

CASE STUDY: YELDCOS IN THE U.S.

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NOTE: THIS CASE STUDY FORMS PART OF A REPORT TITLED *SECONDARY MARKET VEHICLES IN EMDEs: LESSONS AND IMPLICATIONS FOR DEVELOPMENT ACTORS*

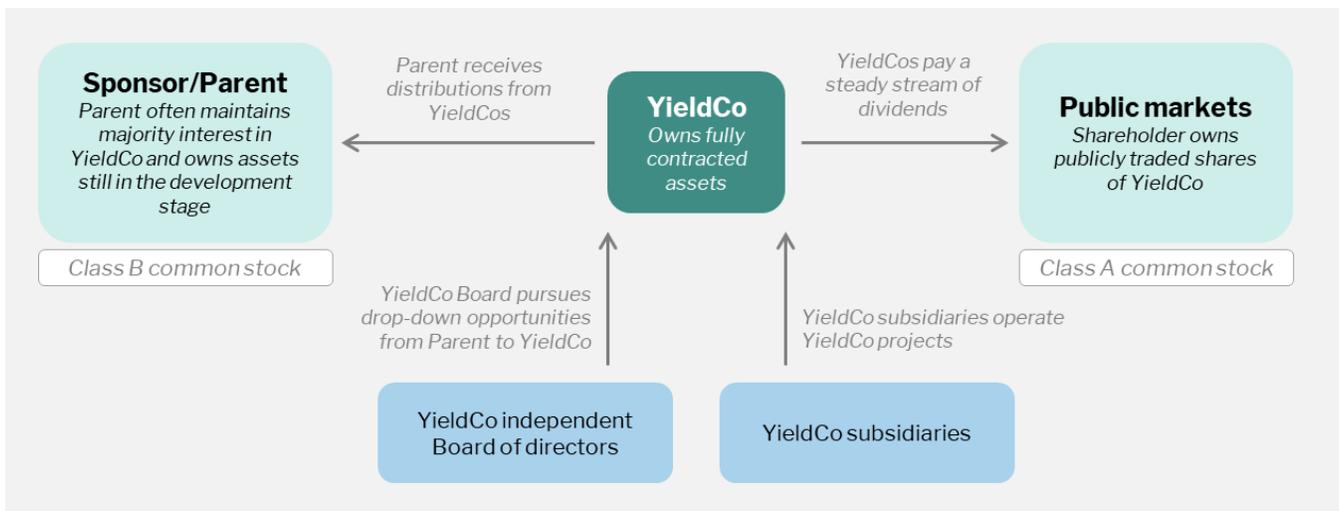


1 Overview

Sponsors use YieldCos to offload operational assets and recycle capital into new projects, while retaining partial (and often majority) ownership or control. YieldCos, in turn, distribute the bulk of their cash flows as dividends to investors, making them particularly attractive in low-interest rate environments. The growth model depends on acquiring additional operating assets, often through drop-downs,¹ and relies on continued

favourable policy and market conditions to sustain yield and expansion. YieldCos are typically structured as C corporations with Class A common stock (which typically carries economic rights such as dividend entitlements but limited voting power) issued to the public and Class B common stock (which carries majority voting power) retained by the sponsor.

Figure 1: Typical Structure of a YieldCo



2 Market level assessment

YieldCos began in the U.S. in July 2013 when NRG Energy launched NRG Yield (now Clearway Energy) raising USD 431 million at USD 22 per share with a 5.5% dividend yield (in what was a historically low-interest-rate environment) (Federal Reserve, 2014). The success of NRG Yield led to a wave of new entrants with four YieldCos going public by the end of 2014 and a further three by 2015.

An important driver was the use of investment tax credits (PTC and ITC²) that lowered project costs and encouraged more renewable build-out, providing the supply YieldCos needed to grow.

By 2015, YieldCos had garnered institutional notice and were seen as a new asset class. However, with this growth, structural weaknesses began to emerge. YieldCos were valued both on the stable

¹ Drop-down: when a sponsor sells a completed, cash-flowing asset into the YieldCo

² Production Tax Credit (PTC): granted wind projects a per kilowatt-hour tax credit on electricity generated for up to ten years post-commissioning, enhancing project cash flow (U.S. Department of Energy, 2009); The Investment Tax Credit (ITC): enabled solar projects to claim 30% of total project cost as a dollar-for-dollar federal income tax credit when the system was placed in service, reducing taxable income and increasing distributable cash (U.S. Department of Energy, 2020)

cash flows of their existing projects and on expected continuous dividend growth which depended on a steady stream of new drop-down assets from their sponsors. Initial public offerings (IPOs) were marketed on expectations of double-digit dividend increases (e.g. targets of 12-15% compound annual growth rates, with some up to 20-25%), which could no longer be achieved once sponsor pipelines slowed. The reduced number of new assets in the pipeline undermined investor confidence and triggered the market correction in 2015-2016.

