Financing of bioenergy projects in Asia

Understanding and mitigating risks

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Abstract

Biomass is already the most commonly used renewable resource of energy in Asia, especially in rural areas. The increased availability of technologies for processing dedicated crops and residues has allowed for substantial increase in transforming biomass into bioenergy for electricity generation, heat production and transportation. Despite its growing importance, bioenergy projects, like many renewable projects, face significant hurdles in obtaining financing in the current market. This is not only because other types of renewable energy projects are more attractive to investors but also that many bioenergy projects simply do not have a robust risk management scheme to satisfy investors' requirements. Experiences from the field have demonstrated that good risk management can make bioenergy projects bankable. Superior risk management can lead to significantly improved financial returns, making the project attractive to both equity investors and lenders. This article presents a consolidated list of key risks, as perceived by many investors, which make them less attractive than other alternatives available in the renewable industry. Further, the article discusses, under each of the risk categories, possible approaches to mitigate and quantify the risks in a manner easy for the investors to comprehend.

Bioenergy in Asia

Bioenergy is energy derived from the conversion of biomass where biomass may be used directly as fuel, or processed into liquids and gases. Popular sources for bioenergy come from agricultural crops and residues, sewage, municipal solid waste, animal residues, industrial residues, forestry crops and residues (IEA, 2017). Of which, wood is one of the most important sources, with more than 70% of wood being harvested in Asia and the Pacific (OECD/IEA, FAO, 2017).

The global bioenergy market was valued at US$168.18 billion in 2016 and is projected to reach US$246.52 billion by 2024 at a CACR of 4.9% from 2016 to 2024 (Transparent Market Research, 2016).

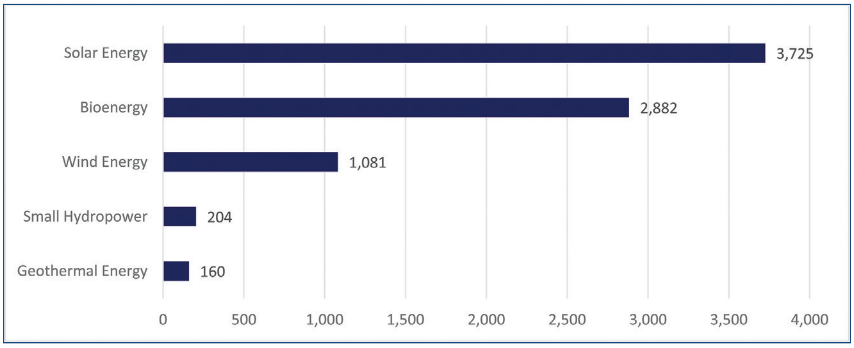
The use of bioenergy has been growing at around 2% per year since 2010. Today, bioenergy is the single largest renewable energy source, providing 10% (50 exajoules) of global total primary energy supply (TPES) (IEA, 2017). It plays a significant role in many developing countries, where it provides basic energy for cooking and space heating. Well over 2.7 billion people – 38% of the world's population – are using traditional bioenergy as their main source of energy (IEA, 2017). The development of more efficient technologies for converting biomass to energy is resulting in multiple environmental and social impacts, including reduction in greenhouse gas emission, energy security enhancement, health improvements, and generation of new job opportunities. According to the IRENA's report, while the renewable energy industry employed 8.1 million people worldwide in 2016, a 5% increase from 2015, bioenergy is one of the key employers, with almost 2.9 million jobs (IRENA, 2016) (Figure 1).

Asia, with its abundant bioenergy resources (Table 1), holds a strategic position in the global bioenergy atlas. Thailand, Indonesia, Philippines and Vietnam generate 34 million tons of bagasse every year. Meanwhile, Malaysia, Indonesia and Thailand account for 90% of global palm oil production leading to the generation of 27 million tons of waste per annum in the form of empty fruit bunches, fibers and shells, as well as liquid effluent (Zafar, 2015).

An increase in demand for electricity due to fast population growth, and a growing need for more environmentally sustainable energy sources, has accelerated the drive to implement the latest conversion technologies to tap the unharnessed potential of biomass resources in Asia. Bioenergy currently accounts for roughly 4% of regional Total Primary Energy Supply (TPES) (with a total installed capacity of 28,975 MWe) (Figure 3).

