Venios Energy Platform (VEP)

Overview

VENIOS®
the world of smart grids

Venios is a young IT-company developing software solutions for efficient smart grid management helping to resolve the challenges of the energy sector.

We are
located in Frankfurt (HQ Germany) and Hartberg (AT) | founded 2012 | owner-controlled | digital | agile | accountable | backed by commercial investors

Our customers are
energy suppliers | public utilities | network operators (DSO) in Europe

Awards received
innovative utility software | pioneering cloud technology | Top 10 Energy Technology Solution Provider | Most outstanding in Energy Software Solutions | Winner of the VDE|FNN – Innovation Hub

A steadily growing ecosystem
Phoenix Contact | Janitza | WAGO | Hausheld | SPIE AG | EnerVance | Greenbird | Microsoft | rku.it | PPC | SGS …

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The efficient operation of future intelligent distribution grids will be characterized by handling large volumes of data, dealing with volatility on the consumer and producer sides, and administering a massive technology increase in the field. VEP is an effective tool for this challenge.
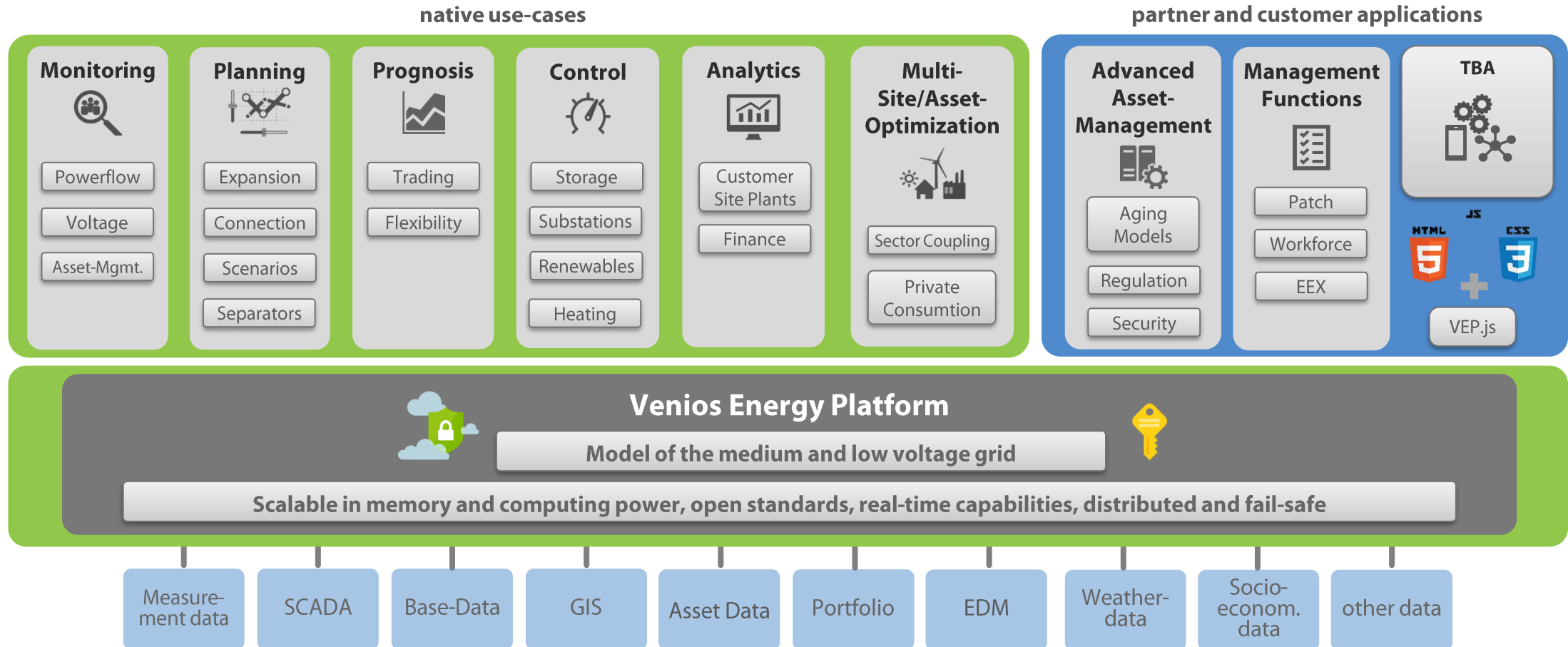
What ist special about VEP?

