

Fabbrica Futuro

Marco Cesari

Operations Manager Bonfiglioli Riduttori
Mobile and Wind Solutions Business Unit

Bologna, 19.03.2014

Agenda

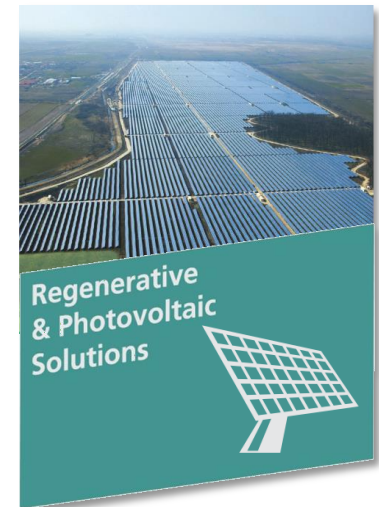
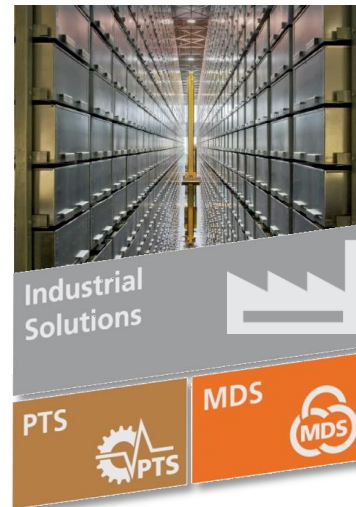
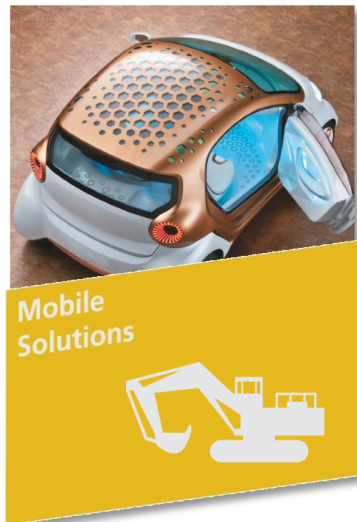
- Bonfiglioli Riduttori overview
- Mobile and Wind Solutions production sites and product lines
- Proud of our Customers
- Headquarters Shopfloor (Forli)
- P&L trend
- How did we do
- P&L main contribution
- What's next

Company Overview



The **Bonfiglioli Group** has been working according to Business Unit logics for years in order to develop the best service and innovation and to offer the most suitable products and business models of the supported areas.

Today the Company consists of **3 Business Units and 2 Division.**





Business Unit Mobile & Wind Solutions

Business Unit Mobile & Wind Solutions



Headquarters of the BUMWS
Manufacturing Site/Engineering
FORLÌ

Site Area

Real estate: **85.000 m²**

Building: **36.000 m²**

Total No. of employees
620

White collar: **164**

Blue collar: **456**

(upd. Dec. 2013)



BONFIGLIOLI TRANSMISSION PVT LTD. MANUFACTURING SITE/ENGINEERING CHENNAI – INDIA

Site Area

Real estate: **26.820 m²**

Building: **16.150 m²**

Total No. of employees
415

White collar: **219**

Blue collar: **196**

(upd. Dec. 2013)



BONFIGLIOLI DRIVES CO., LTD. MANUFACTURING SITE QINGPU – CHINA



Site Area: 10.000 m²

**Completed the purchase of land
for new building with BUINS –
Project for 22.000 sqm building**

Total No. of employees
77

White collar: **49**
Blue collar: **28**

(upd. Dec. 2013)



300 series

Multipurpose
planetary
drives



500 series

Concrete
mixer
drives



600 series

Wheel
drives



800 series

Winch
drives



700C series

Track and road
roller drives



700CK series

Excavators
track drives



700T series

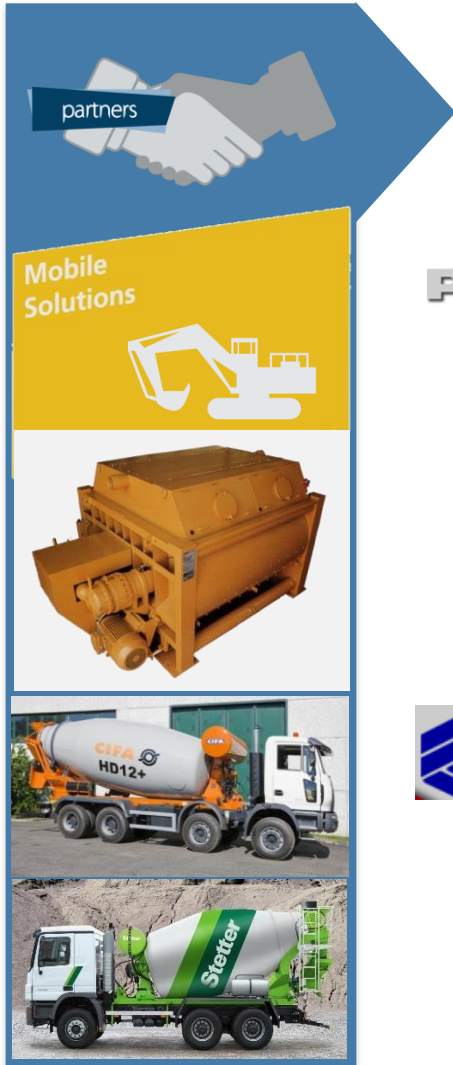
Slew
drives



700TK series

Excavators
Slew drives

Concrete Mixers



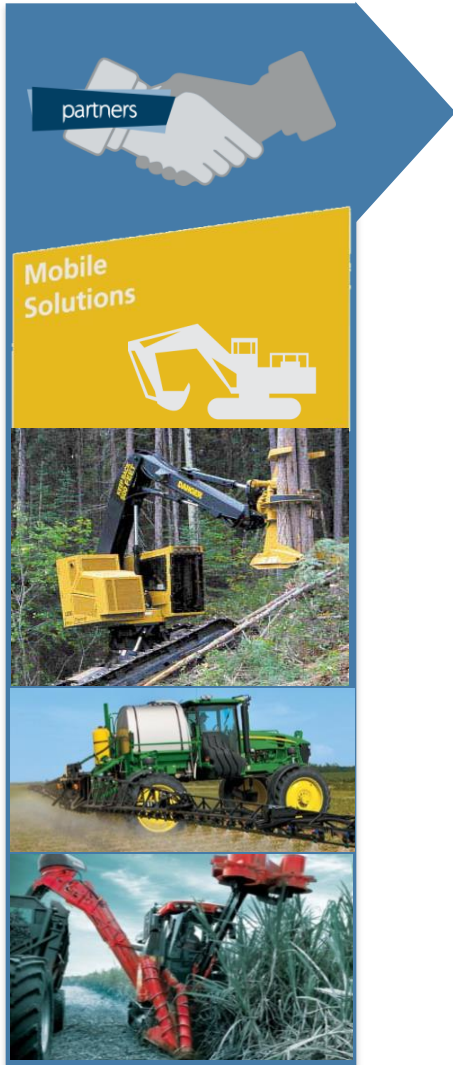
LIEBHERR



Putzmeister



Agriculture, Forestry & Snow Equipment



JOHN DEERE



Tigercat^{MC}



ROTTNE Industri AB -

SERVSPRAY



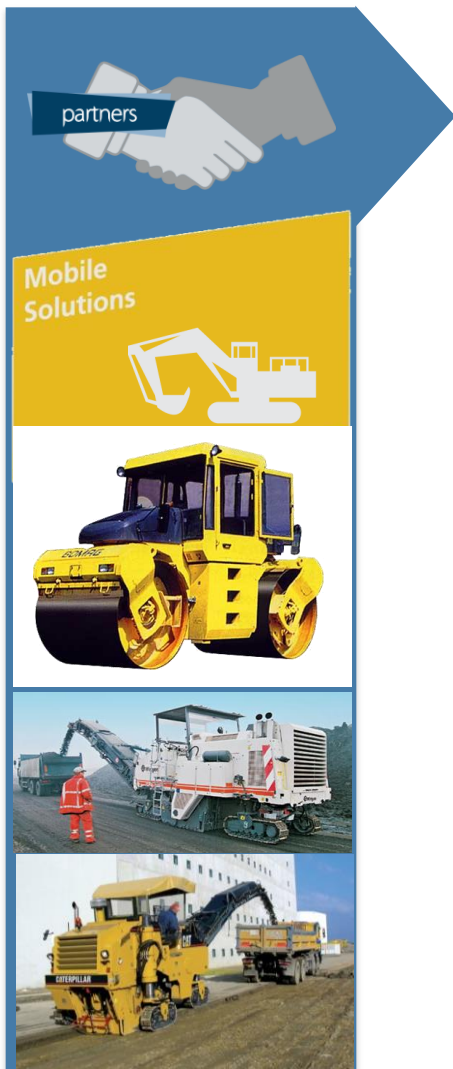
GREGOIRE



AMAZONE



Road Construction



CATERPILLAR®

ZOOMLION
Heavy Industry & Science



DYNAPAC
COMMITTED TO SERVICE AND PERFORMANCE

LIUGONG
柳工

PACKAT
ЗАКРЫТОЕ АКЦИОНЕРНОЕ ОБЩЕСТВО

MARINI
FAYAT GROUP

BOMAG
FAYAT GROUP



AMMANN



PROTON
PRIMUS

BCP



SOMERO
ENTERPRISES

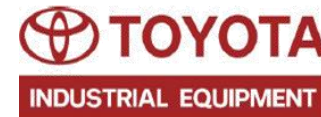
XCMG
徐工集团

SAKAI



Panien

Skid Steer Loaders, forklifts and more



Aerial Platforms, Scissors Lifts, Telescopic elevators



Hinowa

TEUPEN

RUTHMANN



Haulotte 
GROUP



HOLLAND LIFT

AIRO by TIGIEFFE



Excavators



KOMATSU

STRONG

 **HYUNDAI**
CONSTRUCTION EQUIPMENT IND. CO., LTD.

Mecalac

HIDROMEK®

ATLAS

 **NEW HOLLAND**
CONSTRUCTION
NEW HOLLAND KOBELCO



 **TESMEC**
GALLMAC



 **DOOSAN** Doosan Infracore

BENATI

 **KRANEKS**

Takeuchi

Min excavators



WACKER
NEUSON



TATA HITACHI



Crawler Undercarriages



CATERPILLAR®
Caterpillar Industrial Products, Inc. Belgium



VALUEPART
EUROPE



A Titan Europe Plc Company



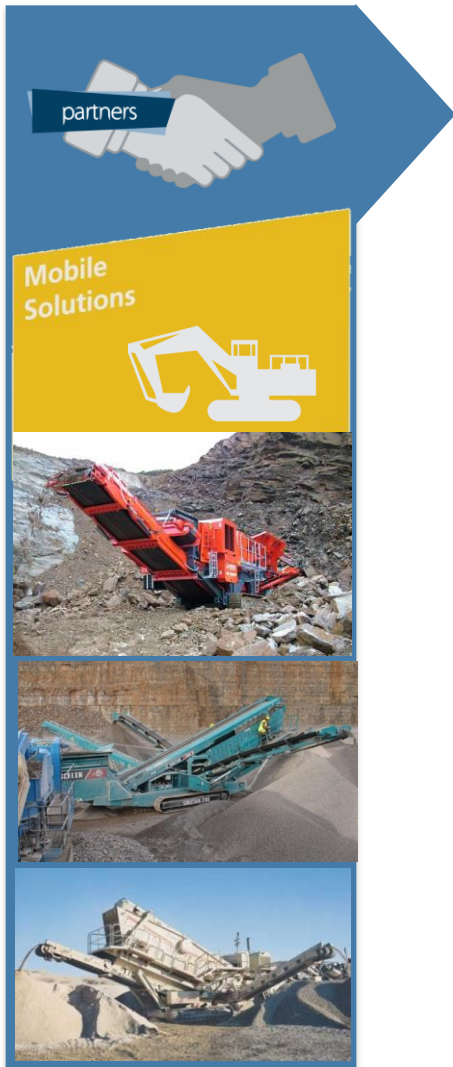
IVA
Johann GmbH
Baumaschinentechnik

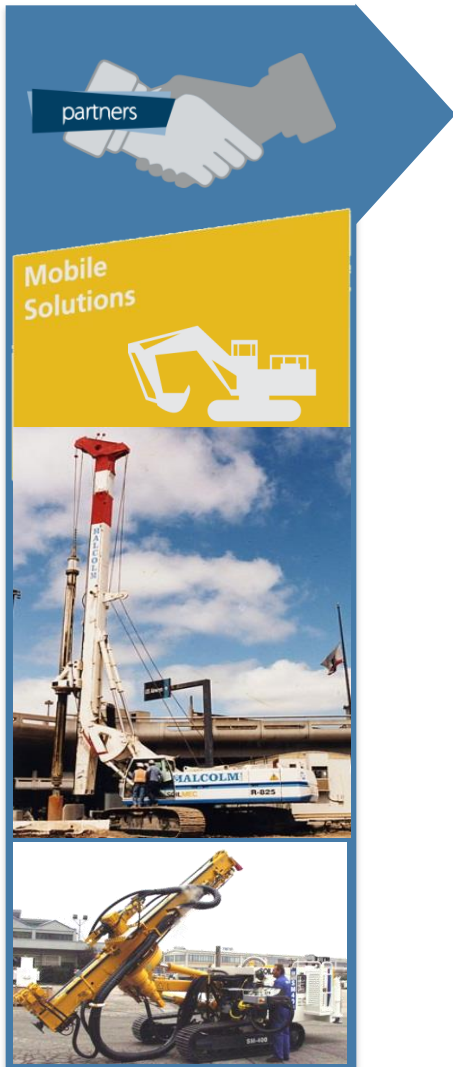


ROTER S.p.A.