Consumption of bioenergy is dominated by the residential sector (80.62%) (Figure 4), reflecting the high proportion of people in the region relying on traditional bioenergy for basic energy services such as cooking and heating.

Bioenergy indeed is bringing changes to many Asian cities and rural communities, from reducing emissions as a means to tackle climate change to fostering rural employment and development. Poor energy access to electricity is still a major issue in Asia. In 2016, over 500 million people in developing Asia lacked access to electricity (IEA, 2016). Small-scale bio-



*Source: IRENA 2016. **Bioenergy includes liquid biofuels, solid biomass, and biogas.*

Figure 1: Renewable energy employment by technology unit: jobs (thousands)

Table 1: Bioenergy potential in selected Asian countries

Country	Estimated Potential (MW)	Main Sources
India	36,000	Various forms of biomass
Indonesia	50,000	Palm oil and agriculture Residues
Malaysia	29,000	Palm oil and wood wastes
Philippines	200	Coconut
Thailand	29,805	Sugar cane, rice, oil palm and wood wastes
Vietnam	2,420	Rice husk, bagasse, coffee husk, wood chip

Source: REEP, 2017

energy can provide access to clean and efficient source of energy.

On a regional basis, Asia is the largest emitter of greenhouse gases in the world. Since 1960, CO2 emissions per capita have grown by an average rate of 3.2 % per annum. The emission continues on the rise, with little to no signs of abating (IEA, 2009). The International Energy Agency (IEA) affirmed that using bioenergy in transport, heat and power generation is a more cost-and-land-efficient way to reduce greenhouse gas emissions, particularly if fossil fuels are the fuels replaced (IEA, 2009).

The way biomass in Asia being collected, consolidated and delivered across the supply chain from farms to the points of use, by far, has created a significantly higher number of sustainable jobs per US dollar invested. Indonesia's labor-intensive palm oil-based biodiesel industry, for instance, supports 223,000 jobs. Meanwhile, bioenergy creates 178,000 jobs in India and 76,900 jobs in Thailand (IRENA, 2015).

The governments of Asian countries are promoting bioenergy programs to address energy security and environmental problems as well as to increase farm income and employment opportunities. Along with implementing ambitious targets and mandates (Table 2), Asian governments have also adopted or are considering a range of supplementary policies including price support for feedstock production, feed-in tariffs, tax advantages, capital grants and/or loans and funding for research and development (Damen, 2012).

Despite its growing importance, bioenergy projects face significant hurdles in obtaining financing in the current market. Many investors still perceive bioenergy projects with high risk and would often prefer to invest in other renewable energy projects such as wind and solar photovoltaic (PV), now that the cost of those projects have been reduced drastically. In fact, global investments committed to bioenergy sharply fell since 2008 (Figure 5). Year-on-year investments dropped roughly by 11% on average during the period between 2008 and 2015. By the end of 2015, investments to bioenergy scored below US$10 billion.

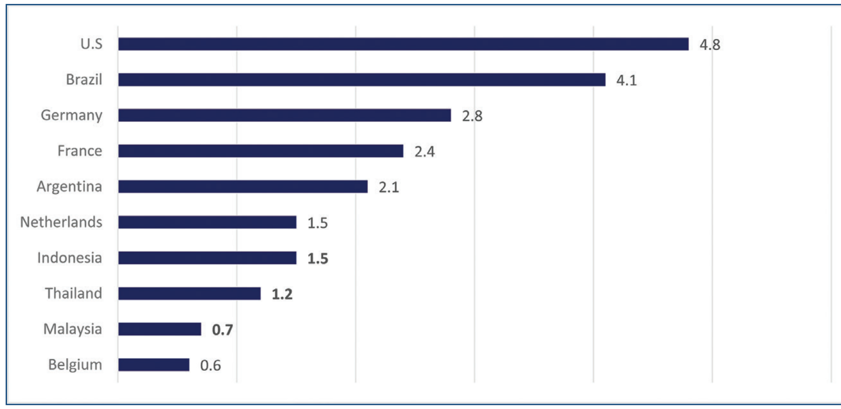
Among challenges such as low fossil fuel prices and rapidly falling installation costs per megawatt (MW) of wind and solar PV, the sharp drop in investment is attributed by the fact that many bioenergy project developers fail to quantify and manage the different elements of risk, thus making projects less attractive to equity investors and lenders. Risks associated with bioenergy projects include market, feedstock, location, engineering and construction, operational and financial risks. Experiences from the field have demonstrated that good risk management can make bioenergy projects bankable. Superior risk management can lead to significantly improved financial returns, making the project attractive to both investors and lenders.

