PISCES Policy Brief No. 5 October 2010

Bioenergy Advance Market Commitments (AMCs) in Sri Lanka

Authors: Steven Hunt, Parakrama Jayasinghe, Thalia Konaris

Editors: Thomas Molony, Namiz Mussaffer

Summary

Over the last decade feed-in tariffs offering a stable and favourable price for electricity generated from renewable sources over that generated from fossil-fuels have been employed in support of renewable energy sectors in several European countries. Feed-in tariffs were initially criticised by more market-oriented countries which favoured more complex renewable obligations and tradable certification schemes. Nonetheless, they have become widely recognised for their effectiveness in creation of renewables markets, and have also been taken up by several low and middle-income countries, including Sri Lanka, which introduced such a measure in its energy policy of 2006. More recently, feed-in tariffs have been grouped under the wider heading of Advance Market Commitments (AMCs). Following pilot application in vaccine markets, AMCs have been proposed for wider application in support of low carbon energy markets in developing countries. Analysis of the performance of AMCs in Sri Lanka to date implies that while AMCs may play a role in incentivising market development, they are not sufficient on their own. Additional measures are required in order to overcome other market barriers and enable a sector-wide response if AMCs are to be an effective stimulus.

PISCES

Policy Innovation Systems for Clean Energy Security (PISCES) is a five-year Research Programme Consortium funded by the UK's Department for International Development (DFID) to develop new knowledge for the sustainable use of bioenergy to improve energy access and livelihoods in poor communities. PISCES is led by the African Centre for Technology Studies (ACTS), Kenya with lead partners Practical Action, M.S. Swaminathan Research Foundation (MSSRF), the University of Dar es Salaam and the University of Edinburgh, together with a network of national and international partners and collaborators.

Policy Working Group (PWG)

The Policy Working Group (PWG) of PISCES is an expert working group whose objective is to develop a consultative and participatory policy methodology to discuss the policy issues and guide policy statements on bioenergy. The group, with focus on Kenya, Tanzania and Sri Lanka, aims to achieve this by bringing together policy makers, stakeholders and experts to develop a combined methodology on participatory policy dialogue and apply the same in developing bioenergy policy.

Introduction

This brief presents the findings of a short study conducted by PISCES in January 2010 assessing the effectiveness of policies incorporating Advance Market Commitments (AMCs) for the energy sector in Sri Lanka (Jayasinghe 2010). The Government of Sri Lanka, along with many other governments and donor institutions, are seeking to use public or donor funding as leverage to attract private capital into infrastructure provision, in an attempt to fill the financing gap for energy access. To this end, policymakers are looking for tools which can create and foster market systems delivering services with social and environmental benefits. Against this background, AMCs have been piloted in accelerating the introduction of vaccines against pneumococcal diseases in developing countries. Early reported successes of this approach have led to further consideration being given to applying AMCs in other sectors, including the low carbon energy sector in developing countries (DFID 2010).

This policy brief aims to analyse experience to date to apply AMCs in the low carbon energy sector in Sri Lanka by examining the reasons why Sri Lanka's feed-in tariff AMC for encouraging Non-Conventional Renewable Energy (NCRE) has so far had only limited success in the bioenergy sector. It is hoped that this brief will provide guidance for policy makers in the design of market incentives that cost-effectively stimulate low carbon energy markets in different stages of development.

The Energy Policy Context in Sri Lanka

Sri Lanka's total energy supply is based on three primary resources: biomass (47.3%), petroleum (45.3%) and hydroelectricity (7.4%). 70% of biomass consumption is attributed predominantly to household cooking.

According to the National Energy Policy and Strategies (NEP&S), the government plans to encourage commercial development of biomass as a new rural industry and to reach a level of 10% (460MW) of grid electricity sourced by Non-conventional Renewable Energy (NCRE) by 2015 (Ministry of Power and Energy, Government of Sri Lanka 2006). The electricity supply industry of Sri Lanka is dominated by the Ceylon Electricity Board (CEB), while the Public Utilities Commission of Sri Lanka (PUCSL) is the multi-sector regulator for physical infrastructure, including the electricity and petroleum industries. In 2007 the state-owned Sri Lanka Sustainable Energy Authority (SLSEA) was established in order to develop the country's renewable energy sector. SLSEA and the PUCSL hold the responsibility of promoting biomass-based energy development in order to meet the 10% NCRE target. (Practical Action Consulting, 2009; Practical Action Consulting, 2010).