Mobile crushers, screeners and shredders





INGERSOLL-RAND
CONSTRUCTION & MINING

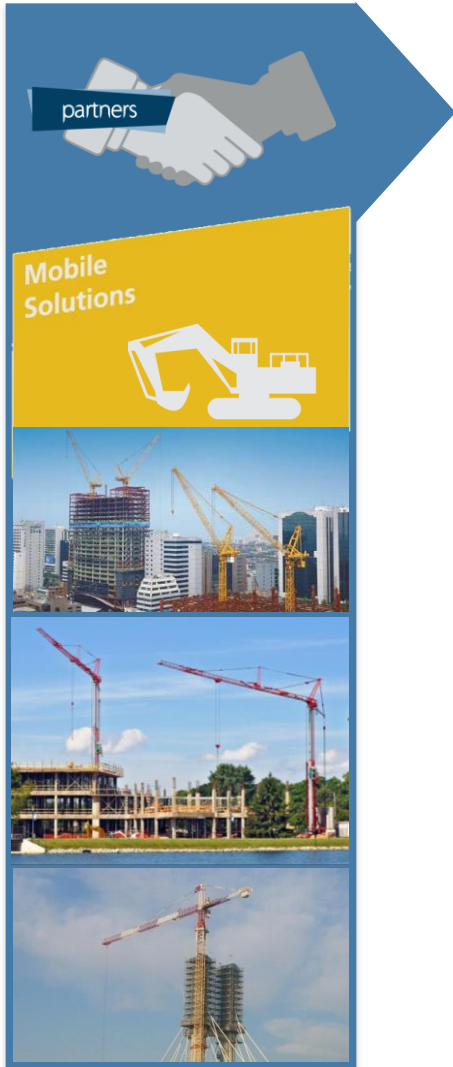


soilmeco
Drilling and Foundation Equipment





Tower Cranes, Mast climbing platforms



LIEBHERR



Mobile Cranes



LIEBHERR

FASSI

TADANO FAUN

ABTOKPAH

PM

FEINMAYER

EFFER

CRANES  PEOPLE

PALFINGER

BRONTO SKYLIFT®



Solmec

COLMAR

TEREX 

BENDINI

TEREX 

DEMAG

TEREX 

PPM

TIL Tractors India

中联浦沅
ZOOMLION PUYUAN GROUP

Balkkran

LOCATELLI
CRANE

HEILA

Construction Equipment

KLAGS
Alu-Krane · Schrägaufzüge · Service · Vermietung

Marine equipments, Cranes, Winches and Hoisting



Marine equipments, Cranes, Winches and Hoisting



WESTECH HMD



Technip

Monyana
ENGINEERING SERVICES



Wind Turbines



Vestas

SIEMENS



SUZLON
POWERING A GREENER TOMORROW

SENVION

IKENSYS

IMPBA
wind



ALSTOM

VERGNET
GROUPE



acciona
Windpower



WinWinD
- generating business -



LEITWIND®

HYUNDAI
HEAVY INDUSTRIES CO.,LTD.



Wind Turbines



MINGYANG ELECTRICITY
明阳电器



中国南车集团株洲电力机车研究所
CSR ZHUZHOU ELECTRIC LOCOMOTIVE RESEARCH INSTITUTE



RRB ENERGY LIMITED
(Pioneers in Wind Power Since 1987)



NuPower Technologies Ltd.

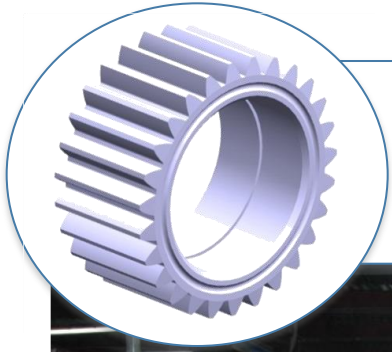


Southern Wind Farms Ltd



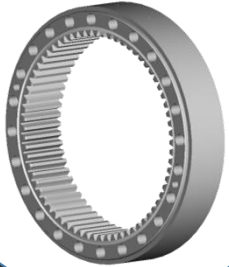


Shopfloor

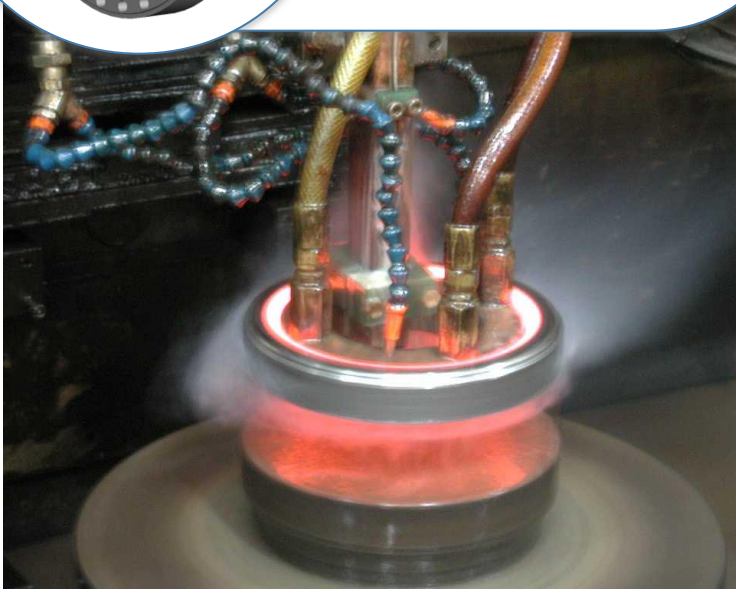


PLANETARY GEAR PRODUCTION

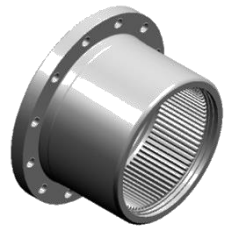


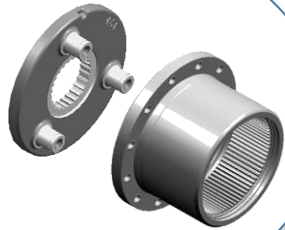
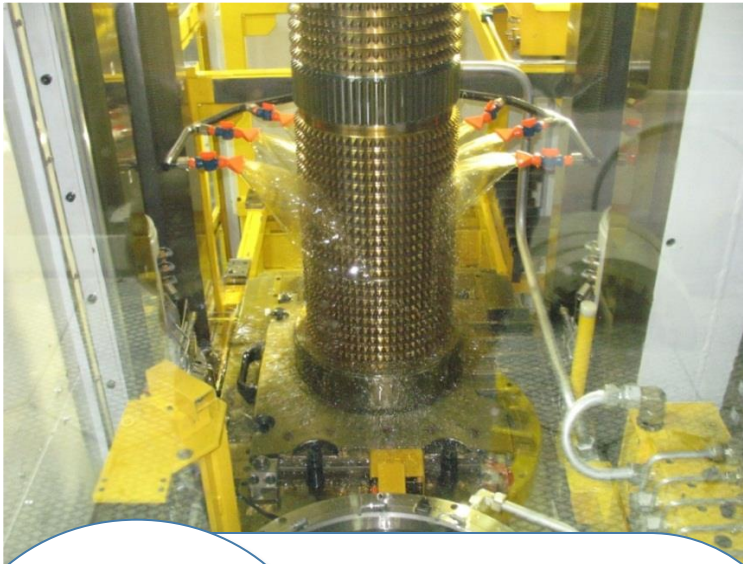


INDUCTION HARDENING TREATMENT



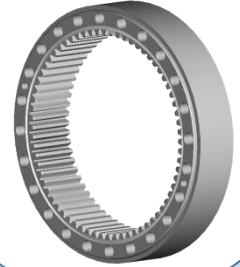
BEARING OUTER RACES HARDENING

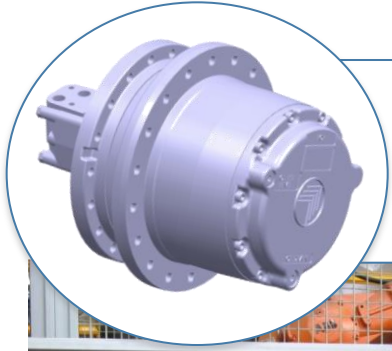




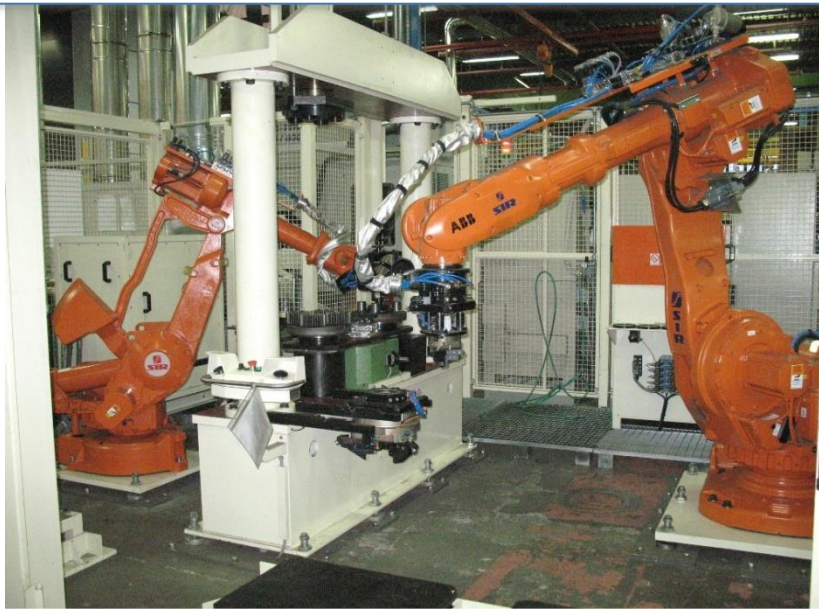
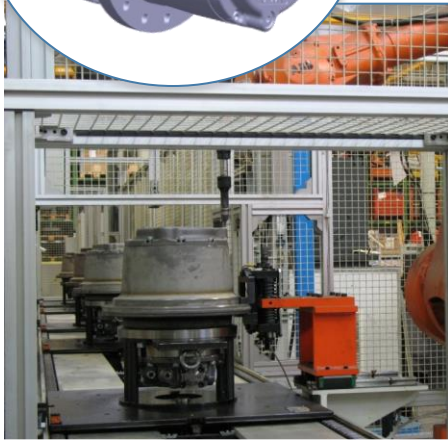
**RING GEAR
BROACHING**

