SCOPI Alumni

Supply Chain Optimization in Petroleum Industry

Botond Bertok

Alumni Conference 2015

UNIVERSITY OF PANNONIA ▸ Faculty of Information Technology

Supply Chain Optimization in Petroleum Industry

Alumni Conference 2015

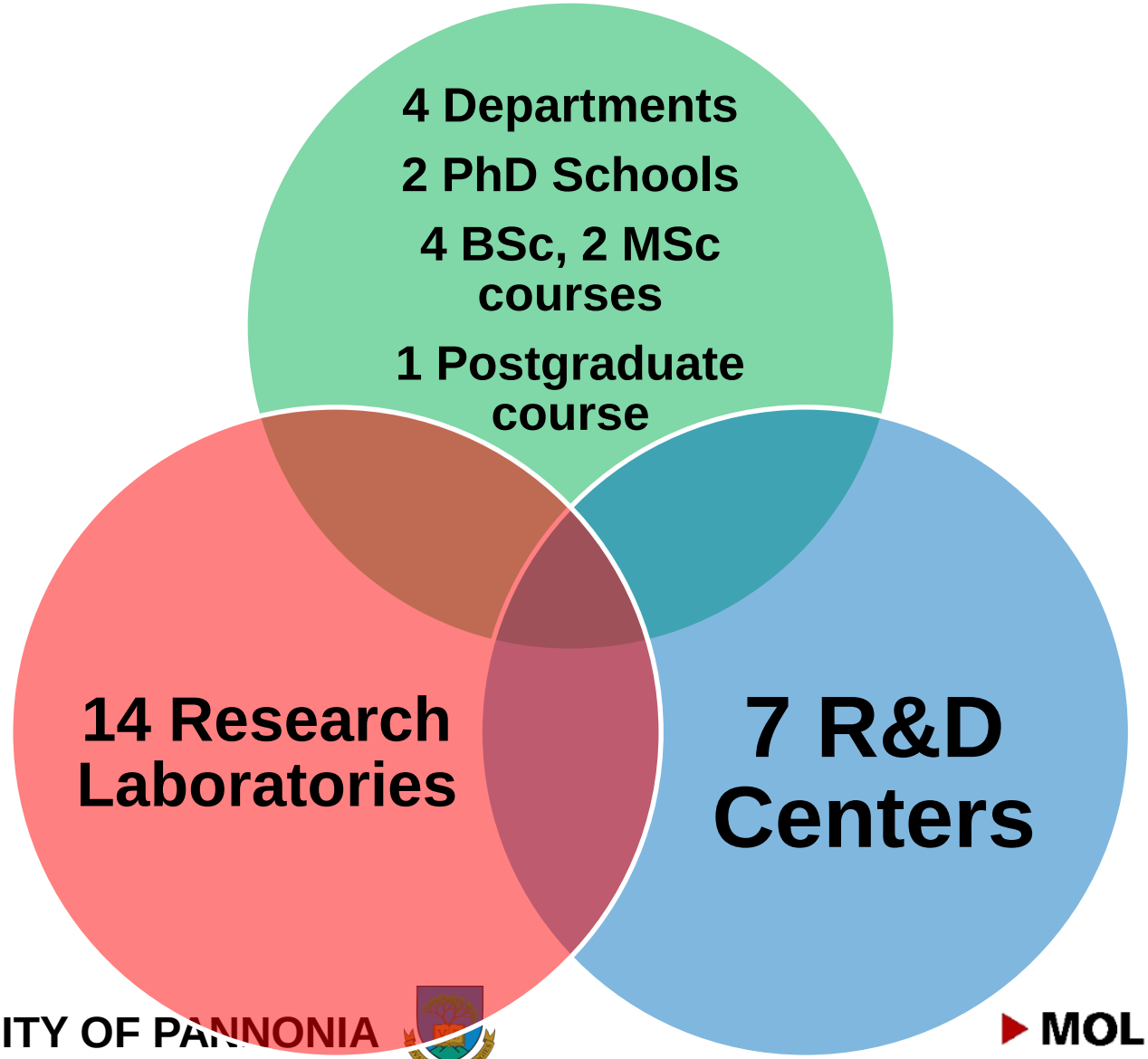
UNIVERSITY OF PANNONIA

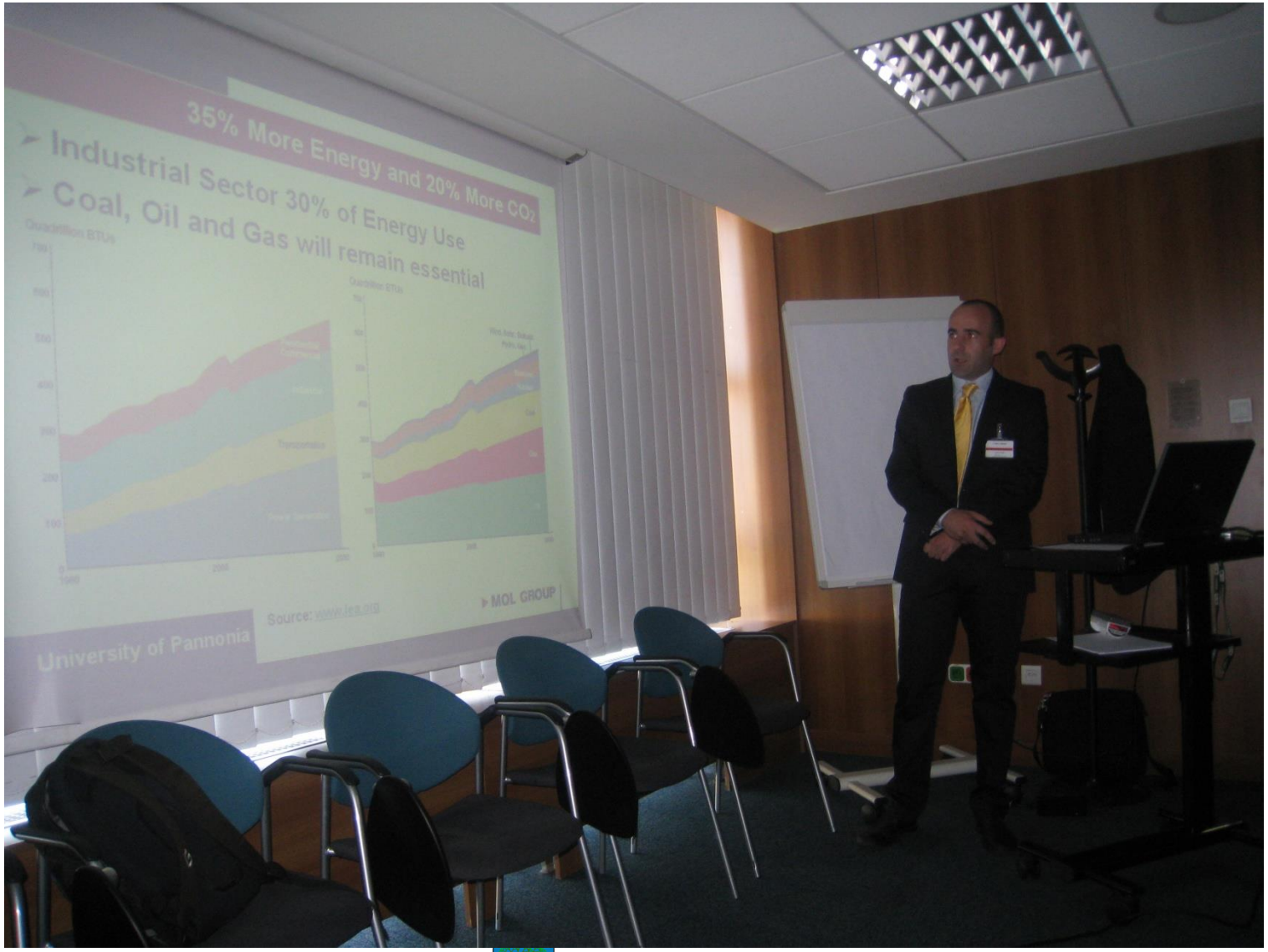
MOL GROUP

Outline

- Faculty of Information Technology and SCM
- MOL – FIT-UP Cooperation
- Supply Chain Optimization in Petroleum Industry Graduate Program

