



Energy 2025: A World Turned on its Head

By James Allen and Selva Freigedo



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EXECUTIVE SUMMARY

The age of centralised energy is about to come to a sudden end.

Today power and wealth are concentrated in the hands of a few, but soon those business models will be fragmented, disrupted and ultimately replaced.

In its place, we'll see the rise of a new kind of energy business. Decentralisation will change the market from one dominated by utilities to YOU-tilities.

That shift will not only reshape the world...it'll turn the market on its head. That sudden transformation will likely create enormous wealth. The decisions you make today could be the key to tapping it.

Dear Fellow Investor,

The year is 2025.

And 'exponential energy' has well and truly arrived.

Energy costs have cratered. Fossil fuels have become fuel fossils. And the energy market has radically changed.

More than that...the world around you *looks* completely different.

You have a solar panel on the roof, a battery in the utility room, and an electric vehicle in the garage. So does your neighbour. In fact, everyone in your town is the same.

Virtually everything you look at either generates, stores or trades energy. Cars, houses, shops, factories...rooftops, windows, greenhouses, garden sheds...they're all generating power.

They're all storing it.

And they're all trading it.

You no longer rely on a single power company to fully supply your home. No more grumbling at how your energy bills always seem to rise at the first sign of cold, but mysteriously stay the same when temperatures rise.

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In fact, you sometimes receive money *back* from the power supplier.

Now, your solar panel, car, home battery and smart meter do all the work for you.

Your solar panel generates power for you to consume when the sun shines.

Your battery stores any surplus power for when it doesn't, including at night time.

Your electric vehicle works in tandem with your home, with the car's battery charging overnight or at your firm's charging point while you're at work, before supplying your home with leftover energy in the evening.

And the blockchain-powered smart meter?

It helps you tap any spare energy you need. Up all night working? Your house is powered by the surplus from next door. Off on holiday? Your home automatically sells *your* energy to someone else in your town.

It's much cheaper...cleaner...and more effective than the energy system of the 20th century.

As industry analyst Andrew Lockley wrote for *Exponential Investor* (one of our sister publications in the UK) in 2016, this little piece of kit will effectively run the show, acting as your very own pit trader in an old-school stock exchange, just without all the colourful clothing.

'You'll be kicking back on your sofa in the evening, watching Game of Thrones (series 54) — but the little blockchain-powered pit trader in your meter will be screaming buy and sell orders into the market,' wrote Lockley.

'This trader will be selling your rooftop solar in the day when you're out — and buying energy to heat your water tank at night. When everyone switches their TV on to watch the FA Cup final, your trader will be selling the energy that's stored in your battery back to the grid; meaning that someone who just has to wash their special party dress can do so — without all the lights going out in her street.'

'This is an energy future that you've probably never imagined — and it's coming sooner than you expect.'

You see, you're not just generating and producing power for yourself, or your family.

You're part of a distributed grid made up of all your neighbours and the wider community. This will enable you — or your meter, more like — to sell your surplus power to your neighbours when they really need power and buy it back when you're caught short yourself.

The smart meter will automate billing, switch appliances on and off based on knowledge of previous usage, and respond to real-time changes in the energy costs. All without you doing a thing.

You are effectively your own mini, virtual power plant.

And so is everyone else.

You are, in fact, what's known as a 'prosumer', producing and consuming your own power, and selling on surplus electricity.

Even better, you invested in the technology that made this shift possible.

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The companies that destroyed your old energy supplier's business model for good, just as other exponential technologies helped Amazon, Microsoft, Netflix and others disrupted major markets (making a killing in the process).

The companies that now dominate the new energy world, generating smart energy for everyone and enormous profits for early stakeholders.

People like you.

Prosumer revolution

Back in 2020, the prosumer revolution is just beginning.

It's in its earliest stages. But we think it'll change the world far quicker than anyone realises.

