

# REC MECHANISMS IN DIFFERENT COUNTRIES

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## **INTRODUCTION**

The current energy scenario in the world is very skewed towards the utilization of conventional sources of energy namely coal, oil and natural gas. The problems of global warming, climate change and decreasing supply of conventional resources leading to their ever increasing prices have led the world economies to shift their focus to more “benign” sources of power generation. Thus, countries have realized the necessity to promote renewable sources of energy which are the solution of all the negative impacts that conventional sources lead to.

The major issue with generation from renewable sources is that the technologies used are nascent and not very well developed except in maybe hydro. This further leads to the increase in cost of generation and thus, supply of electricity from them. This scenario has led to the lack of interest in this sector.

Thus, for these very reasons incentive schemes are initiated in economies to promote the renewable energy sector. One of the main incentives is the issuance of Renewable Energy Certificates which are also called Tradable Renewable Certificates, Green Tags, Renewable Electricity Certificates or Renewable Energy Credits.

Renewable Energy Certificates can be defined as a tradable, non-tangible environmental instrument which represents the benefits (environmental and societal) of producing electricity through renewable sources over production from conventional ones.

1 REC is equivalent to one unit (1 MWh) of electricity generated from qualified renewable resource. It acts as a proof that the generation company has produced some part of its total production by using renewables. The generation company is issued RECs according to its renewable generation.

This REC mechanism is coupled with Renewable Purchase Obligation. This obligates power utilities to purchase some proportion of the electricity they supply from renewable sources. The RPO offers a way to ensure compliance.

The RECs represent the green attributes of the electricity and these attributes are traded separately from the actual power generated. This provides excess income and thus, incentive to renewable power producers.

Different incentive schemes are taken up in different countries. RECs characteristics, its tracking system and mechanism in certain countries is discussed below.

## **CHARACTERISTICS OF RECs**

- RECs provide a measure of meeting the obligation requirement of an electricity retail utility in case of short term short fall caused due to technical issues, failure of equipment, sudden increase in demand etc.). Thus, it provides a handy measure for the utilities.
- RECs provide economic benefits to the purchasers. There are cost differences in generation of electricity using renewable resources depending upon various criteria like geographical features, technological conditions, cost of labor etc. So, RECs help buyers to buy the certificates from low cost countries to make the market more competent and cost effective. Also, economies of scale may also apply in certain large scale projects leading to further decrease in the cost of an REC.
- RECs enable the transfer of benefit of renewable energy to remote areas or those areas which have a dearth of such natural endowments.
- RECs also help future generators buy time to set up their own generation facility since till then they can purchase RECs to fulfill their Renewable Obligations.
- RECs have a drawback too. These certificates can be trade only in the market which is governed by the underlying policy/law. This may restrict the trading of the certificates to within a state.

## **TRACKING SYSTEM**

The tracking system in an REC is a way to monitor and verify the certificates in the market. The tracking systems help in proper and effective implementation of the renewable energy policy and also ensure its success.

Tracking systems are a watchdog of the renewable energy certificates. These systems monitor, verify and track the certificates and also ensure that they comply with the rules and policies relating to it.

The tracking system helps in the following issues:

1. Double Counting: this means either use of REC by a party more than once or use of same REC by two parties simultaneously. This maybe of the following type
  - 1.1. Double Sale: REC is sold to two different parties at the same time
  - 1.2. Double Claim: REC benefit is claimed by more than one party
  - 1.3. Double Use: same REC is used twice by a party
2. Inter-temporal counting: REC transactions of RECs generated in the previous year or that will be generated in future years.

## **AUSTRALIA**

The Mandatory Renewable Energy Target(MRET) scheme was implemented on April 1, 2000 through the Renewable Energy (Electricity) Act 2000 and Renewable Energy (Electricity) (Charge) Act 2000. It set a target of 9500 GWh of renewable energy target by 2010 and a target of 45000 GWh by 2020. This 45000 GWh will contribute to 20% of total electricity requirement of the country.

The MRET states that to meet the renewable energy obligations, energy companies must surrender RECs into their holding account on 31<sup>st</sup> December every year. The RECs to be surrendered must equal 20% of their market share.

The penalty for non-compliance is set at AU \$40/MWh which is reimbursable if the shortfall is met within 3 years of default.

