

ENERGY manager

Newspaper for energy suppliers



Keeping an eye on network status, impending bottlenecks and options for action with smart control systems

Resilience in the Gas Grid Infrastructure

Product report

Grid-based energy transport for sustainable and efficient energy supply

Hydrogen: Energy Supplier and Bridging Element

Product report

New release 2021/1 and upgrade-as-a-service for application software
Innovative and Safe in Gas Dispatching

News

Zugerland transport companies successfully test charging management
Cloud-based Control of Charging Processes

EDITORIAL

Dear Reader,

With the new German government, energy, climate and environmental issues are moving even more into the political spotlight. Even so, the tough wrangling at the COP26 climate conference in Glasgow shows how explosive it still is to agree on joint and imperative measures for CO₂ and methane reduction.

Against this backdrop, utilities must ensure security of supply while also responding to increasing risks due to cyberattacks or geopolitical conflicts. Gas network operators in particular face the challenge of further improving the resilience of energy systems and, in parallel, successively converting the natural gas infrastructure from natural gas to climate-friendly



gases. Advanced industrial engineering for gas transport as well as pipeline operations can make the transition a success. If network data is made available in an automated and decision-oriented manner and pipeline transport is intelligently controlled with the help of proven artificial intelligence methods, network operators will be able to successfully meet the

immense and unexpected challenges of the coming years and respond to them quickly and reliably.

Our smart grid control systems not only make an important contribution to security of supply, but also allow grid operators to demonstrably make their contribution to achieving climate neutrality by 2050. You can find out more about this in our cover story and in other exciting articles.

We hope you enjoy reading the current issue.

Kind regards,

Dr. Simone Bauer Reinhard Bösel
Business Unit Management
PSI Gas Grids and Pipelines

CONTENTS

TITLE STORY

Resilience in the gas grid infrastructure 3

NEWS

PSI Polska supplies SCADA-based control system to Aquanet S.A. in Poznań in Poland 7

PSI supplies assistance system to transmission system operator TransnetBW 10

Zugerland transport companies successfully test charging management 11

Modular training concept conveys learning content in the best possible way 14

Webcasts: Infrastructure versus energy supply network 14

PSI strengthens strategic product development 15

PSI honored for top climate commitment 19

PRODUCT REPORTS

Hydrogen: energy supplier and bridging element 6

New Release 2021/1 and Upgrade-as-a-Service 8

RESEARCH AND DEVELOPMENT

MathEnergy—Simulation of energy grids 9

IDiNA—Intelligent digitalization of the energy supply 16

Integrated platform for peer-to-peer energy trading and active grid management (PEAK) 18

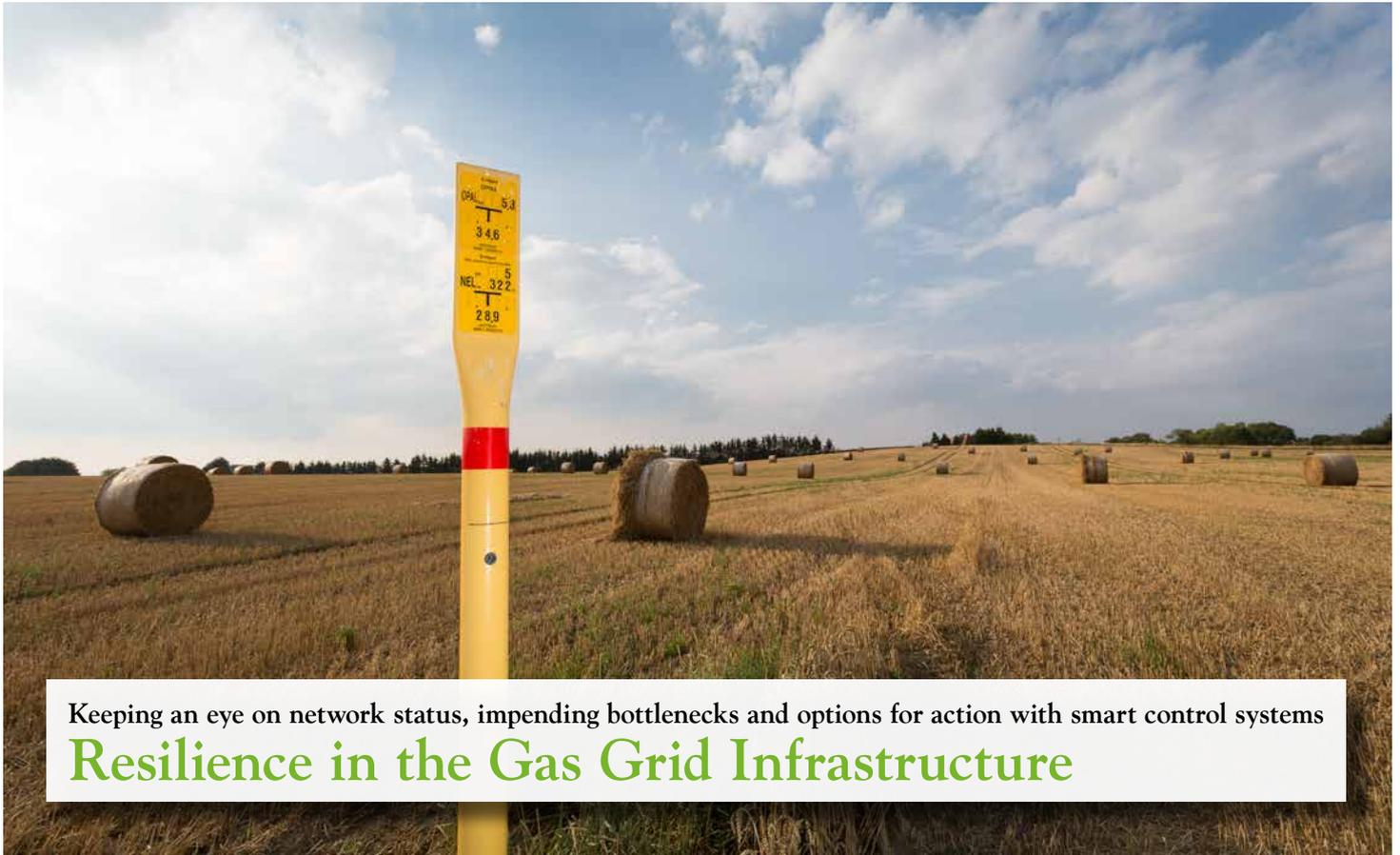
EVENTS

Review of PSIcommand User Group 2021 12

PSI presented smart energy solutions at Enlit Europe ... 13

Review of PSIprins customer advisory board and user meeting 17

Events 19



Keeping an eye on network status, impending bottlenecks and options for action with smart control systems

