4   | Estimate                               | - Notes on estimation  
Ex) Differences in handling manufacturers and construction methods depending on the contractor, and presence or absence of aftercare/maintenance | ○     | ○                                 | ○                                          | ○               | ○              | ○                    | ○                         |
| 5   | Subsidy application                    | - Eligibility for receiving subsidies from local governments  
- Notes on receiving subsidies  
Ex) Checking requirements and time required for application | ○     | –                                 | ○                                          | –               | –              | ○                    | ○                         |
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Construction contract</td>
<td>- Notes on contract Ex) Put the construction period, payment terms, etc. clearly in writing. Be sure to get a contract, specifications, blueprints, final quotation, and wiring diagram.</td>
<td>○</td>
<td>○</td>
<td>–</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>7</td>
<td>Business plan certification application</td>
<td>- Information on the Feed In Tariff system</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>○</td>
</tr>
<tr>
<td>8</td>
<td>Grid interconnection application</td>
<td>- Required application items Ex) Connection to the power grid, desired start date of electricity receiving, and registration of an account to transfer income from electricity selling</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>–</td>
</tr>
<tr>
<td>9</td>
<td>Start of construction</td>
<td>- Estimated time required for construction</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>10</td>
<td>Completion inspection</td>
<td>- Outline of inspection after completion of construction, and documents to be received</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>11</td>
<td>Start of electricity selling</td>
<td>- Documents to be received from the electric power company</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<td>------------------</td>
<td>-----------------</td>
<td>--------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>12</td>
<td>Aftercare/maintenance</td>
<td>- Necessity of maintenance</td>
<td>○</td>
<td>–</td>
<td>○</td>
<td>○</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>13</td>
<td>Disposal</td>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>
2.2.2 Installation method of a solar power generation system

(1) Benefits of the introduction

Table 3 shows the survey results of the benefits of installing a solar power generation system. The information described here is based on the websites of the Japan Photovoltaic Energy Association and the Coolnet Tokyo.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement in disaster response measures</td>
<td>In the event of a power outage due to a disaster or other emergency, a solar power generation system can be used as an emergency power source. Power up to 1.5 kW is available in a typical household solar power generation system. The system can be used as the power source for a television and a charger of mobile phones, although the output power varies depending on the amount of solar radiation during the sunlight hours. In addition, the solar power generation system can be utilized as a more secure emergency power source when it is adopted in combination with a storage battery.</td>
</tr>
<tr>
<td>Global warming countermeasure</td>
<td>Electricity generated from solar power is clean energy. The effect of CO2 reduction due to the use of a household solar power generation system can be represented by a forest area. For example, when power of 4 kW is generated from solar power at eight houses, CO2 emissions equivalent to the area of a forest as large as Tokyo Dome are reduced.</td>
</tr>
</tbody>
</table>

(2) Introduction styles

Table 4 shows the survey results of the introduction styles of a solar power generation system including the installation at consumer’s own expense, lease, and PPA (Power Purchase Agreement). The information described here is based on the websites.
Table 4 Introduction method of solar power generation equipment

<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation at the consumer’s own expense</td>
<td>A consumer purchases and installs a solar power generation system by oneself. The consumer makes a contract with a construction company of the system, and purchases the system and then has the company install it. The consumer can sell electricity to an electric power company under a contract as all generated power belongs to the consumer. Self-consumption is also freely possible. The maintenance cost is paid by the consumer.</td>
</tr>
<tr>
<td>PPA (Power Purchase Agreement)</td>
<td>A consumer offers a space such as a site and roof to a PPA operator, and the PPA operator installs power generation equipment at its own expense and undertakes the operation and maintenance of the system. The PPA operator measures the amount of generated power consumed by the consumer and charges the electric bill corresponding to the amount, and the consumer pays for the electricity.</td>
</tr>
<tr>
<td>Lease</td>
<td>A consumer asks a lease company to install and operate/maintain a system in exchange for paying a monthly lease fee. The consumer can sell electricity to an electric power company and consume it as all generated power belongs to the consumer. Another feature of this style is that the initial capital expenditure for the installation is low.</td>
</tr>
</tbody>
</table>

[Reference URL]
Cleverly Home: https://kurashi.cleverlyhome.com/f-post/5658

2.2.3 Information on solar potential map

Table 5 shows the results of comparison between the two online simulation map tools, the Suncle provided by TEPCO Ventures Inc. and the Environmental Insights Explorer by Google LLC.

