SOLAR LEASING POLICY
Lessons Learned & Implications for Latin America

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17 August 2018, São Paulo, Brazil
Contents

- Background
- Korea’s solar leasing policy
- What makes it a good policy for innovation in renewable energy policies?
- Implications for Latin America
### Background

**Overview of South Korea**

Unfavorable natural and social conditions for large-scale renewable energy

- **Area**: 99,720 km² (107th), mostly mountainous terrain
- **Climate**: a humid continental climate and a humid subtropical climate, low GHI (solar irradiation, clear days)
- **Population**: 51,635,256 (51 million)
- **Rising peak electricity demand in the summer and summer**
- **Residential type**: Apartment (76%), detached houses (24%)

**Energy policies**

Favorable to renewables

- **NDC**: 37% emissions reduction target by 2030 compared to BAU (851 Mt)
- **8th Basic Plan for Electricity Supply and Demand (Dec 2017)**: Nuclear phase-out roadmap, Shutdown of aging coal-fired power plants ahead of the end of their design lifetime to tackle air pollution

**Energy sector**

- **Energy Overseas Dependence**: 94.7% ($80.9 bn USD)
- **Vertically integrated energy market**: KEPCO
- **Energy regulatory framework**: RPS, REC, FIT
- **Electricity mix and renewable energy production**: 40,656 GWh (7.24%) (2017)

![Power Mix (2018)](image)

![Renewable Energy Mix (2017)](image)
• Global Horizontal Irradiance (GHI)
• Solar PV Market Attractiveness

Source: AT-Kearney, 2009
Solar leasing policy was created to meet different needs from different stakeholders.

- Maximization of profits
- Minimization of risks
- Low public awareness

- Minimization of electricity bill
- High upfront cost ($1,200)
- Difficult maintenance
- Reluctance to sign a long-term contract with unknown lessors

- Efficient use of budget
- Stable supply of electricity
- Deployment of renewables
- Concerns for long-term subsidy burden
- Needs to address complaints on harsh penalty from utilities

- Minimization of REP costs
- Heavy penalty for non-/under-compliance with RPS USD 22 million (2012), USD 44 million (2013)

Solar PV Leasing companies

Government

Households

Utilities
Korea’s solar leasing policy

Korea Electric Power Corporation

Paying a monthly electricity rate

Consumers
(Households)
Korea’s solar leasing policy

- **Korea New & Renewable Energy Center***: Selecting lessors, Issuing REP
- **Leasing Companies (REP revenue + Leasing fee)**: Providing installation, operation, and maintenance services
- **Consumers (Households)**: Paying monthly leasing fee
- **Korea Electric Power Corporation**: Paying a reduced monthly electricity rate
- **Utilities (Under RPS)**: Selling REP

*Under Korea Energy Agency, Ministry of Trade, Industry and Energy

Source: Korea Energy Agency
### Timeline

**First failure of the private-led solar leasing**
- SolarCity’s business model
- Low level of public awareness

**2012**

**Pilot project**
- KNREC
- Government Intervention
- Demands for REC from lessors
- Consideration of RPS planning

**2013**

**Introduction of the policy**
- Redesign with lessons from failure
- Continuous interactions among stakeholders

**2014**

**Expansion to apartments**
- Emergence of a new startup
  - Haezoom
- Launch of the second private-led model

**2015**

**Recent changes**
- Progressive electricity rate reform
- Integration of solar and non-solar REC market

**2016**

**2017**

**Second failure of the private-led solar leasing**
- S-Energy
  - Market not ready yet
Results and impacts

As of 2017;

- **37,698 households** in total have signed contracts with solar leasing companies and installed solar PV.
- **42.5 MW of solar energy** has been deployed. **54,595 MWh of electricity** is generated per year.
- **13,000 toe of energy*** has been saved.
- Korean government has **saved USD 31 million** (KRW 35.6 billion)* of the national budget.

*Estimated
Source: Korea Energy Agency
What makes it a good policy for innovation in renewable energy policies?

- Local context is well embedded in the solar leasing policy.
  - Korea, with a small territory and unfavorable climate for solar PV, inherently has limitation of large-scale solar power plant. To maximize solar power generation, rooftop solar PV for detached houses was introduced.
  - 76% of the population lives in apartments; therefore, rooftop solar PV was extended to apartments.

- The solar leasing policy well harmonized with the existing regulatory framework.
  - The standalone private-led solar leasing model developed by SolarCity did not work well in Korea.
  - However, the solar leasing policy combined with RPS and REP turned out to be successful.
  - Newly created REP distinguishes Korea's solar leasing policy from SolarCity's solar leasing model.

- Unlike other conventional renewable energy policies, the solar leasing policy promotes paradigm shift from subsidies of the government to the private sector.
  - It drives more voluntary participations with less subsidy expenditure while actively engaging the private sector on the stage.
What makes it a good policy for innovation in renewable energy policies? (cont.)

- **It was well adapted to dynamic market/institutional conditions.**
  - It quickly responded to external changes such as *Progressive Electricity Rate Reform (2016)* and *Solar and non-solar REC market integration (2016).*
  - It evolved every year by reflecting feedback from markets and households:
    (a) Consumers from apartments wanted to participate;
    (b) Lessors wanted to expand the market to apartments.

- **By engaging different stakeholders from the policy design stage, different needs from different stakeholders could be addressed.**
  - KNREC encouraged active interactions and communication among the stakeholders by holding formal and informal meetings.
  - Early engagement helps ensure active participation of all stakeholders in developing the plan, as well as personal investment in the long-term viability of the plan.

- **Effective monitoring system was implemented.**
  - KNREC conducts random monitoring at households without any notice to leasing companies to guarantee good services.
Lessons learned, limitations and way forward

- Pushing initial solar PV deployment with large government subsidy might not necessarily be a good idea.
  - In the first place, KNREC supported half the cost of solar PV installation. It contributed to initial surge; however, in the long term it could lead people to think that solar PV is not worth installing by themselves.

- REP is not a direct subsidy, but an indirect way of financial support from the government; It is essential to diversify financial support options.
  - REP can play a significant role to gradually turn people away from subsidies; however, REP is still covered by governmental agencies. Then how different is it from subsidies?
  - Government → Large firms → SMEs → Citizens (crowd-funding)

- Low electricity bill is the root cause of a problem.
  - It discourages people to think about and act upon saving electricity.

- The policy should be expanded beyond residential buildings; e.g. commercial buildings.
Implications for Latin America

- **Things to consider:**
  - Local contexts such as geographical condition, economic/industrial structure differ by country, province and city.
    - ex. Cities with a lot of apartments (Brazil, Mexico)
  - Institutional framework and market structure also differ by country.
    - ex. Vertically integrated regulated monopoly (Paraguay), vertically integrated utility + IPP (Bolivia, Ecuador, Uruguay), wholesale market (Argentina, Brazil, Chile, Costa Rica, Mexico), wholesale market + retail competition (Colombia)

- **Suggestions:**
  - It is important to design a scheme which harmonize with the local context as well as existing regulatory framework.
  - It is a good idea to engage stakeholders from the design stage of the policy.
  - Highlighting co-benefits can help deploy solar PV in rural and/or remote areas through microfinance (ex. Shakti in Bangladesh) which will contribute to energy access as well as local economy (ex. training, capacity building).
  - Stable determination to implement the policy matters.
THANK YOU

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