3D of FIT: Education – Research– R&D




35% More Energy and 20% More CO2
Industrial Sector 30% of Energy Use
Coal, Oil and Gas will remain essential
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University of Pannonia

Hungary's Top Faculty in 3D

- Education:
  - (Hungary's) **#1**: Highest ranking required to enter IT engineer BSc program (Minimum of 371/500 points in 2014)
  - (Hungary's) **#1**: Highest average starting salary among graduates in IT
- Research:
  - (Hungary's) **#1**: Most SCI publications/staff members (in engineering) (More than 2 SCI paper/member in 2013)
- R&D:
  - (Hungary's) **#1**: **Highest portion of income from R&D** (**82%** in 2013)


Background Information - Planning
Planning
The backbone of sustainability
Time horizons
Rolling plan
Purpose – to maximize profit in the short term (3 – 6 months)
Coordination of activities
Commercial
Logistics
Refining and Petchem
Tool – PIMS (diff. types)
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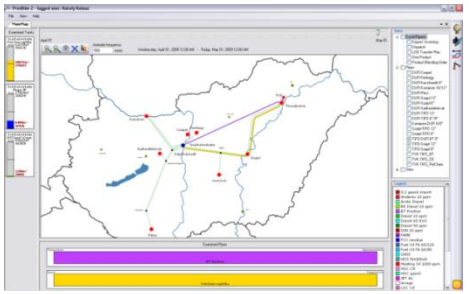
FIT – Main Technical Research Fields

- Medical Informatics
- Sensor networks
- Information security
- **Supply chain management and optimization**
- Intelligent infrastructures

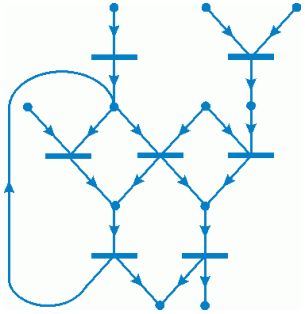
Supply Chain Management and Optimization

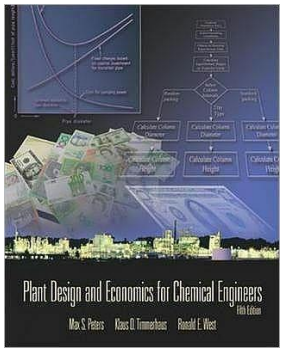
- Area of research
  - Management and design of industrial manufacturing systems
  - Design of sustainable energy supply systems
  - Tool and staff management of logistics systems, integration of geographic information systems
- Partners
  - MOL Nyrt., US-EPA, Kansas State University, TU-Graz



SCM (Continued from the previous page)

- Results
  - P-graph methodology for synthesis of special methods and optimization
    - A separate chapter in textbooks in the USA
    - Each steps has been proven
    - Graphical modelling from engineering point of view
  - Hundreds of publications





- Tasks in the future
  - Multipurpose optimization (environmental, social purposes)
  - Decision support systems based on developed info-communication technologies


IES planning practice
Planning practice in IES
-12-11 Days
-7-5 Days
-3-2 Days
Front month
-1 Days
0
+1-3 Days
Data request
Preparation of base case
Pre- discussion
Preparing alternative cases
Official case definition
Pre-publication of the plan
Operative rolling plan
Executive board meeting

MOL – FIT-UP Cooperation

- Research
- Education
- R&D

MOL & FIT-UP: Research (2006-)

VOCAL Veszprém Optimization Conference: Advanced Algorithms

CALL FOR PARTICIPATION

The Veszprém Optimization Conference: Advanced Algorithms (VOCAL 2006)
December 13-15, Veszprém, Hungary
Faculty of Information Technology, Pannon University (previously University of Veszprém)

The Veszprém Optimization Conference: Advanced Algorithms will be held at the Regional Centre of the Hungarian Academy of Sciences in Veszprém (VEAB), Hungary, December 13-15, 2006. The conference will be hosted by the Faculty of Information Technology, Pannon University.