A key moment came in April 2016, when SunEdison, a major renewable developer and the sponsor of TerraForm Power (TERP) and TerraForm Global (GLBL) filed for bankruptcy. SunEdison had sold operating projects to these vehicles while retaining control through their Class B shares and was responsible for supplying new drop-down assets. The filing raised concerns about pipeline continuity and sponsor oversight, resulting in the loss of confidence in its two YieldCos, both of which saw share prices collapse despite stable project performance. This loss of trust (combined with other factors such as rising interest rates) led to a period of stagnation for listings of YieldCos.

Following SunEdison's bankruptcy, there were also several acquisitions by institutional investors leading to the delisting of four of the original seven U.S. YieldCos. These outcomes were, however, not necessarily negative for all public shareholders: three of these transactions delivered a premium relative to prevailing market prices, while only one was executed at a discount that reduced investor returns.³ By 2024, the three that remained listed were Clearway Energy (CWEN), NextEra Energy Partners (NEP), and Atlantica Sustainable Infrastructure (AY).

Although YieldCos in the U.S. focused mainly on renewables, the model has also been applied to other long-term contracted infrastructure,

including natural gas generation, transmission assets, and water utilities (e.g. NRG Yield's contracted natural gas plants/Brookfield transmission assets). Their emergence in renewables was driven by developers' need for substantial new capital while demonstrating long-term contracted cash flows through power purchase agreements (PPAs). Other utility companies, although they had stable cash flows, often had limited growth prospects and could access cheaper debt, making YieldCos less necessary for them. More recently, data centre operators are exploring YieldCo-like structures to raise capital for AI-related infrastructure which have similar characteristics to renewables a decade ago – i.e. long-term lease revenues which provide the predictable cash flows that support the model. However, no data centre YieldCos have listed yet (O'Brien, 2024).

For emerging markets and developing economies (EMDEs), this suggests potential applicability beyond energy, provided cash flows are stable and contractually secured. For instance, traditional utilities in many EMDEs still face high borrowing costs due to heavy government debt issuance. While many of these utilities are loss-making, ring-fenced subsidiaries or asset portfolios with contracted revenues could still attract investors. In such cases, equity raised through public markets may be valued more highly given the transparency and predictability of those underlying cash flows. YieldCo pilots also have a higher chance of success in EMDEs with existing yield-vehicle frameworks (such as REIT regimes), active institutional investor bases, and predictable dropdown execution. In such markets, development finance institutions (DFIs) could potentially play a catalytic role by anchoring initial listings, provided there is a credible asset pipeline and clear exit visibility.

³ Brookfield (BEP) acquired GLBL at c.50% premium in 2017 and TERP at c.17% premium in 2020. Canada Pension Plan Investment Board bought Pattern Energy at a premium of c.14.8% in 2020, and Capital Dynamics purchased 8point3 at c.12 to 23% discount to the range the stock had been trading at in the months prior to the acquisition in 2018