1 Renewable Energy Certificate (REC) is issued for 1 MWh of electricity generated from specified renewable energy sources. This would mean that 450, 00,000 RECs will be generated if the 2020 target is to be achieved.

These certificates are like electronic currency. These certificates act as a proxy for the carbon emissions that generators avoid producing by generating electricity through renewable energy sources. The RECs are freely traded in the open market. The prices of the certificates are fixed by the market mechanisms of demand and supply.

These certificates are currently trading at around AU \$20/MWh as compared to the set price of AU \$20/MWh. The reason for this is the lack of clarity in implementing the scheme in the first round.

The scheme was mainly propagated for the promotion of renewable energy and provided incentives in the form of RECs coupled with Renewable Purchase Obligations which would lead to the setting up of new renewable energy generation units. Well, this was the plan. But in reality, the existing generators were also included in the scheme, which led to a flaw in the plan. The incentives aimed towards new generation were given to the already existing ones too which led to a slower pace of capacity addition generated through renewable sources.

## **UNITED KINGDOM**

Renewable Obligations (RO) is the successor of the NFFO scheme. Under the NFFO scheme, contracts were awarded to individual generators for the purchase of electricity produced from renewable sources at a premium price for a fixed duration of time. It was applied to England and Wales and was a major instrument for the promotion of renewables until the RO came into force.

RO was enforced by an order under the Utilities Act 2000. Since then, all licensed electricity suppliers are obligated to get a proportion of the total electricity they supply from a set of eligible renewable sources. Under this scheme, 1 Renewable Obligation Certificate is issued for every 1 MWh of green electricity a company generates. The proportion increases year on year from 3% in 2002 to 5.5% in 2005-06 to 10% in 2010 to 15.4% in 2015-16. The goal is to reach 20% by 2020.

The office of Gas and Electricity Markets (OFGEM) administers this scheme and issues and tracks these ROCs. The OFGEM also keeps a check on the compliance level among energy suppliers.

The suppliers can meet their RO by

- Purchasing ROCs or
- Paying a buy-out price of £30/MWh or
- A combination of the above two.

A company that generates more than its target can sell the excess certificates to companies who fail to meet their obligations. Thus, companies are motivated to invest in renewable energy generation units due to the financial incentives.

The price of each ROC is set by market mechanism and reflects the difference between the supplies of renewable electricity in UK (currently 6%) to the RO percentage (around 6.7%).

The policy also applies to small scale generators (<50 kW). These Small Scale RE generators can register themselves with the OFGEM. These generators get ROCs for the amount of electricity that they generate from captive solar power plants/wind turbines and can sell them in the open market. If they are grid connected, they can feed this green energy into the grid and at the end of each year electronic ROCs are added to the generators account.

## Concerns

The ROC policy though aims towards benefiting the renewable energy sector has some concerns over it. The renewable sector is concerned about the financial environment of green energy.

The ROC policy increases the RO of suppliers year on year. The suppliers are forced to meet these rising obligations or pay a buyout penalty. The fines collected from this penalty are recycled to ROC holders. The general view of the British community is that the uncertainty about ROC prices could frighten off potential investors.

According to an Ernst & Young executive “the ROC price must include the recycle benefit. That means that target must not be met so the recycle benefits remain high”

Another concern is that since these recycle benefits should remain high; no one will risk actually exceeding the RO quota.

One rectified flaw in the policy was that when it was implemented, it set only short term targets of up to 2010. This led to investor wariness since investors had doubts about the future of their investments after 2010. But this was corrected and targets of up to 2020 were set increasing the investor interest as well as mitigating investor skepticism.

There is also a general opinion that the government should increase its support to the development of renewable energy technologies. This could serve a dual purpose of meeting the green goals and improving global competitiveness of UK which would in turn lead to creation of economic value for the country.

## **JAPAN**

The special Measures Law concerning the use of new energy by electric utilities also called the RPS law was enacted in Japan in 2003. The law states that a certain proportion of the total electricity purchased by electricity retailers has to be obtained through “new energy source” (renewable energy sources). This law was enacted to enhance the stability of electricity supply, further the environmental goals of the country and also for the overall health of the economy.

Under this law the retailers can fulfill their obligations by

- By generating energy from renewable resources
- By purchasing renewable energy from other generators
- By purchasing New Energy Certificates from other parties

Types of energy covered include: solar generation; wind generation; biomass; medium and small-sized hydro generation (stations up to 1MW capacity); and geothermal generation

The Ministry of Economy, Trade and Industry sets the annual targets for the renewable purchase obligations. The target for 2010 is 12.2 TWh which equals 1.35% of total electricity supply.

