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Full Length Research Paper

Renewable fuel saving obligation: Innovative mechanism for emission reduction

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All energy requirements of human beings can be broadly fulfilled through electricity (power) and fuels. Many governments including Government of India have taken policy measures to make renewable power component as legally binding to power producers through renewable power obligations. Under these laws, power distribution companies have to buy renewable power as fixed percentage of the total power sold. Similarly in few countries, there are legally binding norms for mixing fixed proportion of bio-fuels in automotive fuels. However, there are no policies adopted by any government for cooking fuels like kerosene and Liquid petroleum gas (LPG). Current article proposes RFSO (Renewable Fuel Saving Obligation) as one innovative policy measure which provides legally binding obligations on cooking fuel selling companies rather than independent agencies who do not have any control on sale of cooking fuels. Mechanism like RFSO needs serious attention by the policy makers and needs to be included in emission reduction acts in respective countries.

Key words: Renewable fuel saving obligation (RFSO), electricity, fuels, India.

INTRODUCTION

All energy requirements of human beings can be broadly fulfilled through electricity (power) and fuels. Even though fuels constitute more than 55% of our energy requirement, majority of renewable energy development efforts are directed towards power production. Recent announcement of 'Jawaharlal Nehru Solar Mission' by GOI also has a commitment of generating 20000 MW of solar power and similar commitments are made by Gujrath government (Jawaharlal Nehru National Solar Mission, 2010; Solar Power Policy, 2009). For complying with emission reduction commitments as per provisions of Kyoto Protocol (http://unfccc.int/kyoto_protocol/items/3145.php) many governments give high priority for electricity generation through renewable sources and have made amendments in their laws accordingly. No such efforts are seen for reducing emission from fuels. Few countries have laid down norms for mixing ethanol and bio-diesel in fixed proportions with gasoline and diesel respectively (http://www.ethanolproducer.com/articles/2571/canadian-government-unveils-renewable-fuel-requirement-plans/). However such schemes have also given rise to food versus fuel debates (Kenneth and Adam, 2007). No policies are seen to reduce emission resulting from cooking fuels. In India, domestic energy consumption of kerosene and Liquid petroleum gas (LPG) is approximately 10% of the total energy mix (Bureau of Energy Efficiency, 2005). Almost 50% of population uses firewood for cooking, which in non commercial energy and is not accounted for in the energy mix (Bureau of Energy Efficiency, 2005). Pohekar et al reports very uncertain figures on contribution of different energy sources for cooking needs between 1950 to 2000 (Pohekaret al., 2005). Solar cookers, biogas or wood efficient stoves are some of the possible alternatives which can reduce consumption of conventional fuels like kerosene and LPG (Pohekaret al., 2005). In India, distribution of cooking fuels like kerosene and LPG is

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Table 1. Maharashtra RPS (now called RPO) Operational Framework 2007.

Financial Year	Renewable purchase specifications (RPS)* (%)	Penal rate for shortfall in Rs./kwh
2006-07	3	Nil
2007-08	4	5
2008-09	5	6
2009-10	6	7

*Percentage RPS denotes minimum quantum of procurement of electricity by eligible persons from renewable energy sources.

Table 2. Targets for RPO for state of Maharashtra.

Year	Minimum quantum of purchase (in %) from renewable energy sources (in terms of energy equivalent in kWh)		
	Solar (%)	Non-solar (other RE) (%)	Total (%)
2010-11	0.25	5.75	6.0
2011-12	0.25	6.75	7.0
2012-13	0.25	7.75	8.0
2013-14	0.50	8.50	9.0
2014-15	0.50	8.50	9.0
2015-16	0.50	8.50	9.0

responsibility of petroleum ministry and these fuels are highly subsidized. Petroleum ministry has accepted obligation of replacing 5 to 10% of petrol with ethanol (Belum et al., 2005), however same ministry has not been given any obligations on reducing emission on account of selling cooking fuels. On the other hand, ministry of new and renewable energy (MNRE) have the responsibility of promoting clean technologies like solar cooking, biogas and clean wood stoves (http://www.mnre.gov.in/). There is conflict of interest in the ministries which are allowed to pollute (petroleum and natural gas) and MNRE who has responsibility to clean up. There is no accountability on either of ministries as both have independent functioning and independent targets. RFSO (Renewable Fuel Saving Obligation) is one innovative policy measure suggested by authors, which puts up responsibility of promoting green technologies for cooking fuel in a manner that targets for emission reduction by cooking fuels are also set and met on similar lines of Renewable Power Obligation (RPO). Such mechanism needs serious attention by the policy makers and needs to be included in emission reduction laws in respective countries. An integrated approach is required for promoting renewable energy and discouraging carbon based energy sources.

RPO (Renewable Power Obligation)

Renewable power obligation has been in place in many countries. In India, RPO has been introduced by many state electricity commissions and it has fixed responsibility of generating a fixed percentage of power through renewable sources. This responsibility is fixed on the power producing and distributing company. This share of renewable energy is increasing every year as shown in Table 1, applicable to state of Maharashtra. Similar provisions were made by other states as well. There are penal provisions as specified in the last column (Maharashtra RPS Operational Framework, 2007). These provisions are made by state and central electricity regulatory commissions.