Feed-in Tariff as an AMC

AMCs are defined as market creation mechanisms that provide incentives and guarantees in order to ensure sufficient returns on investment by private sector developers (Chatham House & DFID 2010). They are also seen as a public procurement mechanism that incentivises the market by providing a guaranteed purchase of products (Financial Times Lexicon, 2009). AMCs are known for their application in a 1.5 billion USD initiative by the governments of the UK, Italy, Canada and Russia in order to stimulate the pneumococcal vaccines market in developing countries. This AMC works by committing donors to guaranteeing a price for target vaccines once they are developed while committing pharmaceutical companies to an annual supply of vaccines to target countries. This AMC expires in 2020, by which time recipient countries are expected to have gradually increased their share of the purchase cost. While it is still too early to assess the overall success of the initiative, manufacturers have already expressed strong interest in the first tender (Chatham House & DFID 2010).

Various AMC-like approaches have been identified to also stimulate low carbon markets. A renewable obligations approach is one that requires energy utility companies to commit to a fixed proportion of their energy being derived from renewables, thereby creating a guaranteed market with no fixed price. By contrast, a feed-in tariff approach is one that guarantees a price per unit of renewably-generated electricity at a fixed (or sometimes reducing over time) and elevated tariff for that supply, in order to attract investment and development in the sector. Success requires that it is set high enough to cover costs, but must also be stable and long-term enough to assure investors of an acceptable rate of return and payback period (Worldwatch 2004; Chatham House & DFID 2010).

Sri Lanka's NCRE AMC, introduces a three-tiered feed-in tariff that is intended to be cost reflective and technology specific, covering energy sources including biomass (known as 'dendro' power), hydro, wind, municipal waste, agro waste and waste heat recovery. Under the AMC, CEB guarantees to purchase the full quantity of renewable generation, with a top-up to the feed-in tariff level coming from the state.

Experiences in Sri Lanka to Date

There are only two significant biomass projects in operation, both operating on rice husk; the 2 MW Nipuna project and the 10 MW Tokyo Cement project which is feeding electricity into the grid. The first dendro plant (1 MW) commissioned in Sri Lanka using Gliricidia is no longer in operation, reportedly because the AMC opportunity available with the NCRE tariff announced in 2008 was not made available for this project, due to administrative slowness of the authorities (Jayasinghe, 2010). There are also around 10 smaller off-grid, dendro plants currently used for village electrification. Off-grid installations however cannot benefit from the AMC. Although actors have been attracted to the NCRE market, very few installations have emerged which benefit from the AMC.

AMCs Policy Issues Encountered

The following are key points of analysis regarding the Sri Lankan bioenergy feed-in tariffs policy to date, based on the testimony of sector professionals. These issues are broadly agreed by all sector stakeholders, although prioritisation and responsibility for addressing the issues remain points of debate.

Targeting of incentives

The NCRE policy and the 10% target by 2015 relate exclusively to electricity generation and hence include no incentives for the non-electricity energy sector, including the thermal sector, which is particularly relevant to bioenergy. As a consequence, several thermal energy projects that are underway, and could form key part of the wider bioenergy sector development, are not being supported. In fact, they are being discouraged as the state continues to subsidise fossil fuel prices.

In July 2005, *Gliricidia sepium* was declared the 4th National Plantation crop after tea, rubber and coconut, in recognition of its potential as an energy crop. However, by supporting only electricity supply to the grid, the NCRE policy does not support the production and sale of *Gliricidia* directly. Since bioenergy-based electricity generation has not scaled up yet, *Gliricidia* production has also not scaled up to provide reliable and cost-effective supply and is thus not attractive as a fuel option to would-be bioenergy developers and financiers.

Since AMCs target one outcome (electricity generation) there is clearly the potential to miss other important sub-sectors which could contribute to the development of the low carbon sector as a whole. Additionally, even where an incentive is created, an immature market system may be unable to respond to it if other interconnected barriers remain.

Recognition of wider sector barriers

Despite many developers being attracted into the sector by the feed-in tariff, to date very few have been able to develop projects.

A key challenge is the multitude of approvals (11, as issued

in the SLSEA guidelines) required from different departments of government at local and national levels. This, and the lack of co-ordination between various departments, form key barriers to reaching the point of final approval of the SLSEA and signing the Special Power Purchase Agreement (SPPA) with the CEB.

However, even with SPPAs for future power delivery signed, there remain significant barriers in accessing project funding. Lending portfolios of banks are limited in the amount and risk they are willing to expose themselves to. There is a lack of confidence amongst the banking sector and larger corporate institutes in the reliability of a sustained biomass supply. Despite successful smaller scale plantations, they are waiting for larger plantations to be developed, which is unlikely considering the reluctance of the government to release more available lands under its control to the private sector.

