EXPERT COMMENTARY

Three significant trends are joining forces to make decentralised generation via solar an appealing investment, says Panos Ninios, co-founder and managing partner of True Green Capital Management

Distributed solar: A generational opportunity

Society is at the beginning of a momentous energy transition, as the global energy industry shifts from fossil fuels and thermal-based systems of energy production to renewable energy sources such as wind and solar, supported by batteries. We estimate that this represents a $3 trillion investment opportunity in the US, the UK and the EU over the next decade.

What is important for investors in the sector to understand is that the energy transition is driven by certain socioeconomic forces that have emerged during the last 20 years, which represent fundamental and structural changes in the power business. This has included, first and foremost, the deregulation of the power industry, which unleashed the "animal spirits" of business model innovation and private capital, effectively democratising power generation. Second, there are now attractive economics supporting solar, wind and battery storage, driven by technology and manufacturing efficiencies which did not exist in the past. And finally, there is the environmental crisis facing the planet, which has created a major tailwind for renewable energy innovation and implementation, not least because power generation currently accounts for a staggering 30 percent of global CO2 emissions.

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At TGC, we have been focused on distributed solar power generation and microgrids over the past 14 years, and we believe that these technologies represent a proven, competitive cost solution for the power industry.

Here's how this particular opportunity has developed, and why we believe it makes sense to invest now.

The democratisation of power

Thomas Edison constructed the first purpose-built power plant at Pearl Street Station in New York City in 1882, to commercially electrify Wall Street and the *New York Times*. Today's commercially vibrant electricity markets would be familiar to him.

However, as electrification took hold across the globe, and for most of the 20th century, the power sector was characterised by vertically integrated utilities, typically managed by heavily regulated bureaucracies or under outright government control. This centralised model of power generation, transmission and distribution (T&D) monopolised the industry, making it challenging for private entities or individuals to own and operate power plants. Such monopolistic structures often led to inefficiencies, a lack of innovation and limited or no consumer choice, with large, regulated bureaucracies exerting control over pricing and investment decisions.

However, change started to take shape in the 1980s when, under Prime Minister Margaret Thatcher, the UK initiated a wave of deregulation that transformed the energy sector. Cemented by the UK Energy Act of 1983, Thatcher's government sought to dismantle the state-controlled monopoly of the power sector, allowing for consumer choice through competition in power generation. Across the Atlantic, the US embarked on its own deregulation journey, albeit with a more fragmented and decentralised approach. The US Energy Policy Act of 1992 laid the groundwork for deregulation at the federal level, encouraging competition in wholesale electricity markets.

Crucially, deregulation also empowers individuals and communities to generate their own energy in a distributed fashion, thereby shifting the balance of power towards decentralised ownership and control.

What was missing in the late 1990s, though, was the fundamental economics that would make such a democratisation of power generation particularly attractive.

New economics

Centralised power plants inherently waste energy throughout the fuel conversion, transmission and distribution processes. Between 65 and 70 percent of the initial energy input is lost by the time electricity reaches end-users for consumption (Figure 1). This has profound environmental implications, as the wasted energy contributes to increased greenhouse gas emissions and resource depletion, as well as necessitating more T&D lines to be built to satisfy demand.

In economic terms, 40 to 60 percent of the consumer's electricity bill goes towards T&D capital expenditure, materials and operational costs, as well as providing a return on investment. Therefore, the possibility of arbitraging T&D through distributed power generation, and capturing some portion of that 40 to 60 percent share of the consumer bill, represents a significant opportunity. In practice, this is accomplished by putting power plants on rooftops or adjacent land that bypass the T&D system.

Figure 2 (overleaf) shows the cost to produce every megawatt of electricity for different technologies (referred to as the levelised cost of electricity). Solar compares well against all thermal technologies, with no fuel volatility and without CO2 pollution. At TGC, the distributed solar power plants we have built over the past 12 months are at the low end of solar systems' costs, comparing very well with combined-cycle gas turbines, the most attractive of the thermal generation options.

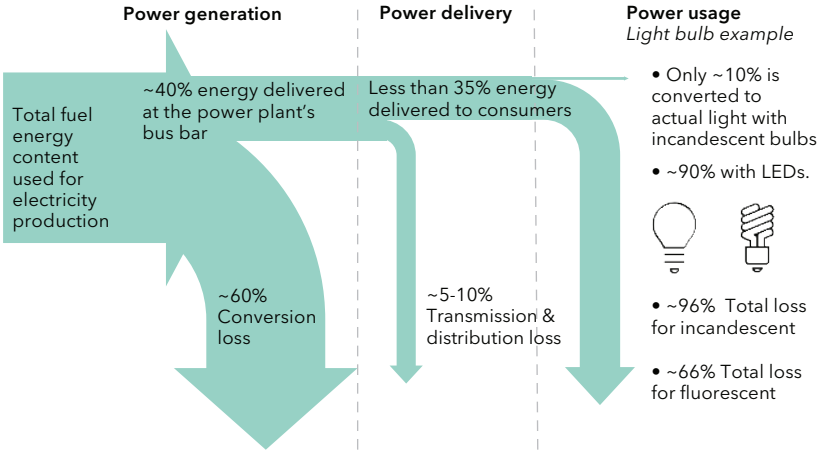
The environmental tailwind

It is now well understood that a decarbonised electricity sector is a cornerstone of a net-zero energy system.

In the US, as of December 2023, 28 states, Washington, DC and three territories had adopted a Renewable Portfolio Standard to promote renewable energy deployment. This requires a percentage of annual retail electricity to come from renewable resources. The Inflation Reduction Act of 2022 has also provided significant support to the renewable energy manufacturing and energy-producing ecosystem.

