



Le Printemps de  
la Recherche  
2011

# COP1'11

Paris, France  
November 23-25, 2011

## Conference on Optimization & Practices in Industry



## PROGRAM

Organized and supported by  
Electricité de France – Research and Development



## CONFERENCE TOPICS

**Topic 1 Numerical Optimization Techniques and Other Industrial Applications**

Decomposition methods, dynamic optimization, combinatorial optimization, real-time optimization, model predictive control, stochastic programming, robust optimization, meta-heuristics.

Stocks, logistic supply management ; large scale problems.

**Topic 2 Generation Management**

Operation, generation and maintenance scheduling.

Renewable energy.

**Topic 3 Mathematical Economics, Energy Markets and Risk Management**

Portfolio management, risk management and dynamic hedging.

Market prices and imperfect competition, decentralized control in energy market.

Game theory and equilibrium concepts, auction models.

# COMMITTEES

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# Wednesday November 23, 2011

## Numerical Optimization Techniques and Industrial Applications

08:15	Hall Ailleret	<b>Registration - Breakfast Buffet</b>	
09:00	Room Ailleret	<b>Opening by Laetitia ANDRIEU and Yannick Jacquemart (EDF)</b>	
	Room Ailleret	<b>Plenary sessions</b>	<i>Chairman: J. Gondzio</i>
09:15	<b>Jean-François FAUGERAS</b> , EDF R&D, France <i>Smart grids: a wind of change in power systems and new opportunities for optimization</i>		
10:00	<b>Uday SHANBHAG</b> , University of Illinois, USA <i>Stochastic variational problems: theory, algorithms and applications to energy systems and markets</i>		
10:45	Hall Ailleret	<b>Coffee break</b>	
	Room Ailleret	<i>Chairman: J. Gondzio</i>	Room Amphi 2
	<b>Theory and Algorithms 1</b>		<i>Chairman: E. Jacquet-Lagrèze</i>
			<b>Transmission System Modelling / Fleet Mix Optimization</b>
11:00	<b>J. GONDZIO, P. GONZALEZ-BREVIS<sup>1</sup>, P. MUNARI</b> <sup>1</sup> University of Edinburgh, Scotland, UK <i>On the theory and new applications of the primal-dual column generation method</i>		<b>P. PISCIELLA<sup>1</sup>, M. T. VESPUCCI, M. BERTOCCHI</b> <sup>1</sup> University of Bergamo, Italy <i>A bi-level programming approach to coordination of generation and transmission capacity planning</i>
11:30	<b>H. A. LE THI, T. PHAM DINH, M. LE HOAI<sup>1</sup>, F. LAUER</b> <sup>1</sup> University Paul Verlaine of Metz, France <i>Learning piecewise affine functions by DC programming and DCA</i>		<b>S. WESOLKOWSKI<sup>1</sup>, K. WILLICK, D. WOJTASZEK</b> <sup>1</sup> CORA, Defense Research and Development Canada, Canada <i>A surrogate model for multi-objective fleet mix optimization</i>
12:00	<b>J. GONDZIO</b> University of Edinburgh, Scotland, UK <i>Limited-memory matrix-free interior point method</i>		
12:30	Room TA220	<b>Lunch break</b>	
13:45	Hall Ailleret	<b>Posters session</b>	
14:15	Room Ailleret	<b>Plenary session</b>	<i>Chairman: Y. Jacquemart</i>
	<b>Grégoire ALLAIRE<sup>1</sup>, Laetitia ANDRIEU<sup>2</sup>, Sandrine CHAROUSSET<sup>2</sup>, Yves LASZLO<sup>3</sup></b> <sup>1</sup> Ecole Polytechnique/FMJH, France ; <sup>2</sup> EDF R&D, France ; <sup>3</sup> University of Paris-Sud/FMJH, France <i>The Gaspard Monge Program in Optimization and Operations Research</i>		
	Room Ailleret	<i>Chairman: J. André</i>	Room Amphi 2
	<b>Theory and Algorithms 2</b>		<i>Chairman: J.-P. Vial</i>
			<b>Optimization for Industry</b>
14:45	<b>J. CHENG, A. LISSER<sup>1</sup></b> <sup>1</sup> University of Paris-Sud, France <i>SDP relaxation for solving stochastic 0-1 linear problems with joint probabilistic constraints</i>		<b>H. A. LE THI, D. Q. TRAN<sup>1</sup>, T. PHAM DINH</b> <sup>1</sup> University Paul Verlaine of Metz, France <i>DC programming approach for solving some non convex optimization problems in production management</i>
15:15	<b>P. CARPENTIER<sup>1</sup>, J.-P. CHANCELIER, G. COHEN</b> <sup>1</sup> ENSTA ParisTech, France <i>Optimal control under probability constraint</i>		<b>M. GEHAN<sup>1</sup>, R. REBAI, L. ROUSSEAU</b> <sup>1</sup> Eurodécision, France <i>Minimizing energetic costs in datacenter</i>
15:45	<b>A. WIECZOREK, A. BUSIC, E. HYON<sup>1</sup></b> <sup>1</sup> University of Paris Ouest Nanterre, France <i>Critical level policies in lost sales inventory systems with different demand classes</i>		<b>F. BABONNEAU, O. LISTES, C. van DELFT, J.-P. VIAL<sup>1</sup></b> <sup>1</sup> Ordecys, Switzerland <i>A tool for the design and analysis of robust flexible manufacturing processes facing uncertain demands</i>
16:15	Hall Ailleret	<b>Coffee break</b>	
	Room Ailleret	<b>Plenary sessions</b>	<i>Chairman: A. Ouorou</i>
16:30	<b>Francis SOURD</b> , SNCF, France <i>Application of scheduling theory to solve real-life railway problems</i>		
17:15	<b>Benoît ROTTEMBOURG</b> , Eurodécision, France <i>Optimizing length of stay control policies for budget hotels revenue management</i>		
18:00			

