

The background is a vibrant cityscape at sunset, with a mix of modern glass skyscrapers and older buildings. The sky is a gradient of orange, red, and purple. Overlaid on the scene are several digital graphics: a network diagram with glowing nodes and lines, a bar chart, a line graph, and a 3D wireframe model of a building. Light trails from traffic and city lights create a sense of motion and energy.

SIEMENS

Ingenuity for life

PSS®Portfolio – smarter tools for smarter grids

Mastering the challenges of changing energy systems

[siemens.com/pss-portfolio](https://www.siemens.com/pss-portfolio)



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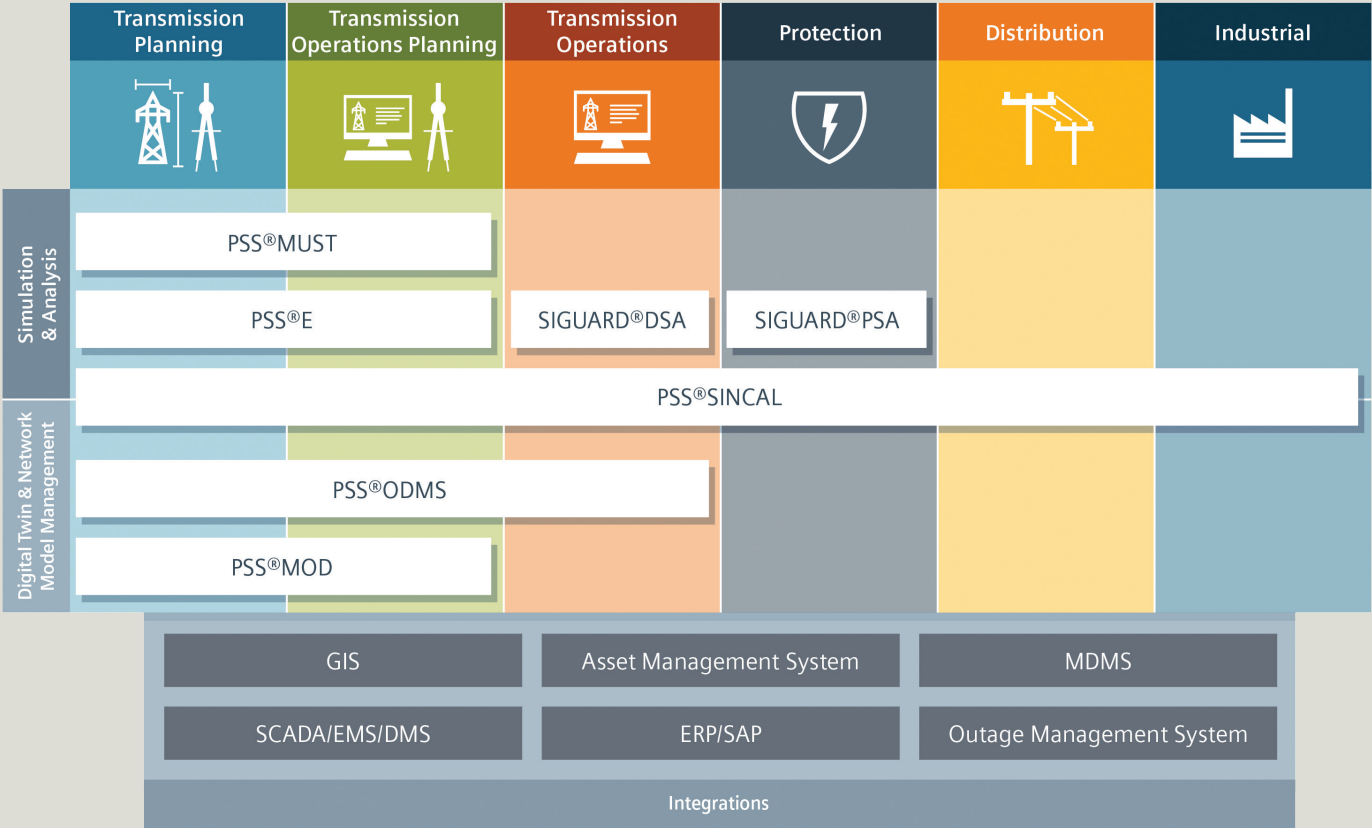
Introduction

Master the challenges of changing energy systems with the PSS® Portfolio

The utility industry is undergoing a transformation, and utilities need to adapt their business processes and tools in order to continue to achieve their objectives in a sustainable way. Trends such as distributed energy, renewables, and digitalization are influencing increasingly complex network models and regulatory requirements. Power system planners and operators require powerful, flexible and intuitive software tools to support their daily grid simulation, analysis, and modeling work.