Biomass – understanding and mitigating risks

Market risk

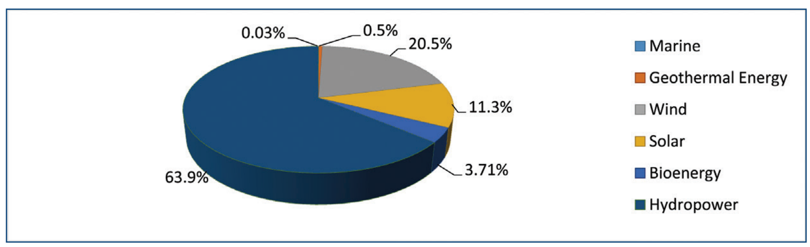
Market risks for biomass project range arise from lack of continued government policy support, status of the underlying commodity markets at both the feedstock end and product end, off-taker's capability and any such conditions that are completely external to the project itself but influence the performance significantly.

Long term consistency of government policy in terms of capital and operational subsidies may not always be available. In 2013, UK Government had contemplated capping the power purchase price subsidies to only 400 MW for biomass, thus affecting several projects that were under development at that time (Harrabin, 2013). Project developers are also required to appraise themselves of policies in the realm of land use, agriculture, forestry and transportation (especially in case of biofuels) as biomass is either a derivative of agriculture or forestry operations. As an example, the reduced availability of rice husk due to a reversal of policy in the rice-pledging scheme in Thailand resulted in



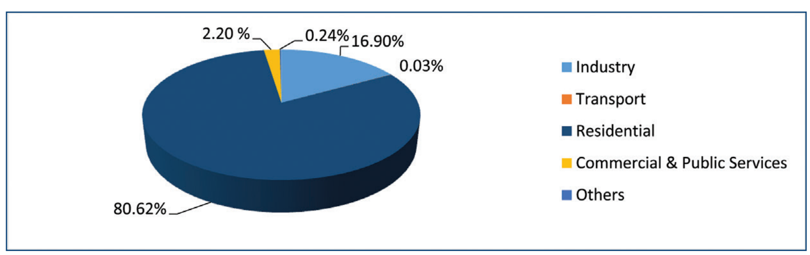
Source: Statista, 2015

Figure 2: The world's top ten biodiesel producers in 2015, by country (Unit: billion liters)



Source: IRENA REsource, 2016

Figure 3: Renewable energy electricity generation by technology



*Source: IEA, 2015. **Asia excluding China*

Figure 4: Final bioenergy consumption in Asia by sector, 2015

acute rice husk shortage in the biomass power plants, causing several of them to either shut down or reduce the output. While the policy was mainly an output of the agriculture department, the impact was on the power/energy business. Such inter-departmental play is increasingly visible in the policy areas for bioenergy projects. The guidelines for land use in terms of food versus fuel have been often controversial and this debate has led by interested groups/NGOs, rendering allocation of unforeseen resources to either resolve them or find alternatives at the development stage of the project, causing delays and additional costs.

Underlying commodity market risks could severely affect both the feedstock end and the product end. At the feedstock end, price fluctuations occur resulting in a challenge for the project to provide a consistency in the operating margins. The high price of rice husk caused by the shortage in supply in Thailand, as mentioned earlier, led to a sharp increase in the cost of power generation. At the product end, i.e biofuels or electricity, both are affected either directly or indirectly by crude oil prices. In addition, heavy subsidies on fossil and grid electricity in some Asian countries are making bioenergy less attractive. India, for instance, spent as much as US$277.3 billion in 2015 on fossil fuel subsidies (IMF, 2015).