# Thursday November 24, 2011

## Generation Management

08:00	Hall Ailleret <span style="float: right;"><b>Breakfast Buffet</b></span>		
	Room Ailleret	<b>Plenary sessions</b>	
	Chairman: J. F. Bonnans		
08:30	<b>Marc STUBBE<sup>1</sup></b> , Tractebel, Belgium <i>The PEGASE project: new algorithms for state estimation, time domain simulation and optimization of very large power systems</i> <sup>1</sup> That talk is given by Bertrand HAUT in the absence of Marc STUBBE.		
09:15	<b>Patrick PANCIATICI, RTE, France</b> <i>Optimization tools to improve the operation and operational planning of Transmission Systems: challenges and possible solutions</i>		
10:00	Hall Ailleret <span style="float: right;"><b>Coffee break</b></span>		
	Room Ailleret <span style="float: right;">Chairman: J. F. Bonnans</span>	Room Amphi 2 <span style="float: right;">Chairman: L. A. Barroso</span>	Room TB10 <span style="float: right;">Chairman: E. Jacquet-Lagrèze</span>
	<b>Hydro thermal generation planning 1</b>	<b>Day-ahead and intra-day production planning</b>	<b>Renewable energy</b>
10:20	<b>A. COUETOUX, O. TEYTAUD, O. RATIER<sup>1</sup></b> <b>N. OMONT, A. RENAUD</b> <sup>1</sup> Artelys, France <i>Monte-Carlo tree search applied to hydrothermal power generation planning</i>	<b>B. CORNELUSSE, A. BEN-ABBES</b> <b>L. WEHENKEL<sup>1</sup></b> <sup>1</sup> University of Liège, Belgium <i>Intra-day power generation rescheduling by supervised learning from Monte-Carlo simulations</i>	<b>S. LUMBRERAS<sup>1</sup>, A. RAMOS</b> <sup>1</sup> Universidad Pontificia Comillas, Spain <i>OWL (Offshore Windfarm Layout optimizer) applying Bender's decomposition to the design of offshore wind farms</i>
10:50	<b>A. HELSETH, G. WARLAND, B. MO</b> <b>A. GJELSVIK<sup>1</sup></b> <sup>1</sup> SINTEF, Norway <i>Prodnett: a computer code for optimal stochastic hydro thermal scheduling with power flow constraints and approximate start-up cost modeling</i>	<b>B. CORNELUSSE<sup>1</sup>, G. SCOUVART</b> <b>Y. LANGER, M. van VYVE</b> <sup>1</sup> n-Side, Belgium <i>Coupling day-ahead electricity markets with COSMOS</i>	<b>A. BILLIONNET, M.-C. COSTA<sup>1</sup>, P.-L. POIRION</b> <sup>1</sup> ENSTA ParisTech - CEDRIC, France <i>Optimizing an hybrid energy system</i>
11:20	<b>V. L. DE MATOS<sup>1</sup>, E. C. FINARDI</b> <sup>1</sup> Universidade Federal de Santa Catarina, Brazil <i>Policy evaluation in the long-term hydrothermal scheduling problem</i>	<b>E. RACHELSON</b> EDF R&D, France <i>Towards a hybrid approach for infra-daily recourse strategies</i>	<b>G. WARLAND<sup>1</sup>, B. MO, A. HELSETH</b> <sup>1</sup> SINTEF, Norway <i>Planning in a hydropower dominated power system taking into account network constraints. Enhancements to the EMPS models</i>
11 :50		<b>N. DUPIN<sup>1</sup>, P. BENDOTTI</b> <sup>1</sup> University of Bordeaux 1, France <i>ILP resolution of unit commitment problem with minimum stop constraints</i>	
12:20	Room TA220	<b>Lunch break</b>	

