



Securitization: Unnecessary Complexity Or Key to Financing the DESCO Sector?

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Annex A Model Term Sheet



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Introduction

In December 2015 the first asset securitization was completed by a distributed energy services company (DESCO). A special purpose vehicle subsidiary of BBOX Ltd. issued asset backed notes – named *Distributed Energy Asset Receivables*, or *DEARs* – secured by approximately 2,500 customer installment sales contracts. The contracts represented the unpaid portion of the purchase price of BBOX's solar home systems sold to customers living without electricity in Kenya. Oikocredit International, a global impact investor, purchased the Kenyan shilling denominated notes for KES 52,000,000.¹

As our confidence grew in 2014 that the DESCO sector would be a game-changing financing mechanism for off grid energy access, we began to ponder how capital would be mobilized to provide the enormous amount of debt financing that would be needed to support the sector's development. We began to think through the structure, rationale and feasibility of securitization as the cornerstone financial instrument for growth of the sector. We approached Oikocredit and BBOX with a proposal to launch the first securitization late that year. Oikocredit was interested in the financing as a way to begin investing in DESCOS. They were also interested in pioneering a financial instrument that would support broader industry wide growth of DESCOS. BBOX was entrepreneurial enough to invest the time, skill and energy to launch the first transaction, even though they knew that it alone would not be cost effective.

The DESCO sector is booming and the leading companies are entering a stage of rapid growth, with voracious needs for capital. As we approach the anniversary of the sector's first securitization, now is a good time assess whether our thesis - that securitization will be the cornerstone of financing the DESCO sector - remains sound.

This article will make that assessment. First, we will describe how securitization can work in the DESCO sector, providing basic structure, terms and pricing theory. We will also discuss possible variations on the basic structure, referring to related financing structures used in Western markets. The article will then describe the advantages and disadvantages of securitization and how securitization can anchor any growing DESCO's corporate finance strategy.

Although the BBOX DEARs 2015-1 transaction has not opened a floodgate of securitizations yet, securitization is likely to become a key financing tool for DESCOS in the years ahead. This is because it can provide a DESCO with:

- Access to new debt investors that would not otherwise finance a DESCO;
- Access to local currency debt that matches the currency of the DESCO's revenues; and
- A diversification strategy in its debt portfolio, easing its reliance on one group or type of lender.

This assessment was recently shared in a piece by Bloomberg New Energy Finance.²

Size matters. The first securitization was small – barely \$500,000 in Kenyan Shillings. In Western markets a \$100 million securitization would be considered small and perhaps \$50 million the minimum.

¹ See <http://www.greentechmedia.com/articles/read/the-worlds-first-securitization-of-off-grid-solar-assets> ; and <http://www.bloomberg.com/news/articles/2016-01-12/african-sunshine-can-now-be-bought-and-sold-on-the-bond-market>. In May of this year, SunFunder launched its Structured Asset Finance Instrument (SAFI) with a \$2 million loan to SolarNow of Uganda. https://data.bloomberglp.com/bnef/sites/4/2016/10/BNEF_WP_2016_10_07-Pay-as-you-go-solar.pdf. The SAFI program is described as “forward looking” rather than a securitization of existing pools of assets.

² https://data.bloomberglp.com/bnef/sites/4/2016/10/BNEF_WP_2016_10_07-Pay-as-you-go-solar.pdf.



We think DESCO securitizations can attract investors with offerings as small as \$5 million. But economies of scale won't be realized unless a company raises much more debt this way.

Although it is expensive to start a securitization program and interest rates paid to asset backed note investors are high today, as the market develops and investors in important African local currency markets become comfortable with this asset class, costs and rates will come down. African institutional investors are seeking investment grade, medium term corporate debt to build balanced portfolios. DESCO asset backed securities are the perfect product for them. But unless several DESCOs use securitization as part of their comprehensive financing strategies, demand for these securities will never develop.

Consequently, every DESCO that is building to scale should seriously consider establishing a securitization program. A securitization will bring new debt investors to the company and will provide a natural hedge by matching the currency of a DESCO's revenues to its debts. Granted there is an upfront investment in establishing a program, but that cost is recovered over time. Moreover, as additional investors enter the securitization market, and capital markets like Kenya's develop, access to capital and costs of borrowing will drop, making securitization very attractive.

Measuring the Value of Securitization

How do we measure whether securitization is a promising financing mechanism that is worth the cost and effort of DESCOs to develop?

There are three important criteria to consider:

Can securitization give DESCOs access to capital that would not be available through conventional borrowing?

There is currently insufficient debt capital available to finance the rapidly growing DESCO sector. Local commercial lenders have been slow to provide conventional cash flow lending. Impact and other international debt providers are struggling to meet demand, even as they and their borrowers face the currency risk inherent in dollar based loans. Will securitization unlock a new class or classes of debt investors and thereby bring more capital into the market? Moreover, if the day comes (and we hope it will) when commercial banks will lend DESCOs conventional working capital loans, will the diversification of a securitization program strengthen a DESCO's capital structure?

Can securitization provide DESCOs with access to less expensive capital than conventional term or working capital borrowing?

"Less expensive capital" cannot be measured only by interest rates. A borrowing DESCO must also measure the transaction costs of structuring, closing and maintaining a securitization program compared to conventional financing. No company should embark on a securitization program unless it intends to issue multiple series of asset backed notes as it grows, amortizing the cost of creating the complex structure over multiple financings. Moreover, one must measure the "cost of collateral", i.e. how much collateral is required to be dedicated to a securitization financing compared to the collateral required for a comparable conventional financing.

Can securitization provide DESCOs the ability to borrow in the same currency as their cash flows?

DESCOs create assets consisting of customer contracts representing the purchase price of a solar home system or the leasing cost of energy services. DESCO customers pay in local currencies. Borrowing in dollars to finance customer payments in local currencies subjects a DESCO to significant currency risk: any devaluation of the local currency will correspondingly increase the cost of repayment of a dollar



loan. DESCOs need borrowing sources that are denominated in the same currency as the cash flow they will be generating to service that debt.

Each of the three criteria above is from the perspective of the DESCO-borrower. But there is also an investor-lender perspective to each question:

Are there investors attracted to the risk profile of asset backed securities that would like to lend to DESCOs but are not lending today?

Do the features of a securitization – diversification of assets, separation of assets from originator risk, match funding by currency to eliminate FX risk – make DESCO asset backed securities an attractive investment?

Where a DESCO should ask whether securitization is less expensive than a conventional borrowing, an investor's sensitivity is to the rate of return as compensation for risk. If an asset backed security is a lower risk asset than a loan to a DESCO, then the investor will happily accept a lower rate. While this rate may still seem high compared to mature-market borrowing, as we will see below, development of a DESCO securitization market should drive these rates down over time.

Basics of DESCO Finance

Before discussing a securitization, it is useful to describe what a DESCO needs capital for.³

At its core, a DESCO acquires inventory (solar home systems, appliances, other products) and sells or leases it to customers in return for periodic payments. A DESCO may need some property, plant and equipment for its operations: trucks, warehouses, office space, tools to repair products, etc., but these costs are relatively small. Most of the capital a DESCO uses is to

- Purchase inventory held for sale or lease to customers, and
- Finance the installment sale of the DESCO's products to its customers or, finance the leasing of the DESCO's energy services offering to its customers.

The capital needed to finance inventory held for sale or lease is working capital – it finances short term assets that will be sold within 6-12 months. Working capital “revolves” – is used, recovered and reused – as inventory is bought, sold and new inventory is bought. Most inventory is purchased in US dollars. Because DESCO inventory is sold relatively fast, the inventory cost is recovered in a short period of time. As a result, a DESCO faces only a short term currency risk financing inventory in dollars even though it sells or leases its products and services in local currencies.