Off-taker's financial and technical capability are to be understood and appropriate risk management. While financial capability in terms of actual time taken to make payments (beyond the agreed credit terms) is a key consideration for providing working capital for the projects, technical capability in terms of grid stability could be a challenge in several locations. Many biomass projects connected to weak grid networks face several electrical trips during operations and each of those stop-start situations cost additional money. Despite their vigorous efforts in reforming the national power market, countries in Asia is still struggling to put in place enough power-generation capacity and infrastructure for transmission. In biofuels projects, the off-taker's management of their own logistics in terms of sending tankers on time could cause pressure on working capital.

Diversifying feedstock, products and markets helps reduce and counterparty risk. Wherever possible, for the sale of power, several market options should be considered, such as utility-scale power purchase agreement (PPA), wholesale market, and/or bilateral PPA. Developing concrete co-product strategies to increase revenues is also highly recommended as a way to minimize risks. For example, for power project additional revenues can be sought from sales of ash, compost and steam and for biofuels projects co-products could be compost, animal feed, carbon dioxide, compressed biogas (as a replacement of compressed natural gas – CNG).

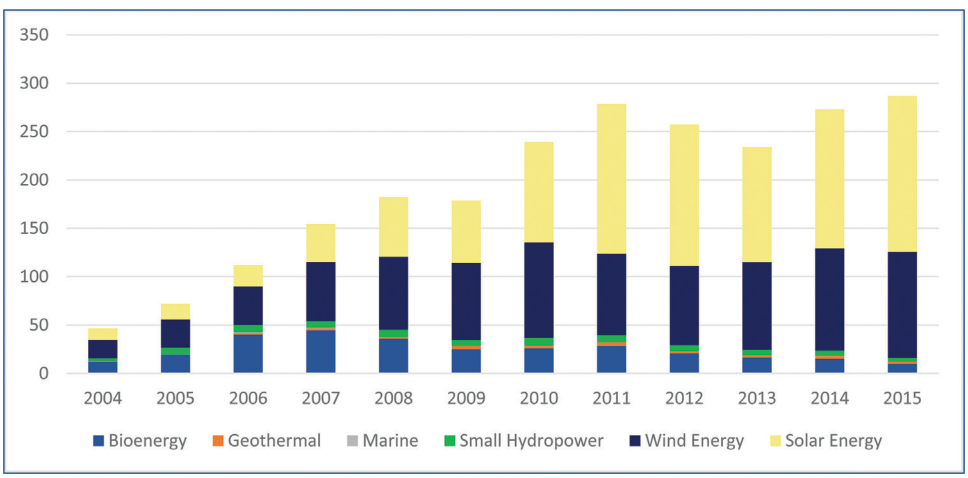
Feedstock risk

The fluctuation in feedstock volumes and prices add substantial risks to bioenergy projects. Commodity price volatility severely affects feedstock prices. It is important to understand various biomass sources and underlying commodity related risks.

Table 2: Bioenergy mandates and targets in selected countries in Asia

Country	Biofuel mandates/targets	Biomass heat & power targets
India	5% blending mandate for ethanol E10 20% blending of ethanol by 2017	10 GW by 2022
Indonesia	B20 20% blending of biofuels in transport, industry, and commercial sectors; 30% blending in power plants. This creates a demand of 5.57 million kiloliters of biodiesel and 3.77 million kiloliters of bioethanol.	810 MW by 2025
Malaysia	B7 and B10 7% blending of biofuels in transport and industry sectors.	1,065 MW by 2020
Philippines	10% blending of ethanol by 2020, and to 20 % by 2030	267 MW by 2030
Thailand	B5; 5 billion liters of biofuel production by 2022	5,570 MW by 2036
Vietnam	550 million liters of biofuel production by 2020	500 MW by 2020

Source: REEP, 2017.



Source: IRENA REsource, 2016.

Figure 5: Global trends in renewable energy investment, 2004-2015

Secure, long-term supplies of low-cost, sustainably sourced feedstocks is critical to the economics of bioenergy projects.

