

日本における屋根上太陽光の現状と課題

Current Situation & Challenges of Rooftop Solar Power in Japan



【ミッション】

「人・まち・組織をエンパワーすることを通じて再生可能エネルギー100%地域実現に寄与する」

【Missions】

"Contributing towards 100% generation of renewable energy in the region through empowerment of people, town and organization"

【創業経緯と事業展開】

前身の会社での市民ファンドによる屋根貸し太陽光発電事業を経て、2015年に設立。首都圏中心に約20社とパートナーシップを組み、**ホワイトフランチャイズ®**方式での地域主導の太陽光発電普及を推進。

2016年、太陽光専門商社と施工店と共に、日本初屋根上太陽光体験型施工サービス「DiO」をリリース。

2017年、都市部初の地域新電力「めぐるでんき株式会社」設立に参画。本社は東京都多摩市。

【Background and business development】

Established in 2015, following the predecessor rent-a-roof solar power generation business funded by civil society. Constructing partnerships with about 20 companies particularly in metropolitan areas and promoting the community-driven solar power expansion via the **White Franchise®** model.

In 2016, released "DiO", the first experience-based rooftop solar power installation service in Japan together with the trading company specialized in solar light and the installer.

In 2017, participated in establishment of "MEGURU Energy CO., Ltd.", the first regional power producer and supplier in the urban area.

The corporate headquarters is located in Tama City, Tokyo.

現状認識とコスト目標

Recognition of current situation and the cost goals

- 日本の太陽光業界において、**FITから自家消費への移行**は政策的方向性
- 大きな電力需要を抱える**都市部の屋根（高圧施設）**は、エネルギー自給率向上・地産地消推進のための**有用資源**
東京だけでも860万キロワットのポテンシャル(H24環境省)
- 高圧施設の電力小売単価は概ね**15~16円/kWh**で推移。発電単価が小売単価を下回る（グリッドパリティ）ことが当面の目標
- 投資回収の目安（※FITに依らない設置ケース）は金融機関からの借り入れやリース適用を前提とした場合、概ね**10年以内**。
 - Transition from Feed-in-Tariff (FIT) to self-consumption is the political direction in the solar light industry in Japan.
 - **Roofs in the urban area (high pressure facilities)** that has an overwhelming demand for power are the useful resources to raise the rate of energy self-sufficiency and to promote local production for local consumption **Tokyo solely has a potential of 8.6 million kilowatt** (in 2012, according to Ministry of the Environment)
 - The retail electricity price for the high pressure facilities basically remains in the range of **15 to 16 yen/kWh**. The immediate goal is "grid parity", where the power generating cost is lower than the retail price.
 - The reference for payback on investment (for installation that is not based on FIT) with a loan from a financial institution or a lease transaction is **within 10 years**.

屋根上設置に関する一般的課題

General issues for installation on rooftops

①耐風圧

(1) Wind pressure resistance

- 異常気象
台風巨大化
- 高い安全意識
- Unusual weather
Extremely large typhoon
High safety consciousness

②耐荷重

(2) Load capacity

- 新耐震基準
- 屋根荷重不十分
- 長期安全性
- New earthquake resistance standard
Insufficient load capacity of roof
Long-term safety

③漏水

(3) Water leakage

- 改修時期とのアンマッチ
- 防水保証切れ
- Unmatching with the upgrading period
Expiration of waterproof warranty

建物属性毎の課題

Challenges for each building attributes

①公共施設

(1) Public facilities

- 高い安全基準
- 膨大な書類作成負担
- メーカーの信頼性
- High safety standards
Enormous paperwork burden
Reliability for the manufacturer

②マンション

(2) Apartment

- 合意形成（分譲の場合）
- 大規模改修のタイミング
- Consensus building (for a condominium apartment)
Timing of a major upgrade

③工場

(3) Plant

- 耐荷重
- 建物の持続性
- Load capacity
Durability of the building

※その他、仲野の階層構造など商慣習の問題、国内メーカー主導の施工・保証制度（家庭用）、建築・設計分野の人材の理解不足など、設置を阻害する要因、コストダウンを抑制する要因は複数存在する。

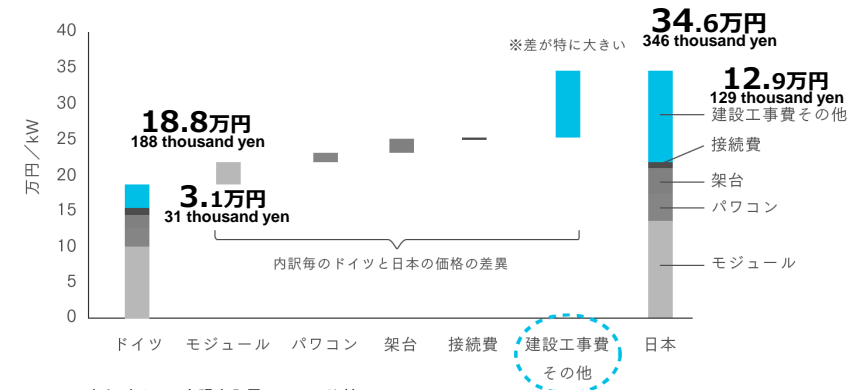
* In addition, there are several factors that inhibit installation and cost reduction, including issues in business practices such as the hierarchy structure of brokers, domestic manufacturers-led installation/warranty system (for household use), and lack of understanding of people in the fields of architecture/ design.