3 Vehicle level analysis – SunEdison

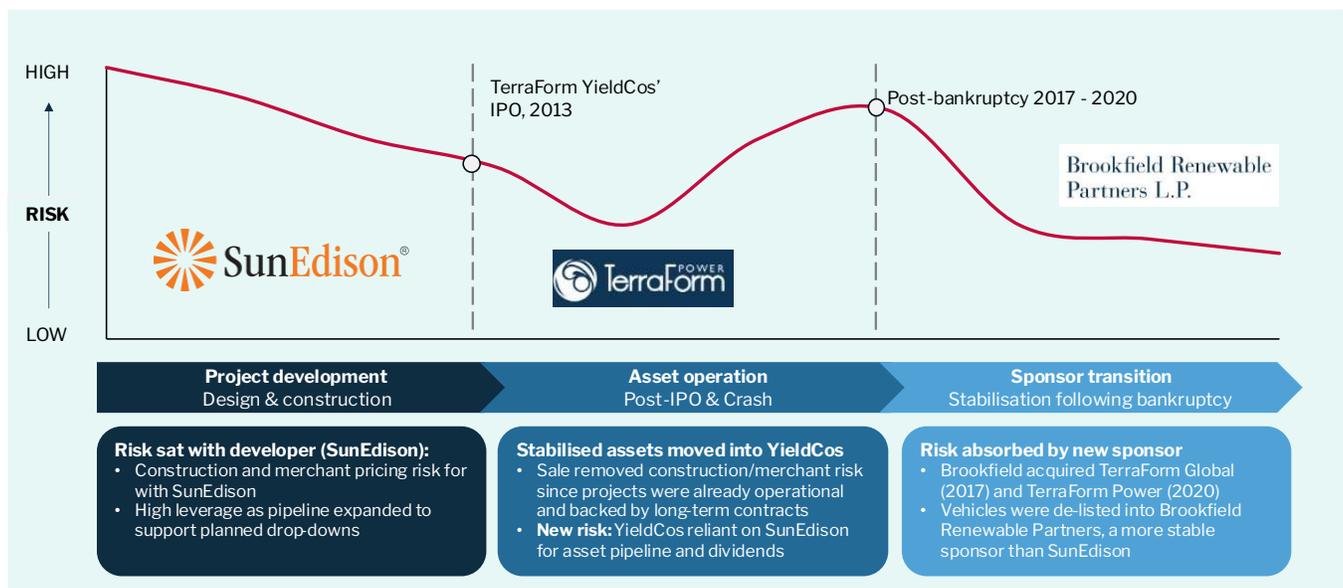
In 2014, SunEdison launched its first YieldCo, TerraForm Power (TERP), to purchase energy projects from SunEdison. The model initially worked, and by late 2014, SunEdison increased its investment by buying U.S. wind developer First Wind for USD 2.4 billion in a deal split between SunEdison (development pipeline) and TerraForm Power (operational assets) (SEC, 2014). In mid-2015, it floated a second vehicle, TerraForm Global (GLBL), focused on emerging markets.

In the same year (2015), SunEdison pursued rapid expansion, including a USD 2.2 billion bid for Vivint Solar that raised investor concerns about its ability to manage rapid growth. The acquisitions were largely debt-financed, which increased leverage and strained liquidity. In early 2016, the company delayed its 10-K filing amid investigations into its

financial disclosures, and by April 2016, it filed for Chapter 11 bankruptcy with billions in debt.⁴ The bankruptcy affected its affiliated YieldCos: TerraForm Power’s share price had already fallen by nearly 50% in the six months leading up to the April 2016 filing. The case showed how sponsor risk and weak governance can erode investor confidence and destabilise valuations even when underlying project cash flows remain stable, particularly when dividend growth depends heavily on a single, leveraged parent.

TerraForm Global was acquired in 2017 and TerraForm Power in 2020, with both entities subsequently delisted from NASDAQ and integrated into Brookfield Renewable Partners (Brookfield, 2017).

Figure 2. SunEdison’s Risk Profile, Illustrative



⁴ Appaloosa Management, a hedge fund investor in TerraForm Power, filed suit to block TerraForm’s planned purchase of Vivint Solar’s rooftop assets, which were linked to SunEdison’s acquisition bid. Vivint Solar terminated the USD 2.2 billion merger agreement in March 2016, removing a major commitment but adding to concerns over SunEdison’s financial position

4 Impact on primary market functioning and sustainable development

The arrival of U.S. YieldCos expanded the investor pool beyond private infrastructure funds, which had more limited exit opportunities than YieldCos with their potential for secondary trading in the public market.⁵ They created a standing, repeat buyer for operating assets and attracted mainstream public equity investors. For example, hedge fund Appaloosa Management, which would have been unlikely to invest without a listed vehicle, held roughly 10% of TerraForm Power and actively engaged the board in 2015 during SunEdison's bankruptcy.