SCOPE

The VOCAL conference focuses on recent advances on optimization algorithms: continuous and discrete; complexity and convergence properties, high performance optimization software and novel applications are reviewed as well. We aim to bring together researchers from both the theoretical and applied communities in the framework of a medium-scale event.

CONFIRMED INVITED SPEAKERS INCLUDE

Lorenz T. Biegler, Carnegie Mellon University, U. S. A.
Hans Georg Bock, University of Heidelberg, Germany
J. Frederic Bonnans, INRIA, France
Dorit S. Hochbaum, University of California, U. S. A.
Etienne de Klerk, Tilburg University, The Netherlands
Yurii Nesterov, Catholic University of Louvain la Neuve (UCL), Belgium
András Prékopa, Rutgers, The State University of New Jersey, U. S. A.
Annick Sartenaer, Notre-Dame de la Paix University (FUNDP), Belgium

CONTRIBUTED TALKS

Each accepted paper will be allotted a 25 minute talk. Authors wishing to speak should submit an abstract via the conference WEB page by July 15, 2006.

PUBLICATION IN SPECIAL ISSUES OF OPTE & OMS

A special issue of the journals **"Optimization and Engineering (OPTE)"** and **"Optimization Methods and Software (OMS)"** will be published from the papers presented at VOCAL 2006. Papers discussing novel solutions of novel approaches to engineering optimization problems will be considered for publication in OPTE, while papers with algorithmic and software focus in OMS. All papers will be refereed according to the standards of the respective journals.

Sponsors

Faculty of Information Technology, University of Pannonia, Veszprém, Hungary

Regional Centre of the Hungarian Academy of Sciences, Veszprém

MOL Nyrt.