Since the comparison results found that the Suncle can provide various simulations such as the electricity selling profit and power saving profit based on the potential information, we decided to put an external link to the Suncle.

Table 5 Comparison of solar potential maps

<table>
<thead>
<tr>
<th>Study item</th>
<th>Suncle</th>
<th>Environmental Insights Explorer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indication of solar power generation potential</td>
<td>Uses color brightness on the map.</td>
<td>Uses color brightness on the map.</td>
</tr>
<tr>
<td>Language</td>
<td>Japanese</td>
<td>English</td>
</tr>
<tr>
<td>Information other than potential</td>
<td>Power saving profit, electricity selling profit, CO2 reduction effect, etc.</td>
<td>Nothing particular</td>
</tr>
</tbody>
</table>
2.3 Survey of subsidies related to solar power generation systems

We checked information on 19 types of subsidies and other support projects that are available for citizens and business operators in Yokohama City when installing solar power generation systems.

2.4 Survey of construction companies of solar power generation systems that offer services in Yokohama City

In order to create a list of installation companies of solar power generation systems in the city, we selected companies that (1) perform a reliable operation and (2) are engaged in the construction in Yokohama City.

As for (1), we deemed companies referred to by related organizations or local governments to perform operations with a certain level of reliability. Based on this assumption, we selected 78 operators that are referred to by the Japan Solar System Development Association (JSSDA), the Japan Photovoltaic Energy Association, and the Kanagawa Solar Bank System.

Concerning (2), we narrowed down construction companies of a solar power generation system that offer services in Yokohama City from among the companies selected in (1), by deeming them as such if they fall under the following:

- It is explicitly stated that they offer services in Yokohama City.
- They have a proven record in Yokohama City.
- They have an office in Kanagawa Prefecture.
- Their service coverage spans all over Japan.

As a result, we selected 43 companies.

2.5 Study and creation of the website design

We studied and created the design of our webpage that would post the above-mentioned survey results.

2.5.1 Website of the City of Yokohama

In the website of the City of Yokohama, we created a webpage, “Guidance on the introduction of a solar power generation system.” Fig. 1 shows the created page (Japanese only).

The URL is: https://www.city.yokohama.lg.jp/kurashi/machizukuri-kankyo/ondanka/etc/pvflow.html

On this webpage, we decided to post the following items (1) to (6):

(1) Benefits of introducing solar power generation equipment
(2) Introduction method of solar power generation equipment
(3) Introduction flow
(4) List of construction companies
(5) Solar map
(6) Information on subsidies related to solar power generation
太陽光発電システム導入ガイド

太陽光発電設備導入のメリット

【温暖化対策への貢献】
太陽光発電による電気は地球温暖化の原因となる二酸化炭素を排出しないクリーンなエネルギーです。例えば、住宅用太陽光発電システムの二酸化炭素削減効果を森林面積に換算すると4kWの太陽光発電36部分が、東京ドーム3倍分の森林に相当します。

【非常用電源としての利用】
災害などで停電になった場合、太陽光発電を非常用電源として利用することができます。一部の住宅用太陽光発電システムの場合、使用可能電力は最大1.5kWで、停電が発生する地域での非常用電源として活用することができます。なお、蓄電池を兼用すると、停電時に蓄電池を動かすことによって、非常用電源として活用することができます。

太陽光発電設備導入のメリット

【設備設置】
需要者が設備を設置し、設置する方法です。太陽光発電システムの施工会社と契約し、契約して設備もしくは、メンテナンス費用は需要者が負担します。

【PPA(Power Purchase Agreement)】
需要者がPPA事業者を依頼し、電力購入の契約を行い、電力会社と契約して電力を買い取ってもらうか、自家消費が可能となります。