With a dedicated repeat buyer in place, developers had shorter holding periods (from commercial operation date (COD) to sale) and clearer exit pathways, resulting in earlier cash flows (and likely higher returns). For instance, in 2014, SunEdison's U.K. wind projects were sold into TerraForm Power within one to two months of COD.⁶

In 2015, U.S. YieldCos acted both as exit vehicles for sponsors and as consolidators of third-party portfolios, together adding more than 3.2 GW of operating capacity.⁷ Illustrative examples include:

- **SunEdison to TerraForm Power:** Shortly after completing two U.K. wind projects in late 2014, SunEdison sold them to its YieldCo, TerraForm Power. The company then closed a major acquisition of First Wind in early 2015 (TerraForm Power, Inc., 2014)
- **NRG Energy to NRG Yield:** NRG repeatedly sold assets into NRG Yield to recycle capital for new construction. Projects such as Buckthorn Solar and the Carlsbad Energy Centre were

built, sold, and transferred to NRG Yield, showing a repeatable cycle of development and drop-downs (NRG Energy, Inc., 2018)

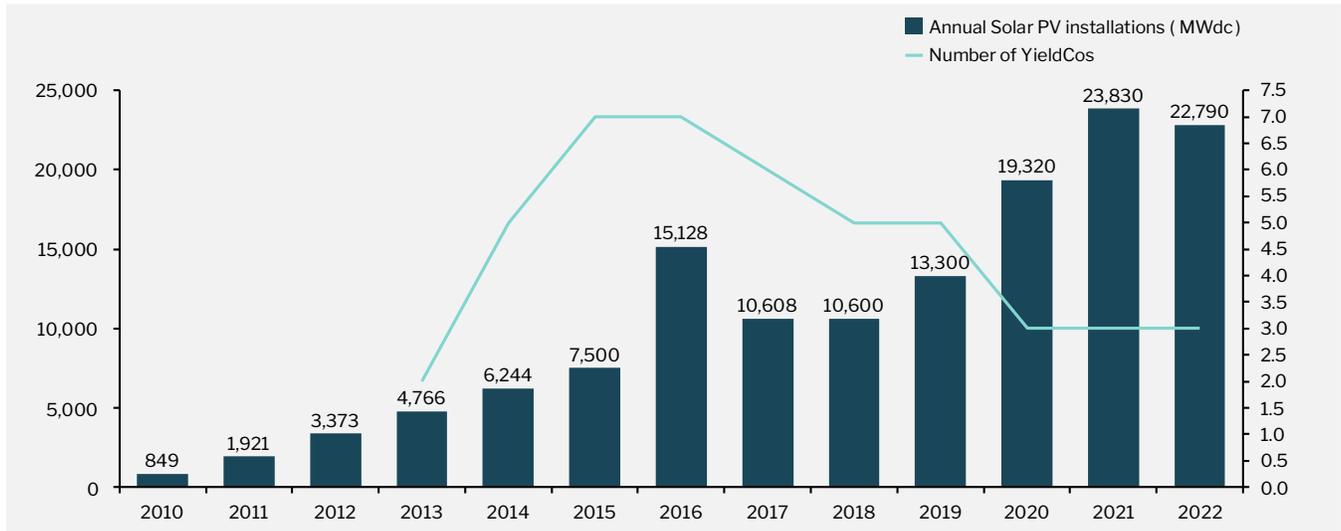
The shorter holding periods and clear exit pathways increased liquidity for project developers.

⁵ TerraForm Power had a turnover ratio of 1.7% (as of November 2015), substantially lower than the S&P average at the time but still providing the potential for immediate liquidity

⁶ A number of factors likely contributed to this compressed timeline in 2014 but as of 2024, [PF Nexus](#) survey shows renewable project sales processes typically take 6 months to complete

⁷ NRG Yield (now Clearway) closed 785 MW in January 2015 (Walnut Creek - 500 MW, Tapestry - 204 MW, Laredo Ridge - 81 MW) from its sponsor; TerraForm Power closed 521 MW from First Wind (January 2015), 521 MW from Atlantic Power (June 2015), and 754 MW (net) from Invenergy (December 2015); NextEra Energy Partners closed a 664 MW package from its sponsor (May 2015)

Figure 3. Solar Installations and Number of YieldCos in the U.S. (SEIA, 2016)



Liquidity effects

- Lower required returns and higher asset valuations:** In 2015, industry experts indicated that unleveraged after-tax discount rates had decreased from 7-8% to c.6% for solar assets, implying higher valuations for operating renewable assets (Martin, 2015)
- Access to additional construction-stage investment:** One structural feature linked to the YieldCo model was the use of warehouse financing facilities which acted as short-term bridges for projects under construction prior to their sale into a YieldCo. They reduced execution risk for lenders by providing a predictable exit route and gave developers faster access to capital during the construction-to-operation phase (Armstrong, et al., 2016)
- Capital recycling:** Alongside falling utility-scale solar costs (down nearly 70% between 2010 and 2016 (Fu, et al., 2016)) and federal incentives like the ITC and PTC, increased liquidity enabled sponsors to recycle capital into new projects. The Climate Policy Initiative noted that *‘this capital can then be invested into new projects that can drive the growth of the sponsor and, eventually, the YieldCo’* (Varadarajan, et al., 2016). SunEdison’s acquisition of First Wind (which expanded its project pipeline and supported higher annual installation targets) is an example of capital recycling