Hungarian Operational Research Society

Museum of Hungarian Construction Industry

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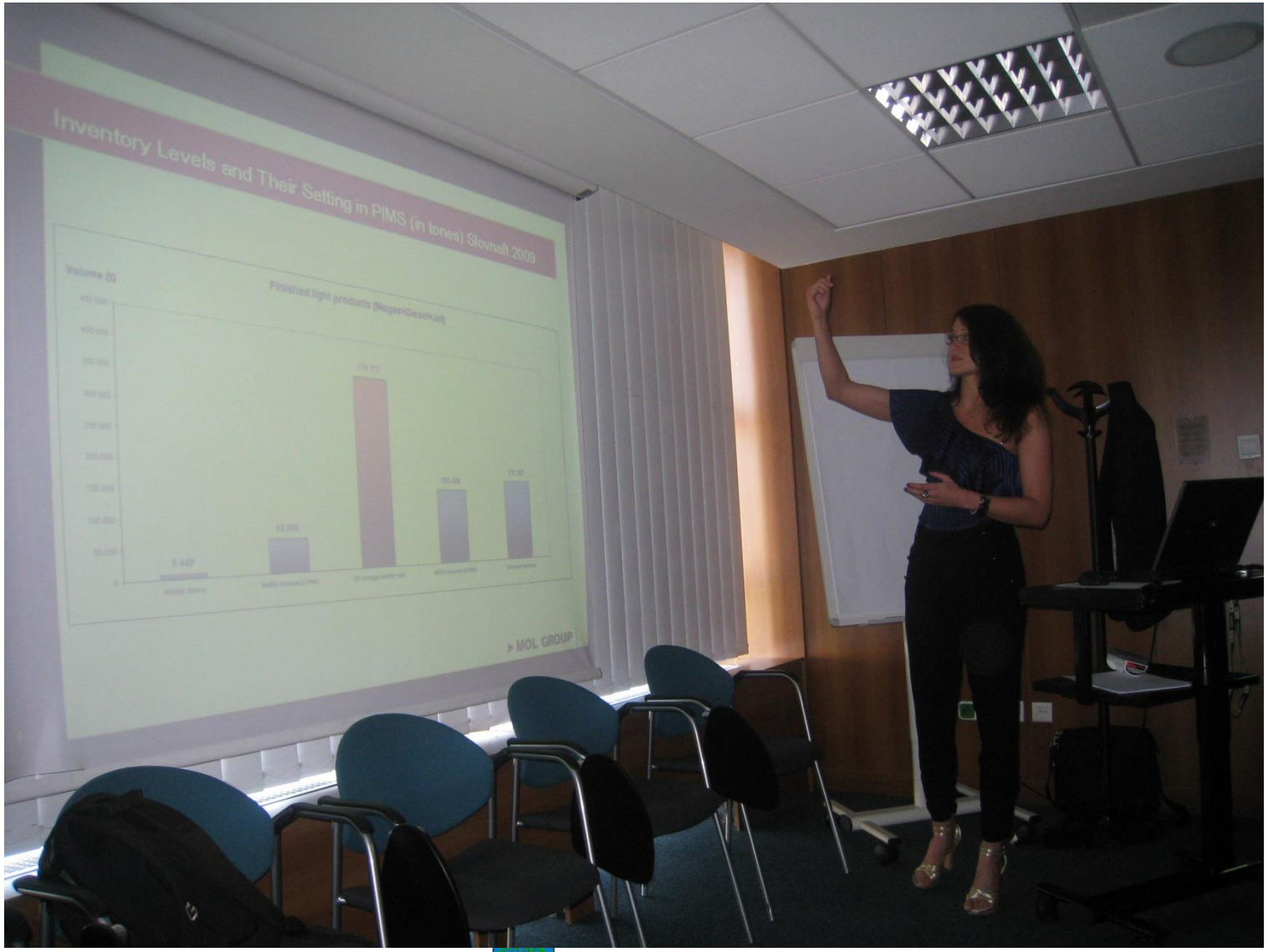
Inventory Levels and Their Setting in PIMS (in tones) Slovnaft 2009