施工生産性の向上余地

Room for improvement of the work productivity

【10~50kW未満】

[Below 10~50kW]



日本とドイツの太陽光発電のコスト比較

(自然エネルギー財団 木村啓二、Romain Zissler 2016.1)

Comparison of the cost for solar power generation in Japan and Germany (January 2016, Keiji Kimura and Romain Zissler, Renewable Energy Institute)

課題に対するソリューション

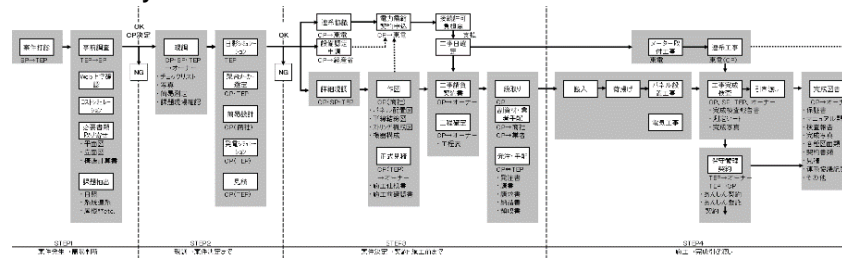
Solutions to the Issues

プロといっしょに建物のオーナーや参加者自ら太陽光発電の設置を行うことで、市民の参画意識を高めつつ、プロと素人の適正な役割分担によって施工コストを低減。
 Owners of the building and participants install the solar power generation equipment by themselves with the professionals. This increases a sense of inclusion of the citizen and while reducing the installation cost through the appropriate role sharing between professionals and amateurs.

新電力による第三者所有モデルにより、建物オーナーのファイナンス負担の軽減、規模を出すことによる設置コスト低減、小売やデマンドレスポンス(DR)等との複合展開による付加価値を創出。
 With the Third Party Ownership model provided by the power producer and supplier, financing burden of the building owner has reduced, the installation cost is lowered based on the economies of scale, and the added value is created through the complex development with retail and demand response (DR).

DiO (Do it Ourselves)

日本初の体験型ソーラー施工サービス
 The first experience-based solar installation service in Japan
 工程分析と作業分解
 Process analysis and work breakdown



- ・ 工事にかかる工数のうち、50%以上は電気工事士の専門外の作業（前後工程を含めると更に割合UP）=**工事シェアリング**
 → 施工費の10-15%の削減余地（※弊社試算による）
- ・ 上記に加え、工程毎の作業の見直し、標準化・効率化を実施
- More than 50% of the man-hours involved in the work is for the work beyond the expertise of the electrical engineers (the proportion further increases when the preceding and subsequent processes are included) = **Work Sharing**
- 10 to 15% of the installation cost may be reduced (* according to our estimates)
- In addition to the above, tasks in each process are reviewed, standardized and made more efficient.

ドイツ製架台を使用し、施工を標準化・参画可能に
 Use of a German-made frame allows standardization of installation and participation

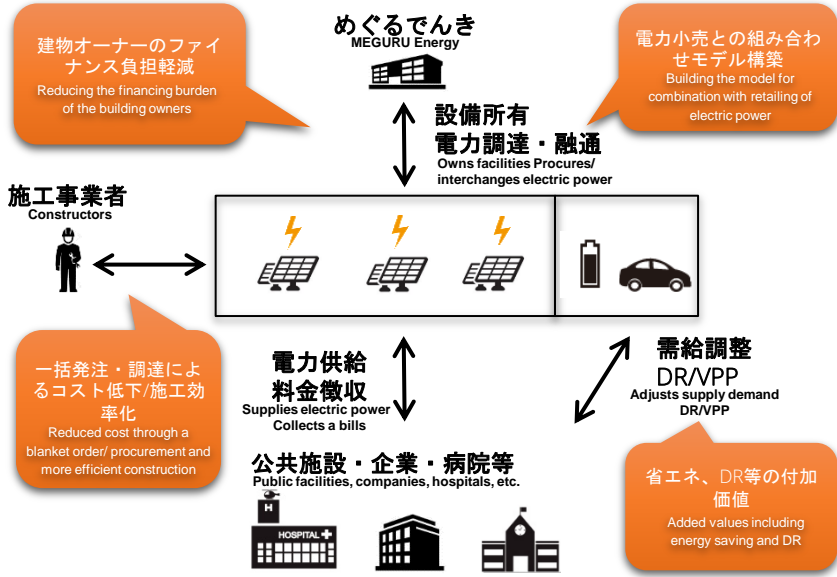


(K2systems社製)
 (Manufactured by K2systems)

めぐるでんき株式会社 MEGURU Energy CO.,Ltd. 都市部初・板橋発の地域電力会社 The first regional electric power utility in the urban area established in Itabashi



設立：2017年8月 所在地：東京都板橋区
 事業内容：再エネ開発、電力小売、スマートコミュニティ開発、ソーシャルインパクト投資の4本柱で展開する地域電力会社。
 「再エネ100%が当たり前の社会をつくる」
 Founded in: August, 2017 Located in: Itabashi, Tokyo
 Business description: A regional electric power utility which maintains four pillars, including development of renewable energy, retailing of electric power, development of the smart community, investment on social impact.
 "Creating a society where 100% renewable energy is normal"



但し、コスト低減は重要であるものの、No.1プライオリティではない。地域がイニシアティブを持ち、地域の利益創出に資する取り組みをつくり、育てていくことが長期的に見た業界の継続的發展につながる。
 The cost reduction is important, but it is not the No. 1 priority. With the initiative of the local community, establishing and developing the framework that can contribute in creating the local benefits will lead to continuous growth of the industry in the long term.