The PSS® Portfolio provides power system engineers and operators with a trusted solution for simulating, analyzing, modeling, and creating digital twins of transmission, distribution, and industrial power systems as well as gas, water, heating, and cooling infrastructures. Users benefit from accurate and efficient power system analysis while catering to technical, regulatory, and economic industry requirements.

PSS® Portfolio – At a Glance



The PSS® Portfolio is comprised of seven powerful software solutions for power grid simulation and analysis and/or digital twin and network model management, each specializing in a different domain.

Readily integrated into any existing IT environment, these powerful and user-friendly tools feature an intuitive graphical user interface, customizable visualization options, automation capabilities, and efficient data management tools. The PSS® Portfolio enables users to exchange data with other systems – including, EMS, DMS, AMS, GIS, and other planning tools – provided through industry standards such as CIM and other native interfaces.

With the depth and breadth of the Siemens PTI PSS® Portfolio, customers benefit from both “all-in-one” as well as highly specialized tools.

PSS®E –high performance transmission planning and analysis software

PSS®E is a power system simulation and analysis tool for power transmission operations and planning. It is used in over 145 countries around the world by utility transmission planning and operations engineers, consultants, universities, and research labs. PSS®E allows users to perform a wide variety of analysis functions, including: power flow, dynamics, short circuit, contingency analysis, optimal power flow, voltage stability, transient stability simulation, and much more. PSS®E has achieved “industry standard” and offers the distinct advantage of being one of the leading power transmission simulation and analysis tools in the world.

PSS®SINCAL – simulation software for analysis and planning for all network types

PSS®SINCAL is a power system simulator for the planning, modeling, and analysis of all electrical power or pipe network types. It is used in over 90 countries around the world by transmission and distribution planning engineers, protection engineers, power system consultants, power quality engineers, power plant and industrial network operators, operations planning engineers, IT professionals, researchers, and more. It offers a comprehensive set of analysis functions, allowing users to simulate and study: power quality, frequency stability, distributed generation interconnection, protection coordination, restoration of supply, and economic driven design decisions.

SIGUARD®DSA – transmission system stability and dynamic security assessment

SIGUARD®DSA is a model-based dynamic stability assessment tool for online control room use and offline operational planning purposes. Contingency study cycles are run automatically, taking the most current snapshot from the SCADA system as a basis. By utilizing the high-speed simulation engines from the PSS® Portfolio, it allows users to perform a wide variety of stability analysis functions, including voltage, transient, small signal, oscillatory, and much more. SIGUARD®DSA helps system operators expand their situational awareness in the control room, and supports them in making critical decisions during stability problems.

SIGUARD®PSA – protection system screening and analysis

SIGUARD®PSA is used by protection engineers and operators to automatically simulate, assess, and improve selectivity, sensitivity, and speed of the protection system performance for different network and operation conditions. It helps ensure reliable protection operation and system security, and prevent cascading blackouts.

PSS®MUST – transfer capacity analysis

PSS®MUST is a tool for managing and utilizing system transmission. The tool supports engineers in determining transmission transfer capability by simulating network conditions with equipment outages during changing network conditions. PSS®MUST complements PSS®E by offering powerful tools for quickly assessing the impact of transactions on transmission networks.

PSS®ODMS – CIM-based transmission network modeling and analysis

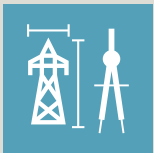
PSS®ODMS is a transmission network modeling and analysis tool that is designed to bridge the gap between multiple utility domains – including operations and planning. It provides power system planners, operations planners, system operators and IT managers with a variety of capabilities, including: centralized data management and exchange across multiple domains (e.g. grid operations, network planning, etc.) – based on open CIM standards, automated case creation for network operations planning studies, ENTSO-E CGMES compliance and PSS®E CIM / CGMES data conversion (for European TSOs), real-time situational awareness (including state estimation and integration with SCADA and measurement data), and offline study functions based on operation model, data, and scenarios.

PSS®MOD - project modeling and data management for PSS®E

PSS®MOD (Model on Demand) provides PSS®E users with a comprehensive solution for power system transmission planning model management. The solution is used by Independent System Operators (ISOs), Regional Transmission Operators (RTOs), Planning Authorities with remote members, and transmission companies with local users. PSS®MOD coordinates submission of network model data from local and / or remote users and provides access to complete study cases “on-demand” for any point in time. By revolutionizing the traditional approach to maintaining transmission network models, its secure, web-based application and central data repository allow multiple users to submit, view, validate and audit planning model data including time-bound network changes organized as multi-phase projects.