Resilience in the Gas Grid Infrastructure

Germany's electricity and gas transmission and distribution infrastructure is exceptionally robust. Most disruptive events can be handled without causing significant supply disruptions. But the global coronavirus pandemic, devastating floods and increasing cyber-attacks show us our vulnerability. Despite high levels of precautionary investment, unforeseen events and threats unsettle us. To ensure the necessary resilience of the power system, data is increasingly automated and provided in a decision-oriented manner. Malfunctions can thus often already be detected before they hit.

But how can operators of critical infrastructures react quickly and safely in exceptional situations? What do control systems have to do today so that utilities can handle area-wide crises with confidence in the future?

Control systems are the technical heart of energy systems

Disruptions to the energy infrastructure, for example due to terrorist at-

tacks on storage facilities and networks or even line disconnections, as well as leaks due to landslides during natural disasters, are often unpredictable. PSI control systems, as the technical heart of power systems, enable the development and integration of crisis response functions as needed. Crisis response functions should provide a high degree of safety in critical situations. To achieve this, they must be easy and safe to operate—especially under stress.

Comparable to the distress call on ships: the red distress button can be used to request help in an emergency and to initiate the rescue operation via a proven response chain. In the event of a crisis, the focus is thus on automated alerting and information provision as well as fast and secure decision support.

Digitized energy networks enable high-quality situational awareness

Our energy systems are increasingly becoming highly complex, distributed technical systems: large-scale power plants are being replaced by a variety of renewable energy sources. In order to ensure a stable and affordable energy supply even in the face of volatile feed-ins and seasonal fluctuations, the interaction between electricity and gas networks is continu-

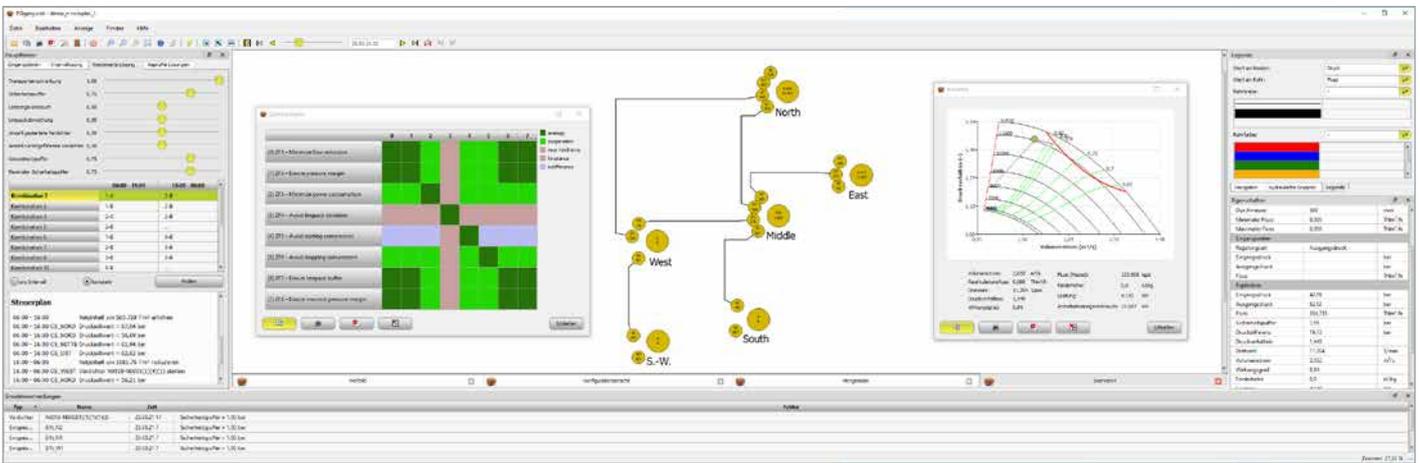
ously increasing. A prerequisite for this is the digitalization of energy networks and continuous monitoring of as many operating resources as possible. Malfunctions can thus often be detected already before they happen. However, due to the complexity, disruptions cannot be completely prevented. Therefore, the energy system must be designed in such a way that any disruptions that occur do not have serious consequences.

comprehensive and precise information for the smooth and permanent operation of the gas infrastructure for network operators. This includes network condition and process data as well as forecast data for different scenarios.

The Gas Grids and Pipelines business unit has launched an innovation offensive to provide even better software support for improving the resilience of critical gas network infrastructure

core competence for this is provided by the optimization tool Qualicision, which couples fuzzy set-based target variables with target conflict analysis. Dispatchers thus obtain a more comprehensive picture of possible courses of action.

The simulation PSIGanesi, originally developed at the Technical University of Munich and permanently enhanced by PSI, is used for highly precise simulations of flows in gas



PSIGasguide with Qualicision.

Depending on the scale of the crisis or the severity of the emergency, there may still be room to maneuver, and experienced dispatchers may be able to take advantage. However, the more widespread a disruption becomes, the more difficult it becomes to keep track of potential collateral damage from individual decisions. In order to be able to bring the power system quickly and safely into a stable state in an exceptional situation, a complete situation picture of the current network status, impending bottlenecks and possible options for action is required.

