



UNIVERSITÀ
DEGLI STUDI DI TRIESTE

XVI Summer School 2011

Francesco Turco

Università degli Studi di Trieste



XVI Summer School "Francesco Turco" Impianti Industriali Meccanici
Abano Terme (Padova, Italy) - 14-16 September 2011



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ING-IND/17 Research team

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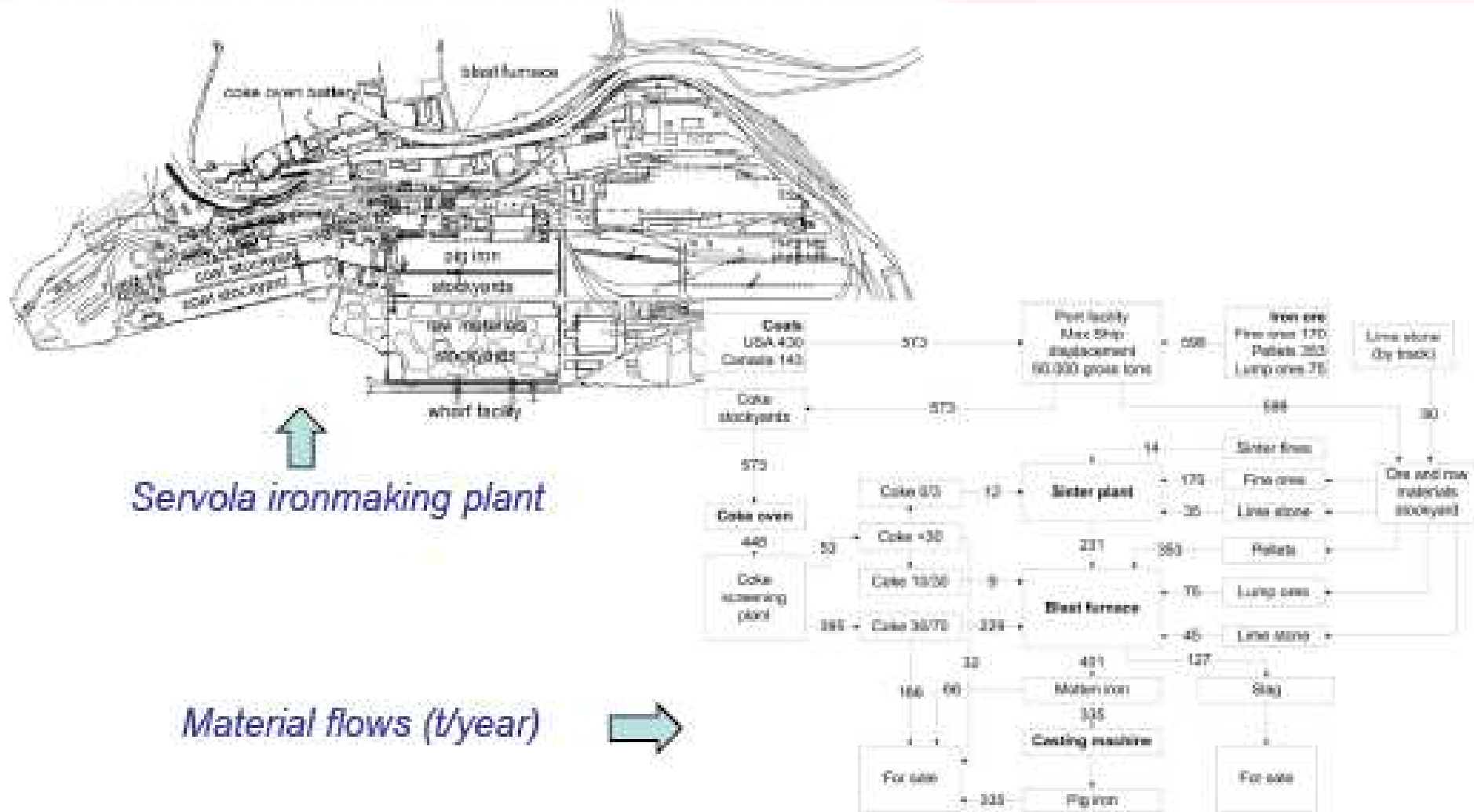