~70% of the world's electricity consumption flows through infrastructure planned or analyzed by the PSS® Portfolio

Applications and Use Cases



Transmission Planning

Transmission planning engineers need to perform a wide variety of studies in order to ensure grid reliability, security, compliance with regulations, and sound capital investment decisions.

With the capabilities of the PSS® Portfolio , TSOs, IPPs, consultancies, and universities **benefit** from:

- Cost-effective long-term network planning
- Trusted results from “gold standard” tool for utilities
- Supports regulatory compliance
- Consistent generation interconnection evaluation

Applicable PSS® Portfolio products

- PSS®E
- PSS®SINCAL
- PSS®MUST

Use Cases:

- Power system simulation & analysis
- Infrastructure expansion planning
- Generation interconnection studies
- Integrated T&D planning





Transmission Operations Planning

Effective operations planning is not only essential to being prepared for reliable grid operations and responses for unplanned events – it is also enforced in many countries through regulations and standards. The PSS® Portfolio provides engineers with the simulation and analysis tools needed to plan for next-day operations.

With the capabilities of the PSS® Portfolio, users **benefit** from:

- Reduced time required to build forecast cases and perform studies
- Improved accuracy and automation in case creation
- Directly integrate data from other systems (outage schedules, load profiles, dispatch, topology, etc.)
- Regulatory compliance support (e.g. CGMES (EU), NERC-TOP-002 (NA))

Applicable PSS® Portfolio products

- PSS®E
- PSS®SINCAL
- PSS®MUST
- PSS®ODMS

Use Cases:

- Automatic case creation for operations planning studies
- Simulation and analysis for next-day studies
- For Europe: supports ENTSO-E CGMES regulation compliance



Transmission Operations

Situational awareness and stability of the power grid is critical for secure and reliable system operation. The PSS® Portfolio helps system operators expand situational awareness in the control room, and assists with the decision making process during stability problems.

With the capabilities of the PSS® Portfolio, users **benefit** from:

- Ability to predict problems and determine best course of action in real-time
- Increased situational awareness at a fraction of the cost of deploying and maintaining a full EMS
- Compatibility with existing SCADA (vendor-neutral) – no need for expensive upgrade or replacement
- Lightweight and easy to deploy solution

Applicable PSS® Portfolio Products

- PSS®SINCAL
- SIGUARD®DSA
- PSS®ODMS

Use Cases:

- Situational awareness in the control room
- Stability cockpit





Protection

System operators, planners and protection engineers face an ever-increasing landscape of challenges around power system protection due to the integration of variable energy resources. The PSS® Portfolio helps protection engineers and power system operators to ensure reliable protection operation, ensure system security, and prevent cascading blackouts.

With the capabilities of the PSS® Portfolio users **benefit** from:

- Revealing weak spots and hidden errors of protection system
- Time savings through automatic simulation and assessment
- Prevention of blackouts
- Established process for continuous protection system improvement

Applicable PSS® Portfolio products

- PSS®SINCAL
- SIGUARD®PSA

Use Cases:

- Power system protection analysis / audits
- Protection setting calculation
- Protection setting database and data exchange



Distribution

Distribution planning engineers need to perform a wide variety of studies in order to ensure grid reliability, security, compliance with regulations, and sound capital investment decisions. The PSS® Portfolio helps engineers design, maintain, and operate power distribution networks.

With the capabilities of the PSS® Portfolio, users **benefit** from:

- Ability to design grids that integrate renewable and distributed energy resources in an economical manor, without sacrificing grid reliability.
- Maximized utilization of existing infrastructure
- High visibility, efficiency, and agility in distribution planning and operation

Applicable PSS® Portfolio Products

- PSS®SINCAL

Use Cases:

- Distribution network planning
- Integrated T&D planning
- Renewable interconnection studies





Industrial

Industrial facility operators and designers require powerful tools for the planning, design, and operation of industrial power networks – such as those for refineries, chemical plants, oil platforms, mining, automobile, and other manufacturing facilities.

With the capabilities of the PSS® Portfolio, users **benefit** from:

- Planning and operating reliable networks for power-intensive industries
- Achieve safe working environment
- Avoid process interruption and downtime

Applicable PSS® Portfolio products

- PSS®SINCAL

Use Cases:

- Planning, design, and operation of industrial power networks



Digital Twins: Modeling and Data Management

There is only one physical power grid, but a typical utility can maintain many diverse grid models – each associated with a different enterprise domain, such as: planning, operations, asset management, GIS, outage management, and protection. Manually maintaining multiple models can result in duplicated efforts, model synchronization issues and inconsistencies, and modeling errors.