PSI stands for powerful support in network management, network simulation, forecasting and transport management. PSI applications provide

and to adapt it to increasing complexity. The existing product portfolio is to be expanded to include AI-based security solutions. The aim is to provide powerful and intelligent tools for analysis, forecasting and decision support in real-time operations to further strengthen the resilience of the gas infrastructure.

Complex network state situations are analyzed and evaluated using powerful AI-based algorithms. A first result is the software solution PSIGasguide, which combines simulation (PSIGanesi) and compressor optimization (PSIGanopt) with established AI-based models for decision-making. A special feature here is that the focus is on decision support with regard to several target variables. The

transport networks and gas distribution networks. This offers users the possibility to plan gas network conditions in advance. It is also successfully used for leak detection and leak location.

In the event of a crisis or disaster, crisis management is supported by the provision of a reliable status assessment and possible options for action to maintain or quickly restore supply security. Response times in crisis situations are thus to be significantly shortened and cascade effects minimized.

Anomaly detection, condition assessment and decision support

The basis for action recommendations is provided by the data collected by

the PSI control system. These data are transferred into a network condition model in which each network condition is qualitatively evaluated and deviations from a safe network condition are reliably detected.

Measures to eliminate the deviations are mapped in an action model in the form of switching and set-point specifications. The dispatcher's empirical knowledge is persisted in the action model. The knowledge of experienced dispatchers is standardized and processed for the evaluation of exceptionally critical situations (network condition model) and control measures based on this (action model). These form the "ground truth data" for the AI. The network state and the actions performed are thus coupled: the situation and the actions performed are continuously evaluated.

Powerful training systems for dispatchers

In the development of the AI-based security solution, PSI focuses on strengthening trust in the AI algorithms and in the traceability of the procedures and learning effects used. To this end, simple controls are provided through which users can influence the prioritization of different criteria. In addition, a goal-relationship matrix is disclosed, through which mutual effects can be identified. On this basis, powerful training systems for dispatchers can be built and resilience KPIs for attack strategies can be obtained and provided from adversarial learning.

The teaching of the security solution by experienced users is an integral part of the solution approach. The transferability of the solutions to other critical infrastructures for elec-

Resilience

is the ability of a system to maintain its ability to function under stress or to restore it in the short term. Resilience goes beyond the property of robustness. A resilient energy system remains functional even in the event of disruptions, and disruptions are quickly remedied.

Situation

provides an up-to-date picture of the energy system in real time. Data on connected resources in all affected energy and structural sectors and on the network status are analyzed automatically. Situation images for the energy supply provide reliable information

- for the respective sectors of electricity, gas, water
- for energetic and structural sector coupling, i.e. the connection between the networks
- for structural sector coupling, i.e. the connection between the energy sectors with the consumption sectors for household, trade, industry and transport

Ground-truth data

are the learning data or also the "basic knowledge". In our case, they include the knowledge of the dispatchers and the complex dependencies between fluid mechanical and thermodynamic parameters, mathematical modeling and legal requirements for controlling the power system mapped in the control system software. The quality of the learning data is crucial for the success of the AI algorithms used.

Adversarial learning

is a deep learning technique that uses two neural networks for this purpose. One neural network is used as a "generator" and supports the generation of new data instances. The other neural network acts as a "discriminator" and evaluates the data for authenticity. Both networks learn with each other in a double feedback loop.

tricity, water and heat and their connection to a uniform overall system is an architectural principle of the selected solution.

Conclusion

Operators of critical infrastructures must react quickly and safely, especially in exceptional situations. A comprehensive picture of the situation across all affected energy and structural sectors is just as import-

ant as fast and secure access to experiential knowledge. The expansion of the PSI product suite with the AI-based security solution supports our customers in further strengthening the resilience of the gas infrastructure. 

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News: Grid-based energy transport for sustainable and efficient energy supply

Hydrogen: Energy Supplier and Bridging Element

For the efficient use of renewable energies, industry relies on the existing and well-developed gas infrastructure. This can absorb, store and transport large quantities of renewable energy in the form of gases in a wide variety of compositions. With intelligent software solutions, PSI provides effective impulses and supports the conversion to a hydrogen-based energy system.

Hydrogen is a proven raw material for the chemical and steel industries and is also increasingly valued as a fuel, especially for heavy-duty transport. A key reason for this is that hydrogen can be produced both from renewably generated electricity and from proven energy sources such as natural gas, and can be transported and stored very cost-effectively via the well-developed gas network.

Hydrogen is particularly important as a bridging element between the energy sectors. Regeneratively generated elec-

tricity, also allows ground storage facilities, also allows large-volume hydrogen feeds. In addition, demand-driven gas supply can be controlled very well by using the flexibility for storage and gas composition in the gas network. The gas infrastructure itself can be operated in a very energy-efficient manner and networks and storage facilities can be used in a market-oriented manner.

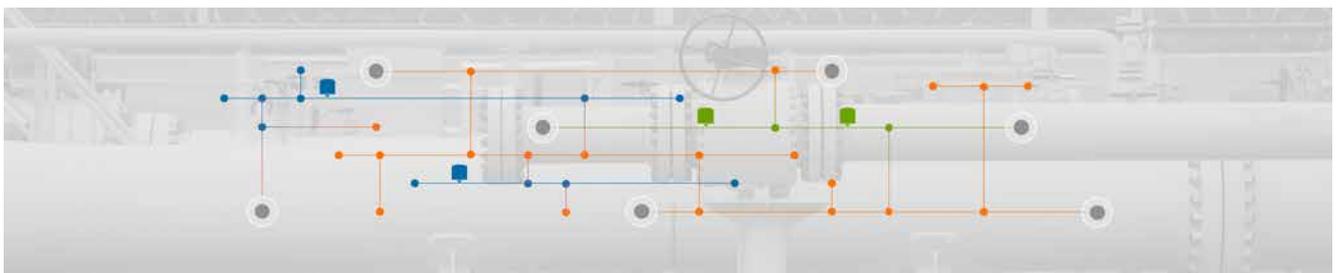
New functionalities support expansion

To allow network operators to fully incorporate the strengths of the gas

network, fluctuating feed-in quantities of different gas qualities are simulated. Using steady-state optimization calculation, optimal process parameters are determined and verified for each scenario.