Till 2010, such legal obligation used to be called RPS (Renewable Power Specifications), since 2010, the terminology used is RPO (Renewable Power Obligation). New targets are specified in Table 2 (Maharashtra Electricity Regulatory Commission - Renewable Purchase Obligation and its Compliance and Implementation of REC Framework Regulations, 2010). These targets now include solar power as a separate component along with other RE technologies. Such measures can bring in time bound promotion of renewable power and corresponding increase in share of renewable power in energy mix of the state. Credit of RPO is a tradable commodity and such mechanism brings in accountability and commitment for promoting renewable power.

Integrated energy policy of Government of India also provides high thrust on renewable power and also agrees that increase in availability of electricity will not reduce kerosene consumption (Draft Report of the Expert Committee on 'Integrated Energy Policy' prepared for Planning Commission, 2005). This policy document mentions obligations only for renewable power and not for renewable fuels. Promotional programs and policies for solar cookers, biogas and biomass are mentioned without specific targets (Draft Report of the Expert Committee on 'Integrated Energy Policy' prepared for

Table 3. Proposed RFSO Operational Framework 2011 for India.

Financial year	(RFSO)Renewable fuel saving obligation (%)	Penal rate for shortfall per kg of kerosene/LPG
20011-12	5	Rs. 50
2012-13	6	Rs. 60
2013-14	8	Rs. 70
2014-15	10	Rs. 80

Percentage RFSO denotes minimum quantum of fuel savings/supplement by eligible persons from renewable energy sources.

Planning Commission, 2005).

NEW PROPOSALS FOR RFSO (RENEWABLE FUEL SAVING OBLIGATION)

Need for RFSO

Issues of fossil fuels and renewable fuels required for cooking are dealt by too many ministries. Ministry of petroleum and natural gas is primarily responsible for providing Liquid petroleum gas (LPG) and kerosene. These fuels are highly subsidized when deployed for cooking needs. Competing technologies like solar cookers, biogas, biomass technologies etc. are dealt by Ministry of New and Renewable Energy (MNRE). MNRE has onus of cleaning up the emissions caused by ministry of petroleum and natural gas. MNRE has no control on these powerful ministries of petroleum and natural gas and for this reason MNRE cannot implement any measurable mechanisms to reduce fossil fuel consumptions substantially. These ministries have conflict of interest. One ministry is allowed to do any amount of emission and another ministry, MNRE is given a daunting task to reduce emissions by all means. It definitely makes more sense that on the lines of RPO the responsibility of reducing fossil fuel consumption or promotion of renewable fuels should be fixed on petroleum and natural gas ministry and not on MNRE. On the same lines as that of RPO, fixed percentage of cooking fuel consumption (or saving) should come from renewable sources and such responsibilities are to be fixed on the fossil fuel manufacturing/selling companies. Initially, 5% of the cooking fuel requirement should be supplemented by renewable energy gadgets like solar cookers, biogas plants and efficient wood stoves and the contribution should go up to 10% in next 4 years. Promoting right kind of technologies will be responsibility of fuel selling companies. Similar to RPO, new specifications for fuel savings need to be evolved. Authors propose 'RFSO' (Renewable Fuel Saving Obligation). This innovation of RFSO is a rational idea because it puts the responsibility of reducing the emission caused by fossil fuel burning, on the companies, who are responsible for the emission. This is on the similar lines as that of Kyoto protocol, which has put onus of cleaning the earth on developed annex-I countries, those are responsible for global warming. One proposal of RFSO is suggested in Table 3.

It will be responsibility of the fuel selling companies, like Indian oil and Bharat Petroleum, to promote RE technologies so that RFSO targets are met. In case RFSS targets are not met then the penalties realized from these companies should go to a 'Green Fund' and MNRE/ PCRA should use this fund to achieve RFSO targets. RFSO compliance should result in 'Renewable Fuel Certificates' (RFCs) similar to 'Certified Emission Reductions' (CERs) generated under CDM. These RFCs should be a tradable commodity. Any agency, company or NGO promoting renewable energy for cooking needs can generate such 'RFC's and trade those RFCs to eligible companies and use such discounts for promoting green technologies.

Conclusions

Legislations like RPO makes it obligatory that certain portion of power has to be generated from green sources, however no such provisions are available for cooking fuels. Kerosene and LPG are promoted by petroleum ministry while green cooking technologies are dealt by MNRE and there is a conflict of interest. None of the existing ministries like MNRE and departments like PCRA, CII, TERI etc. has any accountability towards achieving measureable savings in fossil fuels for cooking needs. Authors' innovative concept of 'RFSO' (Renewable Fuel Saving Obligation) needs to be incorporated in EC-Act or relevant emission saving acts and fix onus of promoting green cooking technologies on the companies, selling fossil fuels. Companies like Bharat Petroleum, Indian Oil, Reliance petroleum limited etc. should be made accountable for the fossil fuel they sell. Measureable portion of fossil fuels need to be replaced by clean technologies like solar cookers, biogas and efficient wood stoves in time bound manner. Proposed RFSO measures can bring in measurable and targeted emission savings and more accountability for the same.

Inclusion of such RFSO measures in EC-Act or other emission reduction act with pollution control boards or with ministry of environment will give legal teeth to such measures.

Even though the paper has been discussed in the background of Indian situation, the guiding principle of fixing responsibility of clean up on the polluters is applicable in all the countries where petroleum or carbon products are used.

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