Feedstock quantity and quality variations due to seasonal and other reasons should be predicted and provided for. For instance, biomass from agriculture, such as rice husk and rice straw, is available only after harvesting period which can stretch only for 6-7 months in a year. Therefore, it is required to procure and store adequate quantity of biomass within this stipulated time. Farm holding size, contractual consistency and other unpredictable local issues might influence the feedstock supply and the availability of the feedstocks. Biomass from forest processing residues may vary depending on the final product being made by that factory (for example, size of wood offcuts) and the impact of chemicals used in their processing (for example, veneer waste from plywood industry may contain glues).

Some countries in Asia, notably Thailand and Indonesia, are deploying the anaerobic digestion technology to treat a range of waste materials-including effluents from cassava starch production, palm oil processing and ethanol production. These waste feedstocks can be more volatile in supply and price when the prices of such commodities as palm oil and cassava are fluctuated. The waste-to energy project in Southern Thailand, for example, has been in operation since early 2016, processing palm oil mill effluent and producing 12,300 MWh annually, which is exported to the neighboring electricity grid (REN 21, 2016). The operation of this power plant significantly depends on the availability of palm fruit and its processing which in turn depends on the prevalent economics of palm oil production.

Feedstock costs can be zero for some wastes, including those produced onsite at industrial installations, such as black liquor at pulp and paper mills, or bagasse at sugar mills (IRENA, 2014). Some waste feedstock projects are paid to take wastes or pay at low cost, such as the case of municipal waste and solid waste. However, a number of projects designed around feedstock waste streams have not been financed due to waste feedstock risk, including price escalation for transportation and handling, and price risk, if there is competition for the waste (Hanson, 2012).

Energy crops, grown for specific bioenergy projects, need to have considerations for land use for fuel versus fuel, overall and sustainable economics of growing it for long periods of time from the point of view of yield per hectare, seed costs, land preparation costs, fertilizer/ pesticides and other chemicals, crop care costs, harvesting, baling and other compacting methods and handling, transportation, competitive uses of land and other local factors influencing land use. A couple of ethanol projects in the Philippines, that were designed with an integrated farming approach for feedstock supply, have faced considerable delays in the conversion of the land use from cash crops/others to energy crops.

Feedstock logistics are not often accounted for very clearly and project need to itemize logistics and fuel preparation costs across the supply chain. In certain countries like India, a third party like Punjab Renewable Energy Services Pvt Ltd., provides consolidation services covering all these costs, with a delivered cost at the gate. Activities encompass collection from several points of collection, loading at point of collection, transportation, unloading at point of storage, reclaiming & loading on to conveyors to boilers, administrative costs, storage costs and care during storage, fuel preparation (sizing, mixing, palletization, crushing etc.). Concerns to be addressed are availability of labor for loading/unloading, availability of trucks to support delivery schedules, availability of authorized personnel at collection points, delivery is possible only over a limited period and certain days of the week, increased inventory carrying costs, increased transportation/ administrative costs, losses during storage and handling.

A good risk management strategy could be to use blended feedstock strategy/ multiple feedstock strategy. Security of fuel supply could also be sought through providing the fuel suppliers an equity stake in the project. Adequate margins must be provided in the feedstock supply.

Varying feedstock sources and preparing adequate working capital must be required in the design and operation of the project. This will significantly improve the revenues and the ability to service fixed costs. Carefully planning stocking and transporting feedstock also helps reduce the costs caused by quality degradation and storage loss while sustaining feedstock supply continuity. Cost considerations for each of the above activities listed in the fuels supply chain and clear plan to address the concerns are a key expectation from investors.

Feedstock procurement planning, linked to the project's output and considering seasonal variations, should be undertaken at project stage and layout the procurement and inventory management plan in details. This exercise should link to the working capital costs and inventory carrying costs for the feedstock. In highly competitive supply situations, it is recommended to manage the suppliers like "customers" and apply all key "customer" relationship management (CRM) methods to bind and secure suppliers to the project. Advance purchase of standing crop is a common practice in the sugarcane industry and has been applied very little outside of this segment in the energy industry and such practices can be investigated for their applicability to procurement of other biomass/energy crops.