That is why Siemens PTI provides industry leading software for creating digital twins of power grids. With real and virtual worlds tightly aligned, utilities get a single source of truth for managing, validating, and exchanging network models across their entire IT landscape.

With the capabilities of the PSS® Portfolio, users **benefit** from:

- Improved business process efficiency (data maintenance, automation, labor, etc.)
- IT integration cost reduction
- Elimination of duplicated modeling effort
- Improved model accuracy / reduce modeling errors

Applicable PSS® Portfolio products

- PSS®ODMS
- PSS®MOD
- PSS®SINCAL

Use Cases:

- Management of the data/models that are used as input for studies across the utility IT landscape (e.g. for planning, operation, protection, etc.)
- Central “single source of truth” database for utility grid models
- Exchange network model data within own company and across other utilities



Customer Resources

Support

- Application support offered by dedicated in-house Siemens PTI Customer Care team with direct access to subject matter experts
- Premium access to product updates, enhancements and improvements as well as new functionality
- Interactive online forums to facilitate knowledge sharing among the community of professionals
- Extensive knowledge database
- Power packed technical user conferences with regional focus to increase product roadmap awareness, providing opportunities to meet with Siemens PTI experts and fellow users

PSS® Ideas Portal

- Platform for PSS® Portfolio users to submit, track, and vote on product ideas – providing a direct link to product engineers and managers
- To request access to the PSS® Ideas Portal, contact pti-support-energy@siemens.com

Siemens Power Academy

- Beginner to advanced level certified PSS® software training
- Flexible delivery options including e-learning or at a customer site
- Standard and customized training
- For more information on Siemens Power Academy visit: usa.siemens.com/pti-education

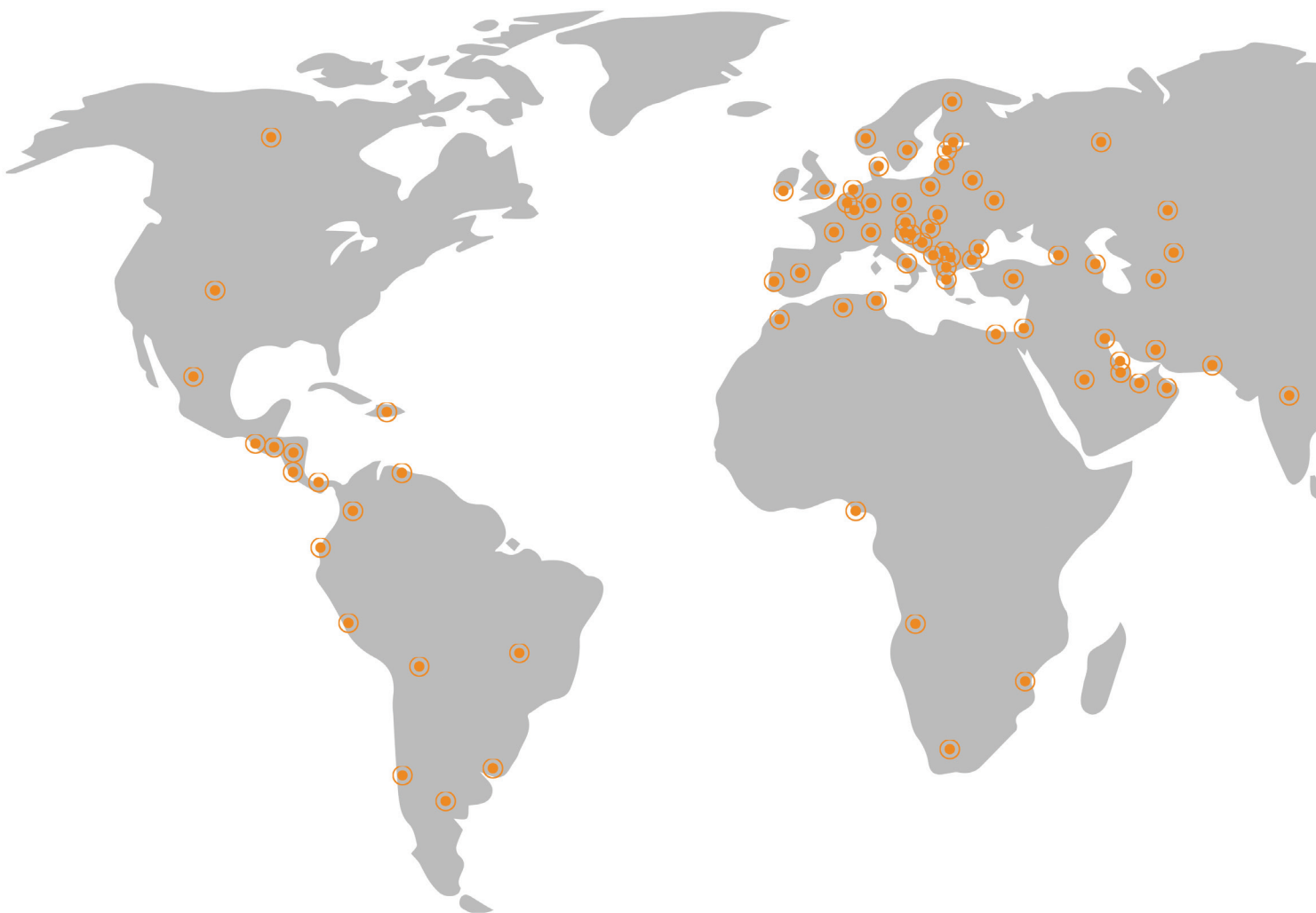
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Company Profile