Optimal monitoring of hydrogen admixtures

Topologies for existing gas networks are imported with associated instrumentation, background maps and address information. Different gas compositions, including hydrogen admixture up to 100 percent, can be tracked and their energy at entry and exit points output based on calorific value. Compatibility requirements and evaluated compatibility states for hydrogen and biogas compatibility can be visualized for valves, control-



Optimally plan, monitor and control transport pipelines and gas networks.

tricity can be converted into hydrogen. The gas grid's ability to safely transport, store and distribute gases in a wide range of qualities makes it possible to dimension electrolyzers in such a way that the gas grid is operated in grid-serving mode for the electricity grid.

Gas networks offer high storage capacities

The high storage capacity of the gas network, with its large, mostly under-

grounded network infrastructure into the reorganization of the energy system, PSI is specifically expanding its proven product portfolio for grid-based energy transport. New functionalities support the expansion of the hydrogen transport and distribution network infrastructure.

In order to support feasibility studies in particular, changes in gas composition with fluctuating feed-in and feed-out quantities as well as con-

ditions, and warning limits can be parameterized if specified hydrogen concentrations are exceeded at network points.

In order to adapt the required drive power of the compressors to the necessary performance and capacity requirements according to the respective hydrogen admixtures, the compressor maps can be structured according to the hydrogen admixture.



Software supports the transformation to a hydrogen-based energy system.

The injection and admixture of hydrogen into the existing network infrastructure also leads to significant changes in the local calorific values. PSI's software solutions are used to calculate the energy contents for

high, medium and low pressure network areas for billing purposes. For all simulation and optimization calculations, the consideration of the fluid mechanical and thermodynamic parameters corresponding

to the hydrogen admixtures is ensured. ☉

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News: PSI Polska supplies SCADA-based control system to Aquanet S.A. in Poznań in Poland

PSIscada Controls Wastewater System

Aquanet S.A., one of the leading Polish companies for water supply and wastewater management, has commissioned PSI Polska Sp. z o.o. with the implementation of the SCADA-based control system PSIscada for the control of the wastewater system in Poznań.

In addition to the implementation of the new system, PSI Polska will plan the introduction of the software and necessary hardware for the water treatment station in Wiśniowa Street in Poznań and in the central wastewater treatment plant in Koziegłowy, as well as their rollout to other areas of the Poznań wastewater system.

As part of its corporate strategy, Aquanet intends to use the investment to build a state-of-the-art centralized technology platform that



will oversee the remote monitoring, control and management of the infrastructure. This includes pumping stations, with and without solids separation, wastewater separation and metering stations, rain gauges, storm overflow units, siphons and traps, and wastewater collection stations.

In a public tender process, the system based on the PSI platform was selected due to its high configurability

and flexibility, among other things through the modern PSI click design technology. The new system will control the infrastructure in Poznań and the surrounding municipalities and is to be introduced within the next two years.

Aquanet S.A. is one of the leading Polish water supply and wastewater management companies and the largest company in Poland offering reception, treatment and supply of cold water as well as collection and treatment of waste and water and wastewater management. ☉

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Product report: New release 2021/1 and Upgrade-as-a-Service for application software

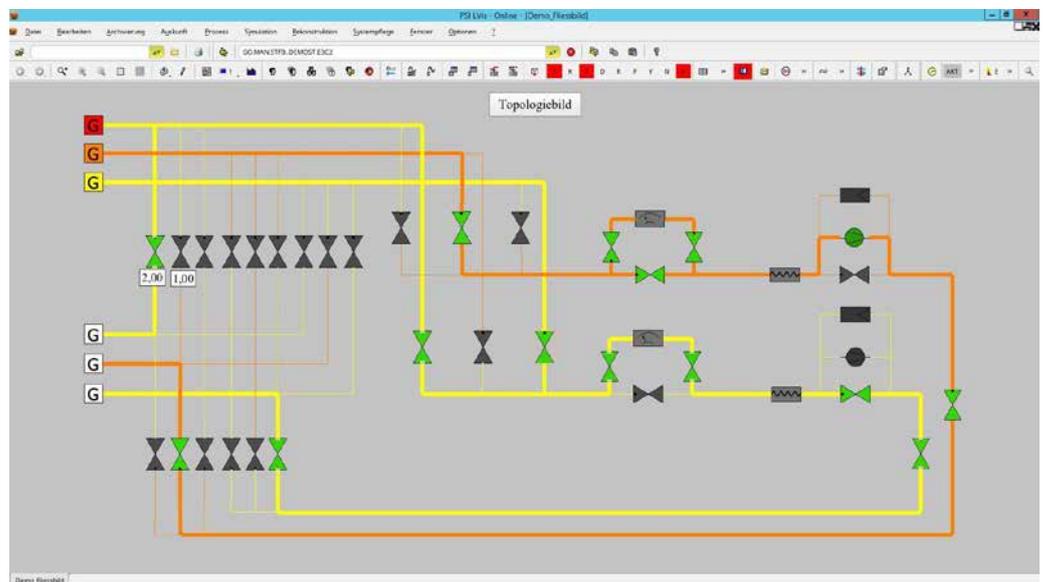
Innovative and Safe in Gas Dispatching

The PSI Gas Grids and Pipelines business unit is providing customers with a new release for the products PSIcontrol, PSItransport, PSiganesi, PSIcomcentre and PSIreporting at least once a year. The focus is on the continuous development of IT security features to protect investments in the energy infrastructure. Via the “Upgrade-as-a-Service” service for application software, all customers can also benefit from the new and improved features for dispatching.

requirements for the next releases, but also dependencies such as:

- Life Cycle Support Matrix, showing dependencies on third-party software components.
- TÜV approvals for billing-relevant products for which demon-

As part of the upgrade service, users can actively participate in the further development of the product. In specialist working groups, experience is exchanged, suggestions for improvement are evaluated, and requirements for new releases are coordinated. Costs for specific new developments can thus be borne jointly. The roadmaps resulting from the user groups take into account not only customer re-



Enhanced flow diagram in SCADA plant images.