In contrast, the capital to finance DESCO customers must be longer term. In the case of an installment sale to a customer, the DESCO needs to finance the purchase price of the product over the term of the customer contract (or at least until the DESCO recovers its cost of goods sold). In the case of a lease of an energy product to customers, a DESCO must finance the cost of the product until recovered by customer lease payments. In either case, this revenue stream is in local currency, making it imprudent to finance these assets in dollars without adequate protection against devaluation of the local currency against the US dollar.

³ A more detailed discussion of the basics of DESCO finance can be found at <http://www.persistentnrg.com/#!/Financing-the-DESCO-sector/mhqg1/578cc6030cf256540e9d13cb>



The challenge in financing a DESCO is financing the customer receivable. Financing inventory should be straightforward, *but only* if the inventory lender knows that the DESCO can repay the inventory loan with a financing of its customer receivables once it sells or leases the product to the customer.

Financing customer receivables can be done using securitization.

DESCOs are Asset Heavy

DESCOs have been financed in a conventional venture capture manner. Companies have been launched with seed capital from “angel” investors and, if successful, have raised institutional venture equity.

Unlike technology-based startups, however, DESCOs are “asset heavy” businesses. Financing hundreds of thousands of customers’ purchases or rentals of solar home systems and appliances requires substantial capital. It is not practical or desirable to raise all this capital as equity. Moreover, the revenue stream from customer purchases and rentals is significant and predictable, making them ideally suited for financing by borrowing.

If current rates of growth in the DESCO sector continue, we project that significant borrowing will be required across the DESCO sector. By 2020 it may be \$2-3 billion.⁴ While this would be an exciting opportunity for commercial banks and debt financiers in developed markets, there has been little interest from local lenders in most markets in financing DESCOs.

While we expect local commercial lenders to become comfortable lending to DESCOs over the next several years, we also believe that local term debt investors – pension funds, insurance companies and asset managers – can also be attracted to the sector.

⁴ See <http://www.persistentnrg.com/#!/Financing-the-DESCO-sector/mhqg1/578cc6030cf256540e9d13cb>



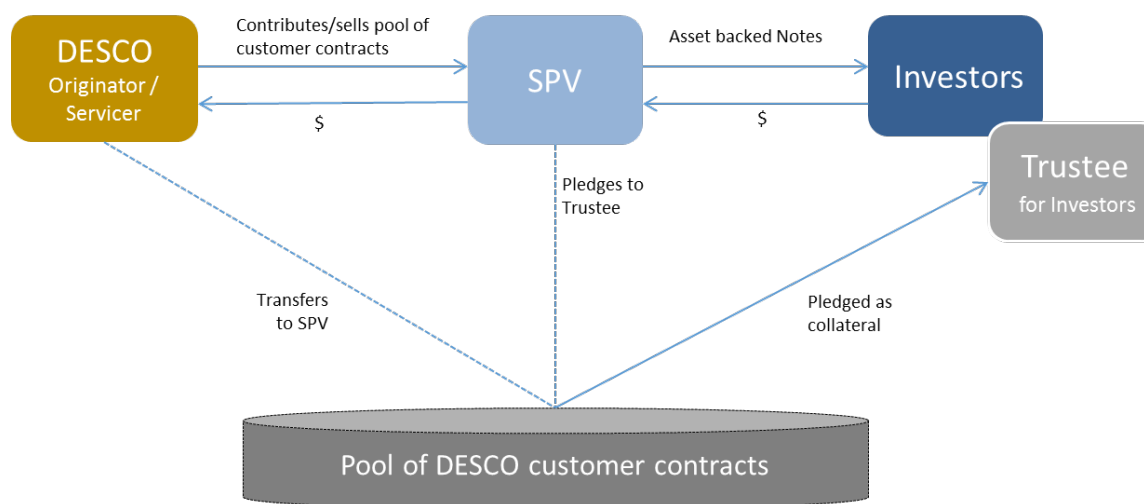
What is a Securitization and How Does it Work?

Securitization Defined

Securitization is a process whereby a company pools a group of its assets and then sells those assets, or the payment stream associated with those assets, in the form of a security.

A basic securitization structure for a DESCO would look like this:

Figure 1 – Basic Structure of a Securitization



Let's unpack the definition and the diagram.

(a) Pooling Assets

The key to a successful securitization is to select a group of homogenous assets that generates regular cash flow. This could be mortgages on homes,⁵ consumer loans for goods such as cars or credit card debt,⁶ or corporate debt obligations.⁷ A group of assets must have a predictable payment stream to be eligible for securitization – in other words, there must be predictability, within an acceptable margin of error, that the contracts will pay as and when due.⁸

(b) Selling the Assets

The Special Purpose Vehicle

One of the complexities of a securitization is the need to isolate the pool of assets in a manner that is suitable to create a security attractive to investors. This is typically accomplished by transferring the assets to a special purpose vehicle, or SPV. The key in transferring the target assets to an SPV is to legally separate them from the DESCO and its other affiliates. Only by achieving a legal separation can

⁵ Mortgage-backed securities.

⁶ Asset backed securities.

⁷ Often referred to as Collateralized Loan Obligations (CLOs) or Collateralized Debt Obligations (CDOs).

⁸ As we will see below, overcollateralization of the asset pool is used to cover the failure of assets to pay when due.



investors in asset backed notes have assurance that future financial troubles of the DESCO will not impair the investor's ability to collect payment on the securitized assets to repay the debt.

How – and how successfully – an asset pool can be separated from the originating DESCO (usually called the “originator”) will depend on the business structure of the DESCO (nature of its contracts, how it books and collects payments, etc.) and the ability to “service” the assets in the event that the originating DESCO ceases to be the servicer of those assets.

Business Structure of the DESCO. It is essential to be able to isolate the pool of assets to be transferred to the SPV. This means segregating the assets within the DESCO's accounting and operating systems and being able to segregate the payment stream from those assets so that they flow into the SPV with no or a minimum amount of interface with the originating DESCO. Ideally customers will use mobile money to pay their obligations and those proceeds will flow directly from the mobile money provider into the SPV's bank account without involvement of the DESCO. This however may not be practical. While this is not fatal to the securitization, it affects the level of risk associated with the asset backed securities being issued (i.e., if the cash flow is successfully separated, the securities will have a higher credit quality).

“Servicing” Securitized Assets. Since an SPV has no operations or employees, it must contract with another party to collect customer payments and perform any obligations it has to customers under the contracts. In the DESCO context, this servicer must monitor payments, take action on defaulting customers, and provide customer maintenance, warranty and related services. In this early stage of the DESCO sector, only the DESCO that originated the customer sale is capable of doing all of these things. This was also the case fifty years ago when the first mortgage-backed securities were issued.⁹ If a DESCO securitization market develops, we would expect standard protocols to be developed to enable third party servicers to manage securitized asset pools. And we would expect a class of third party servicers to establish itself as capable of providing backup servicing.

There are variations on how to create an SPV and transfer the asset pool to the SPV in each of the African countries we have studied as markets for securitization. In Kenya, where the BBOX DEARs 2015-1 transaction was done, the ideal SPV vehicle is a limited liability partnership, or LLP. An LLP is a partnership for Kenyan tax purposes. As a result, any profits earned by the LLP are taxed to its partners. This means that, unlike dividends paid by a corporation, any distributions to the partners by the LLP are not taxed when distributed (i.e., each partner of the LLP has already reported and paid any tax required on its share of the LLP's profits). This allows the originating DESCO to own the SPV and consolidate the SPV with the DESCO for tax purposes and to freely transfer excess cash from the SPV as part of the securitization financing process.