Siemens Power Technologies International

From strategic advisory to technical consulting and state-of-the-art software solutions: Siemens PTI offers a holistic approach to mastering the technical and economic challenges of today's and future energy systems. Drawing upon more than 60 years of experience and continuous innovations in power system planning, Siemens PTI's renowned experts address the full scope of power system analysis, design and optimization studies. Experiences gained in international studies and the dynamic changes to the industry, directly flows into Siemens PTI's comprehensive suite of power system planning and software tools which reliably support the power and energy industry around the world. Our strategic consultants help optimize business value by providing valuable advice in the fields of business transformation, infrastructure development, as well as market and transaction advisory. Siemens' financial strength and regional competence centers around the world make Siemens PTI an ideal partner to develop individual, innovative solutions which create sustainable value for our customers and turn change into opportunities.



Software Solutions

Siemens PTI offers a powerful suite of software applications and solutions to efficiently support system planning and operations with their daily simulation and analysis work. The Power System Simulator (PSS®) Product Suite provides a full set of integrated and specialized applications for the simulation, analysis, and modeling of transmission, distribution, and industrial power networks, as well as gas, water, heating, and cooling infrastructures. Readily integrated into any existing IT environment, these powerful and user-friendly tools feature an intuitive graphical user interface, customizable visualization options, automation capabilities, and efficient data management. Data exchange with other systems (e.g., EMS, DMS, AMS, GIS, other planning tools, etc.) is provided through industry standards (i.e., CIM) and native interfaces. Siemens PTI also provides custom software solutions based on its blend of engineering and software architecture expertise, custom software development capabilities, award-winning project management, and existing product functionality.



Energy Business Advisory

Regulatory bodies are increasingly pushing for level playing fields, environmental responsibility and increased transparency. Siemens Energy Business Advisory is a leading provider of strategic consulting services to utility customers across the US. For nearly 40 years as Pace Global, it has participated in over \$100 billion of energy asset transactions around the world and has managed portfolios at over \$10 billion. By combining rigorous analysis and with deep consulting expertise, Siemens EBA ensures its clients innovative services to support the execution of business transformation, market planning, and risk management. Siemens EBA represents clients in all segments of the energy value chain, including exploration, production, generation, midstream, storage, transportation, distribution, and end-use.

Power System Consulting

Ever changing industry challenges and opportunities along with the rising complexity of modern power systems call for comprehensive, systematic grid planning. Siemens PTI's renowned Power System Consulting experts leverage experiences gained in numerous and diverse projects to derive grid concepts which follow the overall business strategies of utilities and end-customers. Profound power system analysis, both technically and economically, together with leading planning competence provide insight that enable our clients to take well-informed decisions influencing the structure, performance and operation of their systems. Our services address utility as well as industrial or commercial grids and cover the complete range of studies: from steady-state, dynamic and transient analyses to protection and control concepts or power quality aspects. In studies, continuous partnerships, long-term planning or research projects, we tailor our services to individual demands.

Did you know?

- Siemens PTI founded in 1956
- Headquartered in Erlangen, Germany
- Sales offices in 200+ countries / regions
- Global leader in power systems planning
- 2,000+ customers and 3,000+ projects p.a.
- 200+ renowned experts with profound experience

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