**KLINK BROACHING
MACHINE FOR
RING GEAR AND
HOUSING GEAR
MANUFACTURING**





700C – 700CK SERIES

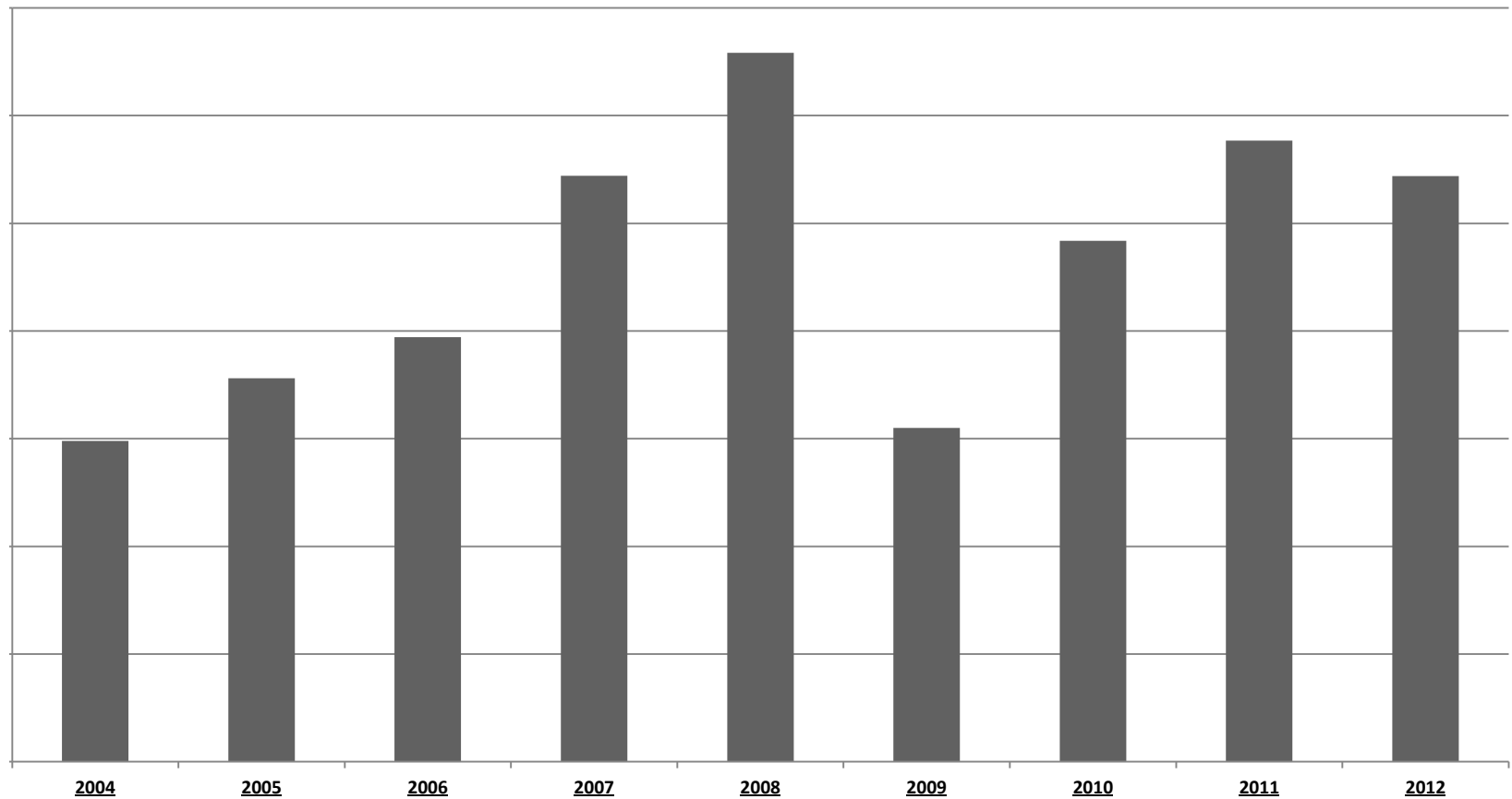


Walking through Trasmital – Automatic Warehouse

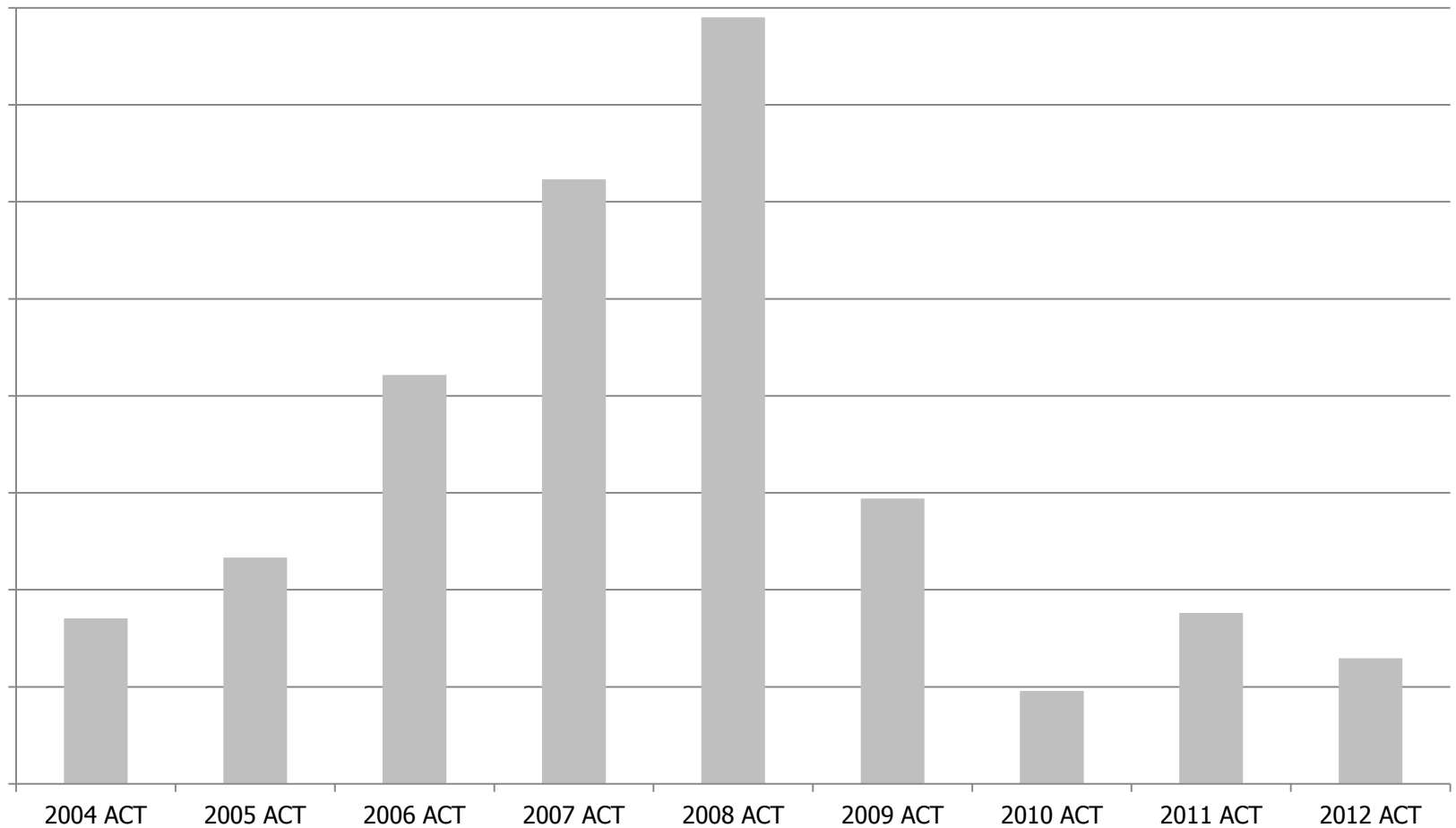


BT Turnover

M€



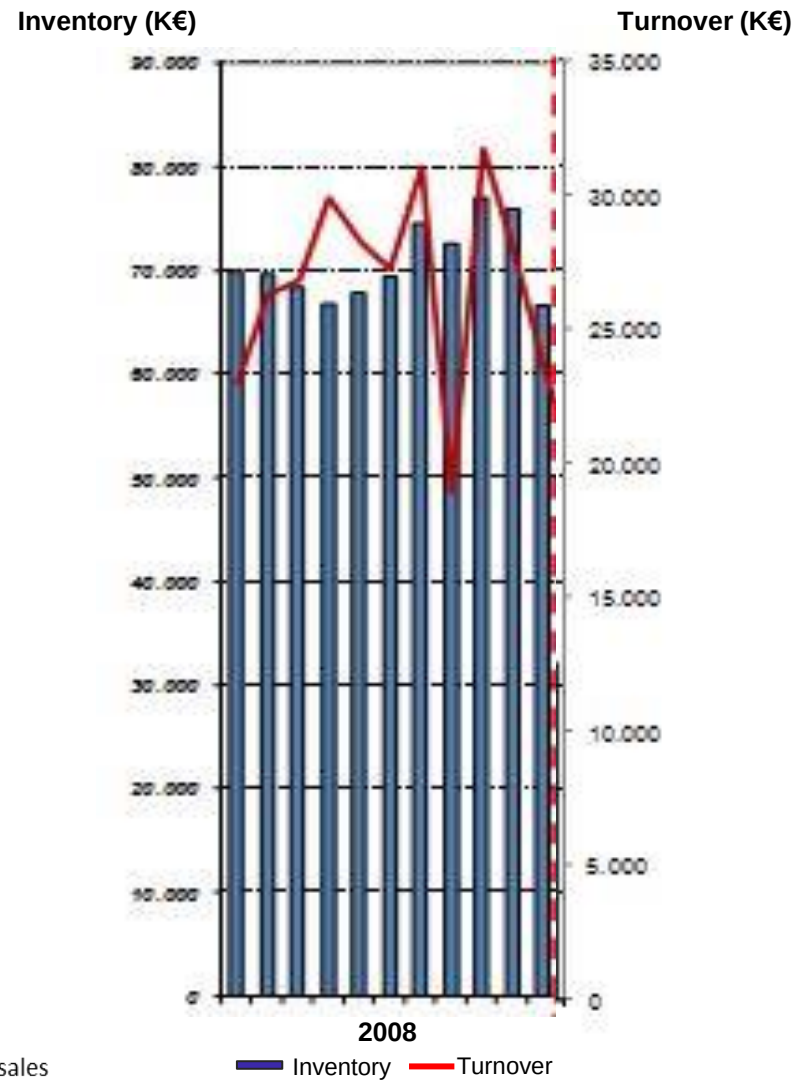
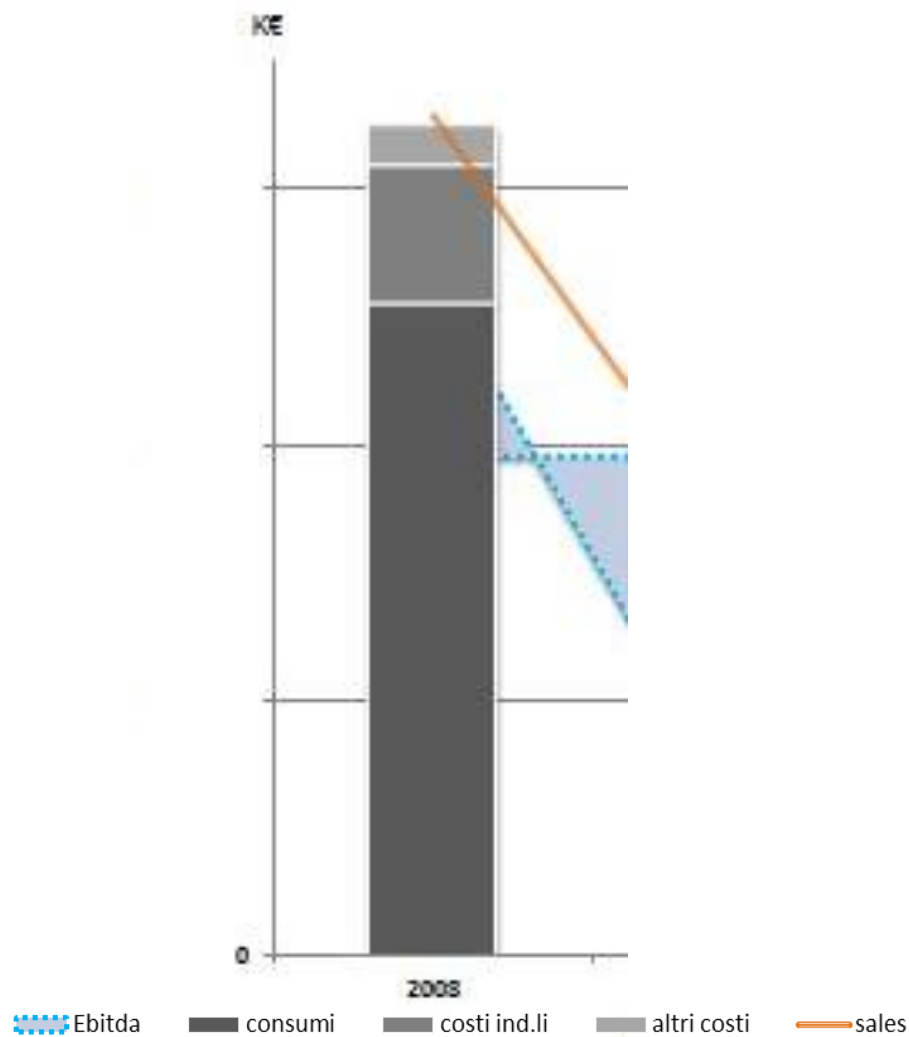
BT Investments





