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SOLUTION BRIEF

Scalable DER orchestration with Intertrust Connect

AI-ready, secure connectivity for DER programs

Building trust for a connected world.

Contents

The evolution of DERs

The shift from centralized to distributed energy

The global energy sector is undergoing a fundamental transformation as centralized power generation models give way to distributed energy resources (DERs) such as solar panels, battery storage, and electric vehicle chargers. This shift is driven by the growing need for grid resilience, cost efficiency, and decarbonization goals.

Governments and industries worldwide are embracing this change. As of 2023, renewable energy—including DERs—accounts for more than 30% of global electricity generation, a milestone driven by rapid growth in solar and wind power[1]. However, scaling these resources requires addressing key challenges, including operational complexity, real-time coordination, and secure connectivity.

This transition is shaped by three major trends: Decentralization, with more energy assets being deployed at the grid edge; Decarbonization, as renewables replace fossil-fuel-based generation to meet aggressive emissions targets; and Digitalization, where AI, automation, and data-driven decision-making enable more efficient grid operations[2].

The need for AI-driven DER orchestration

Despite the rapid growth of DERs, less than 20% of available DER capacity is currently enrolled in VPP programs[3], leaving significant energy and revenue potential untapped. The fragmented nature of DER ecosystems and the lack of standardized integration frameworks make it difficult for utilities, virtual power plant (VPP) providers, and asset owners to maximize the value of their energy assets.

AI-driven optimization is emerging as a game-changer in this space. Studies show that AI-driven grid flexibility could reduce annual grid costs by up to $10 billion[4], while uncoordinated DERs reduce overall grid efficiency by 40%[5]. By leveraging AI, utilities and energy providers can predict and mitigate grid constraints, dynamically balance energy loads, and automate energy dispatch to improve both reliability and profitability.

Achieving AI-driven orchestration at scale requires a secure, scalable, and interoperable connectivity layer to unify fragmented energy assets, enable real-time telemetry, and provide a trusted foundation for AI-based decision-making. Without this foundation, DER orchestration remains expensive, inefficient, prone to security risks, and difficult to scale.

$10 Billion

annual savings from AI flexibility

20%

or less of DER dependency is VPP-enrolled

30%

cost savings from AI-optimized DERs

References

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5. arxiv.org/html/2408.06516v1