- **Laurea triennale in Ingegneria industriale**
 - Gestione della produzione
- **Laurea magistrale in Ingegneria Meccanica**
 - Impianti meccanici I
 - Impianti meccanici II
- **Master Double-degree “Production engineering and Management” (with OWL University Lippe – Germany)**
 - Operations management
 - Industrial plants
- **Specialist Master “Management in Clinical engineering”**
 - Qualità e logistica nella sanità
 - Valutazione delle strutture e dei servizi





Ironmaking plant: mitigation of environmental effects



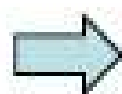


		R1	R2	R3
Strand speed	(m min ⁻¹)	1.00	1.11	1.24
Return fines	(%)	30.74	28.89	31.19
Sintering speed	(mm min ⁻¹)	17.01	19.20	20.67
Degree of vacuum	(mm H ₂ O)	790.35	853.31	811.16
Productivity	(t m ⁻² h ⁻¹)	30.34	34.89	35.74
FeO content	(%)	6.04	5.81	6.45
Coke equivalent	(kg t ⁻¹)	38.94	45.47	44.26

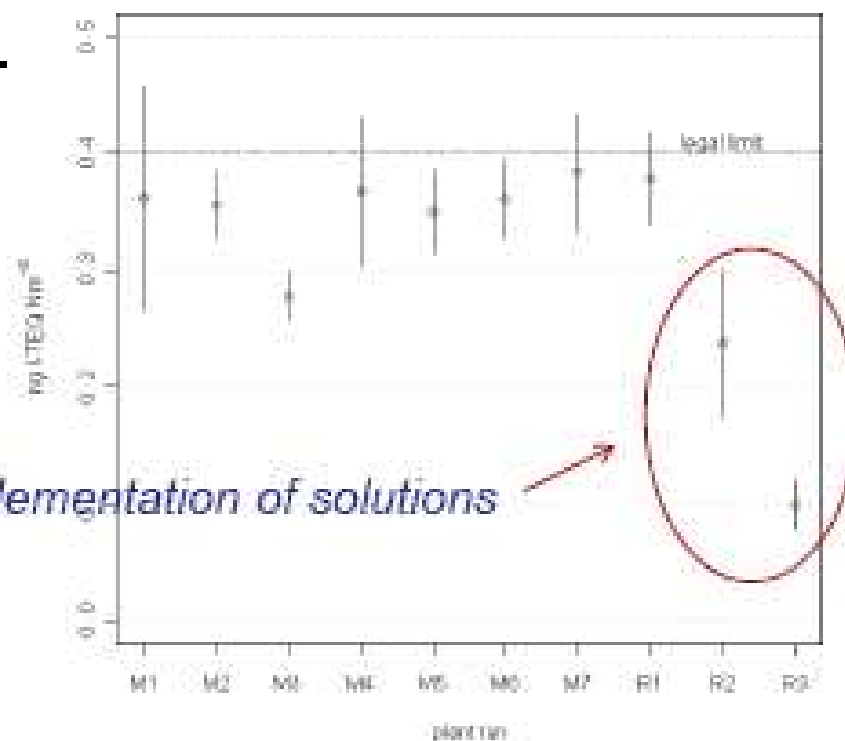


Plant figures

*Experimental runs: dioxin
emissions*

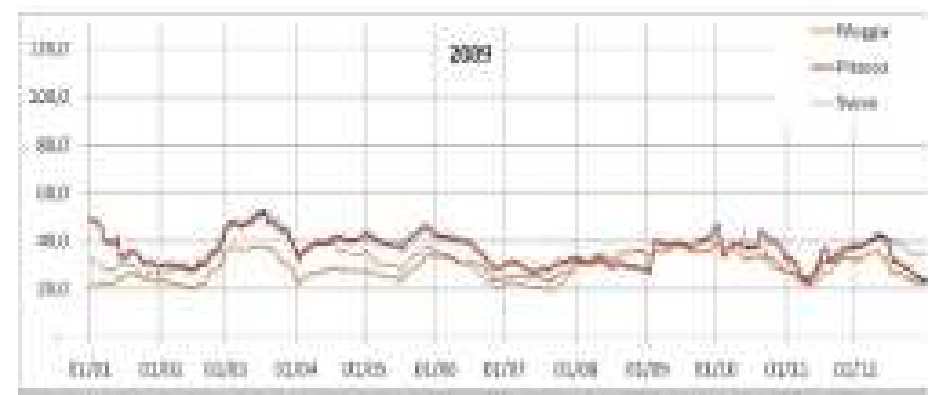
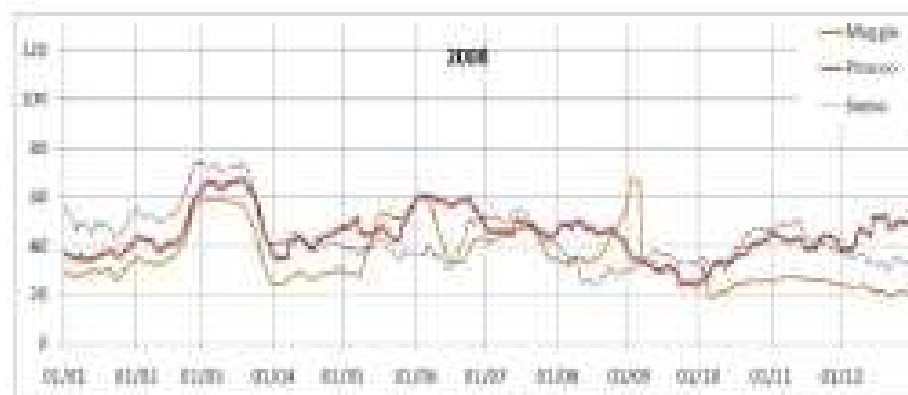
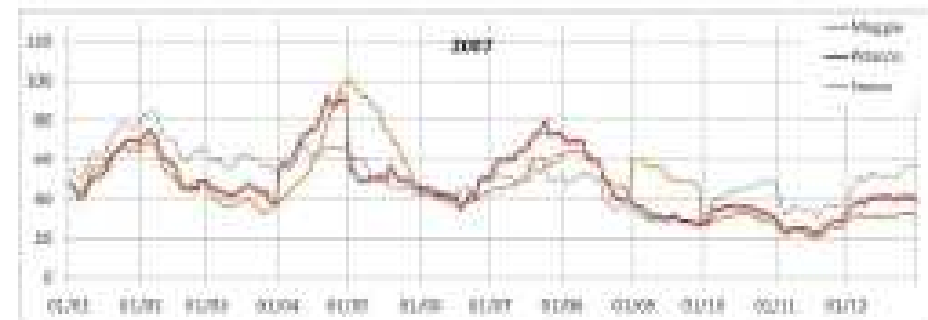
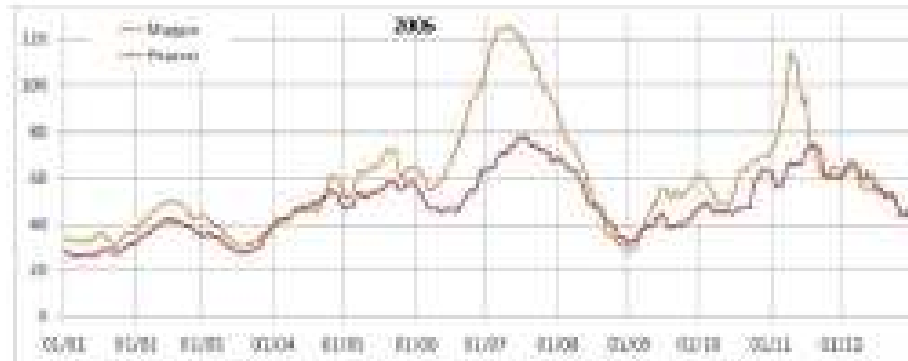