Transferring the Asset Pool to the SPV

Transferring an asset pool to the SPV would seem simple: the originator sells assets to the SPV and takes back the proceeds of the securitization financing as purchase price.

This legal transfer of title to assets from the originator to the SPV is effective in most countries to vest in the SPV all the legal rights to the assets sold. Although there are variations from country to country, the SPV's rights in the pooled assets are generally very strong and adequate to assure investors in the SPV's asset backed notes that they will have first claim on the revenue stream from the pool of assets.

⁹ As you will see in the attached model term sheet, the DEARs structure provides for a successor servicer to assume the DESCO's servicer duties, with full right of access to the DESCO originator's systems to manage the SPV's customers in the securitized asset pool.



In the African countries we have analyzed for securitizations, the difficulty in conveying assets from the originator to the SPV is the value added tax, or VAT. Most countries treat a purchase and sale of assets as a transaction that is subject VAT, even if made between affiliates. The solution to avoiding VAT varies from country to country. In Kenya, the assignment of receivables as collateral for debt is exempt from VAT. While this will not enable the SPV to acquire full legal title to the originator's customer contracts or the underlying solar assets financed, it would allow the SPV to acquire most of the legal rights to the payment stream (i.e., the right to receive all payments under the customer contract). A better solution in Kenya takes full advantage of the LLP structure: the originator can contribute the asset pool to the SPV as a contribution of capital, assigning all its legal right, title and interest to the SPV. When the assets are securitized and sold, the SPV can distribute the proceeds to the originator as a return of capital without any VAT or dividend taxes.

Protecting the SPV's Investors from Originating DESCO Credit Risk

Separating the SPV from the originating DESCO to protect the investor's rights of buyers in the SPV's pool of customer contracts requires three basic things:

Limited Powers. The chartering document of the SPV will limit the corporate functions that the SPV has legal authority to engage in. As you will see from the sample term sheet attached, this is typically limited to buying the assets to be pooled, financing them and carrying on all activities incidental thereto.

Formalities. Following legal formalities is intended to buttress the legal separateness of the SPV. If its formalities – separate board, separate books and records, formal proceedings – are not respected, the SPV may be treated as a part of the originating DESCO. If this were to happen, the originator (or its creditors) may claim that the SPV's assets belong to the originator and investors in asset backed notes are merely creditors of the originator. This would compromise their status as the sole creditors with rights in the asset pool.

Blocking Stake. It is also important to ensure that the SPV is not operated in a way disadvantageous to asset backed noteholders. The most common threat would be that a DESCO owner of the SPV, facing financial trouble, would seek access to the cash flow from the SPV's asset pool. This may be done by requiring the SPV to distribute assets to the DESCO owner, or by taking corporate action to consolidate the SPV with its parent, as in a merger, under insolvency law or by other means. To eliminate this risk the SPV would typically have an independent minority owner that has a consenting vote to any major action such as a merger, distributions or commencement of insolvency proceedings. In DEARs 2015-1 securitization, Persistent Energy Capital holds a 1% stake in the SPV to serve this function.

(c) Creating Asset Backed Notes

Once the pool of customer contracts has been transferred to the SPV, the SPV is in a position to issue debt securities supported by those assets. These securities are commonly referred to as "asset backed notes". A typical securitization will establish the asset backed note structure in the following way:

Designation of Trustee, Paying Agent, Administrative Agent

Where multiple investors purchase asset backed notes, an agent must be hired to collect cash, hold collateral and distribute periodic debt service payments to noteholders. Although there is little



corporate trust activity in the markets we have examined¹⁰, we would expect to develop corporate trustees that would perform these functions as the securitization market develops.

Pledge of Asset Pool

To secure the asset backed notes, the asset pool of customer contracts and all rights associated with them will be assigned and pledged to the Trustee as collateral security for the benefit of the noteholders.

Isolation of Cash Flow Proceeds of the Asset Pool

The SPV would create dedicated deposit accounts into which all collections from its assets will flow and be distributed. Other than the “General Account” described below, all of these deposit accounts would be under the complete control of the Trustee for the benefit of the noteholders, blocking the SPV and originating DESCO from any access to these accounts.

Collection Account: A “Collection Account” would be the central receiving account for payments on the asset pool. All receipts by the SPV would flow through this account.¹¹

Payment Account: A “Payment Account” is established to control the disbursement of all payments related to the asset backed notes. This includes not only debt service on the notes, but payments of taxes¹², servicer fees, costs of collection and other fees and costs relating to the securitization.

Reserve Account: The “Reserve Account” is typically established to hold reserves of cash for the noteholders. An agreed minimum cash reserve is established to provide liquidity to the noteholders. For example, the asset pool customers may have been slow to pay amounts due during a payment period, leaving the Trustee short on cash to pay quarterly debt service. In this case the Trustee could draw on the Reserve Account to make up any shortfall in payments to noteholders. The Reserve Account might also serve as additional collateral, such as in the case where the asset pool pays faster than the amortization schedule on the notes and must be held until payment is due.¹³

General Account. The “General Account” is the SPV’s unrestricted deposit account. Funds in this account are not part of the noteholders’ asset pool. The SPV can freely spend these funds or distribute them to its parent company, subject to country laws and standards of prudence.

Funds Flow Waterfall

Payments received from the asset pool sold to the SPV and pledged to secure asset backed notes are distributed in what is commonly referred to as the “waterfall”. In a typical securitization the waterfall payments would be made in the following order:

First, to pay taxes owing by the SPV relating to the contract pool;

Second, to pay Trustee fees and expenses;

Third, to pay servicing fees to the servicer;

¹⁰ Corporate trustees are required for any public corporate debt issuance. The absence of corporate trustees in the markets is likely because there is little public issuance of corporate debt.

¹¹ As we discuss further below, if an SPV has multiple tranches of asset backed notes outstanding, the Collection Account would receive all payments for all pools of assets. The Trustee would then allocate those collections based on which noteholders owned the assets for which payment was received.

¹² Sometimes a dedicated tax account is created to segregate payments for taxes.

¹³ Or, if there are no prepayment penalties on the notes, the excess proceeds could be applied to prepay the notes.



Fourth, to pay interest due on the asset backed notes;

Fifth, to the Reserve Account to the extent needed to comply with liquidity and collateral covenants;

Sixth, to pay due and overdue principal; and

Last, to the General Account of the SPV.

Selling the Asset Backed Notes

The Trustee, the SPV and the note purchasers enter into a note purchase agreement providing for issuance of the asset backed notes. The Trustee, through the trust indenture and collateral documents, holds all rights in asset pool and Collection, Payment and Reserve Accounts, as trustee for the benefit of the asset backed note holders.

Model Term Sheet

Annex A of this article contains a model term sheet for a basic securitization.

A Securitization Pricing Model

How does a DESCO pool customer contracts and price an asset backed note issuance? Here is a simple multi step model to get started.

Step 1: Estimate expected cash flows

Each asset consists of expected cash flows associated with a customer or a system. This is the case if the DESCO offers a fixed installment plan, i.e. 24 monthly payments of \$7, or if the DESCO offers a true pay as you go plan, whereby the customer can unlock a system with irregular payments. In case of a pay as you go plan, the payments are not fixed and the company needs to estimate the expected payment amount and period.