Highlights in the Release 2021/01

- Support for SUSE Enterprise Linux Server 15
- Template technology for transport contracts: Defined templates can be used to create new contracts. Parameterization becomes more efficient and less error-prone. In addition, the import of new contracts via templates is supported.
- Aggregation of free variables: Free variables can be aggregated directly for balancing purposes. The effort required to create and maintain corresponding M42 scripts is eliminated.
- Improvements to the dispatching functions initiated by the PSI user group:
 - LVIs on the Web: Use of the GP Suite via supported web browsers
 - Monitoring: definition of ad-hoc curves
 - SCADA plant diagrams: Enhancements for flow diagrams
 - OPC UA-enabled clients

stably stable computing cores are required.

- Activities for the changeover to the powerful Java-based PSI platform, via which competencies for efficient product development are further bundled and a high level of IT security is offered.

Outlook

The content of the new Release 2022/01 is already being planned in the working groups and will be available to all interested customers once it has been released. 🌱

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R&D: MathEnergy—Key mathematical technologies for energy networks in transition

Simulation of Energy Grids

PSI has successfully completed the MathEnergy (Mathematical Key Technologies for Energy Networks in Transition) joint project funded by the German Federal Ministry for Economic Affairs and Energy (Bundesministerium für Wirtschaft und Energie, BMWi). In a consortium of engineers, natural scientists and mathematicians, cross-grid models and model-based algorithms for mapping a coupled gas and electricity grid in Germany were researched at all levels.

The mathematical modeling of the communication between grid levels and energy sectors is the basis for the cross-sector data and model exchange and the higher-level monitoring and control tasks based on it.

The modeling approaches further developed in this project enable a targeted exploitation of the strengths of



Math
Energy

It could be demonstrated that the experience gained from mathematical modeling of natural gas networks can be used and further developed for new utilization concepts. In addition, the overall energy balance of cou-

Mathematical modeling of coupled networks, especially considering virtual flywheels, a large number of coupling points, and dynamic feeders and feeders, is becoming increasingly challenging and complex. Model reduction can make an important contribution to mastering this complexity while ensuring sufficient accuracy. In particular for plant control and for operational security in coupled grids, further investigations are necessary to provide for crises and to avoid cascading effects.

Grid stability and security of supply The integration of the further developed mathematical principles into PSI's software products are an import-



Energy grids in transition.

the energy sectors electricity and gas as well as coordinated coupling possibilities.

Key statements on the future viability of networks

The gas infrastructure can be further utilized and converted from natural gas to new utilization concepts.

pled networks can be relevantly increased by coordinated network operation modes.

The greatest economic application potential results from a grid-serving operation of the gas grids for the power grid. This can avoid high investments in the expansion of the power grid and in battery storage systems.

ant building block for strengthening grid stability and thus security of supply, also taking into account the substitution of conventional power plants by renewable energy sources. ☺

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News: PSI supplies assistance system to transmission system operator TransnetBW

Dynamic Network Security Calculation

The transmission system operator TransnetBW GmbH has commissioned PSI with the delivery of a new system for the “Dynamic Network Security Calculation in Operational System Management” (DSIRE). The new software solution will be developed on the basis of the products PSIPassage and PSIneplan V10.

The modular network analysis system PSIneplan V10 enables both the analysis of steady-state network security with the help of load flow and outage variant calculations, as well as the investigation of dynamic processes in the network. For the evaluation of dynamic stability, the modules voltage stability and small signal stability are available in addition to the transient stability analysis.

PSIPassage specializes in energy data management and the associated communication processes. The

Java-based PSIPassage systems are already used by a large number of network operators, including for the KWEP, GLDPM, SOGL and MaBiS processes.

Solution supports in decision-making

The combined system solution DSIRE will support TransnetBW as a critical assistance system for maintaining system security to monitor dynamic stability in both real-time operations and operational planning. DSIRE supports system managers and the op-

erations planner in decision-making within the framework of the effectiveness check of corrective measures and thus makes an important contribution to being able to continue to operate the transmission network safely within the specified limits in the event of an increase in the utilization of the existing network infrastructure.

With around 1000 employees, TransnetBW GmbH operates the electricity transmission grid in Baden-Württemberg and thus secures the power supply in Germany and in Europe. ☉

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Overhead line power pole in extra high voltage network.

News: Zugerland transport companies successfully test charging management

Cloud-based Control of Charging Processes

The Swiss Zugerland Verkehrsbetriebe AG (ZVB) has successfully tested the first active charging management system at its depot in Zug. The foundation is the cloud-based and autonomous system PSIngo (Intelligent Grid Operator) from the PSI GridConnect GmbH for the flexible control of charging processes. The ZVB fleet is to comprise twelve e-buses by the end of 2022 and the line operation should be CO₂-neutral by 2035.

As part of the project, PSIngo as a charging manager demonstrates how established solutions from the energy industry can be adapted and new use cases can provide specific requirements. The focus is on optimizing charging processes while taking existing power distribution and area network structures into account. In line with the successive electrification strategy, the PSI system can be used cost-efficiently right from the

start. In particular, the exploitation of flexibilities for efficient use of the charging infrastructure while ensuring depot operations is one of the greatest challenges for successively converted depots. This is defined by the existing energy infrastructure and the grid connection provided by the upstream grid operator.