It is estimated that three million energy users in Europe are already generating at least some of their own power. It's a trend that is set to expand hugely over the next decade.

According to Navigant Research, Europe is set to install 119.9 gigawatts (GW) of distributed generation capacity in 2026, up from around 29 GW in 2017.

In Australia, the demand for distributed energy resources (DER) is also expected to grow, with the Electricity Network Transformation Roadmap estimating that by 2050 DER may contribute up to 45% of Australia's electricity generation capacity.

Globally, the distributed energy generation market is expected to reach \$103.38 billion by 2022, up from \$54.26 billion in 2016.

Prosumers won't just be part of the system in the future.

They'll BE the system.

By 2025, we will have moved from centralised to decentralised energy production...and from conventional utilities to a sharing economy.

What does that really mean?

It's actually very simple.

Right now, energy is almost entirely centralised. Handfuls of power stations are owned by an even smaller number of companies. (And, globally, an energy market dominated by a few countries that happen to have abundant fossil fuels — a geological lottery.)

But soon that'll change. Decentralised energy essentially means thousands — millions, even — of smaller 'micro' power stations (that could be as small as a house or car), all connected and trading with another.

Digitalisation, blockchain, artificial intelligence, smart grids and the increasing dominance of renewables will evolve the energy market from a limited number of centralised generation units towards millions of distributed sub-systems capable of producing cheap, clean energy.

Now, obviously, this has big implications for utility companies.

Using home and car batteries that integrate with solar — to store excess energy generated during the day to be consumed exactly when you need it — minimises reliance on the traditional utility.

In fact, it could destroy it altogether.

Homeowners and commercial building owners will have all sorts of new choices for how to generate, store and manage their own electricity — solar panels, home batteries, electric vehicles, smart

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thermostats and appliances, with more gizmos coming along every day.

The more they take advantage of these new distributed energy resources, the less power they buy from their utility.

If you're a utility, that's not great news, right? We'll answer our own question:

It's a nightmare scenario for utilities.

Why?

Right now, utilities don't control any of those distributed energy resources. That's because they tend to be located on the customer side of the electricity meter (or 'behind the meter', as it's known in the industry).

But this is where the real opportunity lies. The companies creating these technologies are fuelling a wave of disruption that will destroy the traditional, centralised energy system.

They'll shift the power (both literal and metaphorical) away from big, established firms...and towards a new kind of business.

A new type of utility — one that will dominate the market by 2025.

Think of them not as utilities...but YOU-tilities. Because they wrest control away from the companies that have dominated energy for over a century and hand it to people like us.

Age of the YOU-tility

The YOU-tility of 2025 will be much less active in unprofitable generation and much more prominent on the customer side of the meter. In fact, it'll have a digital footprint right in your home or office.

There, it will connect your needs for flexible, cheap and green energy to new services and charging models based on a virtual mob of new technologies.

It will offer storage systems and energy services, combined in one compelling package.

It will help manage your energy demand, modifying your usage to make sure you have enough for when you really need it, using smarter technology. This will help fuel the prosumer movement, and provide the main grid with additional flexibility and stability.

The YOU-tility of 2025 will connect prosumers together to form giant virtual power plants.

It will be a digitally enabled, shared services organisation that provides corporate services, predictive analytics and forecasting — all fully automated and integrated.

This new kind of utility will dominate the market within a decade. Perhaps sooner than that.

You see, in some respects, the future is already here.

Head to President Street in New York's Brooklyn and you will see a new cooperative, local, energy internet emerging.

On one side of President Street, a few homes with solar panels generate electricity. On the other side, a few other homes buy

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power when the homes opposite them don't need it.

In the middle is a blockchain network, managing and recording transactions with little human interaction.

This is a microgrid project. It's called the TransActive Grid, a joint venture between LO3 Energy and ConsenSys, a blockchain developer.

The homes on President Street are fitted with smart meters that track electricity generated and used in the homes. Linked to this is the blockchain network that records transactions into an immutable, decentralised log that can be viewed by anyone.