13 :45	<b>Room Ailleret</b>	<b>Plenary session</b>	<i>Chairman: J. Gondzio</i>
	<b>Luiz A. BARROSO</b> , PSR , Brazil <i>Integrated scheduling of electricity and gas resources taking into account storage, contracts and transportation networks</i>		

	<i>Room Ailleret</i> <i>Chairman: M. Gendreau</i> <b>Hydro thermal generation planning 2</b>	<i>Room Amphi 2</i> <i>Chairman: M. Minoux</i> <b>Nuclear scheduling</b>	<i>Room TB10</i> <i>Chairman: A. Renaud</i> <b>Scheduling problems for electricity and mining</b>
14:30	<b>G. EMIEL<sup>1</sup>, M. GENDREAU</b> <sup>1</sup> Ecole Polytechnique de Montréal, Canada <i>Applying SDDP for Hydro Quebec production planning</i>	<b>L. PFEIFFER<sup>1</sup>, F. BONNANS, K. BARTY</b> <sup>1</sup> INRIA Saclay, France <i>Sensitivity analysis for the outages of nuclear power plants</i>	<b>S. LANNEZ<sup>1</sup>, J.-C. PASSELERGUE</b> <sup>1</sup> Alstom, France <i>Unit commitment problem: from decomposition to branch-and-bound method</i>
15:00	<b>P. COTE<sup>1</sup>, M. LATRAVERSE, B. LAROUCHE</b> <sup>1</sup> Rio Tinto Alcan, Canada <i>Operation of a hydropower system in northern east Canada using hydrological ensemble prediction and nonlinear interior point optimization algorithm</i>	<b>M. PORCHERON<sup>1</sup>, K. BARTY, B. KADDOUR</b> <sup>1</sup> EDF R&D, France <i>Using stochastic programming to compute usage values for the French nuclear power reactors</i>	<b>A. HAIT<sup>1</sup>, C. ARTIGUES</b> <sup>1</sup> University of Toulouse, France <i>An efficient continuous-time MILP formulation for scheduling with energy cost</i>
15:30	<b>G. EMIEL, M. GENDREAU<sup>1</sup></b> <sup>1</sup> Ecole Polytechnique de Montréal, Canada <i>Developing new approaches to address Hydro-Québec's production planning problems</i>	<b>A. CHICHE<sup>1</sup>, J.-C. GILBERT, M. PORCHERON</b> <sup>1</sup> EDF R&D & INRIA, France <i>Convergence of the progressive hedging algorithm applied to the medium-term electricity planning problem</i>	<b>N. BEEKER, M. DE LARA<sup>1</sup>, F. MEUNIER</b> <sup>1</sup> University of Paris-Est, France <i>Open-pit mine scheduling optimization strategies with and without uncertainty</i>

16:00 **Hall Ailleret** **Coffee break**

	<b>Room Ailleret</b>	<b>Plenary sessions</b>	<i>Chairman: M. Gendreau</i>
16:15	<b>Ken MCKINNON</b> , University of Edinburgh, UK <i>Minimizing load shedding by preventive islanding</i>		
17:00	<b>Antonio J. CONEJO</b> , University of Castilla, Spain <i>Scheduling energy and reserve in systems with high wind penetration</i>		