2008: results

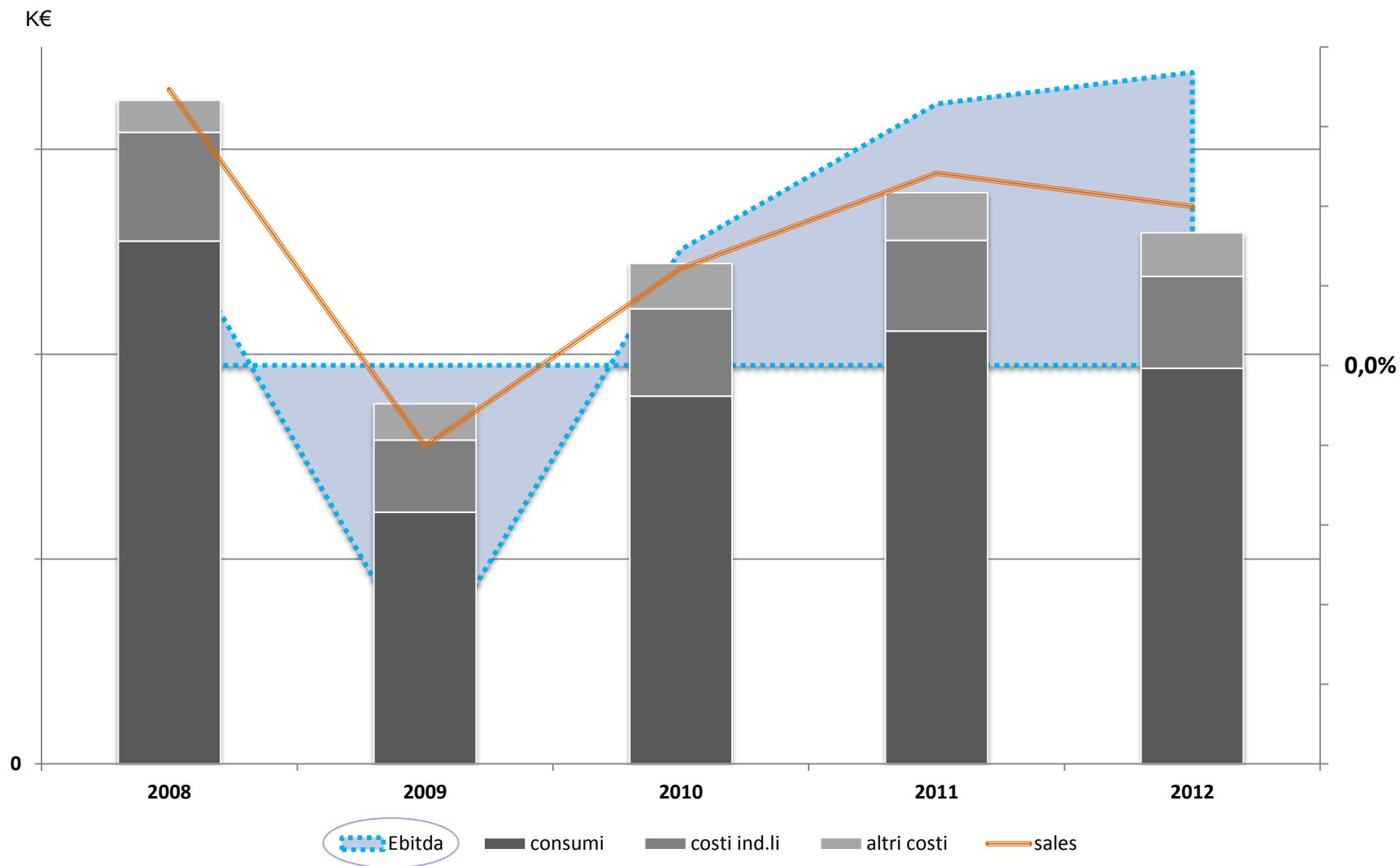
2008: EBITDA and Inventory





P&L Trend

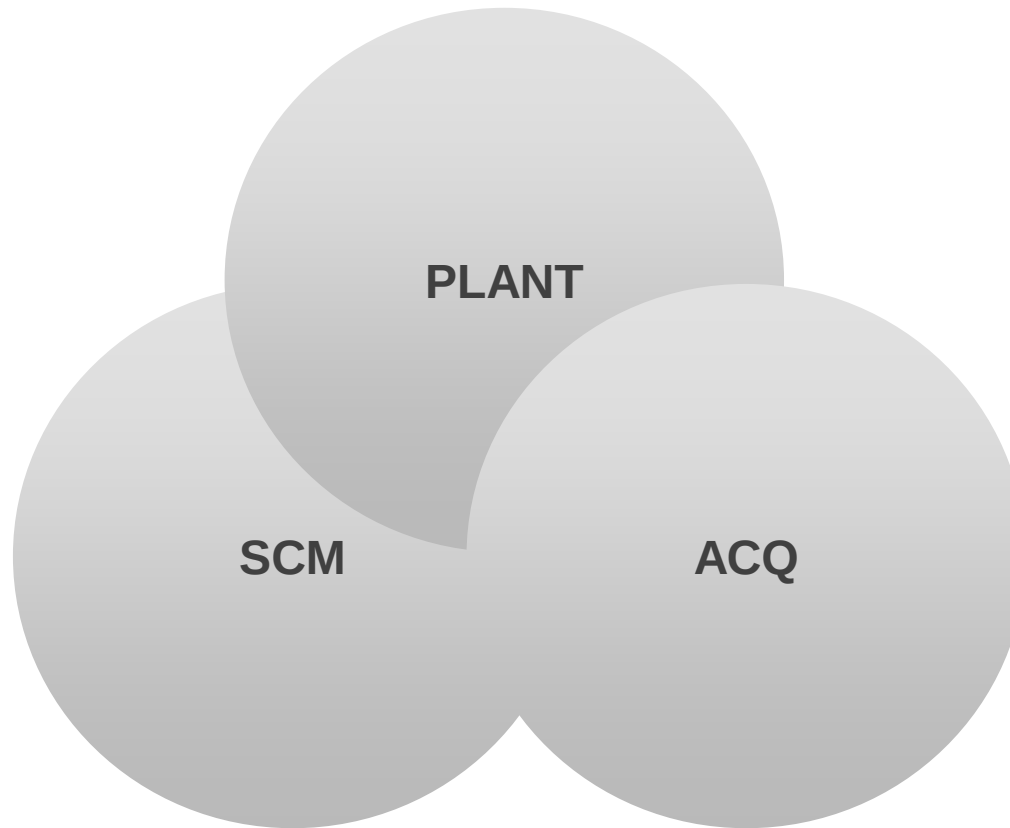
BT Financial performances 2008-2012 – FICOS –

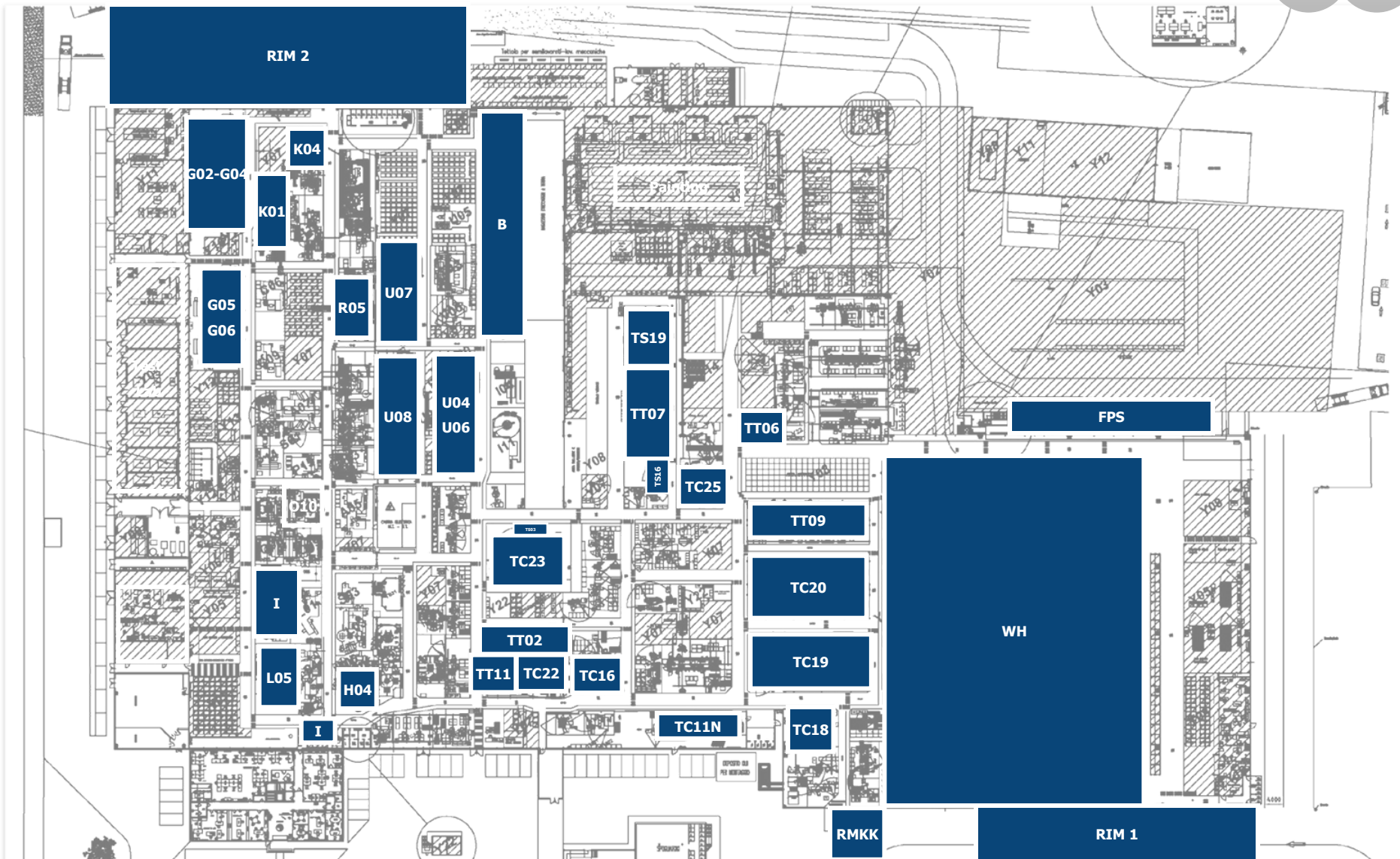


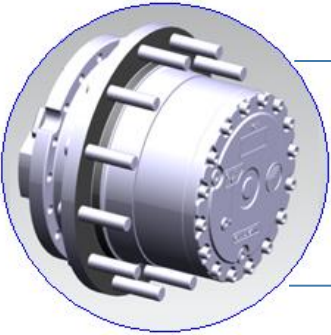
*misurazioni Vs 2008



How did we do?