After implementation of solutions





Ironmaking plant: mitigation of particulate emissions



*Diagrams of particulate monitored at plant surroundings:
implementation of containment solutions started in 2007.*

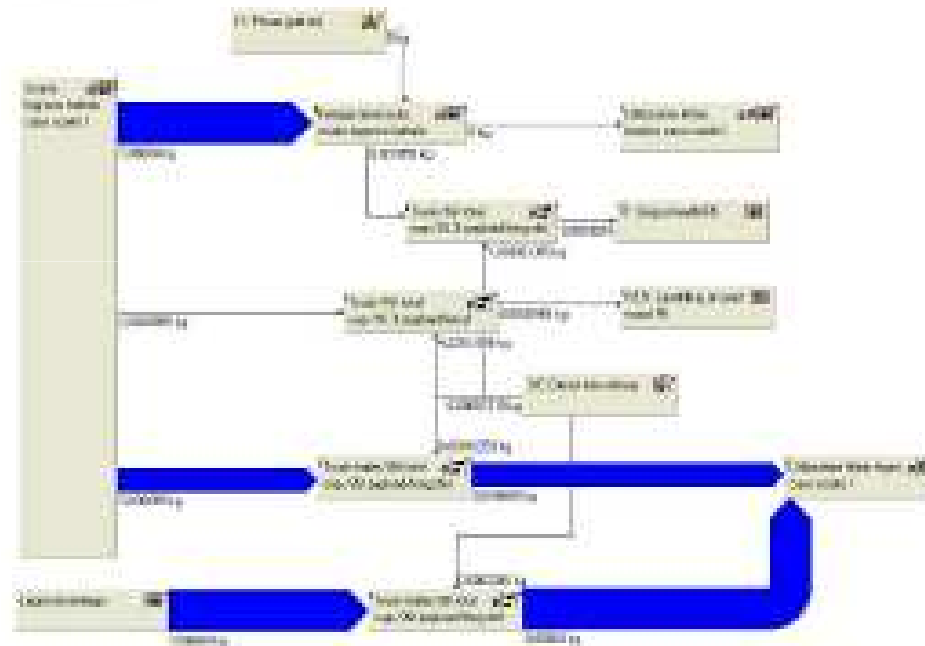




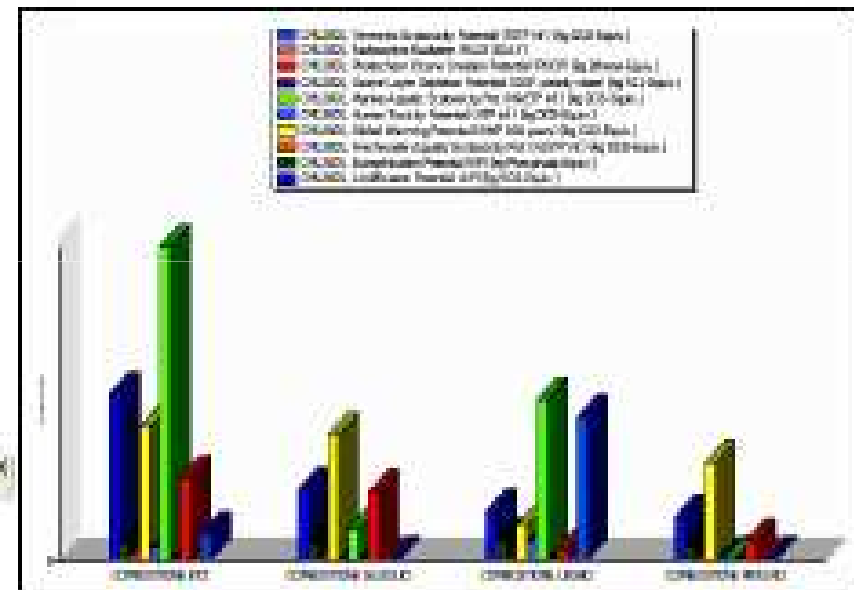
LCA: thermal energy for industry from different sources