An accredited facility can supply these New Energy certificates. If a company wants to buy these certificates it has to submit an application to the government and upon acceptance the government records it as a New Energy Certificate (NEC) in its electronic account.

These NECs represent 1 MWh of electricity generated from renewable resources. An ID is attached to each NEC and these certificates are valid up to 2 years (including the year in which it is issued).

The electricity retailers have to follow a filing procedure as under:

- Submit the obligation amount by 1<sup>st</sup> June every year to the METI
- Fulfill their obligation by either producing or purchasing green energy or purchasing NECs
- Submit their fulfillment status by June of the following year

In case of non fulfillment a penalty of up to 1 million Yen is imposed on interim and annual basis. The price of the certificate is decided through open market trading but a ceiling price of 11 Yen/KWh is set but no floor price is set.

There is also a non-controlled trading environment which is voluntary in nature. It is called the Green Power Certification System. It is managed by Japan Natural Energy Company Limited. Consumers (usually corporate) request the company to supply power using renewable energy and the company either produces it on its own or sub-contracts it. The certification received by



consumer is called the “Certification of Green Power”. The Green Power Certification Council certifies these certificates and maintains a record of the same.

### **Issues with RPS Law**

Certain issues remain in the RPS law and recommendations for the same have been made.

- **Incentives to Generators**

Incentives should be provided to the generators for generating more than their obligatory level. There should be certain rewards attached with these or a policy to carry-over the excess renewable energy generated to the next year. This could be done through the mechanism of ‘banking’

- **Ensuring market liquidity and economic efficiency**

The markets for renewable energy should have more participants to ensure greater liquidity. Also, the transfer of certificates takes place on year ends only leading to a very short duration for trading. This also hampers market liquidity.

- **Inclusion of self generators**

The self generators do not come under the purview of this act since they do not have much choice and since monitoring at such micro level is not feasible. These self generators are thus, exempted from their obligation. Consistency should be maintained in the law to include these generators too since they usually use conventional sources of energy to fulfill their energy needs.

