ABB Ability Energy Management for Sites

OPTIMAX® for Virtual Power Plants

Empower your participation in energy markets

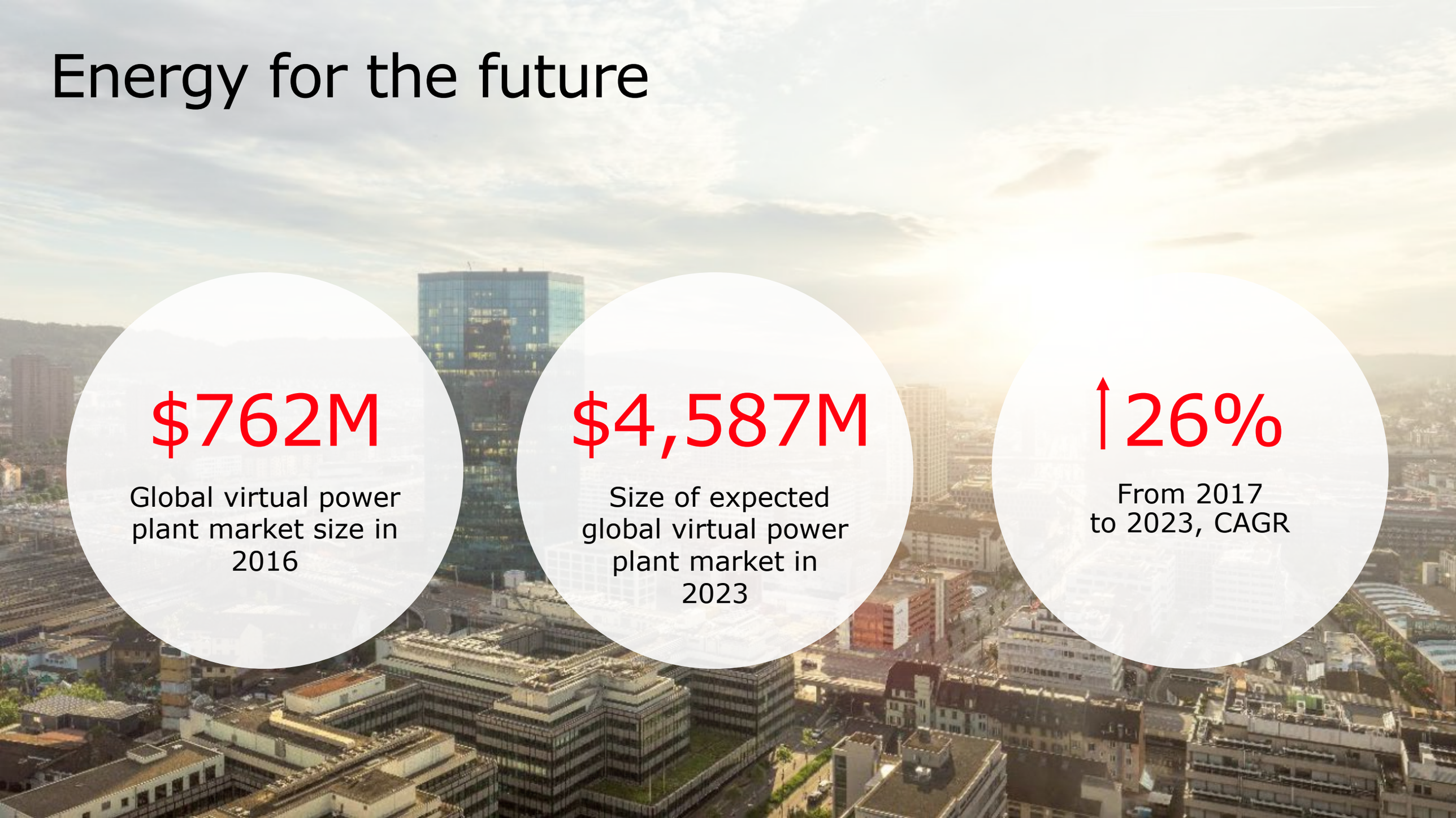
ABB

Microsoft

Agenda

1. Energy for the future
2. Energy transformation challenges
3. The OPTIMAX® solution for Virtual Power Plants
4. Built with Azure
5. OPTIMAX in action
6. Next steps

Energy for the future



$762M

Global virtual power plant market size in 2016

$4,587M

Size of expected global virtual power plant market in 2023

↑26%

From 2017 to 2023, CAGR

Energy transformation challenges

Coordinated asset control

In this decentralized energy environment customers must maximize reliance on their own generation resources. This minimizes their energy costs and empowers them to avoid peak energy consumption and time of use charges.

Shift in business model

Energy suppliers are looking to expand into new markets or would like to offer new functionalities to their customers, but have current limited capacity to support or scale energy optimization solutions.

Transformative. Sustainable. Scalable

OPTIMAX® for Virtual Power Plants (OPX-VPP) seamlessly integrates, controls, and optimizes thousands of distributed energy resources (DERs), into virtual power plants so that the energy they produce can be optimized for inclusion in wholesale energy markets—and more.

