

MOBILE POWER DISTRIBUTION

TRANSPORTABLE, RESILIENT, AND READY WHEN THE GRID ISN'T

UPTIME
FLEXIBILITY
CAPACITY

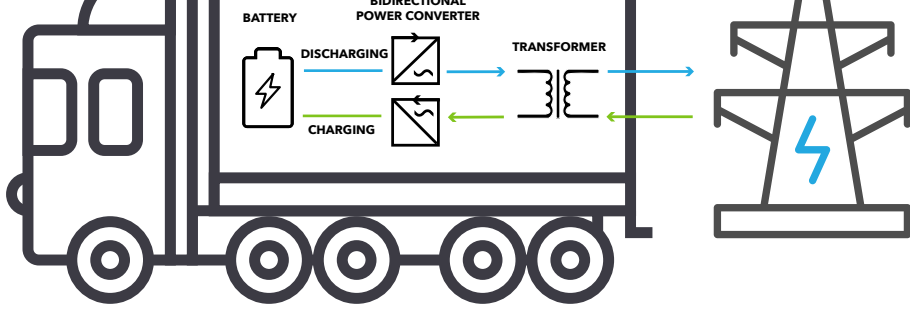
DEMAND FOR MOBILE POWER DISTRIBUTION

RELIABLE POWER WHEN AND WHERE IT'S NEEDED

When permanent grid infrastructure is not an option and reliable power is essential, utilities need a modular, fast-deploying power grid that can fill gaps during maintenance, disasters, or peak load events and temporary locations.

Mobile power grids – self-contained power distribution units often mounted on trailers or containers – deliver reliable power exactly where and when it's needed. They help utilities maintain uptime, scale flexibly, and deploy critical capacity without building permanent infrastructure.

| USE CASE | BENEFIT |
|--------------------------------------|--|
| Emergency Response | Fast power restoration for critical services |
| Temporary Event Power | Short-term delivery without fixed infrastructure |
| Construction & Industrial Projects | Reliable site power without permanent buildout |
| Remote & Off-Grid Areas | Flexible supply where the grid doesn't reach |
| Grid Upgrades & Maintenance | Maintains service during planned outages |
| Military & Defense Applications | Mobile systems for secure field operations |
| Renewable Integration & Load Support | Dynamic voltage support in distributed networks |



From short-term support to long-term resilience, mobile power distribution systems are becoming increasingly relied upon.

STANDARD
CAPACITORS
FALL
SHORT

ENGINEERING CHALLENGES OF MOBILE POWER DISTRIBUTION

STANDARD CAPACITORS FALL SHORT AND INTRODUCE SIGNIFICANT RISK

Mobile power distribution systems face thermal extremes, constrained layouts, and high switching frequency without the benefit of dedicated cooling or redundant infrastructure – pushing the boundaries of important system components.

Capacitors, which are used to regulate voltage, support reactive power, and filter harmonics, are integral to the performance of mobile power distribution systems. They play a vital role in system size, weight and transportability, resilience to extreme environmental conditions, and stable voltage support in unpredictable field conditions. They enable these systems to be compact, lightweight, rugged, and rapidly deployable while still offering full voltage regulation and stabilization capabilities comparable to permanent infrastructure

| FUNCTION | DESCRIPTION |
|-----------------------------|---|
| Energy Storage | Short-term storage to manage brief power interruptions and rapid load changes, enhancing stability. |
| Voltage Regulation | Quickly stores/releases energy to maintain stable voltage amidst fluctuations common in mobile setups. |
| Power Factor Correction | Counteracts inductive loads, reducing energy losses and increasing efficiency, critical for mobile grids. |
| Harmonic Filtering | Paired with inductors to reduce harmonics, improving power quality and protecting sensitive equipment. |
| Reactive Power Compensation | Provides reactive power, stabilizing voltage levels and enhancing overall system reliability. |
| System Flexibility | Enhances operational flexibility by efficiently managing power flow under varying load conditions. |
| Cost Reduction | Improves efficiency and reduces operational costs, valuable in temporary or emergency scenarios. |

Traditional BOPP-based capacitors are failing to meet performance demands of mobile power distribution systems. When exposed to the heat, switching frequency, and space constraints of mobile systems, standard BOPP-based capacitors experience derating, deformation, and accelerated rates of failure. Traditional BOPP capacitors become a bottleneck for mobile power systems.

| CONDITION | BOPP LIMITATION | ENGINEERING CHALLENGE |
|----------------------|---|---|
| High Ambient Heat | Degrades above 85 °C | Requires derating or active cooling to prevent breakdown. |
| Thermal Cycling | Repeated expansion/shrinkage causes film fatigue | Leads to warping and instability |
| Fast Switching Loads | High-frequency charge/discharge increases dielectric losses | Raises internal heat |
| Compact Enclosures | Larger film volume needed for energy storage | Takes up space, limits mobility |
| Remote Installations | Shorter service life | Requires more frequent replacement and maintenance |
| Harmonic-Rich Power | Limited response time and filtering | Poor voltage regulation and power quality |

Mobile power distribution requires capacitor technologies purpose-built for stress, scale, and speed.

BUILT FOR THE
HEAT
SPEED
STRESS



THE PEAK NANOPLEX ADVANTAGE

ENGINEERED FOR EXTREME HEAT, HIGH-SPEED SWITCHING, AND STRESS

Mobile power distribution systems demand capacitors that perform beyond the limits of traditional BOPP film. Capacitor OEMs need a material that can handle higher temperatures, faster switching, and tighter design constraints – without sacrificing reliability and performance.