- A company that offers a *fixed payment plan* to its customers is unlikely to strictly enforce payment defaults. Rather it is likely to build grace periods into every contract.
- A company that *repossesses systems* from defaulting customers for reuse will have to develop an expectation of the number and timing of the cash flows they can generate with such a reused system.
- A company that *leases* its system would expect that customers sometimes miss payments but continue to pay afterwards, until the point when the company ends the lease and recovers the system.
- A company that offers *true pay-as-you-go* financing would have to develop an expectation of how much revenue it will collect from each customer on average.

In each model, the company develops an *expectation* of the size and timing of cash flows. Investors should carefully review the assumptions for the expected cash flows behind any asset backed note:

- If a company offers a fixed payment plan (i.e., an installment sale contract), total expected payments will not exceed total contractual payments and, because of likely occasional defaults, are likely to extend beyond the contractual payment schedule. It would be conservative to



assume that total expected payments are lower than contractually agreed payments and will occur over a longer time frame.

- Of course, expected cash flows will be supported by the company's experience. Although old customers' payment practices won't predict new customers' payment practices, the company's track record in managing its customer contracts over long periods and across broad geographical areas will give investors (and credit rating agencies rating asset backed notes) greater confidence in the company's expected cash flows from a given pool of contracts.

Note Structuring		1	2	3	4	5	6	<i>Month / quarter / year</i>
Step 1	Contractual agreed cash flow period	10.00	10.00	10.00				LCY
	Sum of contractual agreed cash flows	30.00						LCY
	Expected cash flow period	5.70	5.70	5.70	5.70	5.70		<i>Estimate</i>
	Sum of cash flows	28.50						
	In percent of contractual total	95%						

This article presents a simplified model for the pricing of a securitization. In reality, a model which estimates the deviation of future payments relative to contractual payment schedules can become quite complex.

Such models will also depend on a company's strategy when it comes to repossession/reuse of systems from customers who have defaulted. The complexity in this market versus conventional credit markets is that DESCO customer contracts usually assume a certain level of payment default and give customers flexibility in making payments.

Step 2: Calculate present value of expected cash flows

Once the expected cash flows have been determined (timing and size) we can calculate the present value (PV) of these expected cash flows in the asset pool. Once we discount the expected cash flows with a discount factor we have an estimate of the present value of all receivables, i.e., the value of the asset pool.

Step 3: Determine the notional value (principal amount) of the notes

If the present value of the expected cash flows from the asset pool is 100 the note should have a notional value (principal amount) equal or less than 100. The difference is overcollateralization of the notes by the asset pool, giving investors better than 1:1 asset coverage. The discount of the notional value to the asset pool value is a function of the credit quality of the pool and the interest rates born by the notes that are backed by the pool. The discount is determined by supply and demand (i.e., demand by note investors at a given level of collateralization).

Step 4: Structure the payments of the notes bought by investors

Investors buy a note that is paid with the cash flows associated with the asset pool. The timing and size of the payments that investors receive should therefore be as similar as possible to the timing and size of the aggregated payments in the cash flow stream. Where there are mismatches, more cash reserves need to be maintained, increasing the cost of the program for the originating DESCO.

Step 5: Negotiate interest rate on notes

Investors in the notes take a risk that is higher than the risk of a benchmark security (i.e., a government bond of the same maturity). Accordingly, they should receive a risk premium return of the benchmark security's rate that compensates them for the risk of not receiving a payment under the note. The level of risk and right interest rate to compensate for that risk could be estimated from a bottom up analysis



of the probabilities associated with each cash flow or top down with a scenario analysis. The bottom up analysis of each cash flow's probability will be very complex and depend on the ability to correctly predict such probabilities. The top down analysis will be simpler and show the performance of the note in certain scenarios such as "[80%] of expected cash flows are collected" (see also Step 7 below). We recommend showing the performance of the notes in well-defined scenarios. The interest rate on the notes will then ultimately be set by supply and demand (i.e., demand by note investors at a given rate).

The following provides a simple illustration of the steps in a theoretical issuance of 6 month asset backed notes:

Note Structuring		1	2	3	4	5	6	<i>Month / quarter / year</i>
Step 1	Contractual agreed cash flow period	10.00	10.00	10.00				LCY
	Sum of contractual agreed cash flows	30.00						LCY
	Expected cash flow period	5.70	5.70	5.70	5.70	5.70		Estimate
	Sum of cash flows	28.50						
	In percent of contractual total	95%						
Step 2	Interest Rate period	1.00%	1%	1%	1%	1%	1%	Market Interest rate over period
	DF cash flow	99%	98%	97%	96%	95%	94%	Compounded discount factor
	PV cash flow	5.64	5.59	5.53	5.48	5.42	-	
	PV sum of cash flows	27.66						
Step 3	Advance rate	70%	of PV					Input
	Note Notional	19.37						LCY
Step 4	Note duration	6	months					Input
Step 5	Note interest rate	2.50%						Input
	Principal payment, period	3.23	3.23	3.23	3.23	3.23	3.23	LCY
	Interest payment, period	0.48	0.41	0.33	0.25	0.17	0.09	LCY
	Note cash payment, period	3.71	3.64	3.56	3.48	3.40	3.31	LCY
	Sum principal payments	19.37						LCY
	Sum total payments	21.09						



Step 6: Use the waterfall model to simulate return/loss scenarios based on deviations from the expected payment plan.

Given a defined waterfall, one can simulate the cash flows in various scenarios.

Step 6 Waterfall							
Scheduled Cash flows from asset pool		5.70	5.70	5.70	5.70	5.70	-
Default rate vs expectation	0%	0%	0%	0%	0%	0%	0%
Actual received		5.70	5.70	5.70	5.70	5.70	-
Taxes	-0.10%	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	-
Trustee fees	-0.10%	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	-
Service fees	-0.50%	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	-
Reserve account initial balance		5.66	7.61	9.63	11.73	13.92	10.20
Less interest due		(0.48)	(0.41)	(0.33)	(0.25)	(0.17)	(0.09)
Less principal due		(3.23)	(3.23)	(3.23)	(3.23)	(3.23)	(3.31)
Reserve account after payments		1.95	3.97	6.07	8.26	10.52	6.80
Past due amount		-	-	-	-	-	-
Reserve / next period payment		0.5x	1.1x	1.7x	2.4x	3.1x	n.a.
Max ratio reserve / debt service	3.0x						
Payment to operator		-	-	-	-	0.32	6.80
Adj reserve account balance		1.95	3.97	6.07	8.26	10.20	-
Payment to note holder	(19.37)	3.71	3.64	3.56	3.48	3.40	3.40
Loss of principal	-						
IRR	2.67%						
Payment to issuer	19.37	-	-	-	-	0.32	6.80

Step 7: Simulate performance of notes given deviations of realized vs. expected cash flow.

In this case we show how realized deviations from expected payments would impact the repayment of note principal and the IRR on such notes.

Dev from Expect.	Loss of principal	IRR
0%	0%	2.67%
10%	0%	2.67%
20%	0%	2.67%
30%	0%	0.70%
40%	-12%	-4.23%
50%	-27%	-9.62%
60%	-42%	-15.59%



Securitization 2.0: Beyond the Basic Structure

The structure of the first securitization in the DESCO sector described above is a mere bicycle compared to the Tesla-like securitization instruments issued in Western markets. Here are some features of more sophisticated securitizations that the DESCO sector can look forward to developing in the future.

Tranching

Tranching is the practice of issuing *layers* of notes to finance a single pool of assets.

