

# HYBRID SOLUTIONS IN LATIN AMERICA

LATIN AMERICAN AND CARIBBEAN COUNTRIES ARE WELL POSITIONED TO PLAY A LEADING ROLE IN OFF-GRID AND HYBRID ENERGY SOLUTIONS. GROWING DEMAND AND GRADUAL REGULATORY IMPROVEMENTS HAVE CREATED GROWING INVESTMENT OPPORTUNITIES. BY **MARTIN VOGT**, CEO, **MPC ENERGY SOLUTIONS**.

For years now, I have been seeing and talking about the growing potential for renewable energy investment in Latin America and the Caribbean. In fact, there is scope for US\$18bn of investment into the region's renewable energy sector within the next decade. However, in the world of renewable energy, there is never one single piece of infrastructure or technology that is able to deliver for every potential use case. There is a whole ecosystem of solutions and facilities that are needed to turn our renewable natural resources into the electricity that powers growth.

Although Latin America accounts for a small fraction of the global renewable energies market, the region provides an enormous business opportunity for a number of energy solutions. With the exceptions of renewable energy solutions such as biomass and hydropower, renewables often lack the ability to provide baseload capacity that still provides a use case for fossil fuels in many parts of the world. A solution to the baseload conundrum is to develop battery storage and Latin America has the potential to lead the way here with Argentina, Bolivia and Chile, known as the Lithium Triangle, home to the largest lithium deposits in the world. In fact, this region holds more than half of the world's lithium deposits.

In addition, grid transformation, improving electrification rates, and electricity provisions for the rapidly growing population will create further market opportunities for energy storage. Colombia, Brazil and Mexico reportedly have storage growth potential of 8GW–9GW until 2030. The opportunities to find value in a growing market while aiding the energy transition in the region are clearly there, now they need to be capitalised on.

## **Regulation and transmission**

Despite the large market potential for storage, regulatory and market barriers hinder growth. According to the Energy Sector Management Assistance Program (ESMAP), regulatory barriers such as the lack of a legal framework for independent power producers (IPPs), are making it difficult for small renewable power developers to plan and finance projects on the basis of known and consistent rules. In addition, countries in Latin America and Central America

lack well-defined roadmaps, policies, and infrastructure support to effectively capitalise on their large market potential. This could hinder the region's efforts to lower its dependence on fossil fuels and attract investors to aid with the energy transition.

Poor grid infrastructure in parts of the grid across Latin America should be a catalyst for markets to adopt energy storage technologies. Energy storage has the potential to play a vital role in balancing out intermittent power generation, which is a problem currently affecting millions across the region. However, there are certain regulations that need reviewing in order to address this issue.

Regulatory and policy changes are needed, not only for generation and transmission, but also for wider ancillary services. This will enable companies to introduce solutions that will help with power grid stability. Through the use of battery energy storage systems (BESSs) a backup for renewable energy plants can be created. This will mitigate any bottlenecks in the transmission infrastructure, making intermittent power a thing of the past.

The region's transmission system is subject to frequent power line congestion. As demand for electricity grows, battery storage will become a viable option for large transmission grid development in Latin America. Through this review of regulations, the market will also become much more attractive, securing further inward investment into the sector.

## **Remote and off-grid**

The geographical layout of the region also presents challenges within energy generation. There are many natural barriers that separate populated areas from the main grids in the region. This is why remote places including

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islands and rural areas in the region have significant market potential for distributed generation technologies. The lack of a suitable grid network and over-reliance on expensive diesel generators makes a strong case for small-scale solar PV, wind or hybrid technologies, backed by the storage component, which improves system reliability.

Currently, the Caribbean islands have several storage projects in operation or planned. The islands are shifting to solar and wind to reduce their reliance on fossil fuels while meeting growing demand for power. Although the current market is relatively small, the scale of expansion would depend on the formulation of strong regulatory frameworks and a reduction in battery prices.

Dominican Republic, Jamaica, and Puerto Rico are some of the major island nations that have made advances in renewable energy and battery storage. In the remote areas of the region, the number of storage projects is expected to increase considerably to replace high-cost diesel generators and encourage rural electrification initiatives. This should provide strong proof points for further investment into projects of this sort that will help remote areas with the energy transition while offering value given the clear gap in the market.

#### **Distributed and residential**

Not all policies in the region need reviewing, though. Some countries such as Jamaica and Colombia, among others, have net billing schemes targeted at residential solar PV systems. The initiative allows consumers to sell electricity back to the grid at wholesale prices. This mechanism incentivises self-consumption while the high retail tariffs promote the usage of batteries.

One issue does lie within the unreliable ancillary services currently in place in some areas. By upgrading and implementing proper services that support the transmission of energy, the operations across the grid would become much more reliable balancing out the intermittent power. This would also help create more viable business opportunities for battery storage utilisation. The market growth of renewables has also been the result of high prices of electricity, an open and stable business environment, and a decrease in technology costs.

#### **Regulatory framework**

There is no real need for subsidies or incentive programmes that promote renewables or battery energy storage. However, prevailing market conditions and strong government support strongly contribute to the growth of the market. In addition, it is also clear that some stimulus programmes can help prolong a period of low interest rates, meaning there will be increased access to affordable financing. This, paired with the attractiveness of real assets due to their low correlation to capital markets protecting them

from inflation, offers great opportunities for investors looking to capitalise on the energy transition in the region.

We have already seen that there is a lot of potential for further investment into the market, but there is still a clear need to attract investors. By attracting sufficient private sector interest, governments can essentially unload the burden of public-sector spending in the sector. It also helps offer governments autonomy and self-reliance given they will cease to depend on oil or gas imports. This, in turn, boosts the resilience of the region, bringing stability and making it an even more attractive market for investors.

#### **Green recovery**

The global green recovery is offering strong business opportunities across the sector. The energy storage market is relatively small, but represents great potential following the adoption of renewable energy technologies. In regions such as Europe or North America where energy grids are fully developed and there is a strong infrastructure already in place, it can be difficult to find value in opportunities given that upgrades are costly and the existing infrastructure needs adapting to the new technologies available. However, in regions such as Latin America and the Caribbean where there isn't as much infrastructure in place, it becomes easier to implement new technologies within the energy storage market that will help create a good base for the overall infrastructure.

There have been cases of storage deployments in remote areas and in industrial clusters to help alleviate the shortcomings due to high retail prices. Lighthouse projects in the region demonstrate the economic viability and path forward. Some examples include ABB's 24MW battery storage project with the Jamaica Public Service Company, where they are combining solar PV with battery storage; Emera's 5MW battery storage project combining the Lucy solar PV park facilities in Barbados; Latin America's largest battery storage project, which has been developed by AES Corporation and that holds a capacity of 112MW backing local solar PV and wind operations in Chile; and Leclanché's St Kitts hybrid project combining 36MW of solar PV with 15MW battery storage, creating the largest BESS in the Caribbean.

With a more holistic approach to renewable energies, we can create a whole ecosystem that will help provide the energy required to all local communities in the region. At the same time, we can ensure the stability of the energy grid and the storage capacity necessary to deal with the surplus while minimising any power intermittence. This way we can improve the resilience of the region while aiding its transition toward cleaner energies, lowering its overall carbon footprint. ■