And it's pointing the way to a new type of energy system, one that will be scaled out on a much larger scale than the current microgrid on President Street, and in locations all around the world...

...an energy system based around local electricity generation, energy trading between neighbours, and less reliance on traditional utility companies.

A major opportunity for forward-thinking investors

This new energy system means new technology...and new sources of energy...and new business models.

Which means one thing.

OPPORTUNITY.

For anyone who can see where all this is going, you have the chance to take a stake in the business that will dominate this new energy system. Many of them may not even generate energy.

Some will store it.

Some will help trade it.

Some will help connect it.

But ALL of these firms present an opportunity, right now in 2020.

Some of these disrupters are already setting up user communities, so you can sell excess power to peers and top up from them at low rates.

These virtual power plants will tap customer battery storage capacity at times of peak demand.

These power plants will have a lucrative role in balancing out intermittent renewables in real-time markets, all enabled by blockchain, or distributed ledger technology, on behalf of the You-tilities.

Other opportunities exist in energy efficiency and demand management services.

For example, the You-tility will provide homeowners with real-time data that allows them to remotely configure a load of laundry to run during off-peak hours. Aggregated together, this data will enable a grid operator to switch off a piece of equipment at a factory for a few seconds in order to thwart the need for bringing a marginal peaking unit online.

All in real time.

You-tilities will be in prime position to collect, analyse and interpret the flood of information churned out by devices such as smart meters and other sensors around the grid, using the data to offer new value-added services, such as tracking solar panel production, for example.

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By tapping into this abundance of real-time data, You-tilities can use predictive modelling and insight generation to reduce costs, increase revenues from existing operations, and generate new revenues from innovative services.

Emerging new infrastructure and the penetration of the Internet of Things (IoT) will make the aggregation of billions of household devices both feasible and profitable.

In other cases, You-tilities will offer leases or financing for distributed-generation equipment through bill payments.

You-tilities might also invest in distributed-storage installations, which will improve power quality and reliability for commercial and industrial customers, and in virtual storage as a service for distributed-generation customers.

You-tilities are also the natural provider for services such as community solar, where a utility installs an array of photovoltaic cells and leases specific cells to an individual residential or business customer, and credits their bill for every kilowatt that's generated by that cell at a proportion of the cost. This is an obvious solution for customers that don't want a solar panel on their roof, for example.

Electric-vehicle charging stations are another natural space for tomorrow's You-tilities, one that some players are already eyeing.

By 2025, grid energy will still have an important role, of course. Not everyone in Australia will have a solar panel, of course. Not all energy will be distributed.

Your batteries and smart meters will be able to buy grid energy when the price from your neighbour's battery is too high. Similarly, you'll be able to sell your excess power back to the grid when the

price of distributed energy is relatively low.

You-tilities have the opportunity to contract with, incentivise, or otherwise pay distributed resources to help solve grid-management problems — without necessarily investing in their own assets.

This energy megatrend is already sweeping the markets

Some companies can see the way the wind is blowing.

Last year, oil major Shell bought First Utility, the biggest challenger to the UK's six biggest energy firms. Although the companies didn't reveal the price, industry figures said the price was likely in the region of AU\$360–\$550 million.

The deal is fascinating on many levels, and not just because it gives the oil major a strong foothold into the UK household electricity supply market.

Put it this way: Shell's grand plan is likely a lot grander than the paltry margins on offer on household power and gas tariffs, especially in light of the fact it is already pushing into electric vehicle charging.

The deal, in fact, is a pointer to the electric vehicle-filled future of 2025. A future where everything is a potential power station... Chances are, you'll pay a small subscription to access as much electricity as you like — regardless of whether it comes from a PV system, the battery or the grid.

In this scenario, energy is less a commodity produced and sold,

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and more a service – just like data in telecoms. Once upon a time, you paid per minute on the phone or per gig of data. Now you pay one fee and use what you want.