Figure 2a – Tranched Securitization Structure

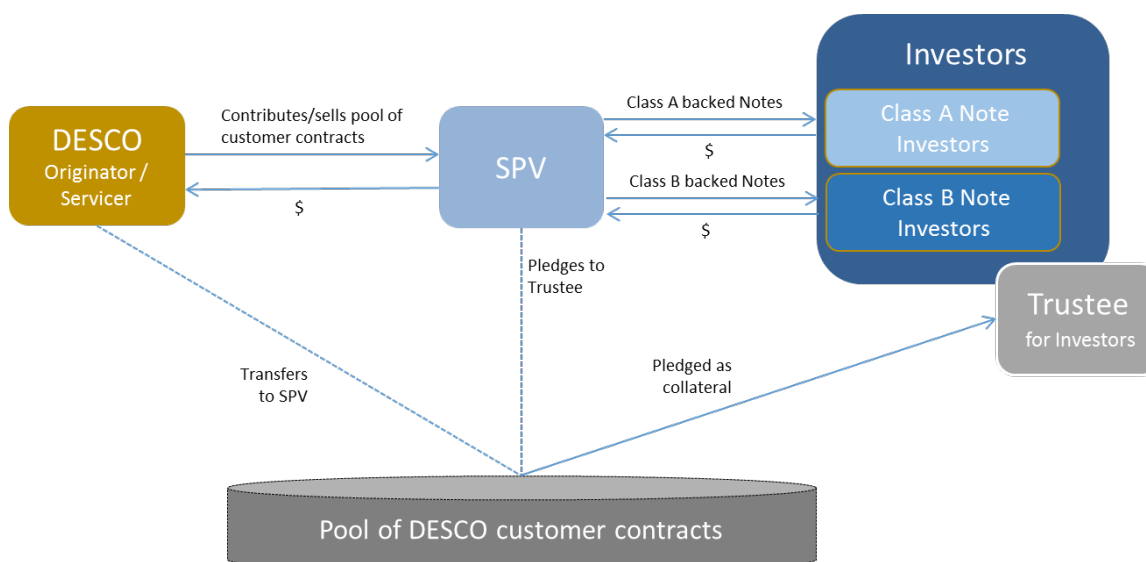
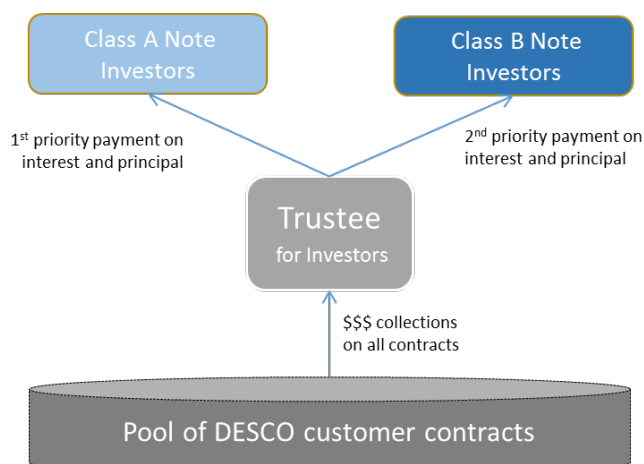


Figure 2b – Tranched Securitization Cash Flows





Let's look at Solar City's August 2015 issuance of \$123 million of solar asset backed notes.¹⁴ Unlike BBOX DEARs 2015-1, Solar City's Solar Asset Backed Notes, Series 2015-1 were of two types: a senior class (Class A) of \$103 million of notes and a junior class (Class B) of \$20 million of notes. The Class A Notes have a right to payment before the Class B Notes. As a result, the Class A Notes were sold to investors at an interest rate of 4.18% compared to the Class B Notes rate of 5.58%. In other words, in addition to the overcollateralization of the pool of assets in the Series 2015-1 asset pool, the holders of Solar City Class A Notes have \$20 million of first loss protection from the Series B Note holders. As a result, Solar City secured an investment grade credit rating of "A" from one of the US rating agencies on the Class A Notes.¹⁵ With an investment grade rating, the Class A Notes were issued at a low interest rate, comparable to other "A" rated corporate debt with similar maturities. The Class B Notes, with a greater first loss risk, were sold at a higher interest rate to investors who were comfortable with a higher payment risk in return for a higher yield.

Securitizations can be issued in multiple tranches, although this would typically be done only for very large debt offerings. For example, US publicly traded private equity fund American Capital Strategies financed a significant portion of its portfolio prior to 2008 by issuing multiple tranche asset backed notes. For example, American Capital's ACAS Business Loan Trust 2007-1 issued \$600 million in asset backed notes in five tranches in April 2007. Interest rates on the first four tranches ranged from LIBOR + 0.14% on the most senior tranche to LIBOR + 1.85% on the fourth lowest tranche.¹⁶ The fifth tranche was held by the originator and effectively served as both an equity cushion for the senior tranches and allowed the originator to retain all excess collections on the underlying assets after payment of the obligations to the senior classes.¹⁷

If the DESCO sector can develop a substantial market for its asset backed notes, tranching will provide companies with flexibility to pursue investors with different risk/return investment objectives. For example, a DESCO's asset pool may not be attractive to a conservative investor on a single tranche basis but could be made attractive if a less risk-averse investor was willing to take a first loss on a small portion of that pool in return for a higher yield. Finding investors to take riskier junior asset backed notes will enable a DESCO to raise more proceeds from an asset pool because less overcollateralization of the notes will be required. These opportunities could increase capital available to the DESCO sector.

Revolving Securitization Facilities

A revolving securitization facility is a note issuance where the asset pool backing the notes changes over the term of the notes. The initial assets in the pool are expected to liquidate (turn into cash payments) before the maturity of the asset backed notes. The SPV issuer is allowed to use "net" cash proceeds from the asset pool – net of payments required to be made to noteholders – to purchase more similar assets from the originator.

Revolving securitizations provide a solution to the potential mismatch between the ideal note maturity for a noteholder and the average life of the assets sold to the SPV to back those notes. For example, if a DESCO's customer contracts require payment in 24 months but a DESCO would like to arrange a four year note issuance, a revolving pool securitization would fill this gap. Typically, the SPV issuer would

¹⁴ <http://investors.solarcity.com/releasedetail.cfm?releaseid=927624>

¹⁵ Credit ratings provide investors with an independent evaluation of the likelihood of default on debt instruments. Many investors will (and, in the case of some regulated investors like insurance companies, can) invest only in bonds and notes that have an investment grade rating. See <http://www.aaii.com/journal/article/how-credit-ratings-affect-bond-valuations.touch>.

¹⁶ "LIBOR" is the London Interbank Offered Rate, the rate that leading world banks charge each other for interbank loans.

¹⁷ See <https://www.sec.gov/Archives/edgar/data/817473/000118143107026323/rrd155173.htm> ;
https://www.moodys.com/research/Moodys-rates-the-ACAS-Business-Loan-Trust-2007-1-offering--PR_129978 .



have a reinvestment period during the term of the notes – perhaps during the first 24 months for our hypothetical four year asset backed note financing – to purchase new customer contracts. Following the reinvestment period, the asset pool would run off like a static securitization asset pool and pay off the notes.