Volume [t]
Finished light products (Mogas+Diesel+Jet)
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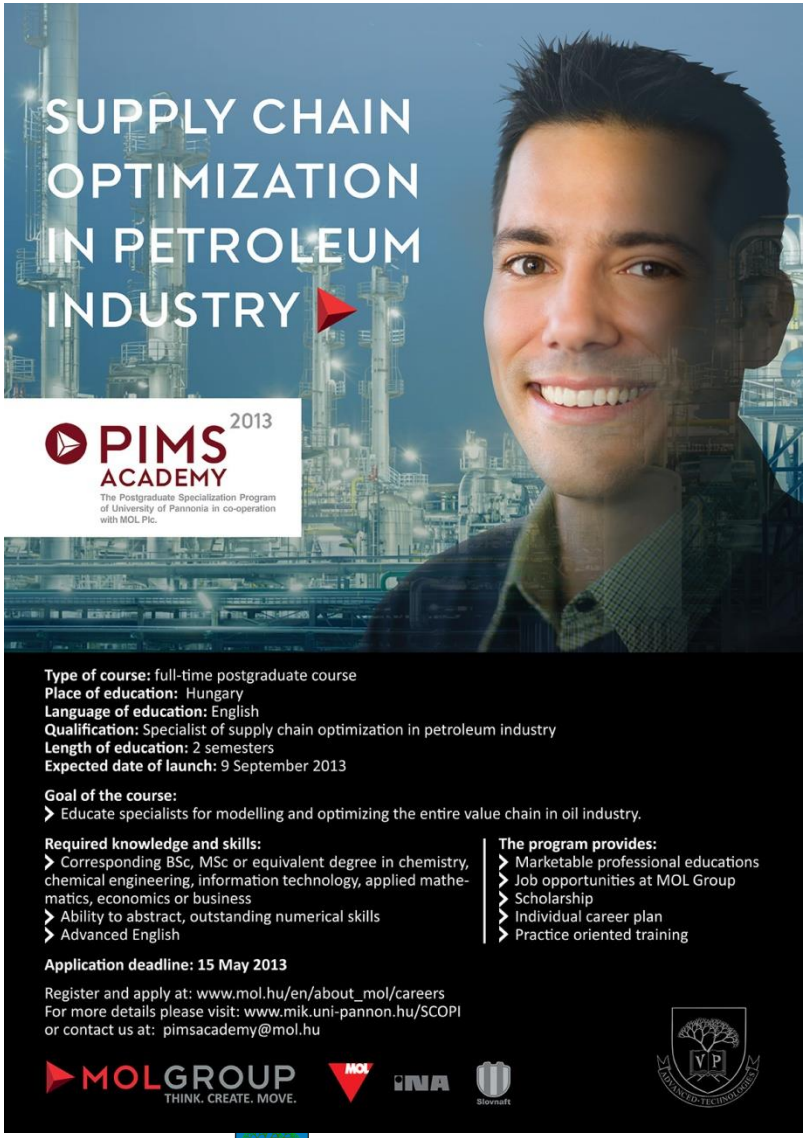
MOL & FIT-UP: Education (2007-)