... creates transparency in the low and medium voltage grid

... represents load flow and asset load in real time

... locates bottlenecks and flexibility

... can actively manage flexibility (across sectors)

... automates network planning processes

... predicts energy demand in the network of the future

... picks up as much information as you like

... passes on information based on rules to third-party systems

... enables the administration of intelligent networks

... consistently supports Microsoft cloud technology

... for the massive parallel processing of large data
    volumes

... offers Venios standard use cases

... offers open space for third-party use cases

Why is that good?

... creates a live view of low and medium voltage grids
    below classic SCADA systems

... captures measurement data from intelligent assets and
    other intelligent sensors in the grid

... predicts future grid load (short / long-term)

... enables flexibility and congestion management in low and medium
    voltage grids

... targeted use of flexibility for grid-related purposes

... Provision / notification of flexibility according to NaBeG_2

... security in future switching operations in the context of
    maintenance and refurbishment through pre-simulation

... relieving the area of grid planning (process costs)

... relief in balancing of loads (cost reduction)

... relief through targeted / avoided grid expansion

Venios Energy Platform – digital – transparent – optimizing – enabling value

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Venios Energy Platform (VEP) unites applications of many vendors for many use-cases and scenarios.

native use-cases

Monitoring
- Powerflow
- Voltage
- Asset-Mgmt.