Impact on SDGs

7 AFFORDABLE AND
CLEAN ENERGY

Increase in installations and lower energy prices: The emergence of U.S. YieldCos coincided with an increase in utility-scale solar PV deployment. Annual installations rose from 3.4 GW in 2012-7.3 GW in 2015 (SEIA, 2016). While tax incentives and falling module costs were important, YieldCos provided a consistent buyer and warehouse facilities supplied early capital, together enabling developers to recycle funds faster into new projects and support more rapid deployment. The Institute for Energy Economics and Financial Analysis noted in 2016, “in the more developed markets of the world, YieldCos...are channelling investment capital into renewables” (Buckley, 2016). YieldCos enabled developers to lower the equity return requirements reducing the overall levelised cost of electricity (LCOE).⁸ For instance, modelling by NYSERDA shows that Utility-Backed PPAs using YieldCo financing can cut electricity cost by an additional USD 3 per megawatt-hour (MWh) compared to non-YieldCo structures (Harris, 2015).

8 DECENT WORK AND
ECONOMIC GROWTH

Employment uplift: After TerraForm Power launched and SunEdison tied in the First Wind pipeline, SunEdison raised 2015 installation guidance by 0.5 GW (from 1.6-1.8 GW to 2.1-2.3 GW). Using NREL's published estimates for construction jobs in utility-scale solar as a benchmark (about 33-39 jobs per year per MW), that uplift equates to 16,500-19,500 total jobs per year during construction, consistent with higher primary market employment in project delivery (Steinberg, et al., 2012).

⁸ LCOE: A measure of the average cost per unit of electricity generated (e.g. USD/MWh) over the lifetime of a power plant, incorporating all capital, financing, operation, and maintenance costs, divided by the total electricity generated. It allows comparison of different generation technologies on a consistent cost basis

5 Key enablers

SUPPLY AND DEMAND SIDE ENABLERS



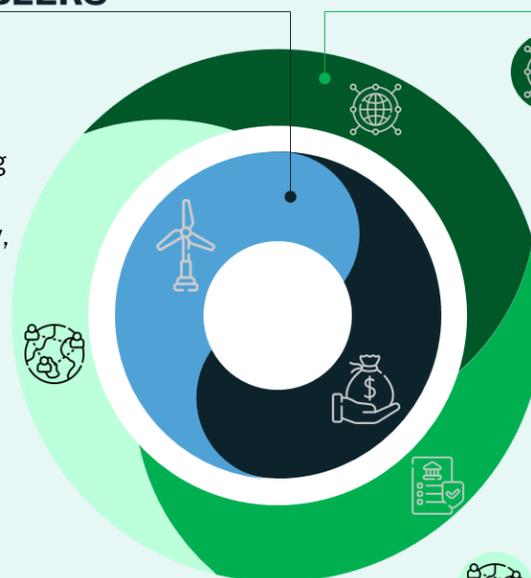
Asset supply:

- **SunEdison's USD 1.5 billion warehouse facility** bridged construction to dropdown, shortening the time frame from build to sale
- **Tax credits drove** new project supply, accelerating build-out alongside falling costs



Investor depth:

- **Sponsor credibility shaped market trust**, with the sponsor's reputation heavily influencing YieldCo performance
- SunEdison's collapse demonstrated how even performing assets can lose value when sponsor risk is not isolated and when growth promises are too aggressive



SYSTEM ENABLERS



Market infrastructure & intermediaries:

- **Right of First Offer (ROFO) agreements** lowered refinancing risk by guaranteeing a buyer for completed projects
- **Major banks (Goldman, BofA, Citi, Morgan Stanley, Barclays)** repeatedly underwrote IPOs, supporting smooth execution



Policy & regulation:

- **U.S. SEC rules required disclosure** of dropdown schedules, relevant agreements, and cash-flow forecasts, increasing transparency and investor trust



Macroeconomic & geopolitical stability:

- **Low interest rates** supported the YieldCo model by making dividend yields attractive relative to fixed income

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