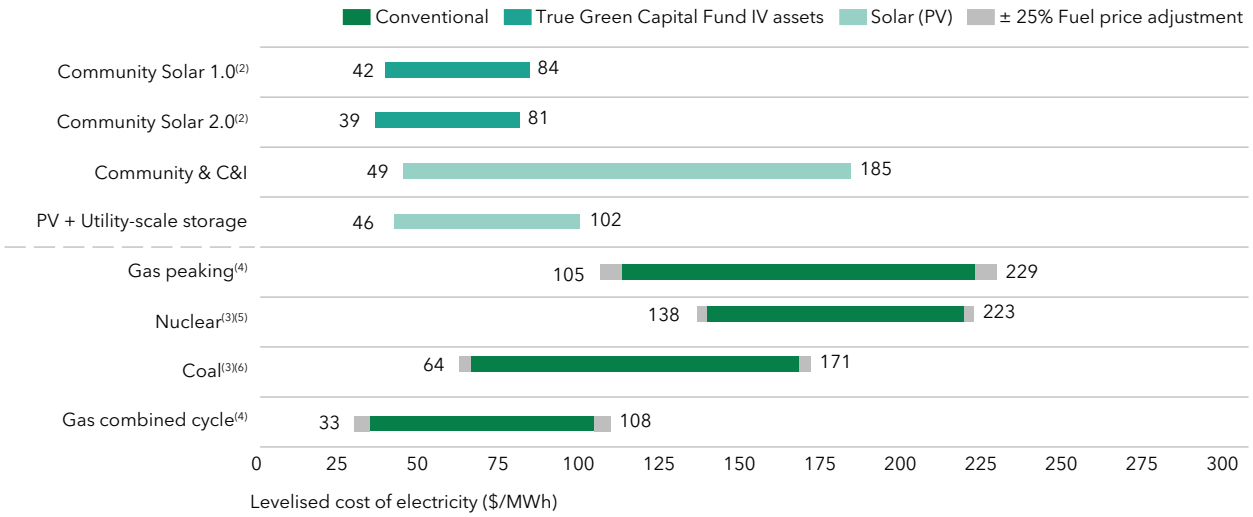
Across the Atlantic, the UK government has set ambitious targets for renewable energy generation, aiming to achieve 70GW of solar power by 2035, despite the entire power system today totalling just 90GW. The EU has also established a comprehensive regulatory framework to promote renewable

Figure 1: Inefficiencies in power generation and delivery



Note that this is a variable calculation dependent on type and mix of power generation, distance covered, and network topology. This figure is used for illustrative purposes to demonstrate energy inefficiency. Source: EIA, GE; TGC analysis

Figure 2: Levelised cost of electricity across different power generation technologies



1. Unsubsidised figures. 2. Based on internal models; subject to change. 3. The LCOE presented herein represents Lazard's LCOE v15.0 results adjusted for inflation and, for nuclear, are based on then-estimated costs of the Vogtle Plant and are US-focused. 4. Assumes a fuel cost range for gas-fired generation resources of $2.59–$4.31/MMBTU. 5. Assumes a fuel cost range for nuclear generation resources of $0.64–$1.06/MMBTU. 6. Assumes a fuel cost range for coal-fired generation resources of $1.10–$1.84/MMBTU. Source: Lazard

energy deployment across its member states. The Renewable Energy Directive sets binding targets for the share of renewable energy in the EU's overall energy mix, with a goal of reaching at least 42.5 percent renewable energy by 2030. Part of this will come via the REPowerEU plan, with the Solar Rooftop Initiative focusing on distributed solar.

Why distributed solar?

The three drivers discussed above – deregulation, economics and the environmental crisis – have created a rapidly evolving energy market, with tremendous opportunity for participation and investment by institutional investors. By focusing on distributed solar power generation, we hope to take advantage of these changes in a segment that we believe will ultimately be the most consequential to the energy transition.

Two factors define a solar power plant as "distributed". The most obvious one is a direct "behind-the-meter" or "private wire" power purchase agreement with a customer that makes the power plant largely independent from the power network (especially when combined with batteries). A secondary layer is what in the US is referred to as "Community Solar" – defined as distributed solar power generation plants with direct contracts with retail and commercial customers, where the power is produced locally and then delivered to the customers through the local distribution network. When combined with batteries, these distributed solar power plants provide a reliable, predictable source of power and benefit from a positive environmental impact and attractive economic fundamentals.

We believe that the energy transition is now firmly underway, and that distributed power will soon be the way we source cost-effective, accessible and clean electricity. Continued increases in power prices, the decreasing entry cost associated with distributed solar power generation, and favourable regulatory environments will lead to further compelling investment opportunities, providing stable cashflow with low correlation to the broader markets. ■

Case study: Westmont, Los Angeles

SOURCE: TRUE GREEN CAPITAL MANAGEMENT

There are many significant clean air issues in Los Angeles, and the city is committed to making improvements

The municipality has the goal of achieving 50 percent renewable energy production by 2030, and net zero by 2050. TGC's 16.9MW Westmont rooftop solar installation has played its part in keeping this mission on track.

TRUE GREEN CAPITAL

13-year track record of sustainable investing

Focused on the U.S. and European distributed power markets

Sustainable Solar

- We believe the next energy transition is underway, where distributed power will become the **way to power our world.**
- We believe the continued increase of power prices, decreasing entry costs of distributed power generation technology, and favorable regulatory environments in both the U.S. and Europe will continue to lead to **compelling investment opportunities.**
- Our goal is **to deliver attractive returns** for our investors while remaining committed to all the Firm's stakeholders and the local communities in which we operate.

www.truegreencapital.com

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