【リース】
設備設置とメンテナンスをリース会社に依頼する代わりに、需要者は月々のリース費用を支払います。

【導入フロー】
太陽光発電設備導入における一般的な導入フローを示します。

施工事業者一覧

神奈川県において、太陽光発電設備を導入する際、神奈川県の施工業者の方々にリーズナブルな価格で安心して設置いただくために、平成23年12月から「かながわソーラーパンクシステム」を運営しています。
施工事業者の選定にご活用ください。

かながわソーラーパンクシステム
http://www.pref.kanagawa.jp/docs/za/gen/31068445(外部サイト)

【ソーラーマップ】
TEPCOのツインビルリース会社が公開するソーラーマップ(サンクル)にて、太陽光発電設備の設置している場所が一目でご確認いただけます。

サンクル https://suncle.jp(外部サイト)

太陽光発電に関する補助金情報

環境省 経済産業省 神奈川県、横浜市が実施している太陽光発電に関する補助金情報も、以下のファイルにまとめました。
太陽光発電設備の導入検討にお役立てください。
2.5.2 Introduction flow of a solar power generation system

We created the installation flow of a solar power generation system based on the survey results in 2.2. Fig. 2 shows the created flow (Japanese only).

The webpage explains the rough flow consisting of (1) Consideration, etc. (2) Procedures and preparations, (3) Construction, and (4) Operation, and outlines the 11 items defined in 2.2 under these four items.

In addition, we set up the Q&A section to answer expected questions from people who are considering introducing a solar power generation system.
太陽光発電システム導入フロー

各ステップの詳細

検討等

1. 必要な事前調査
   事前の検討として、まずは以下のことを確認します。
   - 期待される発電量
   - 設備の設置方法
   - 太陽光発電モジュールの枚数など

2. 現地調査
   設置業者に、太陽光発電システムの設置の可能性を調査し、見積りを依頼します。
   設置業者は、日射量の予測や屋根の方位、形状（切妻、寄せ棟、片流れ、入母屋、人柱屋根）、屋根材（瓦、スレート、金属板瓦棒）などを元に見積りを作成します。
   この時、自宅の設計図面や検針票などを準備しておくとよいでしょう。

情報収集の方法
   太陽光発電システムについて、一般的な知識を身に付けてまず、実際に設置業者に相談する時、ある程度の情報を知っておくことが望ましいです。
   - ソーラーマップ（https://suncle.jp/）
   - TEPCOファインテック株式会社が公表するソーラーマップ（サクル）にて、太陽光発電設備の位置に適した場所が地図上で確認できます。

3. 見積りの依頼
   業者によって見積もり書類の作成方法が異なります。できるだけ複数業者から見積もりを取りましょう。
   相談の際は、丁寧に見積もってもらえるように、アフターケアやメンテナンスも含めて複数の業者から説明を聞いて下さい。

見積りの時の注意点
   - モニターやキャンペーン、期間限定価格などがあっても、すぐに契約せず、充分に検討が必要です。
   - ソーラーシステムはほかに家電製品などをつけたりすることでサービスを強調し、お得感を出して勧誘する場合もありますが、冷静に検討しましょう。

Fig. 2 Introduction flow of solar power generation system (1/4)
Fig. 2 Introduction flow of solar power generation system (2/4)
Fig. 2 Introduction flow of solar power generation system (3/4)
### Reference

※本フローの詳細は下記のホームページをご参照ください。

<table>
<thead>
<tr>
<th>Reference</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>パナソニック株式会社</td>
<td><a href="https://sumai.panasonic.jp/solar/flow.html">https://sumai.panasonic.jp/solar/flow.html</a></td>
</tr>
<tr>
<td>北海道立消費生活センター</td>
<td><a href="http://www.pref.hokkaido.l">http://www.pref.hokkaido.l</a>g.jp/kz/kke/sene/checkpoint.htm</td>
</tr>
</tbody>
</table>

**Fig. 2 Introduction flow of solar power generation system (4/4)**