

A young child is smiling and holding a glowing light stick at a night festival. The background is filled with colorful bokeh lights in shades of blue, green, and yellow. The child is wearing a light-colored t-shirt with a graphic design.

Supply chain integration: Networked Factories, a Lean journey

Pascal Indekeu
Supply Chain Mngr Turnhout
February 27, 2014

PHILIPS

Agenda

Products & Applications

Steps to World Class
Manufacturing

Link with Business Strategy

Lean @ Philips Turnhout

External supplier (PQ)

Internal supplier (Ph Uden)

Products &
Applications

Steps to World Class
Manufacturing

Link w Business
Strategy

Lean @ Philips
Turnhout

External supplier (PQ)

Internal supplier (Ph
Uden)

Products & applications

- Solutions used in:
- Professional market
 - Excellent quality of light
 - With high (lumen) output
 - Low energy consumption
 - Long lamp life

General HID



Outdoor



Indoor



Sports



Horticulture



Special Lighting



Digital Projection Lighting



PHILIPS Lighting Turnhout

Portfolio and applications

- Solutions used in:
- Professional market
 - Excellent quality of light
 - With high (lumen) output
 - Low energy consumption
 - Long lamp life



Shops Projection
Road



Industry



Health & wellness



City Beautification



Entertainment
Sports & Area



HID lamp technology

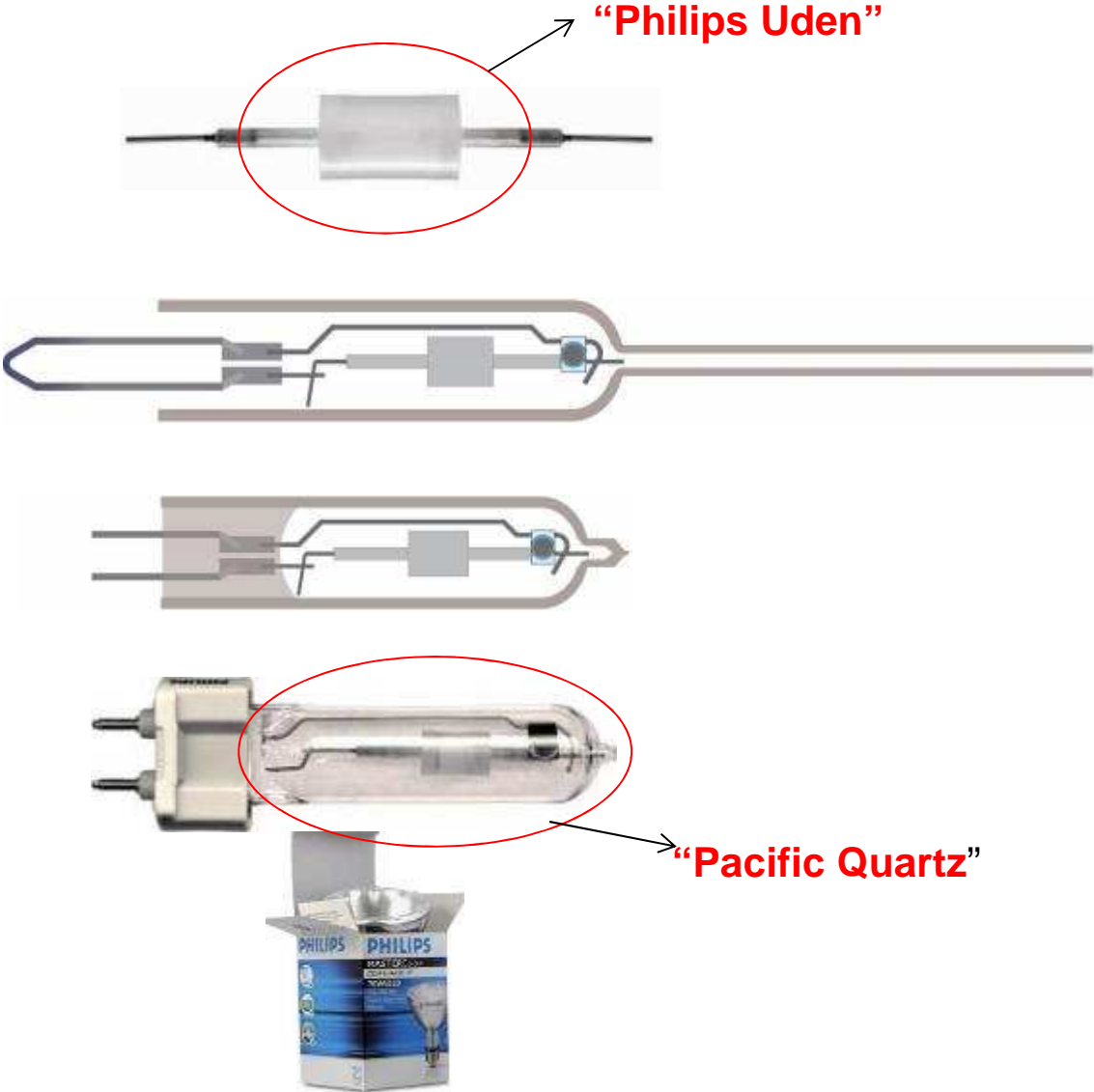
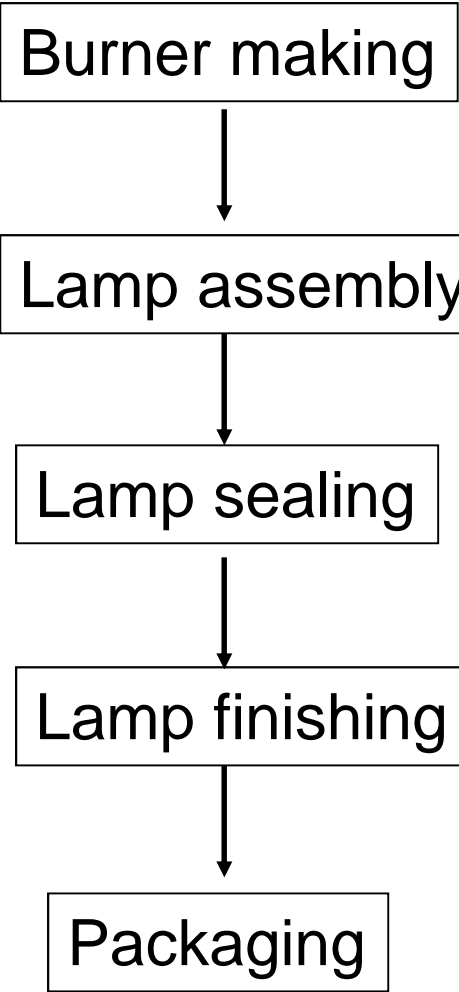
lamp manufacturing