Planning
- Expansion
- Connection
- Scenarios
- Separators

Prognosis
- Trading
- Flexibility

Control
- Storage
- Substations
- Renewables
- Heating

Analytics
- Customer Site Plants
- Finance

Multi-Site/Asset-Optimization
- Sector Coupling
- Private Consumtion

partner and customer applications

Advanced Asset-Management
- Aging Models
- Regulation
- Security

Management Functions
- Patch
- Workforce
- EEX

TBA
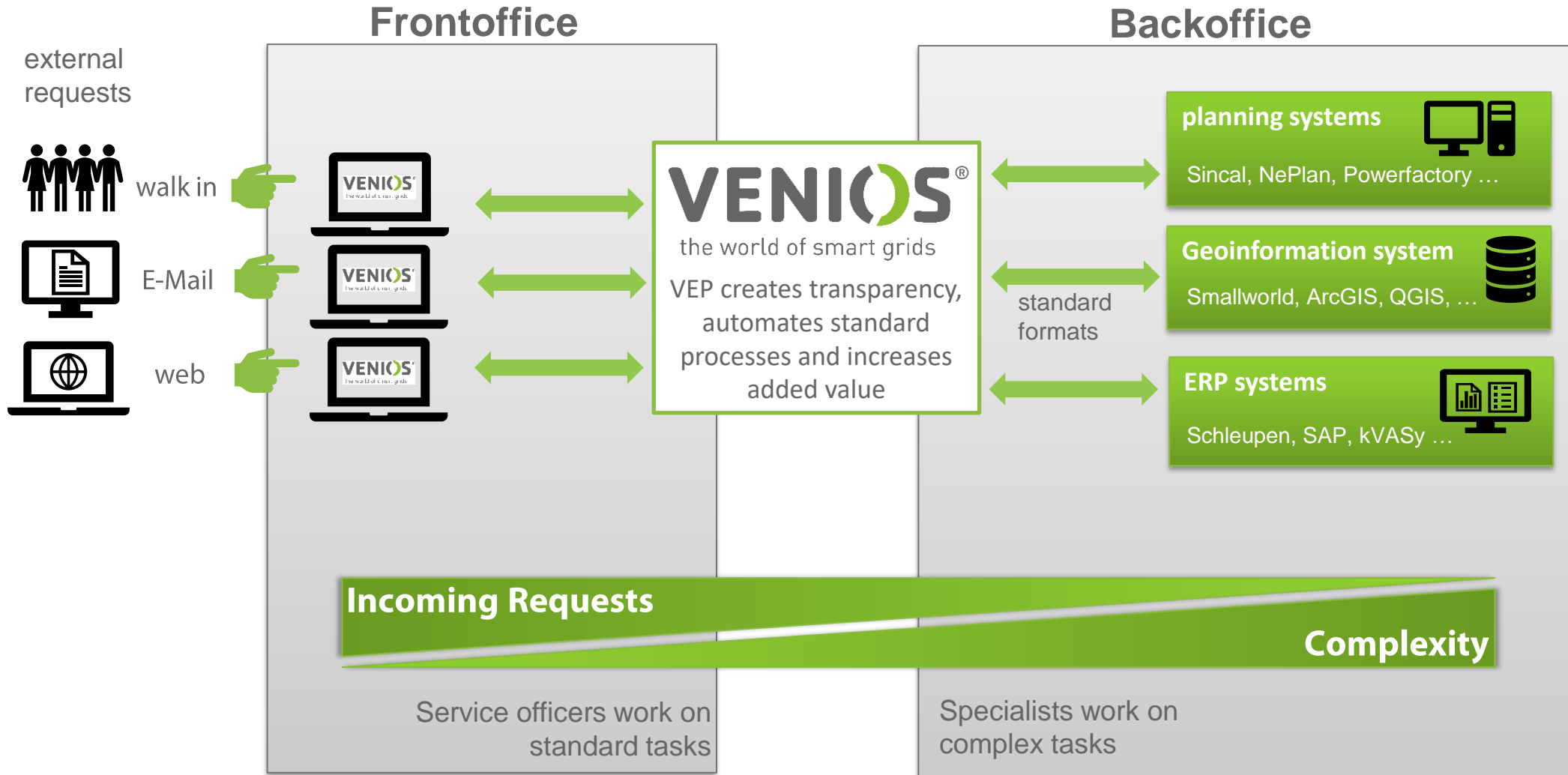HTML JS CSS
+
VEP.js

Venios Energy Platform

Model of the medium and low voltage grid

Scalable in memory and computing power, open standards, real-time capabilities, distributed and fail-safe

| Measure-ment data | SCADA | Base-Data | GIS | Asset Data | Portfolio | EDM | Weather-data | Socio-econom. data | other data |

The Realization of Venios Energy Platform

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Native Use-Cases

Partner and Customer Applications

PHŒNIX CONTACT	SPIE	PPC Power Plus Communications	IBM	ewz smart grid solutions	innogy	more to follow…
Intelligent Substations	Maintenance	Powerquality	Workforce Management	Topology Estimation	Charging Prognosis	….
IoT – Based Street Lighting	Predictive Maintenance	Broadband-Power-Line	Asset Aging Modelling	Local Asset Control		
Battery-Management	Intelligent grid plannng					

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Model of the medium and low voltage grid

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Aggregators	Measurement Data	SCADA	GIS	Asset Data	EDM	Grid Calc	Weather-Data

robotron datenbank-software
a-eberle
hausheld vernetzt intelligent

PHŒNIX CONTACT
PPC Power Plus Communications
WAGO
Janitza®

ids
BTC
PSI

esri
caigos
GE Smallworld

schleupen
SAP
robotron datenbank-software
SIV AG
KISTERS
NEUTRASOFT Wilken Neutrasoft GmbH
Soptim

NEPLAN Smarter Tools
FGH
DIGSILENT
PSS®SINCAL

meteomatics
Socio-oeconom. Data
NEXIGA

dynamic data

base data

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VEP integrates into existing customer software infrastructure, synchronizes between systems and allows efficient processes.

Frontoffice

Backoffice

external requests

walk in

E-Mail

web

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VEP creates transparency, automates standard processes and increases added value

standard formats

planning systems

Sincal, NePlan, Powerfactory …

Geoinformation system

Smallworld, ArcGIS, QGIS, …

ERP systems

Schleupen, SAP, kVASy …

Incoming Requests

Complexity

Service officers work on standard tasks

Specialists work on complex tasks

VEP makes your smart grid transparent and gives you tools to analyze and optimize!

VEP quickly provides clarity as to whether a switching action generates current or voltage bottlenecks in the distribution network.
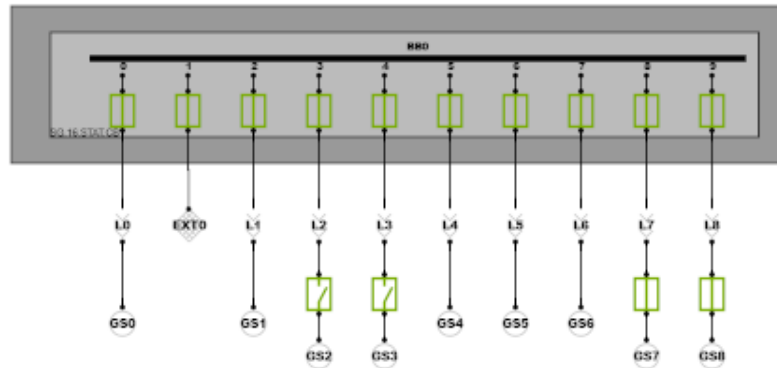
How does a specific switching action affect the network?