Furthermore while finance requirements for individual small-hydro projects are relatively low, larger, grid-connected biomass power plants can require larger investments, which are unlikely to be within the capability of a single local bank. As a result, while fossil fuel-based development is given state support, low interest loans, sovereign guarantees and indirect incentives, in the case of renewable energy projects (apart from hydro) only certain wind projects have been able to provide the collateral or security needed for obtaining bank loans. This is due to the high tariff offered to wind projects and the fact that recognised Sri Lankan corporate entities have come in as developers. This has forced biomass developers to seek foreign funding, which introduces more hurdles and risks not least because the tariff is paid in Sri Lankan rupees, while any foreign financing has to be repaid in foreign currency.

It is clear therefore that although an incentive may attract prospective players to a market, it may have no influence over a series of interconnected barriers to sector development. Even where in principle policy barriers have been addressed, broader issues associated with sector linkages and functioning can still be encountered.

Recognition of sector maturity

An important challenge to the effectiveness of AMCs applied to the bioenergy sector in Sri Lanka is the relative immaturity of the sector in several key dimensions:

- Technology choices for biomass-fuelled electricity generation are not well established and confidence has been undermined when a number of pilot schemes have encountered problems. This implies a remaining R&D and/or technology transfer component is required for sector development.
- Market chains for bioenergy are not in place and lack the established relationships, contract agreements and trust that reduce transaction costs and risk. This also includes inconsistency in the quality and standards of the biomass supplies.
- Financing access: There is insufficient transaction experience with banks around the technology and they are therefore disproportionately nervous about offering loans to the sector.

The small hydro sector in Sri Lanka has reached a level of maturity which the bioenergy sector can be seen to be substantially short of. This was built up over two decades, through a series of initially off-grid projects involving NGO-led technology development and capacity building, followed by the Renewable Energy for Rural Economic Development (RERED) Project, which built technical implementation and management experience at scale and provided financing and guarantees to local banks which in turn financed projects.

It is noticeable that the feed-in tariff applied to small-hydro has had a much stronger effect than that on bioenergy to date, in spite of being less attractive in terms of value. The implication here therefore is that less established chains do not react well to an AMC in isolation and require other support measures, depending on their status. Nonetheless, the multi-dimensional nature of markets and barriers means that a coordinated public policy response is difficult to achieve, as has been the case in Sri Lanka to date.

Ambiguity in responsibilities

One of the main criticisms of the NCRE policy is that there are few clear assignments of responsibility to the various state institutions for its implementation. The underlying assumption in the policy is that the development of the NCRE sector is the responsibility of the private sector, partly because the SLSEA has few financial resources of their own to invest in NCRE projects although they do have a mandate under the SLSEA Act to assist the private sector in overcoming barriers. This reliance on the private sector underplays the importance of a systemic approach to strengthening energy sub-sectors, which acknowledges the diversity of market actors as well as the role of government in shaping basic service delivery arrangements to benefit the population in the longer term (e.g. the strategic imperative to minimise national reliance on fossil fuels).

Furthermore, while the private sector has been vested with the responsibility for the development of the NCRE sector, they are not represented within the tariff fixing committees and consider themselves to have been called in for stakeholder consultations only at a stage when minor adjustments can be accepted for consideration.

Such ambiguities are not only present between government and private entities, but also between the Ministry of Power & Energy (which is considered to own the National Energy Policy) and the Ministries of Environment & Natural Resources, Plantation Industries, Land Development and Agriculture, which despite having responsibilities and resources relating to bioenergy developments cannot be said to have actively bought into the policy. The picture is further complicated by the 13th amendment to the Constitution of Sri Lanka, which gives provincial governments some responsibilities in the power and energy sector. However, their contribution so far has been insignificant. Such issues have made delivering a clear message to markets very difficult except for a few cases in the hydro sector.

Clear and consistent commitment to the AMC

Lack of follow-up on commitments of the NEP&S has undermined the confidence of developers. This includes the commitment to review and revise the policy three years after its application, a period which has already passed. Similarly, following the declaration of *Gliricidia sepium* as the 4th National Plantation crop, there was no follow-up on the decisions made, likely due to an absence of coordination between the various ministries with responsibilities for implementing this declaration. Furthermore, even with the SPPA in place, there is still lack of clarity and assignment of responsibilities on payment to the developer. In such circumstances additional risk must be priced in by prospective developers based on uncertainty about real policy commitment to the AMC, and its longevity past the calculated payback period.

Conclusions and Recommendations

The application of an AMC on bioenergy in the form of a feed-in tariff has provided an impetus to the bioenergy sector in Sri Lanka, stimulating interest in the sector. However, the analysis conducted shows that the AMC has been an insufficient stimulus to generate substantial project activity and implementation in the country. This can be attributed to a range of factors including the targeting of the policy, wider barriers to market scale- up not addressed by the AMC, sector immaturity constraining a response to the incentive, ambiguity in responsibilities, and issues in the credibility of the government's commitment to the AMC.