COMBUSTIONE LEGNO

Calore specifico: 1000
1.000.000.000.000.000.000



Solution 3: wood as fuel.



Results after normalisation.



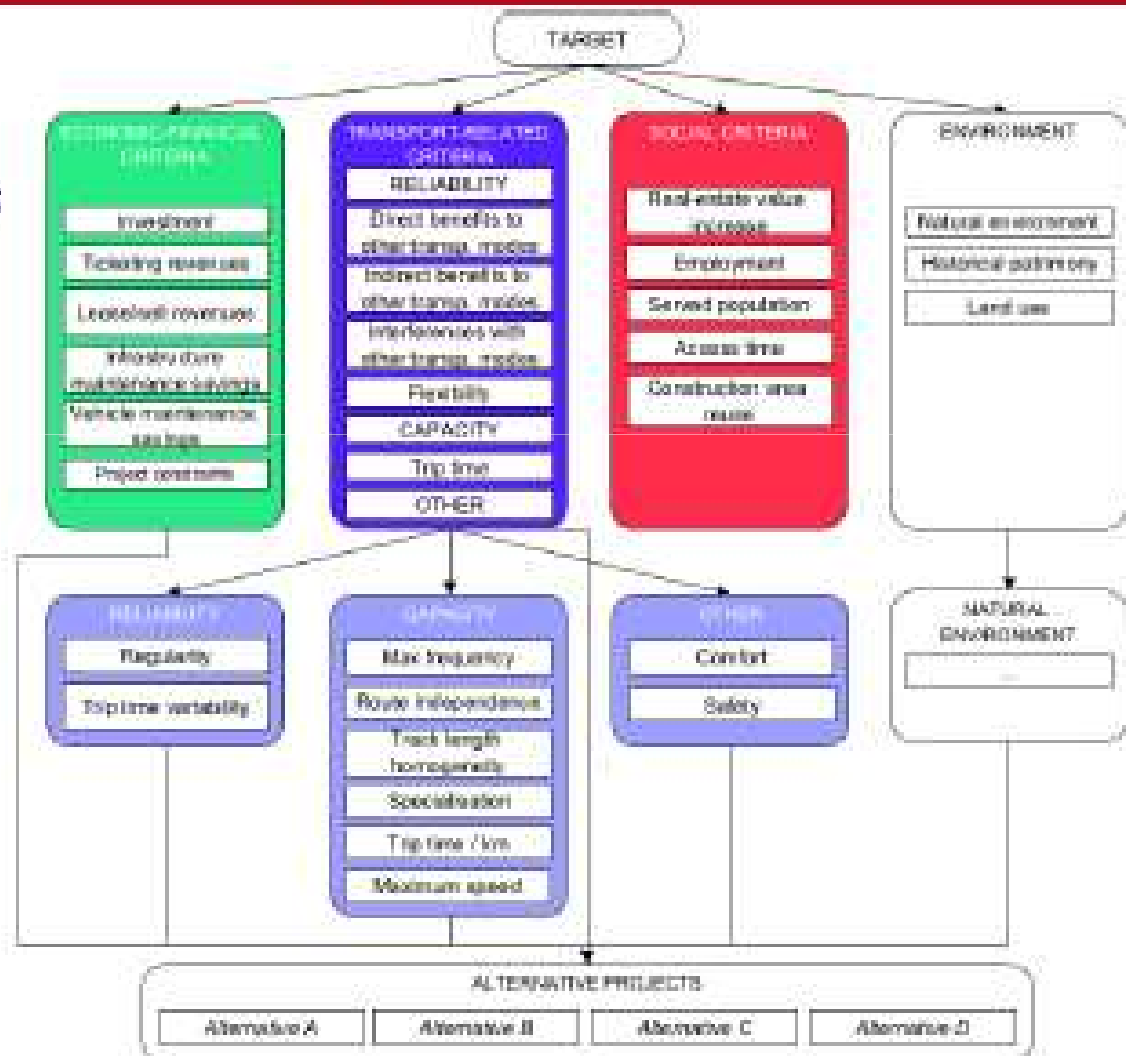


Transportation facilities: evaluation of alternative layouts