Location risk

A key success factor of bioenergy projects is the location. It is necessary for the project to be located as close to their markets e.g. grid, blending depots, port facilities. This helps reduce operational costs while ensuring smooth operation and also reduces other concerns such as logistics for biofuels transportation.

Proximity to feedstock is obvious because of logistics limitations, the economically feasible transport range being limited to a 50 km radius from project site (REN 21, 2016). The collection of feedstock poses the largest barrier since ag¬ricultural production in Asia is mostly small-scale and geographically scattered. Competing uses of biomass from similar projects in the vicinity and from others, for example, cassava roots and chips are used for manufacturing starch and ethanol and thus the same produce of roots from the feedstock for ethanol factories located adjacent to each other and starch factories in the same vicinity. Even when being put in use for similar end use such as generation of steam, the capability of factories that produce food and beverages to be a higher price for rice husk could be much higher than that of a power producer. Woody feedstock fetches far higher prices from paper and pulp producers than being used for boilers in power plants.

Access to infrastructure such as good roads, storage facilities and ports are important considerations. Another important consideration is the availability of waste disposal facilities. Rice husk based power plants in North Eastern part of Thailand have always sought to export their high quality ash but have been deterred by the staggering costs for packaging and transporting them to ports in Central Thailand. This further leads to the challenge of disposing the ash in an environmentally friendly manner. Ethanol plants have always been challenged with the disposal of treated waste water, one option being disposing to farms in the vicinity, provided they exist and the infrastructure for this is available.

Labor and skill availability is also a consideration for location selection. Sensitivity of local communities must also be factored in, to reduce any future social conflicts with them.

Risk mitigation should include a levellized cost of land including long term operating costs effects on additional operating costs due to logistics on the product side/ grid transmission losses, feedstock supply chain costs, waste disposal costs, labor and skill development costs. Additionally, the cost of land levelling and preparation, to be discussed in the subsequent sections, is also a contributing factor to this calculation.

Engineering and construction risks

Inappropriate engineering might lead to the failure of a project. It is often the case in Asia that a preferred supplier is identified at an early stage of the project and several inputs in the project design are taken from inputs provided by such a technology supplier. While this may provide validated capital and operating costs, it is sometimes not possible to extrapolate these from one project to the other. An example of this would be in the selection of the level of automation in the technology. A number of ethanol projects in Asia have designed with a high level of automation and energy and water integration, largely on the lines of such projects elsewhere in Europe/USA. While these designs are flawless, the necessary skills to operate and maintain them do not exist in many parts of Asia. Thus a project developer who may be very impressed with such features in the technology may opt for this, which may be very hard to operate on the ground by the project personnel. This shall then defeat the purpose of the extra capital costs spent in acquiring the sophistication in the technology as some of those features may take a long time (2-3 years) for the operating personnel to learn and put to use. In addition, this may also cause an error in the planning for the number of personnel required to operate, as the original estimate may be based on a fully automated plant. It would rather be that such upgrades are executed in steps, over a period of time.

Another area that is often left unattended is the design of the "balance of plant" or "utilities". While the key components of the project (such as boiler/steam turbine for power projects and the ethanol production block for bioethanol projects) attract a lot of attention at the project development stage, the same is not the case on the rest of the project, leading to challenges in balancing the operations of the project. As an example, a biomass power plant in Thailand had never considered the high level of chlorides in the raw water source and supplied a water pretreatment plant not suitable for this project. The contractor was not provided these inputs as the project developer never focused on this at the development stage. A few samples of water were drawn from "neighbors" and used as the basis, but not enough local expertise was sought because as they discovered later, this was a common issue in that locality. In ethanol plants, the ethanol block suppliers only provide utility requirements at their battery limits e.g. steam flow and temperature under minimum/maximum/normal conditions of operations. Rarely do project developers involve a stem system expert to arrive at configuration that can cater to these conditions in real operating conditions. Neglecting such areas cause significant operational inconvenience and costs.