In response to these issues the following general recommendations are proposed; regarding the use of AMCs:

- If an AMC is to be applied to a market system more or less in isolation of other measures, then it is imperative that the market system targeted is already in a state of minimum maturity in terms of technology, capacity and financing experience such that it is able to respond. This is usually built up over time through different types of non-AMC action via public, NGO, donor, academic and other actors, before a sufficient private sector is in place to constitute a commercial sub-sector which is able to respond. The small hydro sector in Sri Lanka has gone through this process while the bioenergy for electricity sector has yet to do so.
- Immature sub-sectors are unable to respond effectively to the "carrot" stimulus of the AMC because there are a series of wider sector barriers still in place which are impeding progress. These may be linked to market gaps, restrictions on physical capacity, brakes imposed by policy ambiguity, lack of finance or other issues. In order to address such barriers a systemic approach is required to identifying and addressing them. This is very likely to involve a range of actors, not just private developers, but universities, NGOs, government departments and other actors in a wider process. Such an approach can be guided by a Participatory Market Systems Development (PMSD) (Albu M & Griffith A 2005) process which can engage sector stakeholders in a process of learning and development, building co-operation and trust towards a more effective market system. Only after a degree of co-operation and co-ordination can a greater degree of competition and private leadership be supported by an AMC.

Specific to the Sri Lankan context, it is recommended that the Ministry of Power and Energy use the opportunity of the scheduled NCRE policy review to:

- Engage more closely with relevant ministries and the SLSEA to more clearly define respective roles and responsibilities, including streamlining relevant inter-ministerial bureaucracy and permit requirements
- Reassess AMC targeting and, with respect to biomass, consider promoting synergies with the low-carbon biomass process heat sector and the biomass agricultural production system not currently covered by the NCRE policy
- In recognition of the early stage nature of the biomass electricity sector, integrate in the NCRE policy a range of more direct biomass sub-sector support mechanisms based on market chain analysis and gap identification, including technology-related research (e.g. Sri Lanka has no up to date biomass resource map) and participatory market system development. The policy should consequently be made more open to participation from other types of institution, including state-owned actors, NGOs, academic institutions and research institutes, facilitating increased co-operation
- In order to reduce early stage financing barriers, sovereign guarantees for foreign loan funds should be considered and consultation initiated with banks on how more lending can be made available for biomass-based electricity development
- On the basis of the above, commitment to the NCRE policy, and the AMC within it, should be clarified and reiterated at the highest levels. This will boost sector confidence and send a clear signal to all interest groups about the commitment of the Sri Lankan government to building a low-carbon future.

Such a series of actions would be likely to substantially boost the impact and effectiveness of the existing AMC on the biomass to electricity sector, even if it were to remain relatively unchanged to that of today.

Bibliography

1. DFID 2010. DFID - Low Carbon Advance Market Commitments. Available at: http://www.dfid.gov.uk/Global-Issues/Policy-and-Research/Climate-and-environment/Climate-Change/Low-Carbon-Advance-Market-Commitments/ [Accessed 11 June 2010].
2. Jayasinghe, P. 2010. Biomass AMCs - PISCES Sri Lanka Case Study.
3. Ministry of Power and Energy, Government of Sri Lanka, 2006. Sri Lanka Energy Policy 2006.
4. Albu M, Griffith A 2005. Mapping the Market: A framework for rural enterprise development policy and practice. Uhttp://practicalaction.org/docs/ia2/mapping_the_market.pdf. Accessed 11 June 2010
5. Practical Action Consulting 2009. Policies and Regulations Affecting Biomass-Related Sector Development in Sri Lanka. Prepared for PISCES by Practical Action Consulting
6. Practical Action Consulting 2010. Bioenergy in Sri Lanka: Resources, Applications and Initiatives. Prepared for PISCES by Practical Action Consulting
7. Chatham House, DFID 2010. Advance Market Commitments for Low Carbon Technology: Creating demand in Developing Countries.[Meeting Report]
8. Sri Lanka Sustainable Energy Authority, 2010. Renewable Energy. http://www.energy.gov.lk/sub_pgs/energy_renewable_intro_forcast.html#grid [Accessed 11 June 2010]
9. Sawin J.L, Flavin C., WorldWatch Institute (2004). National Policy Instruments: Policy Lessons & Adnavcements for Technology Diffusion Around the World, International Conference for Renewable Energies, Bonn.
10. Financial Times Lexicon, 2009. Advance Market Commitment. The Financial Times Ltd

For further information contact:

Project Manager, Dr. Bernard O. Muok
E-mail: b.muok@acts.or.ke, info@acts.or.ke, Website: www.pisces.or.ke
Phone: +254 20 712 68 90/94/95, Fax: +254 20 233 90 93
For further information about this policy brief contact:
Steven.Hunt@practicalaction.org.uk

Design & Production: Eyedentity Ltd, info@eyedentity.co.ke