Traditional approaches:

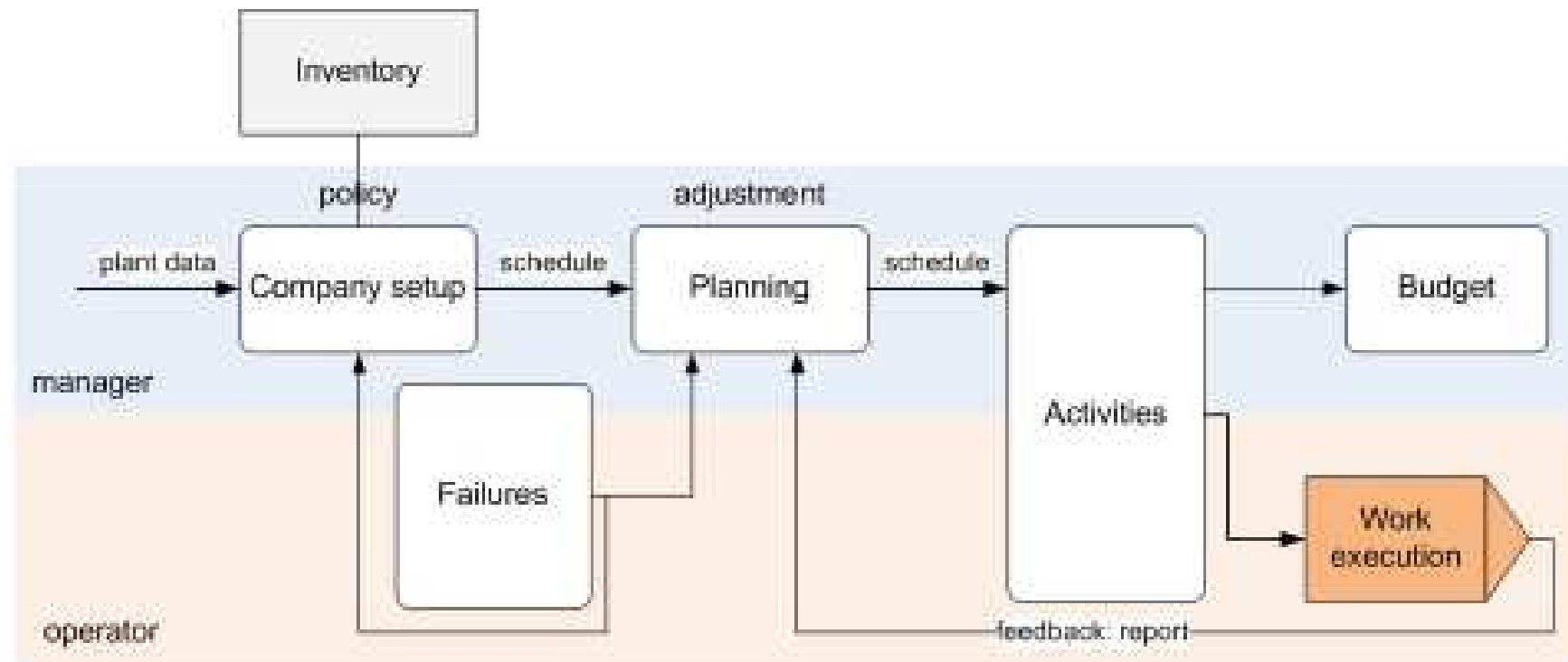
- great attention is given to negative impacts of solutions
- positive effects on the network are overlooked