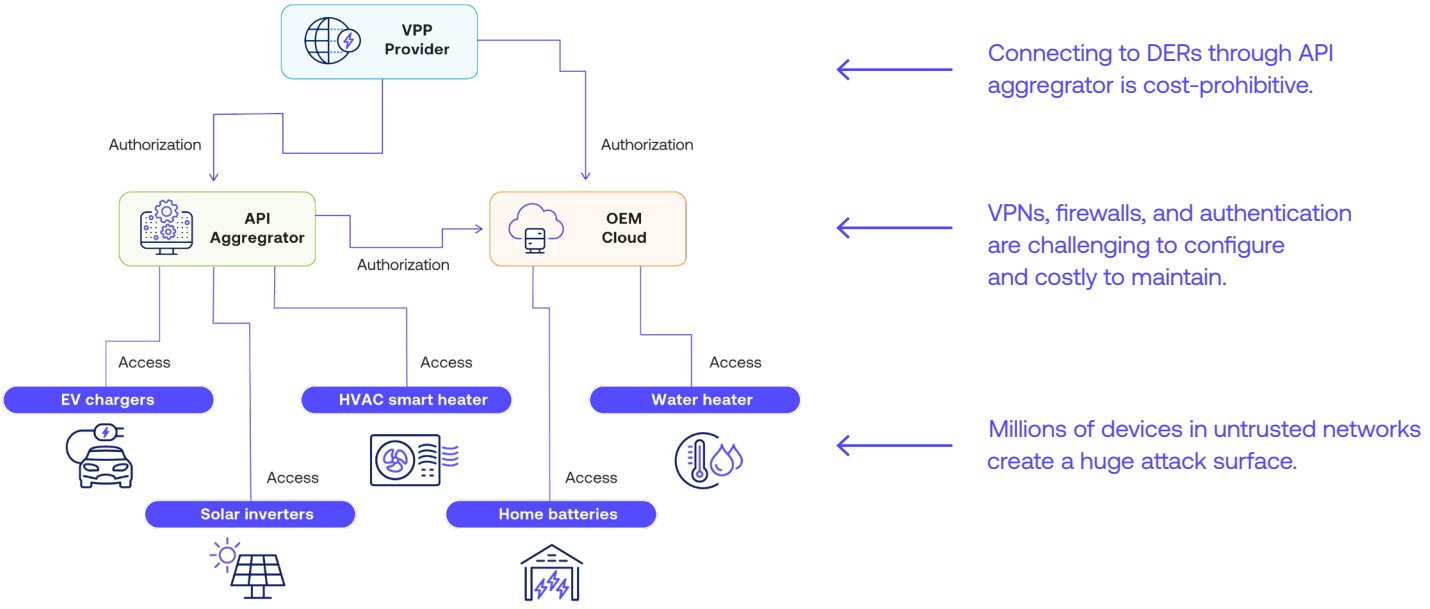
Key challenges in DER orchestration

Roadblocks to scaling DERs

The rapid growth of DERs presents a major opportunity for utilities, VPP providers, and asset owners to enhance energy management and improve operational efficiency. However, scaling and optimizing DER programs comes with a range of technical, operational, and economic challenges that can limit the value of these assets. These challenges can be summarized into four key issues that utilities must overcome.

- **High integration costs**
  Integrating DERs from multiple original equipment manufacturers (OEMs) often requires custom development work for each device type, communication protocol, and regional compliance requirement. These one-off integrations drive up operational expenses and consume significant internal resources, making large-scale DER onboarding financially unsustainable.
- **Limited access and control**
  Utilities and VPP operators frequently lack direct, real-time visibility into the performance and availability of individual DER assets. In many cases, third-party aggregators and proprietary platforms restrict access to device-level data and limit direct control, leaving utilities unable to make timely decisions that optimize system reliability and performance.
- **Security and compliance risks**
  As the number of connected DERs grows, the cyberattack surface for utilities and grid operators expands significantly, exposing critical infrastructure to increased risk. Existing perimeter-based security models, such as VPNs and firewalls, are poorly suited to the dynamic, distributed nature of DER ecosystems, making it difficult to enforce consistent security policies across all assets.
- **Scalability and interoperability issues**
  DER programs often rely on a fragmented technology landscape made up of incompatible OEM devices, platform-specific APIs, and siloed operational systems. This lack of standardization and seamless interoperability slows deployment, limits the ability to manage a growing fleet of DERs, and prevents effective cross-platform orchestration.

Together, these challenges drive up operational costs, slow DER program expansion, limit real-time responsiveness, and prevent operators from fully monetizing the value of distributed energy assets. Without addressing these fundamental barriers, utilities, VPP providers, and asset owners will find it difficult to transition DER programs from small pilots to fully scaled, revenue-generating operations.



The Intertrust Connect solution

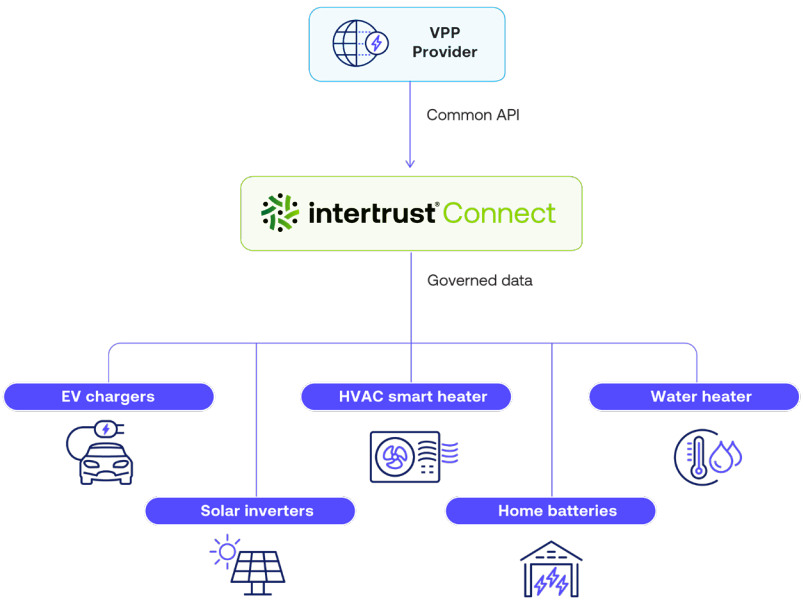
Secure, scalable, AI-ready connectivity

Intertrust Connect is a secure, scalable platform purpose-built to simplify the connection, monitoring, and control of DERs across diverse device ecosystems and technology platforms. By eliminating the need for custom integrations, reducing operational complexity, and enabling trusted data flows, Intertrust Connect provides the essential foundation for seamless DER orchestration.