In terms of construction, the profile of land in terms of the quality of soil and contour have a significant impact on the construction costs. A number of tools are available for getting all relevant data in this connection making this not only convenient but also fast and inexpensive. Such critical information should form a part of the business development and issued to the bidders of the project as a key input for their design.

Selection of the right contractor is always a challenge. Sectoral and geographical experience is of utmost importance. Relying only the financial strength of the contractor is not sufficient. Most investors expect a single-point turnkey solution provider who additionally goes to guarantee the technical performance of the entire project. While sectoral experience may be temporarily acquired during the project stage by hiring the right personnel, geographical experience cannot be "hired" but has to be gained over a period of time. The latter should not be underestimated as each of the countries within Asia (and also elsewhere) have their own local nuances and sub-contracting practices that needs the understanding and appreciation from the main contractors, usually possible only by experience. There are several project examples of delays and cost over-runs when contractors have executed their projects for the first time in certain countries in South East Asia.

Obtaining permits and licenses for construction is time consuming, and the costs and time for those should be taken into account. A clear roadmap may be drawn for this including costs and timelines.

Operational risk

Operational risks are related to not achieving the desired performance due to operational inefficiencies, either because of technical, personnel and other reasons or a combination of these. Hiring experienced personnel is a key to mitigating this risk. The experience with the technology and geography are important.

Project must establish procedures for production planning and link this to feedstock management and utilities management. Feedstock management may throw up scenarios of multiple feedstock/blended feedstock, necessitating to have complete production menus developed for these scenarios upfront.

Several of these projects do not maintain a clear technical records right from the construction stage onwards continuing into the operations. This often inhibits the resolution of operating problems in a timely and economical manner. Data collection and storage during production also does not form a component of the project design, beyond probably a basic Distributed Control System (DCS) capability. Modern tools like data analytics, predictive plant performance, internet-of-things (IOT) based solutions may be explored to tap on higher level of expertise available in the domain, beyond the operating personnel of the plant.

Projects lack an analytical approach in many cases, not only because of lack of data as mentioned above, but also due to lack of laboratory facilities for analyzing feedstock and work in progress. The feedstock analysis largely gets restricted with outputs relevant to assessing quality for making payments to suppliers and not beyond that. Laboratories form an integral part of the production process, with continuous sampling and feedback provided to the production personnel to make adjust to manage outputs efficiently. It is also important to thoroughly document potential equipment errors for maintenance, breakdown and damage repair.

A key focus during operations is the community around the project and hence Corporate Social Responsibility (CSR) programs must form a part of the project design. A certain part of the revenue may be set off for local development activities and this should be budgeted in the project design. A good CSR strategy which allows the engagement of local communities is essential. It helps strengthen project sustainability, manage potential reputation risks for investors, avoid social conflicts within communities, and help reduce political risks.

Designing and operating safety systems beyond compliance requirements is highly desirable. For example, the statutory requirements for safety may be far lower than the actual requirements for ethanol and biofuel projects. Where large volumes of biomass feedstock are stored, impact on safety due to dry biomass, and fine dust, are to be studied and adequate safety should be provided for.

Financial risk

Financial risks exist in the form of lack of capabilities for a follow through investment, capital structure of the company, debt servicing, working capital planning, availability of exit options for investors, focus in creating a sinking fund, currency risks, and providing for CSR.

It is quite common that projects require funds for debottlenecking to achieve its full potential. When such a situation occurs, either the capital structure of the project or the initial investment ask from the investor and/or their committed investment come in the way. This causes impairment to the value of the project due to delays in either mobilizing the funding and/or creating the appropriate corporate structure to accommodate the same. It is desirable that project developers envisage and provide for such follow-through investment in the project design by way of an appropriate amount of investment asked upfront and create the appropriate capital structure to accommodate such additional capital injection.

Debt servicing is one of the key operating challenges for bioenergy projects with variation in costs and revenues. This is expected to be covered through a reserve account, mandated by the lender. However, in order to make sufficient funds available in such a reserve account projects may need to be in operation for a couple of years and any shortfalls in servicing the debt prior to that provide significant challenges to equity investors. Exploring loan guarantee mechanisms and integrating them with the project may be worth the while. Such guarantee mechanism take time and also do cost an additional fee but do provide comfort to the project in terms of covering debt servicing risks.