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PP overview - Technology description
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SCOPI students 2007-2008

- Balaskó Balázs
- Bebesi Gergely
- Borbás Péter István
- Forster Mihály László
- Kenesei Tamás Péter
- Kókai Emese
- Németi Krisztina
- Roschig Marian
- Timkó Valentin
- Váczity Andrea Ágota


INA proposals
1. Trajectory for increasing the percentage of biofuels in Croatia by 2020
2. Amendments to pricing formula – to reflect the distributor cost

SCOPI students 2009-2010

- Caceffo Pierpaolo
- Gábor Máté
- Gajić Dragoljub
- Jeličić Matea
- Marić Zoran
- Patljak Željko
- Ravazzolo Carlo Alberto
- Šokčević Mario
- Špaňová Zuzana
- Varga Tamás Zoltán


Introduction - Sisak refinery flowscheme

SCOPI students 2011-2012

- Al-Thuhli Athari Salim Hamed
- Basic Igor
- Cmrk Danijel
- Dvoran Richard
- Himics Miklós
- Kalina Ágnes
- Osman Elhassan Abdalla Mohamed
- Takács Ágoston
- Tehenics Zsófia

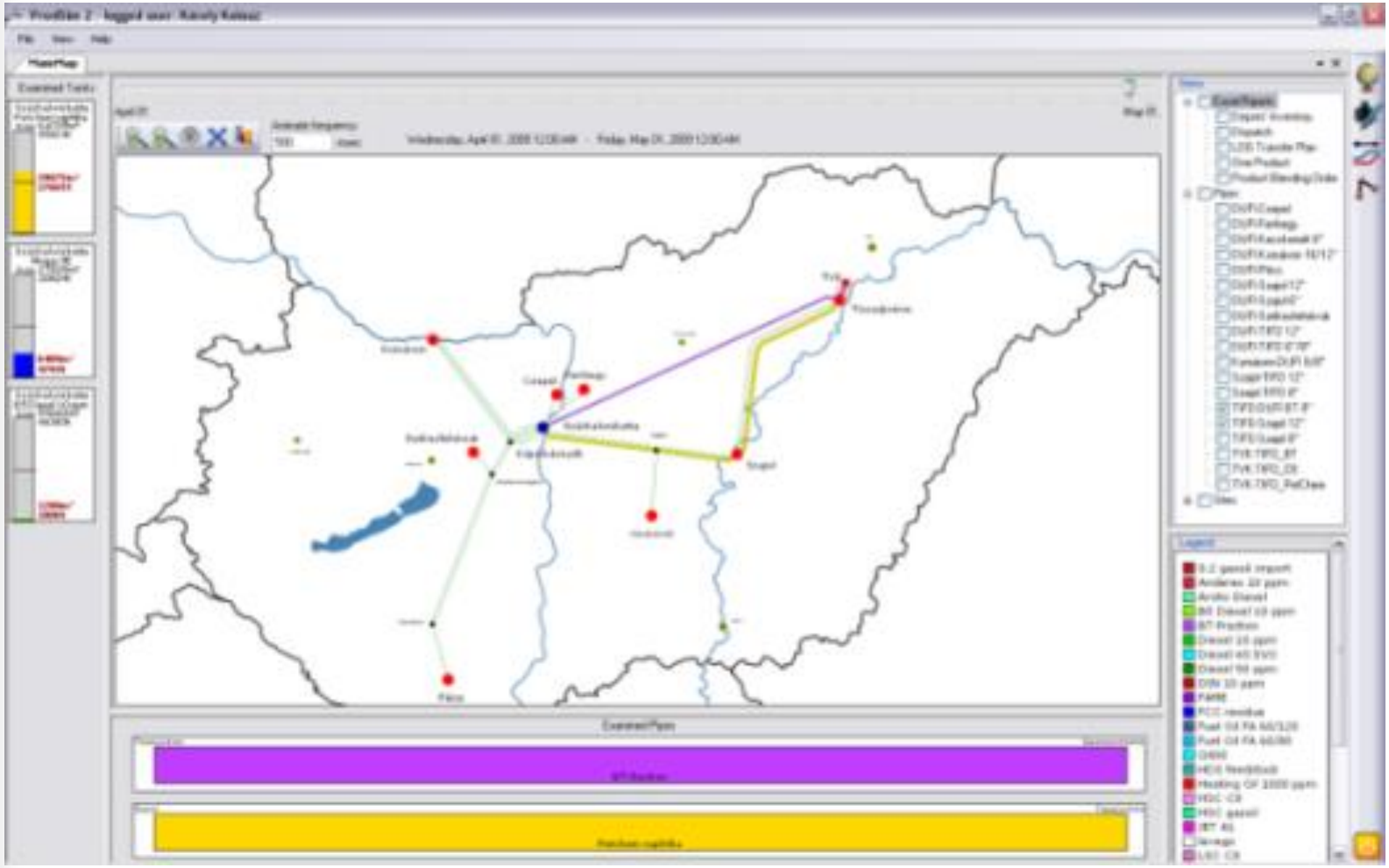
SCOPI students 2013-2014

- Ádám Holczer
- Jakov Mihaljevic
- Grzegorz Szymerkowski
- Gábor Kovács
- Laura Csizmadia
- András Ludányi
- Al-Hamadani Naema Mohammed


The Base Case
OBJ FN (M$)
Purchase (kt)
Total Crude
780.9 (Minimum)
780.900
Sales(kt)
Maximums
Total LPG
free
61.272
Total Naphta
Total Mogas
220.756
220.756
Euro-5 Mogas
47.876
47.876
High S Mogas
172.880
Total DSL
214.814
214.814
Euro-5 DSL
187.111
187.111
High S DSL
27.703
Total HO
21.491
21.491
Total FO
147.495
47.495
MARGINAL VALUES (k$)
Unit capacities
Atmospheric dest.
Isomerization
Sales
Virgin Naphtha
High S Mogas
Euro-5 Mogas
High S FCC Mogas
JET
Euro-5 Diesel
High S Diesel
0,3%S Heating Oil
3%S Fuel oil
Isomerate

MOL & FIT-UP: R&D (2007-)

- ProdSim & DDM



MOL – FIT-UP Cooperation

- Research
- Education
- R&D