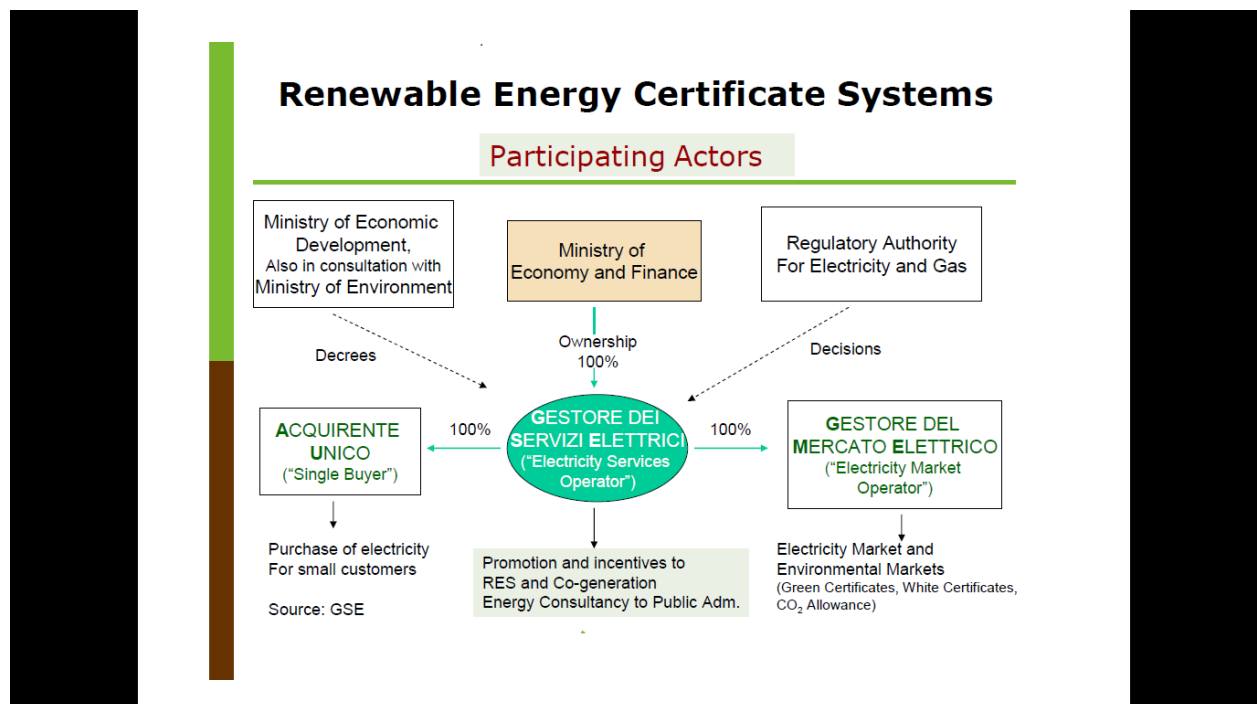
- **Interconnection grid costs**

The renewable energy sources are usually intermittent in nature and thus not a reliable source of energy. If these generation units are connected to the grid, the grid will have to bear additional costs of stabilization. These costs could be in the range of 220 to 550 billion yen. Thus, there is a dire need to make the grid more efficient and modernized and also to establish rules regarding the sharing of these costs.

## ITALY

Renewable Certificate scheme was introduced in 2003 and provides incentives for the development of renewable energy in the country. These certificates are called Green Certificates or certificate Verdi (CV) in Italian. The scheme is as follows:

- Renewable energy producers that qualify as eligible plants (IATR) based on their conformity with specific criteria are issued certificates by the CSE for each MWh produced by them. The clause is that they should have been in operation after April 1, 1999.
- The producers/importers are issued a renewable requirement of 2% (minimum) of the electricity produced to be fuelled from renewable electricity from 2002. The proportion has been increased by 0.35% each year from 2004 to 2006 and 0.75% from 2007 to 2012.
- The renewable requirement of producers is calculated in the basis of the production in the previous year, net of cogeneration, plant's auxiliary service consumption and a deduction of 100 GWh.
- Each green certificate is valid to satisfy the RO of its purchaser for 3 years- the year in which it was issued and two subsequent years.
- GSE purchases the expired green certificates from time to time at pre-determined prices.



## CONCLUSION

The renewable energy sector will play a major role in electricity generation in the coming future. Since the world is currently facing the disastrous consequences of using fossil fuels for energy generation and is working towards a cleaner, greener and sustainable Earth, renewables provide an answer to all their prayers.

Renewables provide a non-emission generating alternative and thus, need to be promoted rigorously by all the countries. Since these resources are renewable and non-diminishing (in certain respects) the use of these resources also fulfills other policy goals like energy security for a country.

As we have seen, Renewable Energy Certificates are one such incentive scheme that provides financial benefits to generators and retailers of electricity. This scheme though is in its nascent stage and not that developed. Measures are being taken to make the markets more efficient and reliable and also to make them less fluctuating. All these problems that are in the REC mechanisms are due to certain aspects of this system being overlooked while formulating the respective REC policy in each nation. Due to the urgent need of promoting renewable energy, countries have implemented these policies without due considerations and now face the consequences. Though these policies are a step towards the betterment of the society as a whole and provide economic as well as environmental and social benefits, the haste in which they have been applied has led to it the criticism of these policies. These policies have also failed to achieve the desired results in certain countries like the United Kingdom.

There is a strong need to reevaluate these policies and restructure them. Though tracking systems have been applied, still many frauds take place in the trading or issuance of RECs. Stronger and more stringent regulations need to be applied but they should not interfere with the market mechanisms. Government intervention should be increased but restricted to the role of a watchdog.

Policies are also not trans-national and every country has a different policy. In cases like of USA different states have different policies. This in turn restricts the free trade of certificates. Thus, to ensure transactions to be economical and affordable, international markets need to be developed to encourage unrestricted trade of these certificates.

The major change in the policy that is the need of the hour is that the incentives should be time bound. The incentives should be provided for a limited period and phased out gradually.

Other steps include the need for transparent mechanisms in the policies to generate confidence among investors and attract them. Non-economic hurdles like administrative problems, lack of training, lack of proper electricity market, poor infrastructure etc needs to be eliminated for efficient policy implementation. The policies for development of this sector should also aim to increase investment in R&D activities to develop better and more economical technologies.

Thus, policy restructuring is a necessity for the holistic development of the renewable energy sector.

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