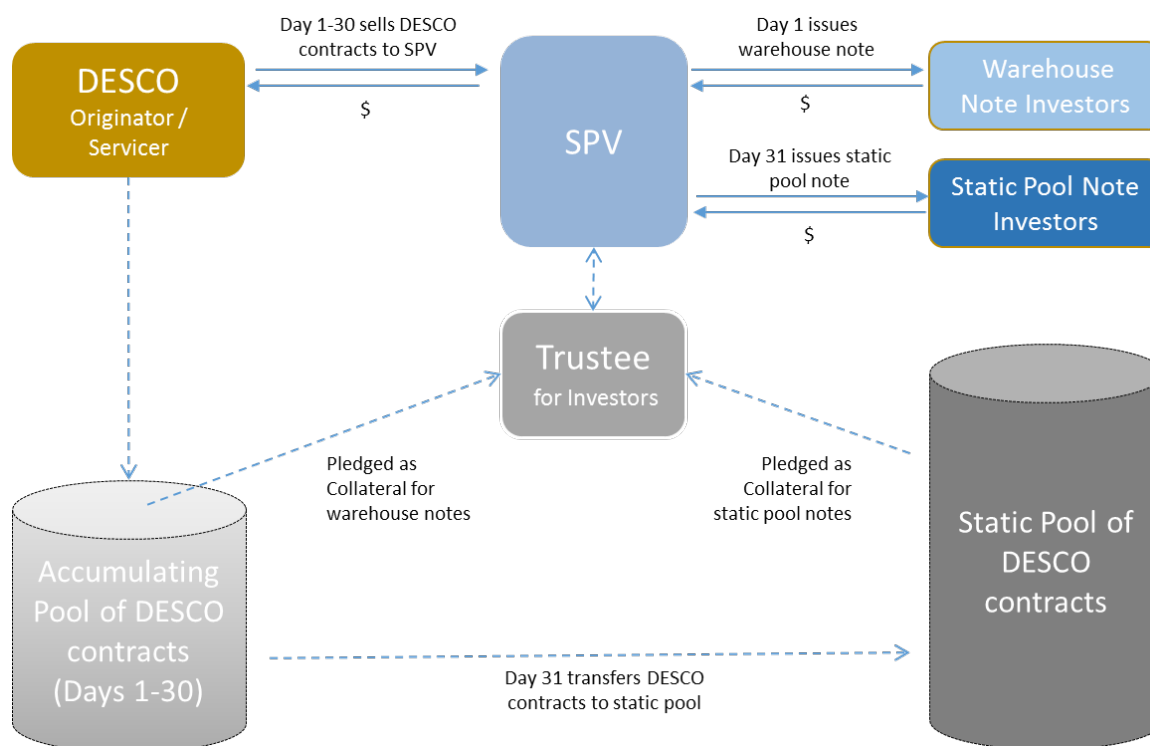
Revolving securitizations are more complex because of the more open-ended nature of the asset pool. Although the SPV's purchase of new assets will have to conform to eligibility criteria to assure note investors that their debt is backed by the same kind of assets as the pool is “refreshed”, there is greater risk of nonpayment than with a static pool where the assets are known on the day the notes are issued.



Warehouse Financing

It is also possible to use an SPV to warehouse customer contracts that are being assembled for a securitization pool. A typical warehouse securitization would allow the originator to sell assets to an SPV to hold in a segregated warehouse pool.¹⁸ Once a pool of assets is large enough to support a note issuance, the assets are re-pledged to secure a new series of asset backed notes with a fixed term. The warehouse facility would then be repaid with proceeds from the fixed term asset backed note sale and could be drawn down again to finance new assets being accumulated for the SPV's next securitization.¹⁹

Figure 3 – Warehouse Securitization



A warehouse securitization works like a revolving line of credit. Investors in a warehouse securitization would invest on similar terms to a working capital lender: the securitization would have a lending period longer than the holding period for assets in the pool, allowing the originator to utilize the facility like a working capital facility for the term of the financing. When the warehouse asset backed notes mature, a new series of notes could be sold to cover the DESCO's warehouse financing for a future period.

¹⁸ For example, in a \$300 million warehouse securitization by Provident Funding Associates, the assets – mortgage loans originated by Provident - were allowed to remain in the warehouse for up to 60 days.
<http://www.americanbanker.com/bulletins/-1006006-1.html>

¹⁹ See also <https://www.moodys.com/research/Moodys-ABS-RMBS-warehousing-gains-popularity-as-EMEA-smaller-originators-->

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Single or Multiple Special Purpose Vehicles?

In Western markets it is customary practice to set up separate SPVs for each asset backed note issuance. The SPV is typically a subsidiary of the originator of the assets.²⁰

The relative ease of creating corporations and trusts in places like the United States does not exist in many emerging markets. Trusts may also be used for securitizations but, as noted above, many emerging countries do not have fully developed trust laws. Uncertainty regarding the legal and tax status of trusts makes them currently impractical for DESCO asset securitizations.

Because of the relative difficulty of creating legal entities in most emerging markets, we currently recommend that a DESCO embarking on a securitization program use a single SPV for multiple securitizations. For example, in Kenya, a limited liability partnership like BBOX DEARs Kenya LLP, the issuer of the BBOX DEARs 2015-1 notes, could be created. The SPV would acquire (through purchase or capital contribution as discussed earlier) pools of assets and issue multiple series of asset backed notes, each series secured by a separately pledged and segregated pool of assets. Each issuance of notes would have separate Payment and Reserve Accounts to segregate cash proceeds collected from its pool of assets. A single trustee would act as trustee for all series of notes issued. The trustee would thereby be in a position to determine and allocate any disputed payments among different creditors on an impartial basis.

A multipurpose SPV could also hold a warehouse securitization facility. In effect, the SPV could finance the origination and securitization of a DESCO's assets in an ongoing program, buying new customer contracts as they are originated by the DESCO and financing those contracts through maturity. Effectively, a securitization finance a DESCO's entire pool of customer contracts from origination to repayment.

Other Structured Finance Options for DESCOs

The securitization structure for DESCO finance described above works for DESCOs that follow a sales finance model, i.e., where the customer enters into an installment sales contract or hire purchase agreement and owns the solar assets at the end of a fixed payment period. Many DESCOs, particularly minigrid DESCOs, operate on an energy services model, i.e., selling services. Their customers never purchase the assets. For ease of reference, we will call these "Energy Services DESCOs".

Because there is no fixed financing contract with the customers of Energy Services DESCOs, there is no asset to sell to an SPV issuer to back notes. The very nature of the relationship between the DESCO and the customer makes the separation of the revenue stream from the DESCO impossible from the standpoint of an investor in asset backed notes.

Not surprising, enterprising financiers in mature capital markets have created other structured finance variants to isolate the value of revenue streams similar to those generated by Energy Services DESCOs. Here we look at these and consider their potential usefulness in our sector.

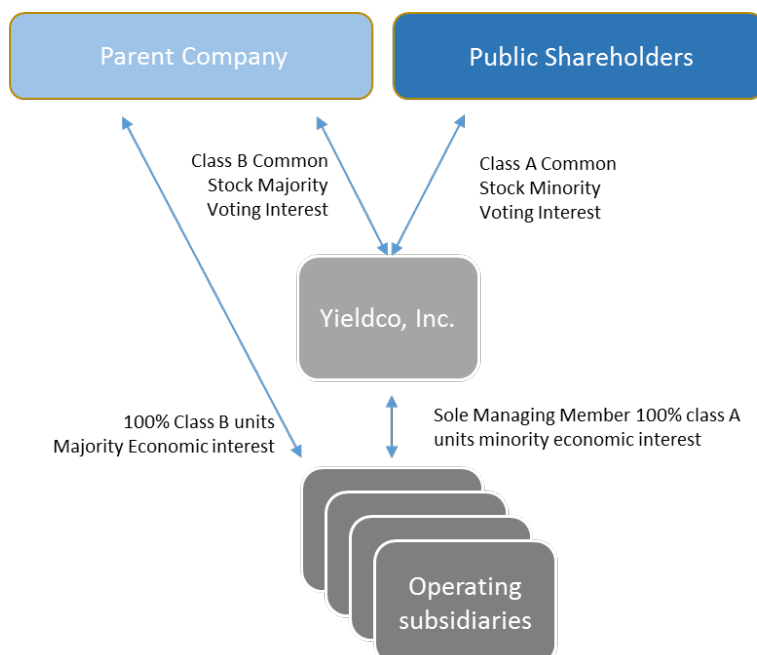
²⁰ In the early days of Western securitizations originators would sell assets to independently owned SPVs and seek sale treatment for accounting, legal and tax purposes. This had the affect of accelerating income to the originator selling the assets, which was often desirable for accounting purposes but undesirable for tax purposes. This practice has largely been abandoned, in part because of structuring difficulties beyond the scope of this article and in part because the accounting "gimmick" of accelerating income via securitization became disfavored.