17:45 **Free time**

20:00	<b>DINNER</b>		
22:30	<b>MAISON DES CENTRALIENS – 75008 PARIS</b>		

# Friday November 25, 2011

## Mathematical Economics, Energy Markets and Risk Management

08:30	Hall Ailleret <b>Breakfast Buffet</b>	
	Room Ailleret <b>Plenary sessions</b>	Chairman: R. Aid
09:00	<b>Mette BJORN DAL</b> , NNH, Norway <i>Congestion management methods for the Nordic electricity market</i>	
09:45	<b>Daniel RALPH</b> , University of Cambridge, UK <i>Risk averse investment in electricity generation</i>	
10:30	Hall Ailleret <b>Coffee break</b>	
	Room Ailleret <b>Risk Management</b>	Room Amphi 2 <b>Energy Economics</b>
	Chairman: R. Aid	Chairman: O. Bardou
10:50	<b>A. SHAPIRO, W. TEKAYA<sup>1</sup>, J. P. DA COSTA, M. PERIRA SOARES</b> <sup>1</sup> Georgia Institute of Technology, USA <i>Multistage energy planning - risk neutral and risk averse approaches</i>	<b>M. ARMSTRONG<sup>1</sup>, A. GALLI</b> <sup>1</sup> Mines-Paris, France <i>Using copulas to model the impact that production incidents have on commodity prices with a stochastic optimization framework</i>
11:20	<b>P. CARPENTIER, J.-P. CHANCELIER<sup>1</sup>, G. COHEN, M. DE LARA, P. GIRARDEAU</b> <sup>1</sup> Ecole des Ponts ParisTech, France <i>Dynamic consistency for stochastic optimal control problems with risk constraints</i>	<b>S. LEPAUL</b> EDF R&D, France <i>A micro-economic view of long-run marginal costs in programming models</i>
11:50	Room TA220 <b>Lunch break</b>	
	Room Ailleret <b>Plenary session</b>	Chairman: Y. Smeers
13 :15	<b>Stein-Erik FLETEN</b> , Norwegian University of Science and Technologies, Norway <i>Hedging policies in hydroelectricity companies - an empirical study</i>	
	Room Ailleret <b>Liquidity Risk</b>	Room Amphi 2 <b>Energy Markets</b>
	Chairman: O. Bardou	Chairman: Y. Smeers
14:00	<b>S. VILLENEUVE<sup>1</sup>, X. WARIN</b> <sup>1</sup> Toulouse School of Economics, France <i>Optimal liquidity management and hedging in the presence of a non- predictable investment opportunity</i>	<b>F. BABONNEAU<sup>1</sup>, A. KANUDIA, M. LABRIET, R. LOULOU, J.-P. VIAL</b> <sup>1</sup> Ordecys, Switzerland <i>Energy security: a robust programming approach application to European energy supply via TIAM</i>
14:30	<b>F. BABONNEAU, J.-P. VIAL, O. FERON, O. KLOPFENSTEIN<sup>1</sup></b> <sup>1</sup> EDF R&D, France <i>Robust optimization of strategic portfolio allocation for asset liability management</i>	<b>D. AUSSEL</b> University of Perpignan, France <i>On spot electricity markets with transmission losses</i>
15:00	Hall Ailleret <b>Coffee break</b>	
	Room Ailleret <b>Plenary sessions</b>	Chairman: R. Aid
15:15	<b>Alfred GALICHON</b> , Ecole Polytechnique, France <i>Risk measurement: pitfalls and solutions</i>	
16:00	<b>Axel PIERRU<sup>1</sup></b> , IFP Energies Nouvelles, France <sup>1</sup> That talk is given by Yves Smeers in the absence of Axel Pierru. <i>On the development of dynamic stochastic general equilibrium models for climate change policies</i>	
16:45	Room Ailleret <b>Closing by Yannick Jacquemart (EDF)</b>	
17:00		

## Posters

**A. CHIKHAOUI<sup>1</sup>, B. DJEBBAR, A. BELABBACI, A. MOKHTARI,** <sup>1</sup>Univ. of Tiaret, Algeria

*Quadratic simplex algorithm for calculating optimal solution*

**E.A. PAPA QUIROZ<sup>1</sup>, P. R. OLIVEIRA,** <sup>1</sup>Univ. Nacional del Callao, Brazil

*An extension of proximal methods for quasiconvex minimization on the nonnegative orthant*

**N. BRAHIMI<sup>1</sup>, T. AOUAM,** <sup>1</sup>Univ. of Sharjah, United Arab Emirates

*Production routing problem with backlogging*

**P.-L. CARPENTIER<sup>1</sup>, M. GENDREAU, F. BASTIN,** <sup>1</sup>Ecole Polytechnique, Montréal, Canada

*Mid-term production planning for a large hydro-dominated power system in Quebec by the progressive hedging algorithm*

**A. S. TA<sup>1</sup>, H. A. LE THI, T. PHAM DINH, M. LE HOAI, D. KHADRAOUI,** <sup>1</sup>INSA Rouen, France

*Solving many to many multicast QoS routing problems by DCA using proximal decomposition technique*

**Y. -S. NIU<sup>1</sup>, T. PHAM DINH,** <sup>1</sup>INSA Rouen, France

*An efficient DC programming approach for portfolio decision with higher moments*

**I. AHMAD,** King Fahd University of Petroleum, Saudi Arabia

*Optimality conditions and duality in nondifferentiable multiobjective programming*

**M. T. VESPUCCI<sup>1</sup>, M. BERTOCCHI, M. INNORTA, S. ZIGRINO,** <sup>1</sup>University of Bergamo, Italy

*A stochastic model for generation expansion planning in the long period*

**C. CORCHERO<sup>1</sup>, F. Javier Heredia,** <sup>1</sup>Universitat Politècnica de Catalunya, Spain

*Optimal electricity market bidding strategies considering emission allowances*