606W SERIES



Before workshop



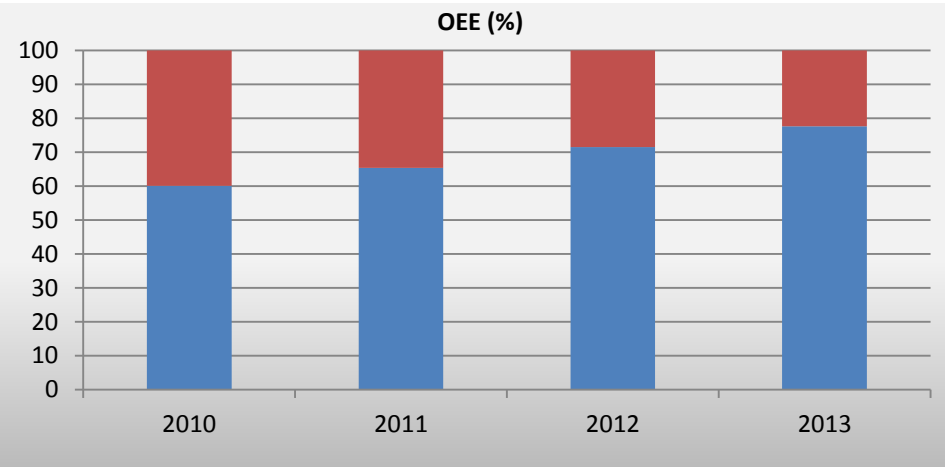
After workshop

Main KPI's



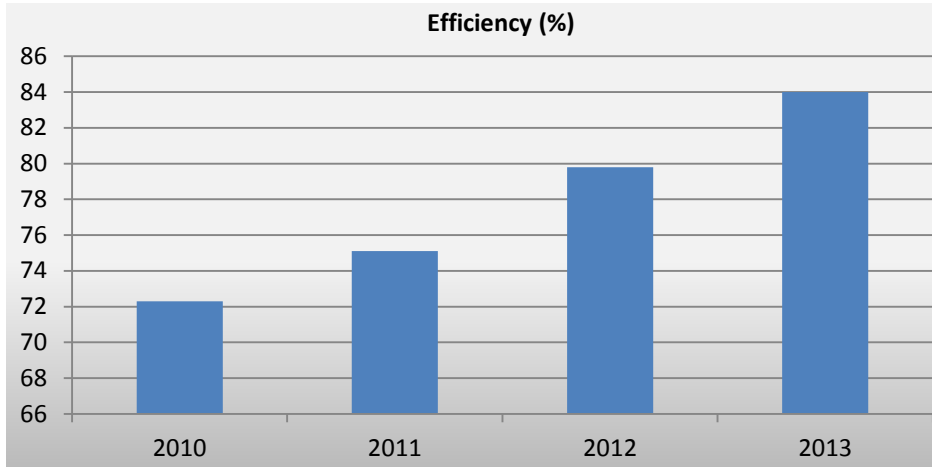
MACHINING

OEE (%)

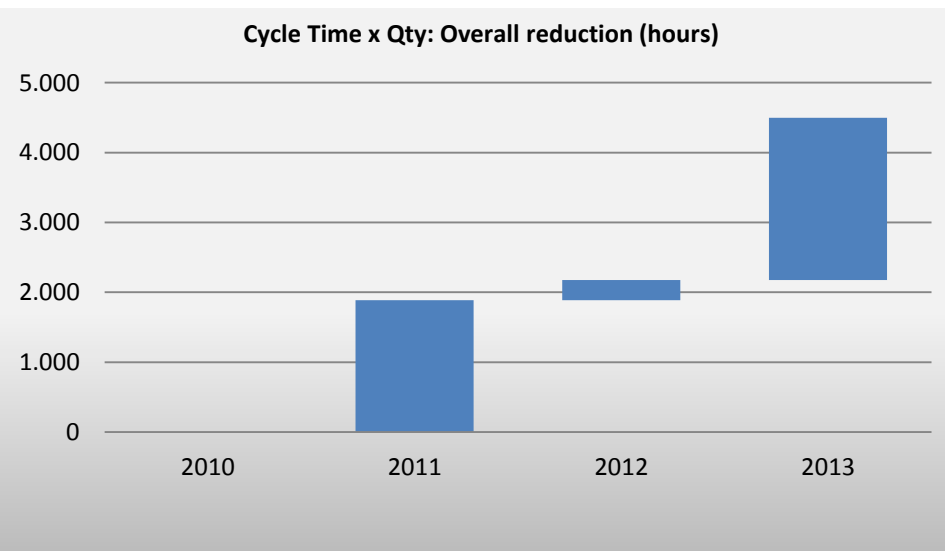


ASSY

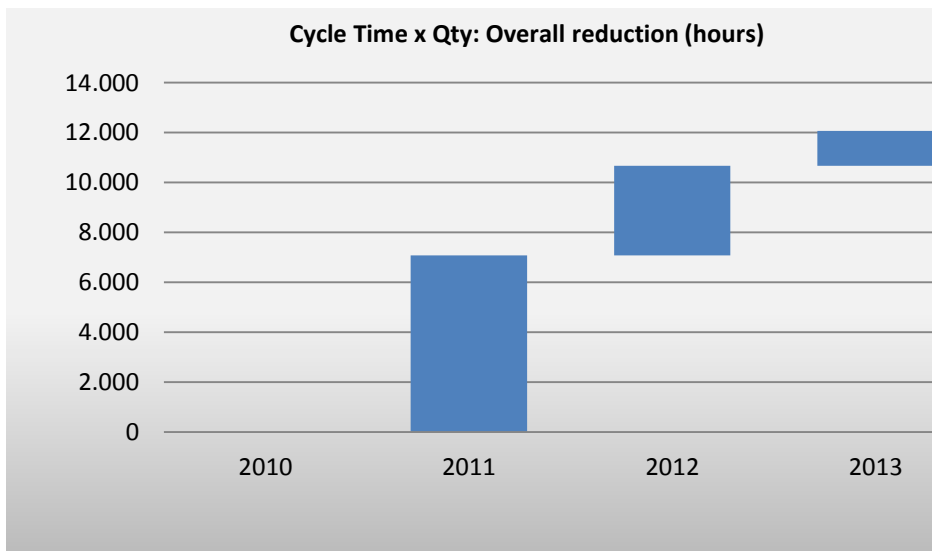
Efficiency (%)



Cycle Time x Qty: Overall reduction (hours)



Cycle Time x Qty: Overall reduction (hours)



Plant KPI's

PLANT
SCM ACQ

Operations KPI: Production Dept and Accidents at work

Manufacturing Performances

Assy Efficiency/OEE
Cycle Time Reduction

Safety Indicators

Quality Control:
Incoming Checks KPI
Process Control KPI
8D Customers KPI

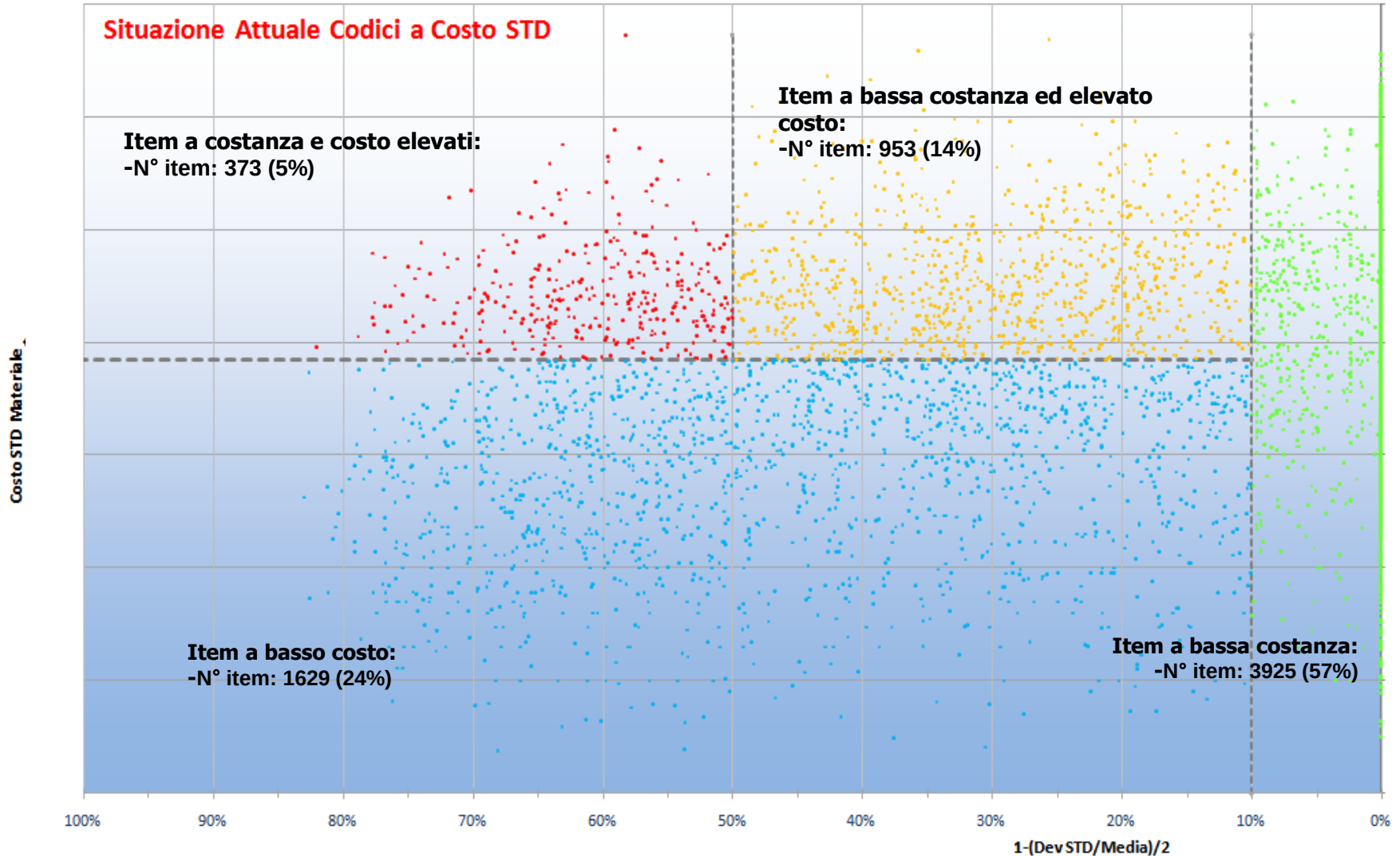
Maintenance Indicators:
Machines MTBF
Machines MTTR

AREA PRODUZIONE														color code	
id	description	base algorithm			unit	TGT 2012	range 1	range 2	ytd	actual	OK IF	ytd	actual		
1	OEE LM	W	Nr. Hours of routing x quantity produced/available machine hours			%	74%	1%	5%	73,5%	73,0%	+			
3	EFFICIENCY LM	W	Nr. Hours of routing x quantitv produced/available direct workers hours			%	112%	1%	5%	105,8%	113,4%	+			
Operations KPI-2012: Quality Control															
5	EFFICIEN														
7a	ABSENTE														
7b	ABSENTE														
10	ASSY TIM														
11	MACHINI														
AREA CONTROLLO QUALITA'															
color code															
id	Acronym	base	Description	unit	TGT 2012	range 1	range 2	avg YTD	actual	OK IF	actual	avg YTD			
1	FREE PASS	M	Suddivisione per tipo di controllo delle Entrate Materiale % Free Pass (Nessun Controllo)	%	6,00	1%	6%	7,24	6,35	+					
2	SKIP	M	Suddivisione per tipo di controllo delle Entrate Materiale % Stock Q Skip	%	75,00	1%	6%	71,19	75,87	+					
3	CAMPIONATU														
4	COLLAUDARE														
Operations KPI: Production Equipment reliability															
MAINTENANCE AREA															
color code															
id	description	base	algorithm	unit	TGT 2012	range 1	range 2	ytd	actual	OK IF	act	ytd			
1a	Broaching machines - MTBF	M	$MTBF = \sum T \text{ MachinesWorking} / \text{Number of dow ntimes}$	hrs	25,0	3	6	22,8	20,5	+					
1b	Broaching machines - MTTR	M	$MTTR = \sum T \text{ MachinesDow ntime} / \text{Number of dow ntimes}$	hrs	0,9	0,3	0,6	1,3	1,1	-					
2a	Turning with robot - MTBF	M	$MTBF = \sum T \text{ MachinesWorking} / \text{Number of dow ntimes}$	hrs	85,0	3	6	30,6	-	+					
2b	Turning with robot - MTTR	M	$MTTR = \sum T \text{ MachinesDow ntime} / \text{Number of dow ntimes}$	hrs	0,9	0,3	0,6	1,5	-	-					
2c	Turning without robot - MTBF	M	$MTBF = \sum T \text{ MachinesWorking} / \text{Number of dow ntimes}$	hrs	85,0	3	6	88,9	-	+					
2d	Turning without robot - MTTR	M	$MTTR = \sum T \text{ MachinesDow ntime} / \text{Number of dow ntimes}$	hrs	0,9	0,3	0,6	1,9	-	-					
3a	Working centers - MTBF	M	$MTBF = \sum T \text{ MachinesWorking} / \text{Number of dow ntimes}$	hrs	25,0	3	6	32,6	-	+					
3b	Working centers - MTTR	M	$MTTR = \sum T \text{ MachinesDow ntime} / \text{Number of dow ntimes}$	hrs	0,8	0,3	0,6	1,3	-	-					
4a	Gear cutting cells - MTBF	M	$MTBF = \sum T \text{ MachinesWorking} / \text{Number of dow ntimes}$	hrs	165,0	3	6	59,5	-	+					
4b	Gear cutting cells - MTTR	M	$MTTR = \sum T \text{ MachinesDow ntime} / \text{Number of dow ntimes}$	hrs	0,8	0,3	0,6	2,6	-	-					
5a	Grinding machines - MTBF	M	$MTBF = \sum T \text{ MachinesWorking} / \text{Number of dow ntimes}$	hrs	58,0	3	6	26,1	36,3	+					
5b	Grinding machines - MTTR	M	$MTTR = \sum T \text{ MachinesDow ntime} / \text{Number of dow ntimes}$	hrs	0,8	0,3	0,6	1,6	1,1	-					
6a	Pinion toothing machines - MTBF	M	$MTBF = \sum T \text{ MachinesWorking} / \text{Number of dow ntimes}$	hrs	117,0	3	6	63,9	-	+					
6b	Pinion toothing machines - MTTR	M	$MTTR = \sum T \text{ MachinesDow ntime} / \text{Number of dow ntimes}$	hrs	0,7	0,3	0,6	1,5	-	-					
7a	Induction hardening with robot - MTBF	M	$MTBF = \sum T \text{ MachinesWorking} / \text{Number of dow ntimes}$	hrs	50,0	3	6	13,5	31,3	+					
7b	Induction hardening with robot - MTTR	M	$MTTR = \sum T \text{ MachinesDow ntime} / \text{Number of dow ntimes}$	hrs	0,9	0,3	0,6	1,2	1,1	-					
7c	Induction hardening without robot - MTBF	M	$MTBF = \sum T \text{ MachinesWorking} / \text{Number of dow ntimes}$	hrs	50,0	3	6	39,1	77,9	+					
7d	Induction hardening without robot - MTTR	M	$MTTR = \sum T \text{ MachinesDow ntime} / \text{Number of dow ntimes}$	hrs	0,9	0,3	0,6	1,2	0,0	-					
8a	Hobbing machines - MTBF	M	$MTBF = \sum T \text{ MachinesWorking} / \text{Number of dow ntimes}$	hrs	215,0	3	6	164,2	-	+					
8b	Hobbing machines - MTTR	M	$MTTR = \sum T \text{ MachinesDow ntime} / \text{Number of dow ntimes}$	hrs	1,0	0,3	0,6	1,1	-	-					