Yieldcos

A Yieldco is a company formed to hold operating assets that produce a predictable cash flow. Yieldcos became popular in the US solar market in the several years. Both SunEdison and NRG formed Yieldcos and sold grid scale solar power projects to them.

Yieldcos have typically offered a class of their equity securities to the public. They periodically distribute dividends to shareholders from the cash flow generated by the Yieldco's operating assets (typically tariffs from the sale of power to utilities). A typical structure looks like this:



Source: NREL

The originator of the Yieldco must maintain a more active role in Yieldco's operation. If the Yieldco's assets are power plants, the originator would operate them under operation and maintenance contracts. But, like a servicer in a conventional securitization, the originator could be replaced for bankruptcy, nonperformance or other breach of its obligations.²¹

The financing of Yieldcos with equity instead of debt reflects the open-ended nature of the cash flow stream in the Yieldco. This open-ended nature is a function of both uncertainty (unlike a debt, there is no maturity) and potential profitability (more than a fixed sum may be paid to shareholders over time).

²² A Yieldco used to finance an Energy Services DESCO might use debt or a combination of debt and equity.

An Energy Services DESCO using a Yieldco could potentially access the same pool of investors targeted by DESCOs issuing asset backed notes. An Energy Services DESCO could take a pool of customers and contribute all rights to those customers (i.e., service contracts, ownership of the assets used by those customer, etc.) to a wholly owned Yieldco. The Yieldco would have a higher credit quality than the DESCO because it does not have all the business risk the DESCO bears in expanding the business – it has

²¹ See <https://financere.nrel.gov/finance/content/deeper-look-yieldco-structuring>

²² There are also certain tax benefits from the structure that benefit equity investors.



only the risk of operating the assets already in operation with existing customers. With this higher credit quality the Yieldco could issue medium term notes with a term less than the expected life of the underlying customer relationships and for less than the total expected revenue stream, providing two aspects of overcollateralization. The Energy Services DESCO, as the owner, would retain all the excess revenue not used to service Yieldco notes. Perhaps there would also be investor interest in buying equity in the Yieldco to participate in this residual revenue stream.

Yieldcos are on a bumpy road in the US, in part because of the recent bankruptcy filing of SunEdison, which had previously launched two publicly traded Yieldcos. Eight publicly traded Yieldcos in the US have raised \$3.8 billion since 2013.²³ Although the US experience is a cautionary tale, a conservative use of the Yieldco structure would be promising for Energy Services DESCOS.

Revenue Notes and Equipment Trust Structures

Other variations on the securitization structure may work for DESCOS that sell energy services.

Revenue Notes refers to selling the revenue stream from an asset or obligation. Revenue notes are typically a financing scheme for governments, particularly to repay construction costs of infrastructure projects such as toll roads. *Equipment Trust* structures involve segregating an operating asset or assets in an SPV and then leasing it to the user. The SPV borrows to purchase the asset or assets. When the loan is repaid title reverts to the user.

Like Yieldcos, revenue note and equipment trust structures provide tools that could be used by DESCOS to design structured finance debt instruments.

Advantages and Disadvantages of Securitization

Even the most basic securitization is more complex than a conventional loan. The added complexity of a securitization must be weighed against its benefits before any DESCO embarks on a program.

Disadvantages

High Transaction Costs.

Transaction costs, particularly to create the initial transaction in which a DESCO forms an SPV and securitizes its first pool of assets, can be very high. Costs of creation of the SPV, adjusting accounting systems, software and funds flows to segregate and track assets, and the costs of legal counsel to document and advise on such a complex transaction, are substantial.

Limited Efficacy of Asset Isolation.

Key to credit worthy asset backed notes is the successful isolation of the assets from the originating and servicing DESCO. Only noteholders (or their agent or trustee) should be able to collect payments on those assets. Isolating DESCO customer receivables and payments thereon – the primary assets being securitized - is a challenge for several reasons:

1. For all practical purposes the originating DESCO is the only entity that can effectively serve as servicer to collect the SPV's customer contracts and service the customers' systems.
2. Most DESCOS have their own proprietary operating platform (software and systems) to control customer solar home systems, manage payments and provide general operations and customer

²³ For more background see <http://www.utilitydive.com/news/yieldco-problems-systemic-or-a-speed-bump/419190/> .



service. There are only a few operating platforms available for license by multiple DESCOS. The absence of industry-wide software and systems would make it difficult for any replacement servicer to step into the role of the originating DESCO as servicer of the SPV's portfolio of assets. Under DEARs securitization documentation, the backup servicer has a right to access the servicer's software and servers if the servicer is removed. This process will no doubt be inefficient if the noteholders take action to remove a servicer.

3. There is no established back-up servicer industry for asset backed securities in Africa. If the DESCO securitization market develops, it is reasonable to expect that a backup servicer industry will develop just as a mortgage servicing industry has developed for mortgage-backed securities in Western markets.
4. Directing customer payments to flow automatically to the SPV (i.e., transmitting mobile money payments directly from telecom into an SPV-owned collection account) can be challenging. Most DESCO's cannot segregate customer's payments in order that those sold to the SPV automatically flow into a collection account and others flow directly to the DESCO. This means that collections are made into an account of the DESCO that must be swept on a daily or weekly basis into the SPV's Collection Account. The SPV and noteholders' interests in this "float" can be legally protected, and the daily or weekly sweep means that the noteholders are only exposed to a day or week of lost collections, but practical abuse by the DESCO remains possible.

Reporting Complexity

Transaction complexity leads to reporting complexity: The DESCO must be able to generate reports to noteholders on the performance of multiple asset pools as it develops a full program of financing its customer contracts through securitization. This is more daunting to a young DESCO than it will be as DESCOS mature and develop mature systems to manage their databases.

Weak Capital Markets

Africa's institutional capital markets are very small. South Africa, Nigeria and Kenya have capital markets in varying degrees but there appear to be few institutional buyers of corporate debt in other sub-Saharan African countries.

This is very much a "chicken and egg" problem – supply of investment grade debt must be available to attract institutional investors and investors must be present to make it worth bringing investment grade debt to market. Building a securitization market for DESCO finance may take time in some countries.

Advantages

The disadvantages of using securitization are substantial, but they are largely transitory. In contrast, there are substantial advantages for a DESCO to have a securitization program as part of its overall corporate finance strategy.

Transaction Costs will Decline

A DESCO that creates a full-fledged securitization program that includes a warehouse financing mechanism and periodic issuances of asset backed notes should recover its upfront transaction costs relatively quickly. How quickly will depend on the volume of debt the DESCO raises. Legal costs will drop significantly as the issuances become routine.



Higher Quality Debt Instrument (Lower Cost of Funds)

There are several features of a securitization structure that make the securitized debt “higher quality” than a conventional loan directly to the DESCO. By “higher quality” we mean that the debt instrument has a lower risk of non-payment.