The same thing is going to happen to the energy system.

That's why we call it **Exponential Energy**. It's the same trend we've seen emerge so disruptively (and so lucratively) in the telecoms, entertainment, retail and financial systems:

New technology allows us to do things better, faster and cheaper. That causes prices to fall and existing businesses to innovate or die. New, disruptive business models emerge, which quickly scale up and create enormous wealth.

This is what drove Amazon, Microsoft, Netflix and Apple to such enormous heights.

Chances are, we'll see a similar phenomenon take place in the energy market.

Find those companies...the Amazon or Microsoft of new energy...and fortunes could be made.

In this version of the future, utilities will make little or no margins selling electricity.

In fact, the former boss of German utility Innogy said that the sector is moving towards something akin to the telecoms industry. Individual kilowatt-hours, he said, would soon have almost no value, just like data in telecoms.

'Bandwidth is what is sold, and that will come to the energy sector too,' said Peter Terium.

'We need new business models based on the exchange of data via the internet,' he added.

All of Europe's major utilities are desperately scrambling to push into networks, services and renewable energy as they seek to forge new ways to deploy rapidly advancing technologies in an increasingly digital environment.

For example, UK utility Centrica is committed to invest AU\$182 million over the next few years in start-ups and acceleration programs as part of a wider plan to become more involved in physical and digital technologies, and innovative ideas that can deliver new products and services to its customers.

Among other acquisitions, it has bought smart data and technology solutions firm Rokitt Astra through its innovation unit. Spain's Iberdrola, Italy's Enel, the UK's National Grid and Germany's EnBW have all made similar purchases, with more on the cards.

Some of these smaller firms and start-ups entering the space right now will make fantastic acquisition targets that we can profit from.

Utilities are eager to expand their cleantech portfolios, and new companies are offering a bounty of investment opportunities.

Obviously, there will be challenges along the way. To change a business model that has been essentially unchanged for so long won't happen overnight.

In many places, utilities tend to be heavily regulated monopolies with guaranteed returns, operating in a market where the basic underlying technologies have, until recently, not changed substantially in decades.

Traditionally, utilities have invested in things like more transformers or new power lines, and other hard equipment, to meet growth and peak demand on their grid.

Overhauling ageing grids will be lengthy and costly.

But change is coming, and fast

We are irrevocably on the path to a low-carbon, smart-energy world. It's already happening fast, and is set to accelerate and intensify in the coming years.

The development of smarter homes, smarter cities, and perhaps completely self-sufficient off-grid communities will be a reality by 2025. As a result, utilities and the wider electricity market will be focused on services tailored to needs, rather than today's more standardised markets and products.

Building a connected, digitised grid offers lucrative opportunities for the companies offering applications piggybacking off the platform — i.e. the digital grid — hosted by the utilities.

These applications — from an array of electrical equipment manufacturers, tech firms, construction companies and consumer product firms — could include services to manage the appliances in a connected home, charge EVs, or conduct peer-to-peer transactions to trade solar energy with neighbours. Distributed energy technologies might be a threat to the traditional type of utility of today, but they're a huge opportunity for the utility of tomorrow.

The utility of 2025 will be the orchestra leader, balancing an entirely different sort of grid — one with millions and millions of inputs, and many opportunities to provide unique services.

By 2025, distributed energy technologies will have become part of a broader ecosystem on the grid.

We'll have a distributed hybrid system made up of a patchwork of both large power plants and microgrids, powered by distributed energy resources such as solar power. Such a decentralised energy

system would be capable of delivering efficient, reliable and, in many cases, renewable energy.

This is no dystopian vision. It's already happening across the world.

And we're going to show you how to profit from it.

Tomorrow, you'll get the chance to read about three incredible opportunities that sit at the heart of the enormous transformation taking place in the energy markets.

Until then,

**James Allen and Selva Freigedo,
Beyond Oil**



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