Technical process split up into 2 main steps:

- Burner manufacturing
- Lamp assembly



Lamp assembly major steps



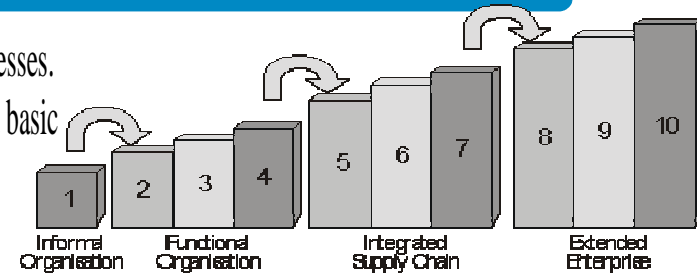
Steps to world class manufacturing

Supply Chain Management Four Levels of Maturity

< 2000

Level 1 is Informal: a company doing business but without formalised procedures or processes. Management is characterised by fire fighting. The lack of formalised policies/processes and basic operations management results in unpredictable quality and supply.

Keywords: no formal plans, no forecast, no balancing of supply and demand.



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2000-2011

Level 4 is Functional: a company with good functional management, which is optimising the performance of own function without reference to what is happening in other areas of the business. Processes are typically carried out sequentially with information being passed “over the wall” from one function to the next. Functional orientation sub-optimizes enterprise performance in asset management, cost and customer satisfaction.

Keywords: cost driven, reactive, monthly processes, push, standard services.

2012-current

Level 7 is The Integrated Supply-Chain: processes are cross-functional and optimised for the whole organisation. Processes are carried out in parallel by cross-functional teams and information flows freely around the organisation. Some integration with major suppliers and customers. With alignment across all sub-processes and levels of management, operational processes are integrated and display world-class and continuous performance, and continuous improvement.

Keywords: flexibility, responsiveness, pro-active, weekly/daily, pull, differentiated services, cross-functional decision making.

Level 10 is The Extended Enterprise: a company that is on the leading edge of all emerging practices. It is highly internally and externally integrated, working with enterprises ranging from Suppliers’ Suppliers to Customers’ Customers. There is internal and external process integration, allowing each enterprise to focus on its customers, core competencies and creating value.

Keywords: real time full visibility, event driven, JIT, joint optimisation, customised services.