Planning method management

Estrazione dati W41

Analizzati Item con Fabbisogni + consumi sul 2009



Politiche di approvvigionamento 2009			
	% a valore		LT medio pesato (gg/ lav)
CA - ordine chiuso	76%		20,92
CA - Ordine aperto	24%		
N° item gestiti in CLF/CLP		3.804	

Politiche di approvvigionamento 2011			
	% a valore		LT medio pesato (gg/ lav)
CA - ordine chiuso	39%		14,41
CA - Ordine aperto	61%		
N° item gestiti in CLF/CLP		3.325	

Delta politiche 2011 vs 2009			
	% a valore		LT medio pesato
CA - ordine chiuso	-37%		-31%
CA - Ordine aperto	37%		
N° item gestiti in CLF/CLP		-13%	

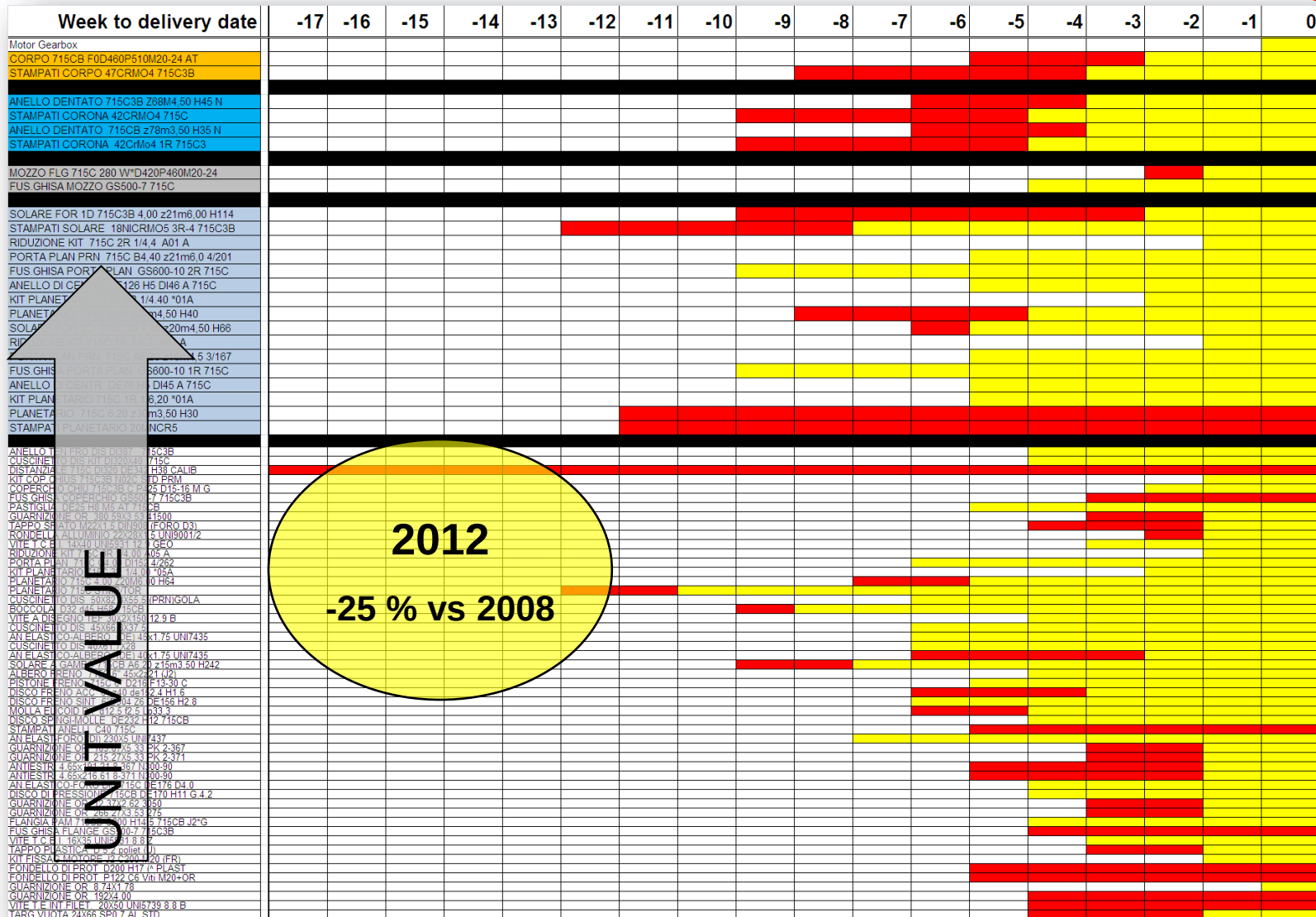
Ex: 2T706T3191A01 da 13 a 9 settimane

Ex: 2T255608241A da 14 a 11 settimane (606 BOMAG)

LT Deployment – 715C –

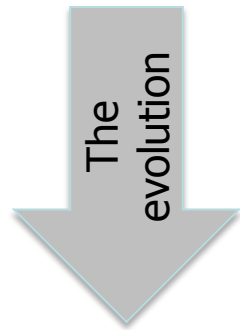
(2012 Vs 2008)

PLANT
SCM ACQ



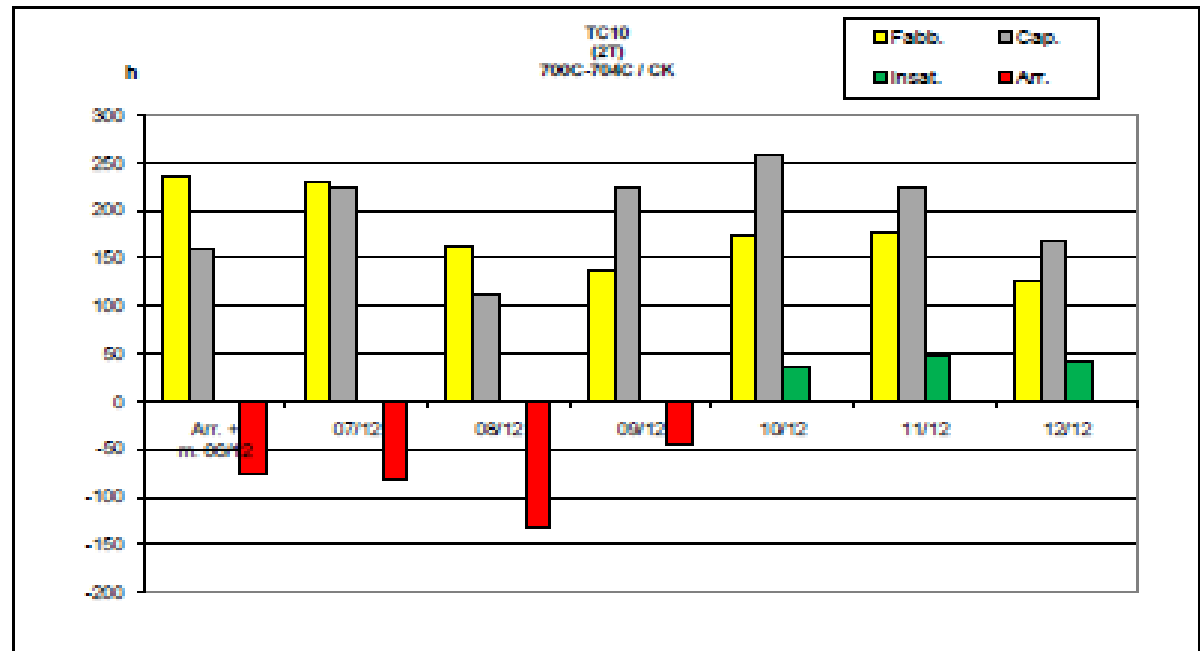
2012
-25 % vs 2008

Capacity Dashboard



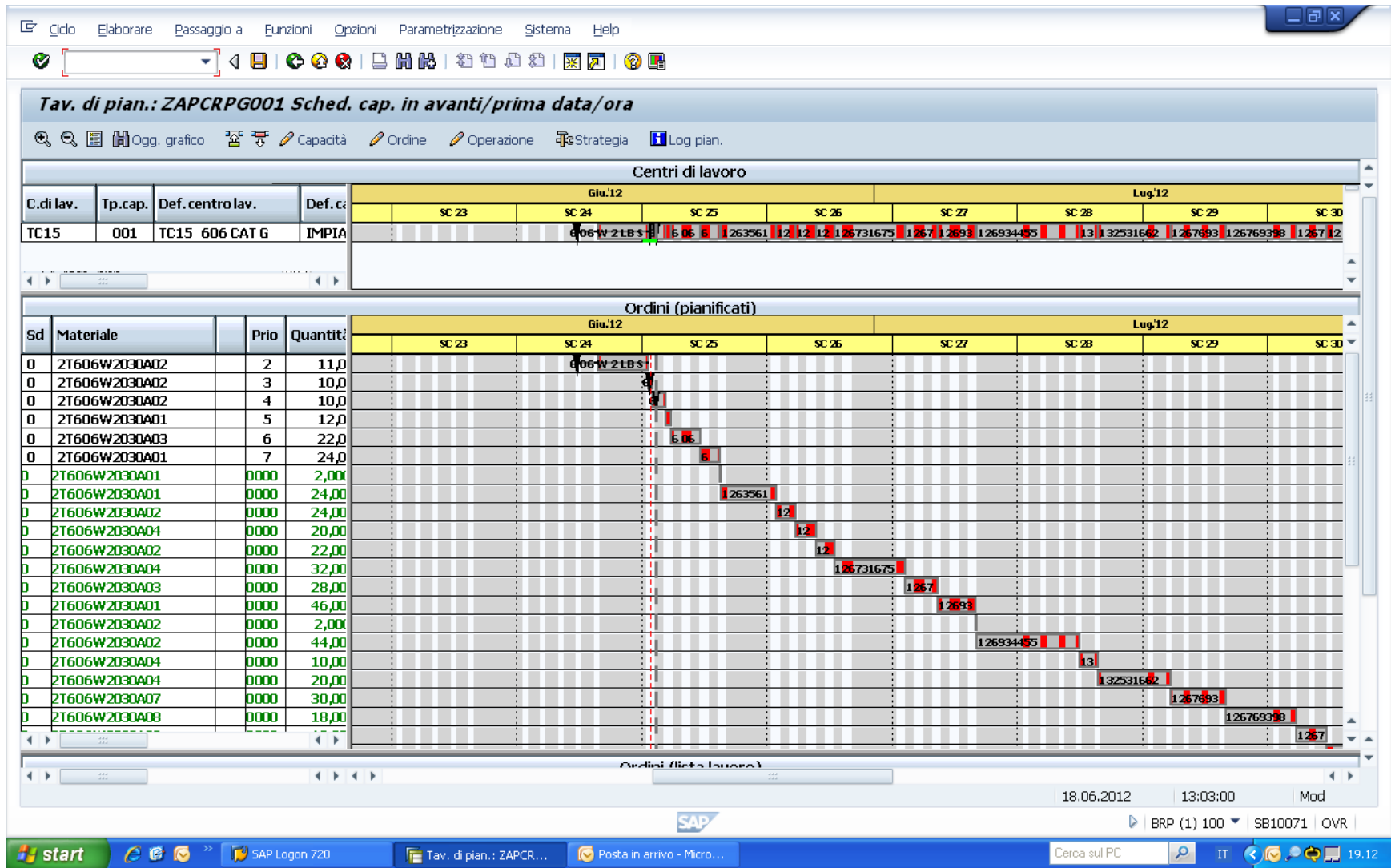
YEAR	AREA	WC	U.M
2009	Plant	No detail	Euro/d
2010	Assy	Assy WC	Pcs/d
Today	Assy/Machining	Assy + Machining WC	h/d
Tomorrow	ALL	Supplier + Assy + Machining WC	h/d

