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Nokia has introduced an innovative technology, the Nokia Virtual Power Plant (VPP) Controller Software, aiming to reduce energy usage, carbon emissions, and associated expenses in mobile networks. The solution offers mobile operators an innovative solution to maximize the utility of backup cell tower batteries at base station sites.

Through seamless transitions between grid power and backup batteries, operators stand to decrease their energy expenses in electricity spot markets significantly. Moreover, this innovation allows operators to generate revenue in grid frequency balancing markets while concurrently reducing their carbon footprint.

Having conducted successful trials, Nokia aims to roll out this advanced technology later this year. "VPP-related services from mobile networks are a nifty means for operators to help drive environmental benefits through more efficient energy usage and less wastage while also helping the P& L by monetizing existing assets," said Emanuel Kolta, Lead Analyst, Network Sustainability and Innovation at GSMA Intelligence, in a statement.

Nokia's VPP Controller Software introduces a transformative role for base station backup batteries, typically left dormant due to infrequent power cuts. By tapping into power reserve markets overseen by transmission system operators, operators can leverage these cell tower batteries for financial gain while bolstering grid stability.

According to the firm, operators bid to provide power during peak demand periods through auction-based systems, turning their battery backups into lucrative investments with predictable returns.

Moreover, Nokia's software integrates seamlessly with renewable energy sources like solar power, further reducing CO2 emissions. "By selling excess power to the grid, operators can become "virtual power plants" and develop a new revenue source, something that scales the more of a network footprint utilized in this way," said Kolta.

Safety measures ensure the batteries' suitability for reserve power usage, while machine learning algorithms optimize offerings based on consumption patterns and available backup capacity. This includes participation in Fast Frequency Reserve markets, demanding sub-second response times for grid offloading and battery monetization. With low latency processing and Nokia's robust power system, entering and succeeding in power reserve markets becomes effortlessly accessible for mobile operators, according to the firm.

Nokia's commitment to extreme energy efficiency includes product enhancements like the extreme

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deep sleep mode in AirScale Habrok Massive MIMO radio units. This mode slashes energy consumption up to 97 percent compared to an active cell without traffic.

With support for wide RF bandwidths up to 400 MHz, Habrok can utilize fragmented spectrum or enable network sharing with just one antenna. Plus, their strong RF output extends coverage while being super energy-efficient. These radios are also smaller and lighter, making network setup quicker and cheaper.

Additionally, Nokia offers a ‘zero traffic, zero energy’ solution, shutting down all radio resources during idle periods. Furthermore, Nokia introduces the MantaRay Energy solution, enhancing the energy efficiency of radio network software with AI/ML-driven optimization.

Another innovation the firm offers is the Liquid Cooled baseband hotel site solution, delivering up to 90 percent energy savings in cooling systems compared to active air cooling. According to Nokia, it also contributes to an 80 percent reduction in carbon emissions by repurposing waste heat for other applications like building heating.

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Web: <https://www.sumthingtasty.co.za/contact-us/>

Email: energystorage2000@gmail.com

WhatsApp: 8613816583346