1. Segregation of Assets. Dedicating assets and cash flows to note investors ensures that the cash from those assets will flow first to repay the note investor.
2. Track Record. As the DESCO borrows through successive issuances of asset backed notes, demonstrates payment rates and the ability to manage reporting, cash flow, etc., it will develop investor confidence. Higher credit ratings on its notes can be secured and investor demand for its notes should increase.
3. Tranching Enhances Asset Values. The ability of a DESCO to “slice and dice” its asset pool, issuing tranches of asset backed notes, gives it the ability to build a portfolio of securities with a minimum interest cost.

The virtue of higher quality debt is clear: it means lower interest rates on asset backed notes compared to other debt and less collateral coverage, allowing the DESCO to borrow more with the same pool of assets. In short, this means a lower overall cost of borrowing.

Access to Local Capital Markets

Securitization offers the possibility of borrowing from local investors in the same currency as the assets that will repay the debt.²⁴ Many regulated institutional investors such as insurance companies and pension funds are subject to statutory investment distribution requirements. For example, insurance regulators require licensed insurance companies to invest in a diverse portfolio of high credit assets, including both government debt and investment grade rated corporate debt.

There is a securitization market in South Africa²⁵ and developing capital markets in other African countries, particularly Nigeria²⁶ and Kenya. Investment bankers in Kenya report that most regulated institutional investors in Kenya are “underweight” (underinvested) in medium term investment grade corporate debt.²⁷

While the depth and appetite of African capital markets for securitization is beyond our research capabilities, anecdotal evidence suggests that the ingredient needed for the development of medium term debt capital markets in many African countries is *product*. DESCOs have the opportunity to offer that product and lead this market development.²⁸

²⁴ Although in Kenya asset backed notes can be offered at retail to small investors, doing so is subject to greater regulation and is not likely to be worth the effort in the near term. See, “*Laws of Kenya, Chapter 485A, The Capital Markets Act, Section 33C*” and “*The Capital Markets (Asset Backed Securities) Regulations 2007*”. Most other African countries do not have laws covering asset securitizations.

²⁵ <http://www.banking.org.za/securitisation>

²⁶ Like Kenya, Nigeria has a regulatory regime for securitizations. See <https://www.estateintel.com/wp-content/uploads/2015/04/Approved-New-Rules-and-Amendments-to-the-SEC-Rules-and-Regulations.pdf>

²⁷ These reports are consistent with our own experience: Once the DEARs 2015- transaction was announced, we received several inquiries from institutional investors and asset managers seeking an opportunity to invest in the BBOX DEARs 2015-1 notes and asking us to bring future securitization investment opportunities to them.

²⁸ Although several attempts have been made to bring a securitization to market in Kenya since its initial enabling laws were adopted, the DEARs 2015-1 asset backed notes appear to be the first securitization in that market.



Access to Dollar Investors without Dollar Risk.

If local markets are not deep enough, DESCOS will need to raise debt in international markets. The currency mismatch between local currency assets (receivables) and hard currency liabilities creates an exposure that DESCOS – like all businesses – should avoid.

Securitization can provide an advantage in addressing this issue even when borrowing in international markets. Structured payments can more easily be swapped into hard currency payments than less well defined cash flow streams. The fact the swap party would face the SPV as counterparty in a securitization rather than the DESCO originator may further facilitate such a transaction as the SPV may have less counterparty risk than the DESCO itself.²⁹

In an ideal scenario, the note issuing SPV would enter a matching cross currency swap with a qualified counterparty and then issue asset backed notes in local currency to local currency investors and hard currency notes to international investors side by side. While there are few institutions that would trade a cross currency swap in some of the markets in which DESCOS are scaling, some are beginning to consider this opportunity. And currently there is one dedicated hedge provider – TCX – that is ready to take the currency exposure in most markets and with DESCO asset backed securities.

Beyond using currency hedging to access debt in unmatched currencies, the ability to issue debt in different currencies without assuming currency risk may have a more subtle benefit. Sometimes market inefficiencies lead to situations where investors in one currency market have more interest in buying debt than investors in another currency market. Such a demand imbalance can lead to situations where the interest rates – which should in theory be financially equivalent – are more attractive in one currency than in the other. Flexibility to invest across currencies with adequate hedging protection would allow a borrower to take advantage of these market incongruities.

Debt Portfolio Diversification

Even as DESCOS are successful in accessing working capital – whether from local banks or from other sources – securitization offers the potential of diversification of funding sources. This diversification eases dependence on a single source of funding. It will make a DESCO more stable as market forces fluctuate and will reduce the counterparty power of a single commercial bank or bank group as the company's sole source of borrowing.

Markets are unpredictable. Lenders have their own issues.³⁰ Loan facilities may not be renewed. Lenders appetites to take on more debt may change or be insufficient to meet your needs. While multiple sources of debt can be complex and may not be the most cost effective, such diversification mitigates a significant risk.

²⁹ Counterparty risk is a major challenge when trading derivatives as any P&L of a given currency position is effectively a loan from one counterparty (with a positive P&L) to the other counterparty (with an equally large negative P&L).

³⁰ For example, Kenya's Chase Bank was suddenly placed in receivership by the Central Bank of Kenya in April of this year. <http://www.businessdailyafrica.com/Corporate-News/539550-3366232-d0nk1m/>



Conclusion: Securitization Will Be the Cornerstone of DESCO Sector Finance

Debt needs of DESCOs could reach \$2-3 billion by early next decade. As the sector thrives, the amount of debt needed to support it will grow.³¹ Securitization has the potential to open new debt markets to DESCOs. High quality asset backed notes will bring in new investors.

We believe, based on our own conversations with investors, the experience in developed markets and the realities of corporate finance, that institutional investors in Africa will have a strong demand for longer dated, rated, higher yielding debt instruments to match their portfolio structure and return requirements.

To structure a securitization takes time and focus. It is initially costly. But we firmly believe that the investment is worthwhile as it will open doors to commercial and institutional capital for DESCOs.

Our Recommendation

Every DESCO that is preparing to scale should be seriously considering launching a securitization program. Issuances are not economical under \$5 million and become more cost effective as the size of issuance exceeds \$50 million. The few DESCOs that have customer contracts that can support more than \$5 million of asset-backed notes should begin their programs.

While every DESCO is different, markets will coalesce around common debt instruments. In Western markets, early asset backed note offerings had substantial variation but, over time, gravitated to common features so that investors could easily compare offerings. In the DESCO sector, every company should feel free to provide their own leadership in defining this emerging debt market. However, we also encourage collaboration and, as we have tried to do in this article, transparency, in an effort to accelerate the coalescence that will be crucial to the market.³²

Beyond DESCOs: The potential for securitization of small consumer debts

The basic formula for securitization of DESCO receivables – pooling small customer receivables and pledging them to secure high quality debt securities – may be useful to provide capital for other small consumer finance businesses in emerging markets. Companies that sell products such as water tanks, satellite TV services, small farm equipment (water pumps, etc.) could be candidates for securitization. Microfinance institutions might also access cheaper capital by pooling assets and securitizing them. Development of this tool could open up low-income consumer finance, making other products and services available to low income and off grid consumers.

³¹ See “Financing the DESCO S-Curve” <http://www.persistentnrg.com/#!/Financing-the-DESCO-SCurve/mhgg1/578cc4ef0cf26df1ae598637>

³² Efforts at collaboration have already begun, led by the World Bank Group and the Global Off-Grid Lighting Association to establish industry standard metrics to assess portfolio performance. See https://data.bloomberglp.com/bnef/sites/4/2016/10/BNEF_WP_2016_10_07-Pay-as-you-go-solar.pdf. This is potentially quite useful if the metrics give comfort to investors and are adopted by rating agencies.