VEP determines the load for each resource:
- Electricity
- Voltage
- Apparent power (active and reactive power)

Result
- Test report with bottleneck problems
- Visualization of voltage and current bottlenecks in the map view

VEP determines the grid resources that represent a grid bottleneck with a high degree of penetration of PV systems, storage and charging stations.
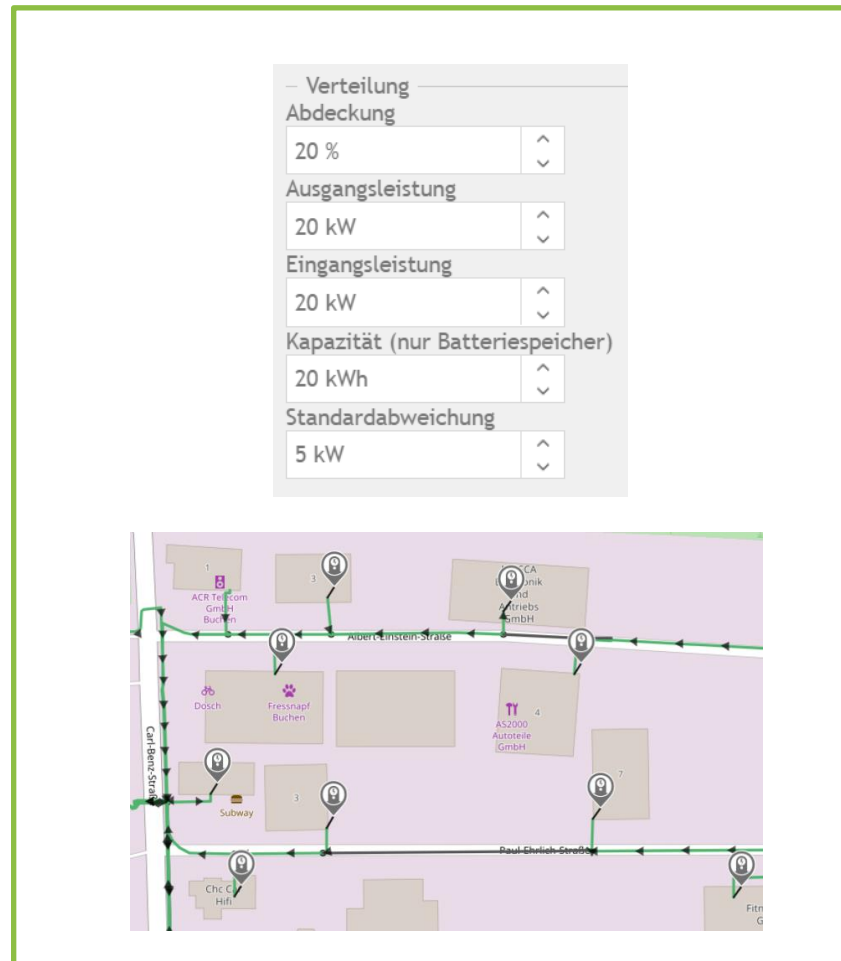
**How does the network behave with a future penetration of X %?**

VEP distributes the following plants in the distribution network by default or at random, simulates the usage behaviour and identifies bottlenecks.
- PV systems
- PV systems with battery storage
- charging points

Result
- Test report with bottleneck problems
- Visualization of voltage and current bottlenecks in the map view