Control operational costs and regulatory requirements

Maximize trading opportunities

Expand into new markets

Control costs and requirements

OPTIMAX® for Virtual Power Plants aggregates and dispatches decentralized generation resources (DER) and monitors operations for greater control of energy costs, complying with emissions regulations and other reporting and trading capabilities.

Enables distributed energy providers to seamlessly integrate, optimize, and trade energy from small-scale generators

Engage in many aspects of virtual power plant operation and energy production, including trading, operating, monitoring, and more.

Monitor and report functions that improve communication and reduce time-spent on corporate or regulatory requirements.

Provides VPP operators with improved data visibility and data consolidation across multiple sites.

Maximize trading opportunities

OPTIMAX® for Virtual Power Plants enables maximized revenue from optimal participation through intelligent trading of surplus energy on wholesale energy markets using the forecasting, planning, and real-time optimization capabilities of this software.

Key capabilities of OPTIMAX® software will help you manage your energy portfolio, plan trades, and optimize real-time operations.

The forecasting and trading capability can help you understand the current load and forecast renewable sources of energy.

Gain insight into today’s and tomorrow’s power production, to see how much energy will be generated, sold, or stored.

Balance your power pool, dispatch assets automatically, and plan for and execute ancillary services and demand response calls with **Real-time Optimization**.

Expand into new markets

OPTIMAX® for Virtual Power Plants can help you expand into new markets and offer unique business models, based on its flexible architecture, that will provide new functionalities to existing and potential customers and can scale to accommodate additional DERs.

Move from operating as utility to functioning as an aggregator.

Create new and flexible business models by combining hardware, software, operations and more into energy as a service (EaaS).

Allows aggregators and energy service providers simple access to a broad portfolio of assets with the flexibility to enter into the market.

Scalable cost-effective offerings that gain efficiency as your customer portfolio grows.

Built with Azure

Optimize power consumption and production with the Microsoft Cloud

Case study: Making a Caribbean island grid fossil-fuel free

WEB Aruba supplies the island with electricity and drinking water, using 134 MW capacity produced by thermal (fuel oil), wind, and solar plants. By 2020, WEB Aruba plans to generate half its energy from renewables and half from alternative fuels.

Experience counts
WEB Aruba selected ABB due to its extensive microgrid experience and microgrid portfolio.

Maximize renewable usage
The ABB solution maximizes the use of renewables while minimizing the consumption of fuel oil.

WEB
WATER- EN ENERGIEBEDRIJF ARUBA N.V.

Practice sustainability
With day-ahead optimization based on weather and load forecasts, real-time optimization to balance fluctuations in supply and demand, and dynamic load shedding to ensure grid stability, the system readily accommodates the intermittency of wind and solar — and the goals of its fossil fuel-free future.

Case study: 20 units to 2,800 in just 3 years

When Next Kraftwerke contracted with ABB six years ago, they were a VPP startup with just 20 bio-gas production units. Now they have grown into one of the largest VPP operators in Europe.

To accomplish this feat, they needed a solution that was scalable, offered real-time operation, standardized open interfaces and provided easily configurable optimization modules. OPTIMAX provided all these features without the risk of downtime.

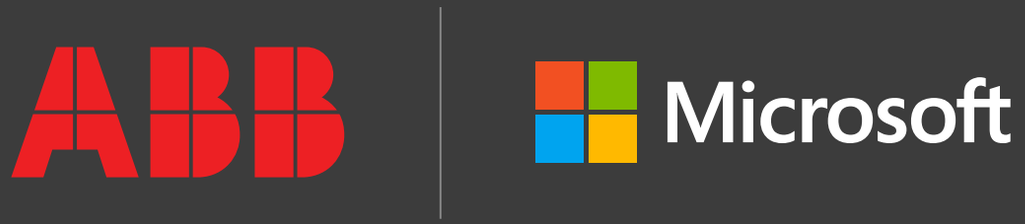
Critical flexibility
New customers and generating units are added continually without interrupting operations because all hardware and software additions are made without system shutdown.

High scalability for rapid growth
With the help of OPTIMAX, Next Kraftwerke grew from a pool of 20 units to 2,800 in its first three years. It now manages more than 5,400 producing and consuming technical units across eight countries. They manage 4.5 GW of capacity, largely from renewable sources. The smallest unit generates a few kilowatts of solar power, while the largest, a biomass plant, produces 20 MW.

NEXT
KRAFTWERKE

Next steps

- We'll connect you with the sales team for ABB OPTIMAX for Virtual Power Plants: us-energyindustries.communication@abb.com
- Learn more about ABB OPTIMAX for Industrial and Commercial at: https://new.abb.com/power-generation/in-control/in-control-01-2017/virtual-power-plants



Virtual Power Plant Energy Asset Mgmt.

ABB OPTIMAX Reference Architecture