The following capabilities empower utilities, VPP providers, and asset owners to efficiently scale and manage their DER programs:

- **Seamless DER connectivity**
  Provides a single, secure integration point for connecting DER assets, eliminating custom one-off integrations and reducing ongoing operational complexity.
- **Real-time data and control**
  Ensures real-time access to telemetry, performance data, and device status, empowering utilities and flexibility program operators with granular visibility and control over individual DER assets — a critical capability for both operational reliability and market participation.
- **Cost-effective scalability**
  By replacing fragmented direct-to-OEM integrations and eliminating dependency on expensive third-party API aggregators, Intertrust Connect reduces DER integration costs by up to 30%, enabling economically sustainable growth.
- **Enhanced security**
  Built on Intertrust's decades of leadership in device identity and data protection, Intertrust Connect ensures end-to-end encryption, authentication, and secure data governance. This zero-trust model protects critical energy infrastructure from cyber threats while maintaining compliance with regulatory and operational requirements.
- **Interoperability across devices**
  Supports 99% of major DER OEMs, covering solar, storage, EV charging, HVAC, and other distributed assets. Its protocol-agnostic design ensures seamless compatibility, avoiding vendor lock-in and future-proofing DER programs as technologies evolve.

Intertrust Connect transforms DER integration from a costly, fragmented process into a scalable, secure, and AI-ready foundation for modern energy flexibility programs. Whether enhancing operational visibility, reducing integration costs, or enabling advanced AI optimization, Intertrust Connect empowers utilities, VPP providers, and asset owners to unlock the full value of their DER programs, today and in the future.



Intertrust Connect provides the essential foundation for seamless DER orchestration.

Key benefits and advantages

Why Intertrust Connect stands out

Intertrust Connect delivers measurable benefits for utilities, VPP providers, and asset owners, helping them streamline DER onboarding, reduce operational costs, and unlock AI-driven flexibility and optimization. One of the most significant advantages of Intertrust Connect is that it allows utilities and VPP providers to maintain full ownership and direct control over their DER connections.

Unlike third-party aggregators that act as intermediaries and limit direct access to devices and data, Intertrust Connect enables real-time, device-level telemetry and control across the entire DER fleet. This direct visibility and command ensure operators can fully optimize DER performance, respond quickly to grid events, and maximize the value of their flexibility programs—all without compromising operational independence. Intertrust Connect also significantly reduces the cost and complexity of DER onboarding and ongoing integration.

With support for major DER OEMs, the platform eliminates the need for custom integrations, allowing operators to quickly onboard new assets regardless of device type or manufacturer. By removing reliance on expensive third-party aggregators and providing a single integration layer for all DERs, Intertrust Connect reduces DER connection costs by up to 30%, allowing programs to scale economically and adapt to evolving technology landscapes without vendor lock-in.

Built on Intertrust's proven zero-trust architecture, Intertrust Connect ensures that every DER connection is authenticated, encrypted, and continuously monitored to protect against evolving cyberthreats.

The platform enforces strict access controls at the device level, ensuring only authorized parties can access or manage critical DER data and operations. By embedding robust data governance and end-to-end security, Intertrust Connect helps operators comply with regulatory requirements, while also ensuring that all data feeding AI optimization engines and operational systems is authentic, untampered, and trustworthy.

Utilities and VPP providers can maintain full ownership and direct control over their DER connections.

Who benefits from Intertrust Connect?

Benefits of secure, AI-ready DER orchestration

Utilities and VPP providers managing growing fleets of distributed energy resources (DERs) need a cost-effective, scalable way to securely connect and control diverse assets across their service areas. Whether managing flexibility services, participating in energy markets, or optimizing grid operations, these organizations require direct, real-time access to DER data and performance—without the cost and complexity of custom integrations or reliance on third-party aggregators.

Intertrust Connect provides a single, secure connectivity layer that supports direct integration with 99% of major DER OEMs.

Utilities and VPP providers can scale their flexibility programs faster, reduce operating expenses, and future-proof their DER strategies as device ecosystems evolve.

Contact us today to schedule a consultation or demo and learn how Intertrust Connect can accelerate your DER program.

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