Designing a better Korean RPS
: Comparative study with foreign cases

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Korea government has changed its renewable energy policy from FIT to RPS since 2012. Based on case study of foreign countries and comparison between Korean and foreign cases, we tried to find a meaningful implications so that korea government can benchmark in the future for a better policy making. Rationale behind comparative case study are as such : It is hard to generalize the result from the data collected and regression model in that policy is differentiated according to the country

RPS (Renewable Portfolio Standard)

- Defined as an obligation on electricity supply companies to produce a specified fraction of their electricity from renewable energy sources.
- End of 2013, out of 144 countries with national renewable policy targets, 79 countries adopted RPS, whereas 98 countries did FIT(Feed In Tariff). [1]
- In U.S., RPS quota ranges from minimum 10% to maximum 40% (CA:33%) In EU, average RPS quota is around 20%
- Korea RPS quota is 3% in 2014 and 10% by 2022, (RPS was started from 2012 in Korea)

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022~
(%)	2.0	2.5	3.0	3.5	4.0	5.0	6.0	7.0	8.0	9.0	10.0

[Source : 신에너지 및 재생에너지 개발 이용 보급촉진법 시행령 별표3]

REC (Renewable Energy Certificate)

- REC is tradable, non-tangible energy commodities that represent proof that 1MWh of electricity was generated from an eligible renewable energy source.
- Major countries both implementing RPS and REC are UK, USA, Italy, Japan, and South Korea.
- REC weight in Korea

Source	Solar	Wind	Fuel-cell	Geo thermal	ESS
Weight	0.7~1.5	1.5~2.0	2.0	2.0	4.5~5.5

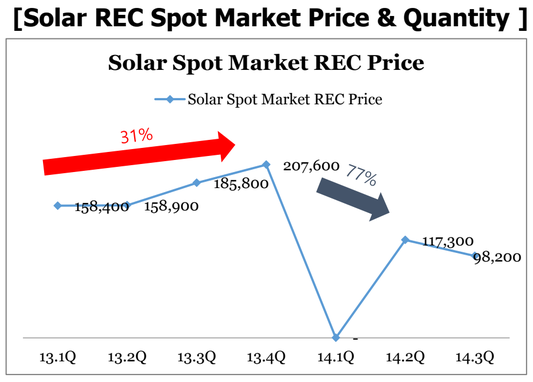
Obligator in Korea

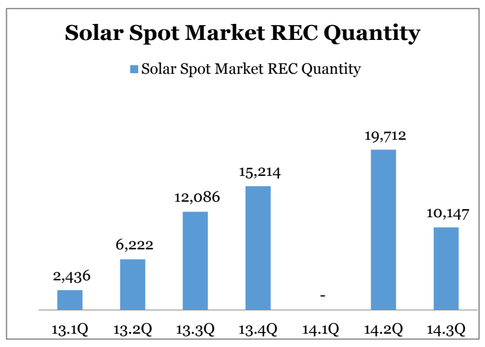
KEPCO Subsidiary(6)	Independent Power Producer(6)	Public(2)
한국수력원자력(주), 한국동서발전(주), 한국남부발전(주), 한국서부발전(주), 한국남동발전(주), 한국중부발전(주)	POSCO ENERGY, MPC, GS EPS, SK E&S, GS파워, 평택에너지서비스	한국지역난방공사, K water

Problems that Korean Obligators are facing

❶ More than half of Obligators failed to meet the designated target since 2012.
❷ Solar industry is watching carefully REC price trend in the spot market.

[Solar REC Spot Market Price & Quantity]





❸ Too much "Government REC" quantity in the market

- Government gave to Government REC to obligator to help them to meet the RPS target.
- Government accounts for around 30% in total RPS portion 2013

❹ Local Approval : So many renewable projects were delayed by local approval

❺ Low Penalty Condition

- It is designed that if obligators fail to meet the initial target, they are required to pay penalties by 150% of REC standard price. However, sometimes REC spot market price happens to be higher than 150% of REC standard price, which means paying penalties would be cheaper than buying REC in the spot market.
- This distorted market system has been discouraging market players from actively buying REC.
- There is no rule or regulation to correct this reverse price situation at the moment.

Methodology – case study

☐ **Our object countries**

- ○ U.S. (California) RPS regulation
- ○ U.K. RPS regulation
- ○ Japan RPS regulation
- ○ Australia RPS regulation

1. **Rather long history of RPS regulation**
2. **Doing well in terms of renewable energy 's diffusion**
3. **Different continent**

Summary Tables

	RPS Legislation	Penalty (Unit : Won)	Fulfilment rate	quota (%, Year)	Note
Germany	-	-	-	-	
U.S.	1983~	55,000 ~ 77,000won (50~70 USD)	91% ('07)	10~30 ('20)	Can replace RPS quota by energy efficiency program
Japan	2003	-	100% ('06)	-	Differentiated quota for each producer
U.K.	2002	52,206won (30 pounds)	63% ('07)	15.4 ('15)	-
Italy	1999	207,700won (1.5 times of REC price (€150)	–	17 ('20)	Apply FIT on solar energy
Korea	2010	1.5 times (45000 won)	60~70%	8 ('20)	

Benchmark Foreign cases

#1 Benchmark Japanese Case

- **Korea REC price is too volatile** → Setting a Price Band in order that investors (or firms) can hedge REC price volatility risk.
- **In Japan**, Renewable Energy Utilization Act on Special Measures Article 8 Defines the upper limit (11 yen/kWh)

#2 Benchmark Italy Case

- **Korea has unfavorable nature for renewable energy production** → CDM or Import REC to make duty

#3 Benchmark German & Denmark Case

- Time-consuming process to get license to set a power plant which incorporates renewable energy source such as wind farm. → Letting local stakeholders have a right of share of power plant business.
- **Middelgrunden wind farm (Denmark) :** Investor union (8500 people) holds 50% of total share of Middelgrunden wind farm.
- **Germany (2010) :** Community residents have 54% of total wind power 52% of total renewable energy

Our Final Suggestion to Korean Government

For a better policy making and implementation,

Price

- Define a realistic REC price band so that renewable energy providers ensure stable profit
- Based on appropriated rate of return (eg. IRR 10%)
- Holds meeting to discuss a reasonable REC periodically

Spot Market

- Gradually reduce "Gov REC", in order to activate spot market
- Support for the market expansion (financial derivatives s.t. future, options..)

Approval

- In the case of renewable energy business, temporarily give licensing right to Central government (not local government)
- Considering global expansion
- Increase community power (residents participatory plant)

Penalty and Incentive

- Increase penalty from 150% to 300% to give strong motivation to obligator
- Introduce new incentive policy

References

[1] Renewables 2014 global status report, renewable energy policy network for the 21st century