In addition to years of experience in the analysis and digitalization of electrical supply and area networks, PSI offers a comprehensive concept for

the efficient and simplistic electrification of public transport. With modular and flexible software products, customers benefit from a unique and specific solution.

Zugerland Verkehrsbetriebe AG is a transport company based in Zug in Switzerland. With 400 employees, ZVB operates around 120 buses, of which four are currently E-normal buses. In 2022, eight E-articulated buses will be added. On a normal working day, ZVB transports an average of 65 000 passengers in the canton of Zug and the surrounding areas. 🌱

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E-bus in operation at Zugerland Verkehrsbetriebe AG.

Event: PSIconmand User Group Meeting 2021 took place for the first time again on site

AI-based Networking of Operational Processes

At the PSIconmand User Group Meeting from September 29–30, 2021, customers finally had the opportunity to find out live in Aschaffenburg about the innovations in the PSIconmand 4.0 Field Force Management System and the roadmap for future releases. The enthusiasm was clearly felt by all. In many interesting conversations and exciting discussions as well as presentations, the participants were able to exchange directly.

Taking into account the fact that operational processes at network operators have to interact much more strongly, these should ideally be coupled in the future—despite different responsibilities. This includes the areas of switching management, construction and maintenance, fault clearance management and asset management as well as mobile network management.

AI in productive use at customer site

PSIconmand 4.0, as an intelligent Field Force Management System, forms the basis for optimized, AI-sup-



The participants in front of the PSI headquarters in Aschaffenburg.

ported capacity planning as well as maintenance and fault management. To determine the best possible time, the AI technology PSIconmand is used, which is already integrated several times in the planning processes

of the customers. PSIconmand and PSIconmand have already been successfully used for years by several network operators.

In addition, the AI expert from PSI, Dr. Jonas Ostmeier and a representative from DB Services presented the

joint EOS project. As part of the user group's exchange of experiences, DB Services then reported from the customer's perspective on the problem, the framework conditions and the project requirements for the maintenance and upkeep of properties. The project shows that PSIconmand can successfully optimize the corresponding service units based on AI, not only in the energy sector but also in other industrial sectors.

Switching management supports redispatch requirements

The conference was rounded off by numerous other presentations, including the flexible adaptation of PSIconmand to customer processes and requirements using PSI Click Design. On the subject of switching management, the extensive support for generating and digitizing switching requests and for data provision was reported bearing in mind the current redispatch requirements.

The next meeting of the PSIconmand User Group is scheduled for the third quarter of 2022. 🌐

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Dynamic live presentations with appropriate distancing.

Event: PSI presented smart energy solutions at Enlit Europe

Integrating Electro Mobility into the Power Grid

At the Enlit Europe 2021 in Milan, PSI has presented intelligent software solutions from the areas of network control technology and maintenance as well as load and charging management and the network integration of electro mobility from 30 November to 2 December.

One focus was the depot and charging management system PSLebus, which maps, monitors and controls all processes related to the use of electric buses. This combines the depot management module with the charging management system PSImartcharging, considering the relevant influencing factors and dependencies for efficient charging and dispatching, thus ensuring

optimal availability of all vehicles. Furthermore, the solution PSIngo (Intelligent Grid Operator) for active network control of the low and medium voltage network as well as for charging and load management in public transport and for the network integration of electro mobility has been presented.

Another highlight was the proven network control system PSIcon

with new functionalities e.g. for operation via web and object browser as well as extended network fault processing for efficient network operation.

In addition, information were provided on the intelligent Field Force Management System PSIconmand, which forms the basis for optimized, AI-supported capacity planning as well as maintenance and fault management of the energy supply. 

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Customers and interested parties took the opportunity to find out about the latest developments directly and in person at the PSI booth.

News: Modular training concept conveys learning content in the best possible way

Qualified Employees Work More Effectively!

Training is an important part of the daily handling of software, enabling users to get to know the systems from the ground up. The modular training concept of PSI's Electrical Energy business unit is aimed specifically at customers who use the control systems PSIcontrol, PSIprins and the Field Force Management System PSIcommand.

With different training modules, the learning content can be adapted to the respective customer processes in the best possible way. The range of training courses includes scheduled courses for users and administra-

tors and covers the areas of operations management, reporting, system technology, SCADA, data preparation, process linking and project planning. All training courses take place across customers on an anonymous training system—partly online, partly in

Aschaffenburg or in Berlin. Customers can also book training tailored to their system. 

For an overview of the training courses, visit <https://on.psi.ee/Training>



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News: Infrastructure versus network of energy supply in the webcast

Integrating E-Mobility into the Grid

In November 2021, PSI launched a webcast series that provided information on the effects of e-mobility on the utility grid. At the same time, solutions were shown that already take the technical boundary conditions into account in advance.

**“Ready for zero emission”
Moving easily into the future
with the depot management
system**

In the first webcast, the complete solution PSIEbus for vehicle dispatching and charging management was presented: from the integration of different engine types, AI-based and automatic parking space and circulation planning to the connection

via a standardized interface to many years of successful use and practical testing.

**Load and charge management
systems—status quo and quo
vadis?**

The second webcast highlighted the future-proof path to charging e-fleets and showed how charging management supports operational processes

in practice. In focus: how energy suppliers must ensure the supply of the charging infrastructure.

**Disposing of e-buses safely and
efficiently**

To conclude the series, a selected customer reported on his experiences and challenges in introducing an e-bus fleet and the appropriate charging management system. 

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News: PSI strengthens strategic product development in the electrical energy business field

Bundled Synergies and Innovation Power

In the Electrical Energy business segment, Dr.-Ing. Andreas Kubis strengthens the Product Development Division, together with the long-standing Manager Andreas Scheurich. In addition, Dr. Kubis as Subsidiary Manager will continue to perform his previous function as Division Manager for Research & Development. The aim is to integrate the results of more than ten ongoing research projects even more quickly into product development.