*New evaluation
structure proposed:*





Flow diagram of the CMMS





Boscolo M., Padoano E. (2011), Monitoring of Particulate Emissions to Assess the Outcomes of Retrofitting Measures at an Ironmaking Plant, <i>ISIJ International</i> , 51 (9), 1554-1561	4
Boscolo M., Padoano E. (2011), Solutions for containing dioxin emissions from iron ore sintering at Italian plant, <i>Ironmaking & Steelmaking (ISSN 0301-9233)</i> , 38 (2), 119-122.	4
Nicolich M., Pozzetto D., Simonato G. (2011), Applications of Lean Methodologies Into a Semi-finished Wood Products Manufacturing, <i>Production engineering and management for furniture industry, Bagnaria Arsa (UD)</i> , pp.34-49. ISBN 9788878731004	5
Longo G., Padoano E., Strani S. (2010), Improving the assessment of railway projects through new performance indicators, <i>EURO XXIV Usbon, 24th European Conference on Operational Research, July 11-14 2010</i> .	6
Da Re A., Padoano E., Pozzetto D. (2009), A CMMS solution for small industries based on open source tools: structure and implementation, <i>MM2009 4th International Conference on Maintenance and Facility Management, Roma (Italy), 2009 April 22-24</i> , 59-64 (ISBN 978-88-95405-03-2).	6
Boscolo M., Padoano E. (2008), Investigations into dioxin emissions at Italian iron ore sintering plant, <i>Ironmaking & Steelmaking (ISSN 0301-9233)</i> , 35 (5), 338-342.	3
Mondolo M. D., Padoano E., Pozzetto D. (2008), Evaluation of the effects of failures on performance indexes of a continuous casting plant, in Kuljanic E. (ed.) <i>AMST'08 - Proceedings of the Eighth International Conference, CISM, Udine 12-13 June 2008</i> , pp. 247-254, ISBN 978-88-85137-22-9.	5
Boscolo M., Padoano E., Tommasi S. (2008), Identification of possible reduction strategies for PCDDyF emissions in pre-existing iron ore sinter plants, <i>Ironmaking & Steelmaking (ISSN 0301-9233)</i> , 35 (2), 146-152.	3
Boscolo M., Padoano E., Tommasi S. (2006), Identification and monitoring of environmental indicators to evaluate the requalification of a coke-making plant, <i>Stahl und Eisen (ISSN 0340-4803)</i> , 126, June 2006, 57-63.	5
De Monte M., Padoano E., Pozzetto D., Simonato L. (2007), Dimensioning of a logistic platform serving packaging lines of high quality food products, <i>11th International Scientific Conference on Production Engineering CIM 2007, Biograd (HR), June 13-17 2007</i> , 111-116 (ISBN 978-953-97181-9-8).	6

Research Topics – Ing/Ind-17

1	2	3	4	5	6	7
Production system analysis and design	Auxiliary plant analysis and design	Processes and production technologies	Ergonomics and safety of industrial systems	Production system management	Logistics	Production system automation



Recent research projects (2006-2011):

- “Nuove vernici nanostrutturate a basso impatto ambientale per il settore del legno-arredo con life cycle assessment ed analisi di sostenibilità come criteri guida” (POR FESR 2007-2013)
- “Confronto di due possibili utilizzi degli scarti della lavorazione del legno mediante la metodologia del Life Cycle Assessment” (FederlegnoArredo)
- “QUICK BUDGET” sistema A.I. per la ripianificazione aziendale in tempo reale a capacità finita (POR FESR 2007-2013)