In several cases, the lack of working capital planning at the project design stage have caused stressful situations, making it hard for the project to raise additional working capital subsequently during such times. Seasonal fluctuations in working capital requirements should also be factored in the planning.

Providing plausible exit options for investors are crucial to project financing. While exit is part of the project design in case of most debt providers, for equity creating an appropriate exit as part of the project design is important. It may be noted that unless a project is of a significant investment (which most standalone bioenergy projects are not), stating an initial public offering (IPO) is often not a plausible and feasible option for exit. The higher the number of exit options available, the more attractive the project could be to investors and all possible scenarios may be discussed with the investors.

A sinking fund, provides for the "rainy day", and could be a good hedge in times of seasonal fluctuation of feedstock prices (for example, the project may buy and stock feedstock at lower prices during the season) and or provide for unforeseen plant maintenance expenses. Even though projects may be covered by insurance policies for operational breakdown, it is expected that the project developers spend their own funds to get it fixed, while the claim from the insurance is being processed. This results in lesser downtime and loss of revenue. A sinking fund is one created beyond the stipulation of lenders, such as the reserve account, and should be a norm to deposit a certain portion of the revenues into a controlled account.

International investors often face significant currency risks where the revenues and dividends are in local currency. Investors quite often attribute hedging costs for the currency and consider this as part of their costs in the project. While the project developers may not be accounting for this, it is a consideration at the investor's end. As enumerated in the earlier section, a CSR related fund should also be a part of the project design.

Conclusion

It is often the case that investors view the risk adjusted returns of the projects after accounting for all of the above risks and more. It is recommended that project developers cover as many of the above risks as mentioned in this article and quantify them in terms of costs, either at the project development stage or at the operating stage, i.e either in capital or operating costs. This not only provides a clear picture to the investor but also helps the project developer build and operate the project successfully.

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Asia Pacific SEforALL Hub

The Asia Pacific SEforALL Hub is led by ADB, UNDP and ESCAP, with the Hub Secretariat hosted at ADB Headquarters in Manila, Philippines. The three organizations will help catalyze major new investment opportunities to speed-up the transformation of the world's energy systems, pursue the elimination of energy poverty, and boost prosperity. The Hub will leverage on the existing structures of ADB, UNDP and ESCAP energy programs and integrate the strengths of all three development partners. It looks to grow its partnerships and consolidate efforts to promote Sustainable Energy for All in Asia and the Pacific region.

The SEforALL Asia Pacific Hub aims to accelerate and facilitate the achievement of SEforALL's goals to transform energy systems for a sustainable, prosperous future by harnessing its three development partners' convening power, country presence and networks to mobilize partnerships to catalyze concrete actions at the country level.

The Asia Pacific Hub will facilitate and coordinate core activities in the region, with respect to the SEforALL goals, in close co-operation with the SEforALL's Global Facilitation Team. A better policy environment will accelerate the further development of sustainable energy, which is why the AP-SEforALL Hub established a Sustainable Energy Center for Excellence, hosted by the Sustainable Energy Association of Singapore. The Singapore-based facility will become a venue for the region's policy makers to receive training on policy, technology, and project financing matters in the sustainable energy sector.

Forging partnerships with diverse groups of institutions is crucial in addressing energy challenges facing the region. Partnerships mobilize resources (financial, human, and others), leverage knowledge, meet unique needs for highly specialized development projects, and make aid more effective throughout Asia and the Pacific. The Asia Pacific Hub is always seeking new partners to support inclusive, environmentally sustainable growth and development in the region.

Key activities of the Asia-Pacific Hub for the SEforALL Initiative:

- Support the preparation of rapid assessments, country action plans and investment prospectuses
- Facilitate policy dialogues among stakeholders
- Catalyze investments in energy access, renewable energy, and energy efficiency
- Develop market-based approaches for the delivery and consumption of energy
- Build synergies and promote knowledge sharing among its stakeholders
- Conduct regular monitoring and evaluation of activities and initiatives of its stakeholders

For more information, access:

http://www.se4all.org/hubs_asia-pacific-hub