Business Unit Manager Wolfgang Fischer explains: “PSI’s research and innovation projects have created a Europe-wide radiance and beyond innovation ecosystems with network operators, research institutions and other industrial partners. The secret of success lies in the focus on the actual challenges to be solved in grid operation with 100 percent renewable energies, which can only be achieved by pooling the partner’s expertise.

Product strategy in close coordination with customers

With the reinforcement by Dr. Kubis, we promote exactly this in order to de-



Dr.-Ing. Andreas Kubis.

fine and coordinate our product strategy even closer with our customers. This step is groundbreaking in order to adapt PSI products to the requirements of volatile, uncertain, com-

plex and ambiguous markets in a future-proof manner.”

Delivery of products and upgrades fully web-enabled from the cloud

In addition Dr. Harald Schrimpf, CEO of PSI Software AG emphasizes: “With the Java-based PSI platform, we have made our industry segment partner-ready, global and significantly more profitable. We deliver the products and upgrades fully web-enabled from the cloud to customers’ private clouds and on premise installations. Despite numerous special features such as high security and blackout risks, this will also be used for higher energy networks with our cloud low-voltage control systems and field force management system. We expect this will result in higher economies of scale for common features so that our 500 energy network customers can spend more of their budgets for their unique selling propositions and climate future tasks.”

Move to new offices in Dortmund Technology Park

At the beginning of October 2021, the R&D division moved into a modern and larger office in Emil-Figge-Strasse 88-90. The PSI Group has two more branches in Dortmund, PSI Logistics and PSI FLS Fuzzy Logic & Neuro Systems. 

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The new location in Dortmund at Emil-Figge-Strasse 88-90.

R&D: IDiNA—Intelligent digitalization of the energy supply

Validation Platform for Novel Applications

With six partners, PSI Software AG is participating in the research project IDiNA which is coordinated by the Otto von Guericke University Magdeburg. PSI will develop a validation platform for novel digitalization applications in network operations and test it as a cloud-based solution. This will enable research partners to validate their new research results with real data such as historical measured values and network states. PSI intends to develop and implement new Function-as-a-Service (FaaS) business models for PSI's customers and partners.

The research project "Intelligent Digitalization of Energy Supply to Optimize Grid Operations and Increase Acceptance (IDiNA)", launched on March 1, 2021 and funded by the 7th Energy Research Program of the BMWi, will promote the provision of information by end customers with the development of new business models. This is of great importance for the digitalization of the energy system and thus of the power supply as a critical infrastructure.



For the first time, IDiNA focuses on the concrete value of information,

which is based on the creation of benefits in existing and future processes of grid management, energy markets or in a change in consumer behavior of private individuals and companies.

The consortium consists of PSI Software AG, Otto von Guericke University Magdeburg (project coordinator), Brandenburg University of Technology Cottbus-Senftenberg, the research institution OFFIS e. V. as well as Stadtwerke Wunsiedel GmbH, Stadtwerk Hassfurt GmbH and Es-geht! Energiesysteme GmbH. IDiNA is funded under the funding code 03EI4024 in the 7th energy research program of the BMWi with approx. 2.4 million euros. 

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PSI at the E-world 2022 in Essen

The PSI Group will present integrated, highly available and economical software solutions as well as cloud-based applications for the energy industry at the E-world 2022 in Essen.



Events: Review of the PSIprins customer advisory board and the Thüga user meeting

Improved Services in the Network Control System

Approximately 100 municipal utilities, distribution network operators, infrastructure operators and industrial customers use the PSIprins control system to manage their electricity, gas, district heating and, in the industrial environment, their process energy networks. In its efforts to offer each customer the best product for its application, PSI is supported by the Customer Advisory Board and the Thüga users.

This year's PSIprins-Thüga user meeting took place in Neugattersleben on November 11–12, 2021.

The hosts from Erdgas Mittelsachsen, together with Thüga AG and PSI, had invited the Thüga companies to their home for two exciting days. The event met with keen interest from 26 participating customers from 15 different companies. In addition to the current topics from the utilities and PSI, the focus was on news about PSIprins Release 8 and the legal changes in the cyber security environment.

Both the positive and the constructive, critical feedback helps PSI to continuously adapt the processes and to further improve our service.