Next-generation NanoPlex film delivers. Engineered specifically for high-temperature, high-frequency environments, operates reliably up to 150°C, lasts up to 5x longer, and offers 4x the energy density while enabling compact, high-efficiency capacitor designs. By moving beyond BOPP's limitations, NanoPlex enables a new generation of capacitors to match and exceed the performance demands of grid modernization.

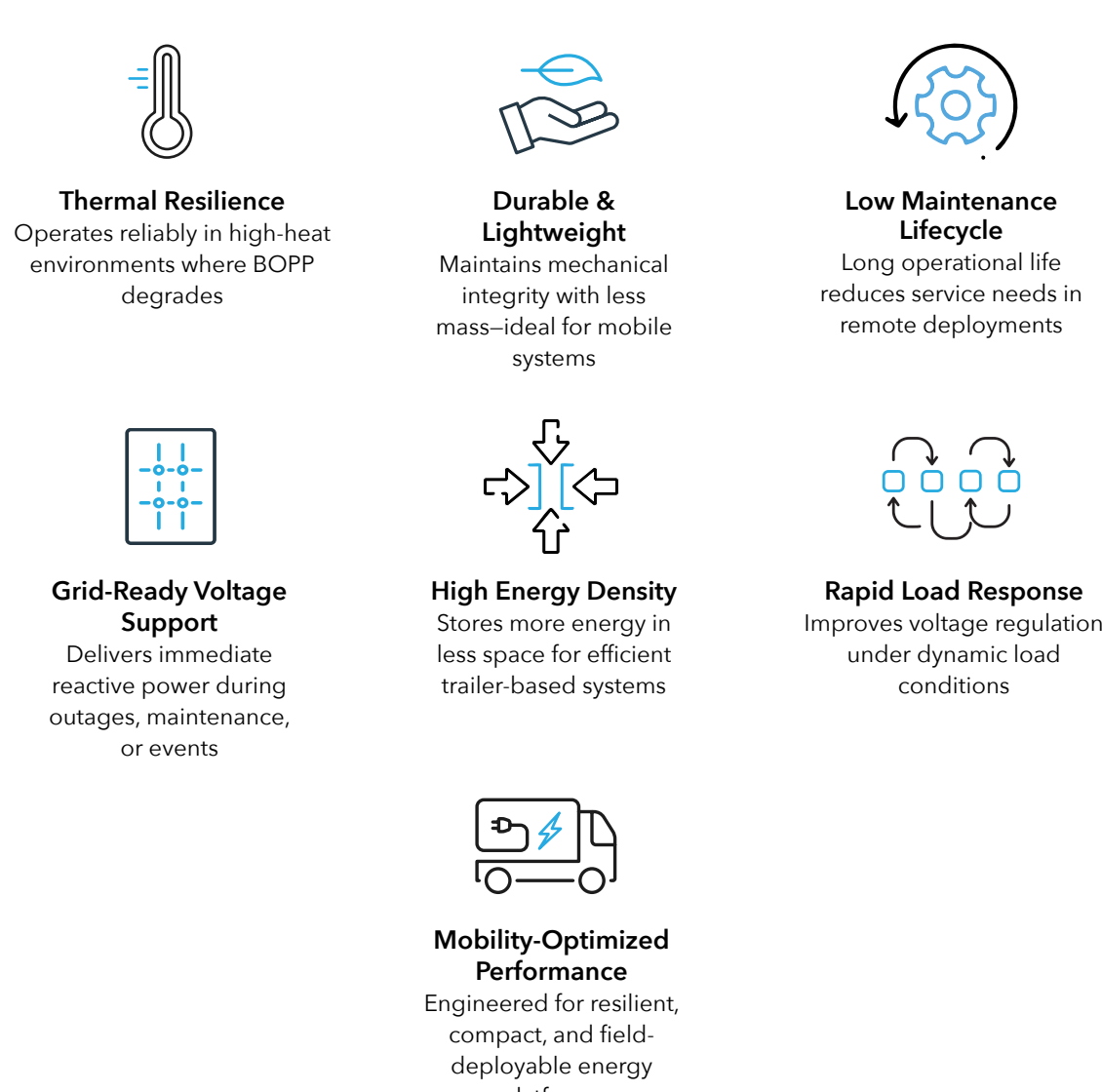
| ADVANTAGE OF NANOPLEX CAPACITORS VS. BOPP CAPACITORS | | |
|--|--|--|
| | NanoPlex | BOPP |
| Max Operating Temperature | Up to 135°C without derating | Up to 85 °C without derating |
| Thermal Stability | No film shrinkage up to 135°C | Noticeable film shrinkage and degradation beyond 85 °C |
| Operational Lifespan | 5x longer operational life | Significantly shorter under HFS stress |
| Dissipation Factor | 50% lower losses, much higher efficiency | Higher losses, greater self-heating and inefficiency |
| Energy Density | Up to 4x energy storage per volume | Much lower, limiting miniaturization |
| Size & Weight | Up to 50% smaller and 30% lighter | Larger and heavier to achieve equivalence |
| Design Compatibility | Plug-and-play replacement for existing designs & equipment | Default film for legacy designs |
| Manufacturing & Design | 100% USA engineered & manufactured | Overseas 80% of BOPP film supply sourced overseas 70% from China |
| Supply Chain | 100% allied nation sourced and secured | Geopolitically instable |

RESILIENT
HIGH-
PERFORMANCE

ENGINEERED TO OUTPERFORM

NANOPLEX ENABLES RESILIENT, HIGH-PERFORMANCE MOBILE POWER SYSTEMS

NanoPlex isn't just a better film – it's a generational leap forward for mobile power distribution systems. It enables mobile systems that can withstand extreme conditions, fluctuating loads, and compact design constraints without sacrificing reliability, efficiency, or lifespan.



NanoPlex capacitor film is the foundation of tomorrow's compact, resilient, and powerful mobile power distribution systems.