



SAVE THE DATE

AI FOR THE PROCESS INDUSTRIES

WEBINAR | 11 & 12 JUNE 2026

**Paris Dauphine - PSL and SECF join their expertise
to contribute to increase efficiency and competitiveness**

Europe's process industries sit at the center of the energy transition, circular economy, and strategic autonomy. Between now and 2050, competitiveness will depend on turning sustainability requirements into engineering advantage: designing circular products, deploying low carbon manufacturing at scale, and operating plants as data driven, resilient systems. Using AI tools becomes imperative.

“ AI is in an important mode of change and impacts all process industries. ”

The SECF Four Ps — a guiding principle

To align technology decisions, investment, and societal expectations, the future of the process industries can be framed through four objectives that must be pursued simultaneously:

- **Product:** Innovative, functional, and circular products designed for performance, reparability, reuse, and end of life value recovery.
- **Planet:** Operations and value chains that respect planetary boundaries: deep decarbonisation, reduced toxic footprints, and resource efficiency.
- **Profit:** Industrial competitiveness, productivity, and bankable business cases—turning sustainability into a source of margin and resilience.
- **People:** Safety, skills, inclusion, and trust: protecting workers and communities while building a workforce for the digital and circular era.

The Four Ps offer a simple governance lens for boards, deans, and policy makers: every major initiative should state—explicitly—its contribution to each P, the trade offs, and the metrics used to manage them.

PUBLIC

Industrialists, students, academia and all entities concerned with industry

CALL FOR COMMUNICATIONS

Abstract proposal : 15 April 2026

Acceptance notification : 30 April 2026

Webinar : 11-12 June 2026

Conference website: <https://premc.org/pds26/>
(all submission and registration information available on the website)

KEY TOPICS

AI for Process Optimization & Control
Digital Twins & Advanced Simulation
Predictive Maintenance & Asset Performance
Monte Carlo Tree Search & Advanced Optimization
Energy Efficiency, Decarbonization & Sustainability
Safety, Risk & Regulatory Compliance
AI for Chemical & Materials Innovation (SSbD & Eco-design)
Industrial Data, Infrastructure & MLOps
Generative AI & Industrial Knowledge Systems
Supply Chain, Planning & Industrial Systems
Human-AI Collaboration & Skills
Advanced AI Methods & Research Frontiers
Industrial Case Studies & Applications

Detailed topics on the next page.

DETAILED TOPICS

1. AI for Process Optimization & Control

- Reinforcement learning for advanced process control (APC)
- AI-enhanced Model Predictive Control (MPC)
- Real-time optimization (RTO) using machine learning
- Hybrid first-principles + ML models
- Nonlinear and multivariable process modeling
- Soft sensors and virtual analyzers
- AI for batch vs. continuous process optimization

2. Digital Twins & Simulation

- AI-enabled digital twins for plants and assets
- Physics-informed neural networks (PINNs)
- Surrogate modeling for computational fluid dynamics (CFD)
- Hybrid simulation environments
- Closed-loop digital twins for operations
- Digital twins for operator training

3. Predictive Maintenance & Asset Reliability

- AI for predictive maintenance in rotating equipment
- Anomaly detection in process data
- Remaining Useful Life (RUL) estimation
- Root cause analysis using ML
- Reliability-centered maintenance with AI
- Edge AI for condition monitoring

4. Monte Carlo Tree Search

- Retrosynthesis
- Parameters optimization
- Molecule design
- Modeling complex systems
- Formula optimization
- Material Design

5. Energy Efficiency & Sustainability

- AI for energy optimization in refineries and plants
- Carbon footprint monitoring and reduction
- AI for electrification and decarbonization strategies
- Process integration and heat recovery optimization
- AI for hydrogen production and storage
- Waste minimization and circular economy optimization

6. Safety, Risk & Compliance

- AI for process safety monitoring
- Early warning systems for abnormal situations
- Hazard identification using NLP
- Risk modeling and probabilistic AI
- AI for regulatory compliance and reporting
- Cyber-physical risk detection

7. AI in Chemical & Materials Development

- AI for catalyst discovery
- Machine learning in reaction optimization
- Autonomous laboratories (self-driving labs)
- AI-guided formulation development
- Materials informatics
- Generative models for molecular design

8. AI & Industrial Data Infrastructure

- Data governance in process industries
- Time-series modeling for industrial data
- Data quality and sensor fusion
- Edge vs. cloud AI architectures
- Industrial IoT and AI integration
- MLOps for manufacturing environments

9. Generative AI & Knowledge Systems

- Large Language Models (LLMs) for plant documentation
- AI copilots for operators and engineers
- Automated report generation
- AI for troubleshooting and knowledge retrieval
- Conversational interfaces for control rooms

10. Supply Chain & Planning

- AI for production scheduling
- Demand forecasting in process industries
- Inventory optimization
- Supply chain resilience modeling
- AI-driven logistics optimization

11. Human-AI Collaboration

- AI adoption strategies in industrial environments
- Change management for AI transformation
- Trust and explainability in industrial AI
- Operator-in-the-loop AI systems
- Workforce upskilling for AI-enabled plants

12. Advanced Methods & Research Frontiers

- Causal AI for industrial systems
- Uncertainty quantification in ML models
- Transfer learning across plants
- Federated learning for industrial sites
- Multi-agent systems for plant-wide optimization
- Graph neural networks for process networks

13. Industry Case Studies

- AI deployment in refineries
- AI in specialty chemicals production
- AI in food and beverage manufacturing
- AI in pharmaceutical manufacturing
- AI in pulp & paper operations