Exceptional praise for stability of grid control system

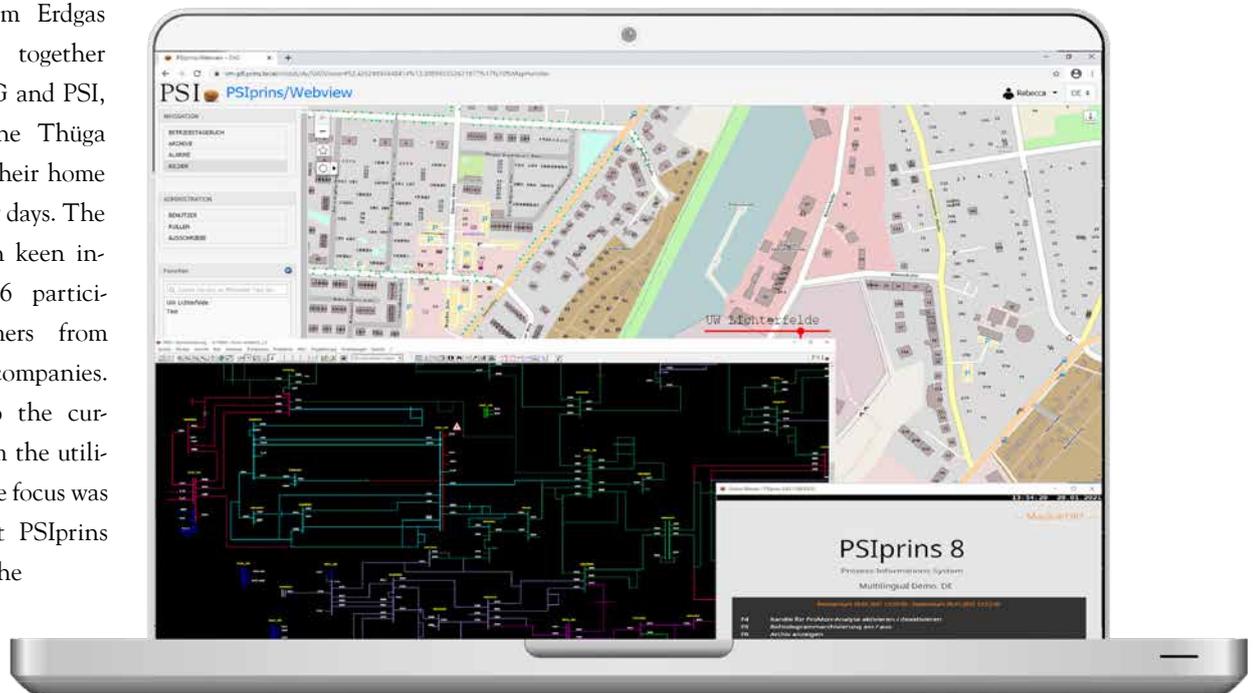
The PSIprins Customer Advisory Board was founded in 2008 and consists of different companies that form a representative cross-section of all PSIprins users. The last meet-

ing was held online on November 18–19, 2021 with the same agenda. The feedback from both dates is sim-

ilar. The stability of the PSIprins network control system is extremely praised. The range of functions is currently sufficient and large new requirements should rather be developed outside the control system, as it was the case recently with the topic of Resdispatch.

Today, more than 20 percent of PSIprins customers are already using the latest Release 8 and are thus very well equipped for the future. More new control system. The resulting PSIcontrolX will offer further functions as a successor system. PSIprins will be supported and further developed until all upgrades to PSIcontrolX have been carried out. 

PSIprins customers were also acquired in 2021. The product is being further developed on an ongoing basis. The focus is on integration with other PSI products, in particular PSIcommand for field force and switching management as well as PSIngo for grid transparency in low voltage. In parallel, PSI is working on merging PSIprins with the PSIcontrol



PSIprins 8 and Webview module in use.

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R&D: Integrated platform for peer-to-peer energy trading and active grid management (PEAK)

Optimized Integration of Prosumers

PSI has been awarded the contract for the PEAK research project. This is to ensure the optimized integration of prosumers, who act both as energy producers and consumers, as well as electricity customers based on one energy platform. The research project is funded by the German Federal Ministry for Economic Affairs and Energy (BMWi) and has a budget of 4 million euros.

The PEAK project will develop a prototype of an integrated platform for peer-to-peer (P2P) electricity trading and active grid management with market-based use of flexibilities (PEAK platform). Distributed ledger technology, better known as “blockchain” technology, is used to securely handle direct marketing via smart contracts. The growth of decentralized energy feed-in as well as the expansion of e-mobility and larger grid areas are given special consideration.

Secure handling of trading activities

Based on the distributed ledger technology to be used, access to the trading platform and trading activities will be digitally secured through the use of modern self-sovereign identity (SSI) technologies. Real-world testing

to obtain insights into statistical evaluations of their own electricity consumption, as well as the settlement of payments for the energy transfer provided.



Energy trading and network forecasting.

will take place in a field test within the campus network of the University of Wuppertal.

Software agents will play an important role in the project. Based on user preferences recorded via the app for electricity customers, they will enable automated participation in electricity trading, including the associated control of energy systems. In addition, the customer will be able to use the app

In-depth process knowledge and mature algorithms and methods

The PEAK project bundles the expertise of PSI and scientific and industrial partners into a unique competence cluster for the development of new processes and services. As one of the few providers, PSI has in-depth process knowledge and mature algorithms and methods for increasing the efficiency of energy use, both in the energy industry and in the area of smart grids. Furthermore, the research project contributes to an economical and environmentally compatible energy supply with a high level of supply security at the same time. 

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Peer-to-peer energy trading.

News: PSI reached third-highest score in the IT industry group

Climate Engagement 2021

In a study conducted for the first time by the magazine FOCUS and the sustainability initiative For Our Planet and published on November 6, 2021, the PSI Group was recognized as one of the German companies with top climate commitment. The award-winning companies were selected by FOCUS/For Our Planet together with research partner Fact-Field, Klimaschutz-Unternehmen e.V. and Prof. Dr. Stefan Schaltegger from the Centre for Sustainable Management (CSM) at Leuphana University Lüneburg.

To determine the top list, 42 000 companies located in Germany received an extensive online questionnaire in which the companies provided information on their previous climate commitment and its seriousness, the market impact and contribution of climate-friendly products, and climate targets. In addition to the online survey, public sources were analyzed for quality assurance in a multi-stage process.

Furthermore, a group of experts conducted a scientifically supported research to record information on the status of climate commitment and the main climate impacts of products and services. On this basis, a total of 88 companies were recognized for their top climate commitment, including five companies from the IT industry group, among which PSI achieved the third highest score.

Social responsibility and sustainability have been of particular importance to PSI in customer projects and its own processes since the company was founded in 1969. PSI supports the United Nations' sustainability goals and makes a significant contribution to the careful and sustainable use of energy and raw materials in the energy industry, production and transport sectors with advanced software products. Since 2011, PSI has reported emissions data to the Carbon Disclosure Project (CDP) and consistently pursues the goal of avoiding CO₂ emissions and supporting customers in achieving their emissions targets.

Link to FOCUS / "Our Planet" publication: www.focus-klimaschutz.de 

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The PSI blog features more interesting and in-depth articles on production, logistics, AI, energy and mobility.



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