Details



Levelling process: from weekly to daily bucket scheduling

PLANT
SCM ACQ



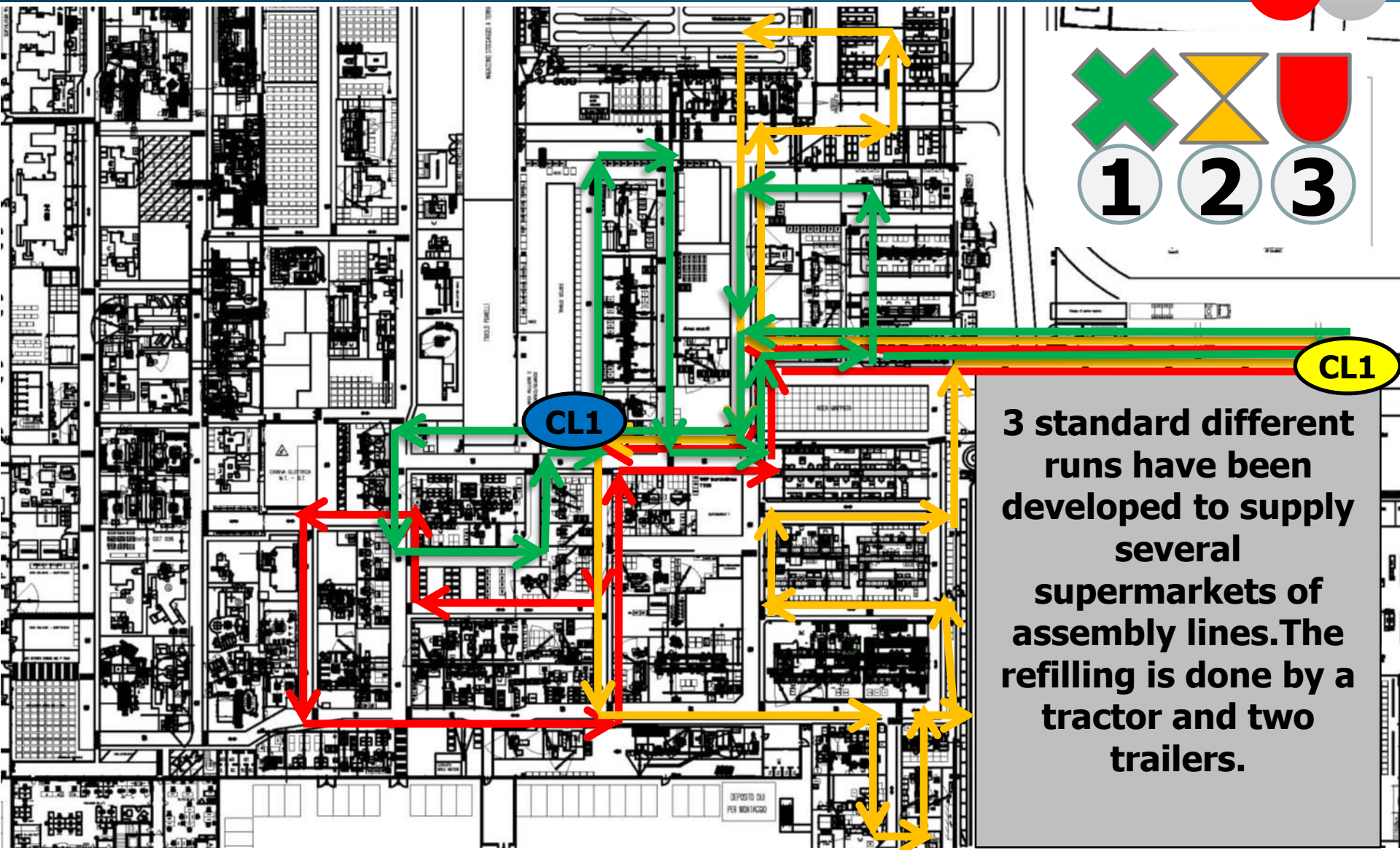
Assembly line refilling: Routes summary

Projects

PLANT

SCM

ACQ



Sales Planning
Order Management
Turnover
BUMWS Stock
Service Level.

APO Planning rules monitor
APO Order Management

Procurement
-Inbound OTD
-LT
-Lot Size

Plant Stock monitor
Automatic Warehouse

Capacity Dashboard



• Savings Yearly Project

- Direct Materials
 - By committing business to Suppliers
 - By negotiating materials through Value Analysis
 - By negotiating prices with base material prices
- Indirect Materials
 - By reducing Suppliers base and defining rebate agreements based on business volume

• SCM collaboration

- Lead Time reduction*
- Flexibility increase
- Supplier OTD increase

• Working capital reduction*

• Frame contracts with Strategic Suppliers at BU level

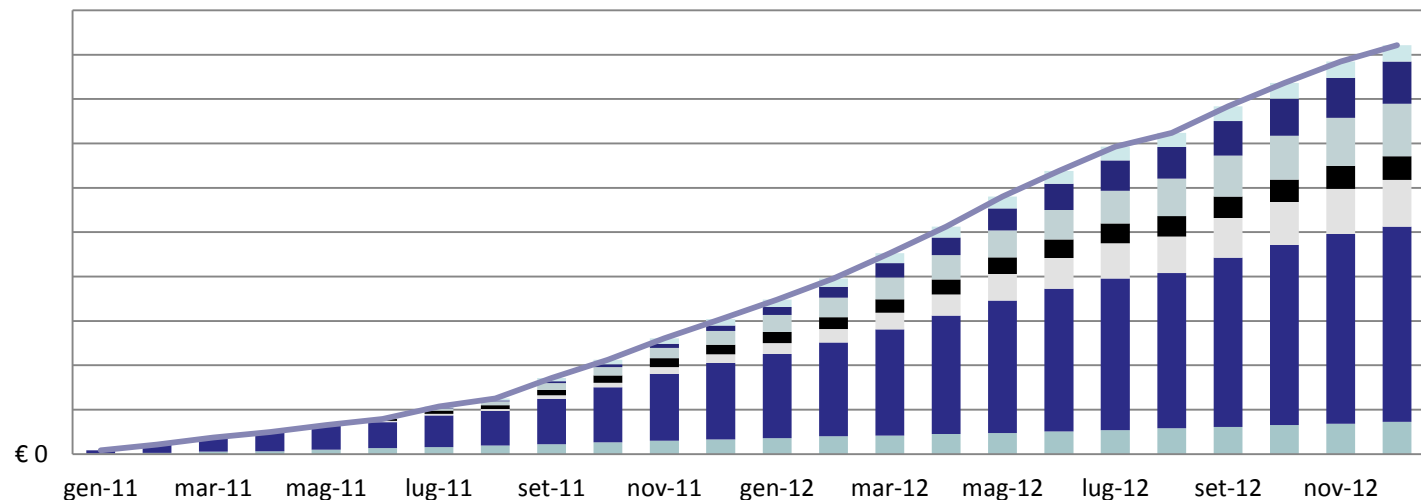
Purchasing KPI's

PURCHASE KPI											
id	description	base	algorithm	unit	TGT 2013	range 1	range 2	avg YTD	actual	OK IF	color code
1	PPM raw parts	monthly	(No of scraps/ No of parts delivered)x 1000K - 6 months rolling	PPM	5000	1,0%	1,0%	5925	6.004	-	
2	PPM finished parts	monthly	(No of scraps/ No of parts delivered)x 1000K - 6 months rolling	PPM	1000	1,0%	1,0%	2252	2.376	-	
3	PPM commercial parts	monthly	(No of scraps/ No of parts delivered)x 1000K - 6 months rolling	PPM	200	1,0%	1,0%	253	352	-	
4	Total PPM	monthly	(No of scraps/ No of parts delivered)x 1000K - 6 months rolling	PPM	1000	1,0%	1,0%	845	899	-	
5	OTD	monthly	No of PO raw delivered on time/ No PO raws	%	98%	0%	0%	70%	69%	+	
6	PPV	monthly	$PPV = \frac{\sum (Current Price - STD price) \times QTY}{Supplier spend}$	%	-1,7%	0,0%	0,0%	-2,54%	-2,75%	-	
7	SUPPLIER OVER ALL RATING	monthly	$SOR = PPV \times 30\% + OTD \times 30\% + PPM \times 40\%$	%	100%	35%	0%	80%	80%	+	
9	CONQ (month)	monthly	$\sum Suppl. CONQ (month)$	k€	100	1,0%	1,0%	50	70	-	
10	CONQ YTD	monthly	$\sum Months CONQ$	k€	1000	1,0%	1,0%	208	208	-	
11	% CONQ	monthly	$CONQ_YTD / SUPPLIER SPEND_YTD$	%	1,0%	0,0%	0,0%	0,49%	0,59%	-	
12	RCONQ	monthly	Reinvoiced CONQ / CONQ (updated N-3 months)	%	90,0%	0,0%	0,0%	80,4%	80,4%	+	
15	%NVSS	monthly	$\sum subcontracting parts spend / \sum supplier spend$	%	4%	0%	0%	5,3%	5,82%	-	