Flexibility management and e-mobility

VEP uses the flexibility of controllable consumers and feeders to improve grid stability and reduce grid expansion needs.
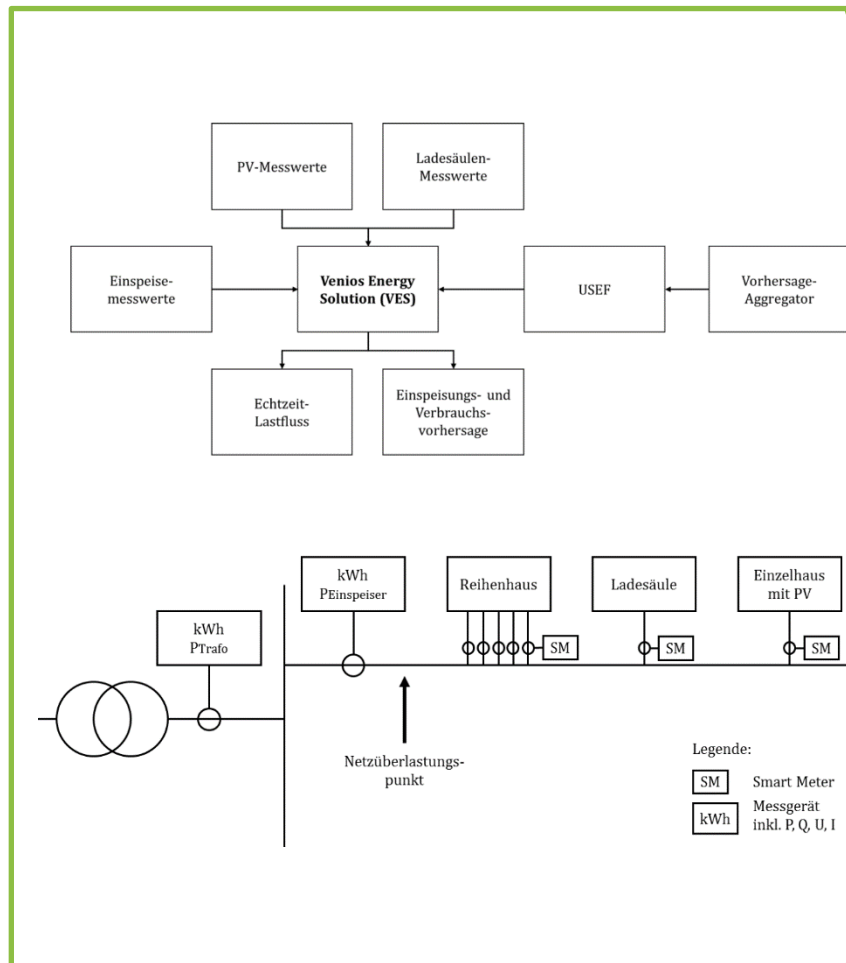
VEP combined for network security analysis
- measurement data
- Load and production forecasts
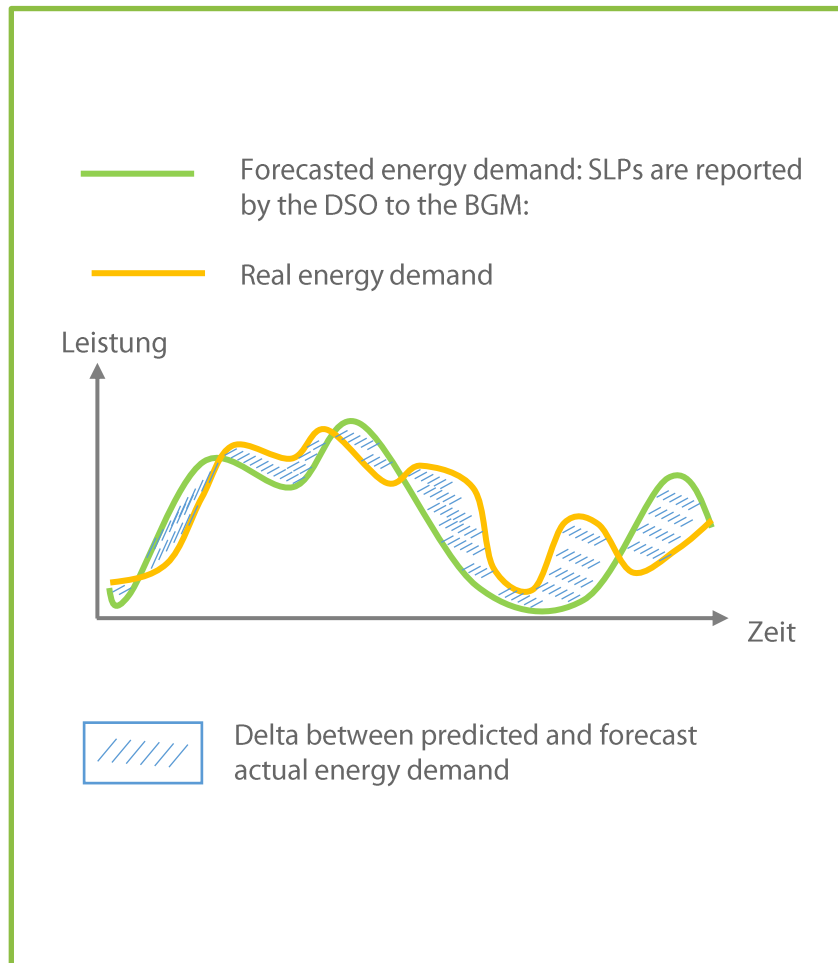- Models and network information

VEP determines
- Specifications for flexibility
- makes them available to the DSO

VEP unterstützt
- USEF Universal Smart Energy Framework.
- Control of the charging infrastructure
- Communication via SMGWs

VEP provides a more accurate forecast based on neural networks. This results in annual cost savings that are recognized in the balance sheet.

Forecasted energy demand: SLPs are reported by the DSO to the BGM:

Real energy demand

Leistung

Zeit

Delta between predicted and forecast actual energy demand

Problem: Distributor delivers SLPs to Balancing Group Manager (BGM)

→ Cost of balancing the delta between SLPs and actual energy consumption through balancing energy and intraday trading
Lösung:

VEP predicts expected energy demand through optimized models
→ smaller Delta