P&L main contributions

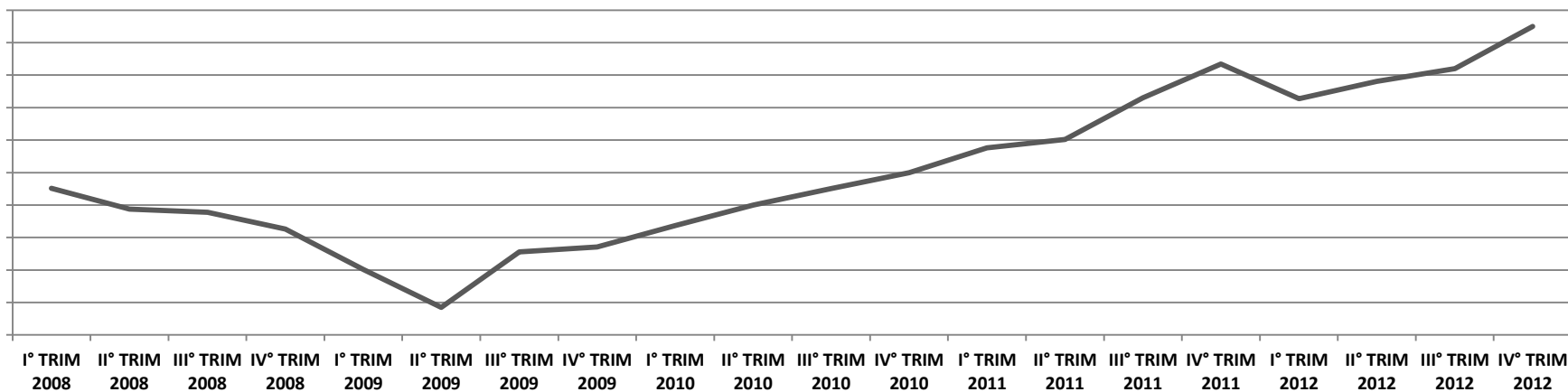
Project savings: 2011-2012 breakdown



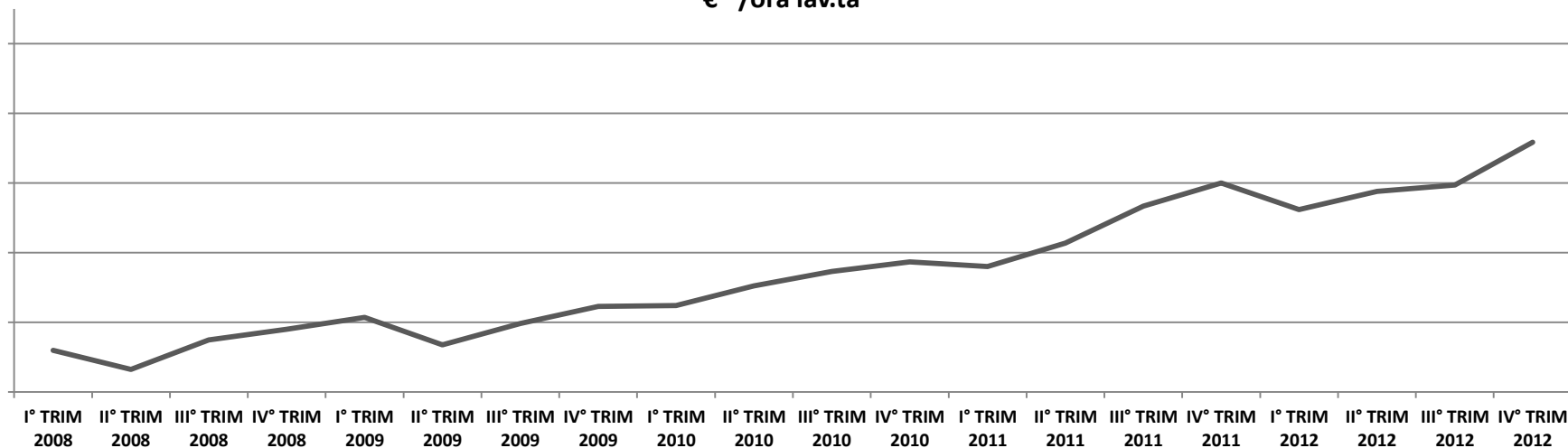
	gen-11	feb-11	mar-11	apr-11	mag-11	giu-11	lug-11	ago-11	set-11	ott-11	nov-11	dic-11	gen-12	feb-12	mar-12	apr-12	mag-12	giu-12	lug-12	ago-12	set-12	ott-12	nov-12	dic-12
Quality control	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 15.	€ 20.	€ 36.	€ 50.	€ 63.	€ 70.	€ 82.	€ 92.	€ 110.	€ 121.	€ 132.	€ 143.	€ 155.	€ 157.	€ 167.	€ 176.	€ 184.	€ 184.
Indirect purchase	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 5.7	€ 9.8	€ 20.	€ 32.	€ 44.	€ 63.	€ 90.	€ 121.	€ 164.	€ 198.	€ 248.	€ 295.	€ 342.	€ 357.	€ 387.	€ 420.	€ 452.	€ 476.
Logistics	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 24.	€ 43.	€ 73.	€ 92.	€ 117.	€ 155.	€ 189.	€ 221.	€ 242.	€ 276.	€ 302.	€ 332.	€ 366.	€ 423.	€ 462.	€ 493.	€ 538.	€ 591.
OEE Machining	€ 0	€ 0	€ 0	€ 6	€ 0	€ 21.	€ 35.	€ 43.	€ 63.	€ 82.	€ 100.	€ 108.	€ 126.	€ 133.	€ 151.	€ 167.	€ 189.	€ 209.	€ 224.	€ 229.	€ 241.	€ 252.	€ 261.	€ 265.
Equipment/Manpower	€ 0	€ 0	€ 0	€ 1.3	€ 7.5	€ 13.	€ 18.	€ 21.	€ 38.	€ 52.	€ 74.	€ 97.	€ 122.	€ 150.	€ 190.	€ 238.	€ 296.	€ 345.	€ 397.	€ 410.	€ 446.	€ 482.	€ 508.	€ 526.
Assy	€ 39.	€ 93.	€ 160.	€ 214.	€ 270.	€ 293.	€ 357.	€ 391.	€ 512.	€ 620.	€ 753.	€ 859.	€ 948.	€ 1.0	€ 1.1	€ 1.3	€ 1.4	€ 1.6	€ 1.7	€ 1.7	€ 1.9	€ 2.0	€ 2.1	€ 2.1
Lean & Green	€ 4.1	€ 13.	€ 26.	€ 32.	€ 49.	€ 66.	€ 78.	€ 95.	€ 110.	€ 130.	€ 150.	€ 164.	€ 177.	€ 200.	€ 206.	€ 224.	€ 237.	€ 253.	€ 268.	€ 289.	€ 305.	€ 325.	€ 341.	€ 363.
GRAND TOTAL	€ 43.	€ 106.	€ 187.	€ 248.	€ 328.	€ 394.	€ 535.	€ 625.	€ 856.	€ 1.0	€ 1.3	€ 1.5	€ 1.7	€ 1.9	€ 2.2	€ 2.5	€ 2.9	€ 3.1	€ 3.4	€ 3.6	€ 3.9	€ 4.1	€ 4.4	€ 4.6

Productivity Trend

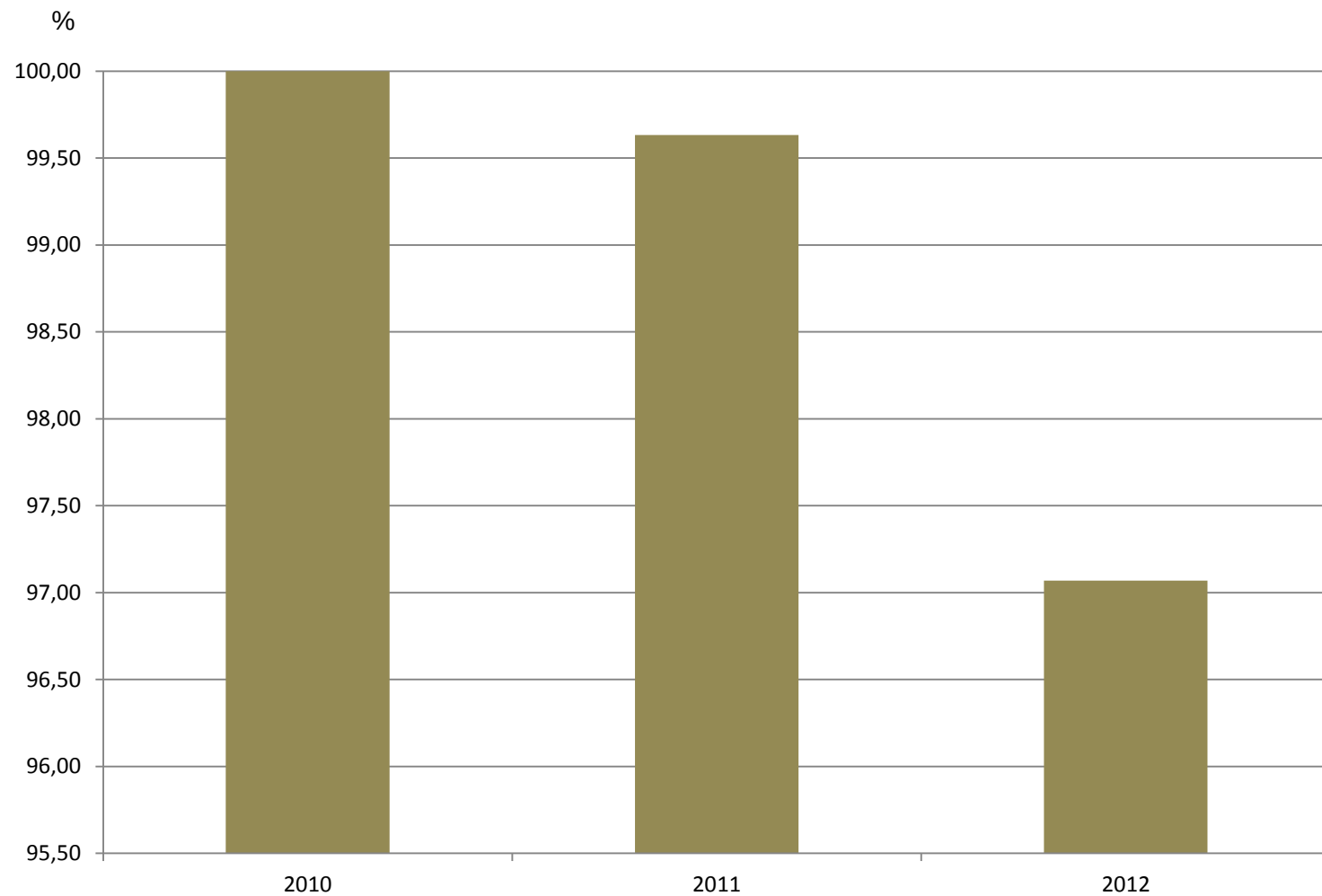
Pz /ora lav.ta



€* /ora lav.ta



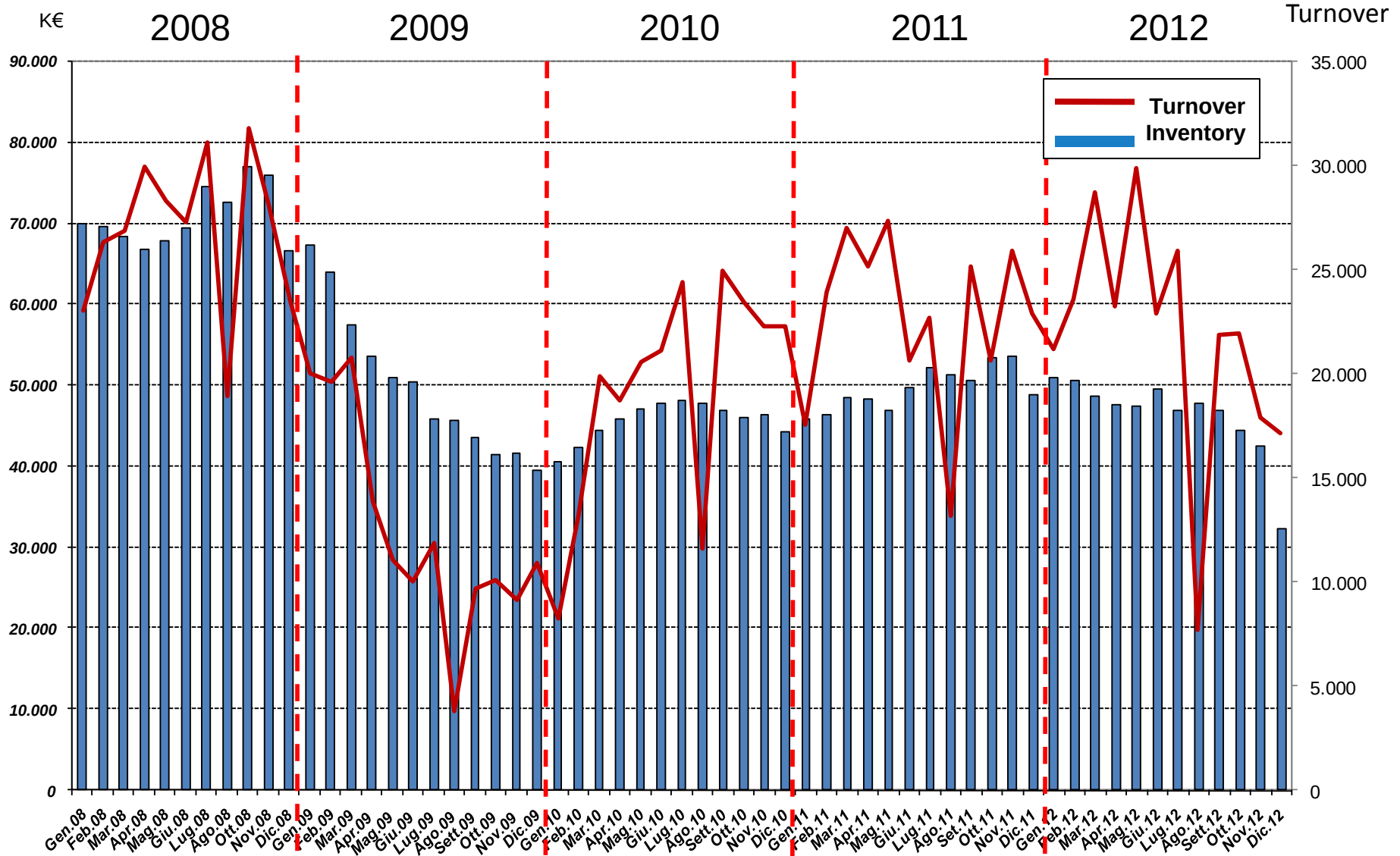
Direct Material Saving YOY*



* On average yearly cost

BT Inventory vs Turnover

PLANT
SCM ACQ





What's next?

INSANITY:

**doing the same thing
over and over again
and expecting different results**

Albert Einstein

THANK YOU!