Products&Applications

Steps to World Class Manufacturing

Link w Business Strategy

Lean @ Philips Turnhout

External supplier (PQ)

Internal supplier (Ph Uden)

Link with our business strategy

Drive
Performance

- **Delivery reliability 98%**
- **Reduce Stock to 5,6% of MAT**

Accelerate-
Change

- **Change mindset**

Implement
Strategy

- **Lean Operations to drive the organization**

Optimize use of Cash

Products &
Applications

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innovation  you

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Products &
Applications

Steps to World Class
Manufacturing

Link w Business
Strategy

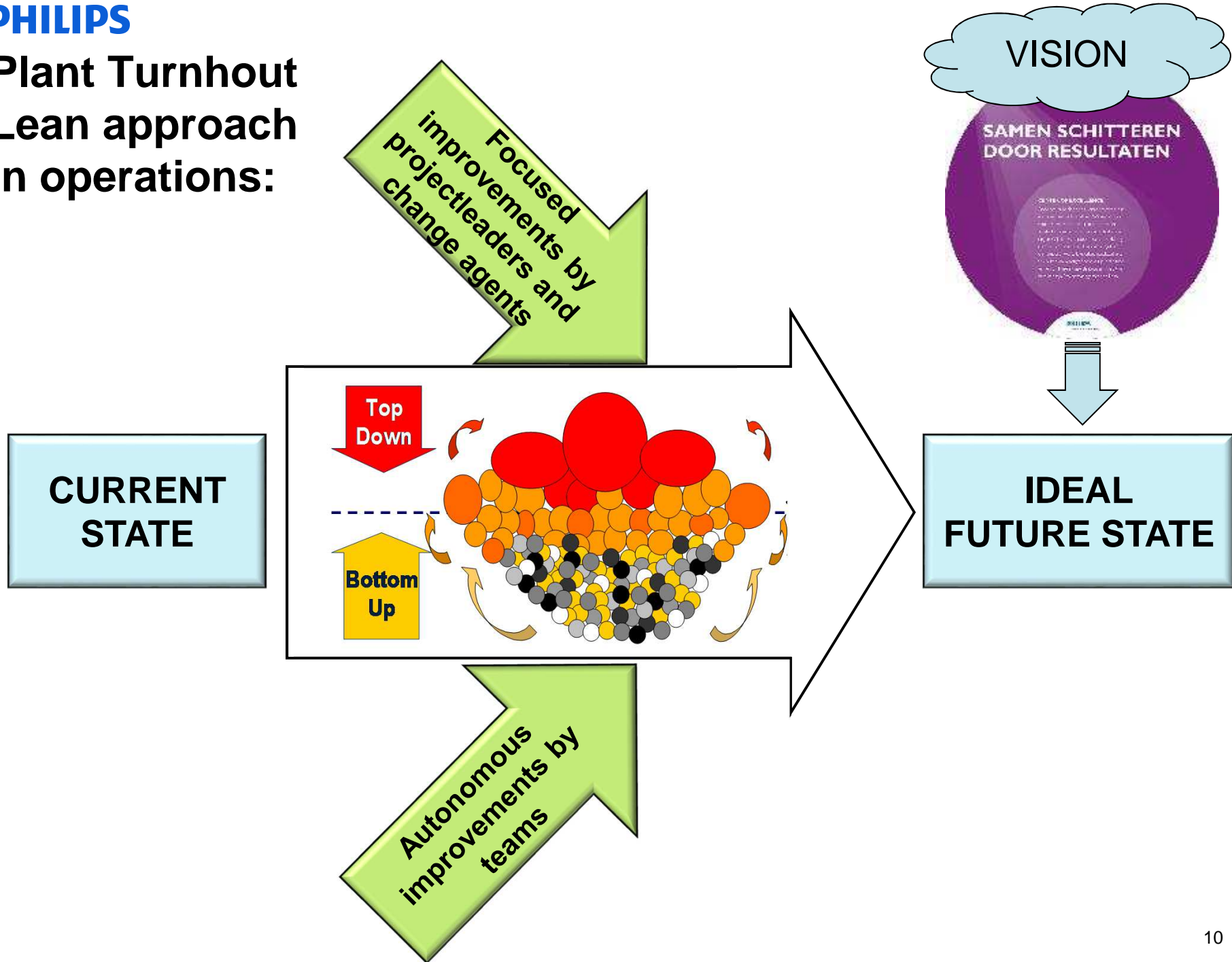
Lean @ Philips
Turnhout

External supplier
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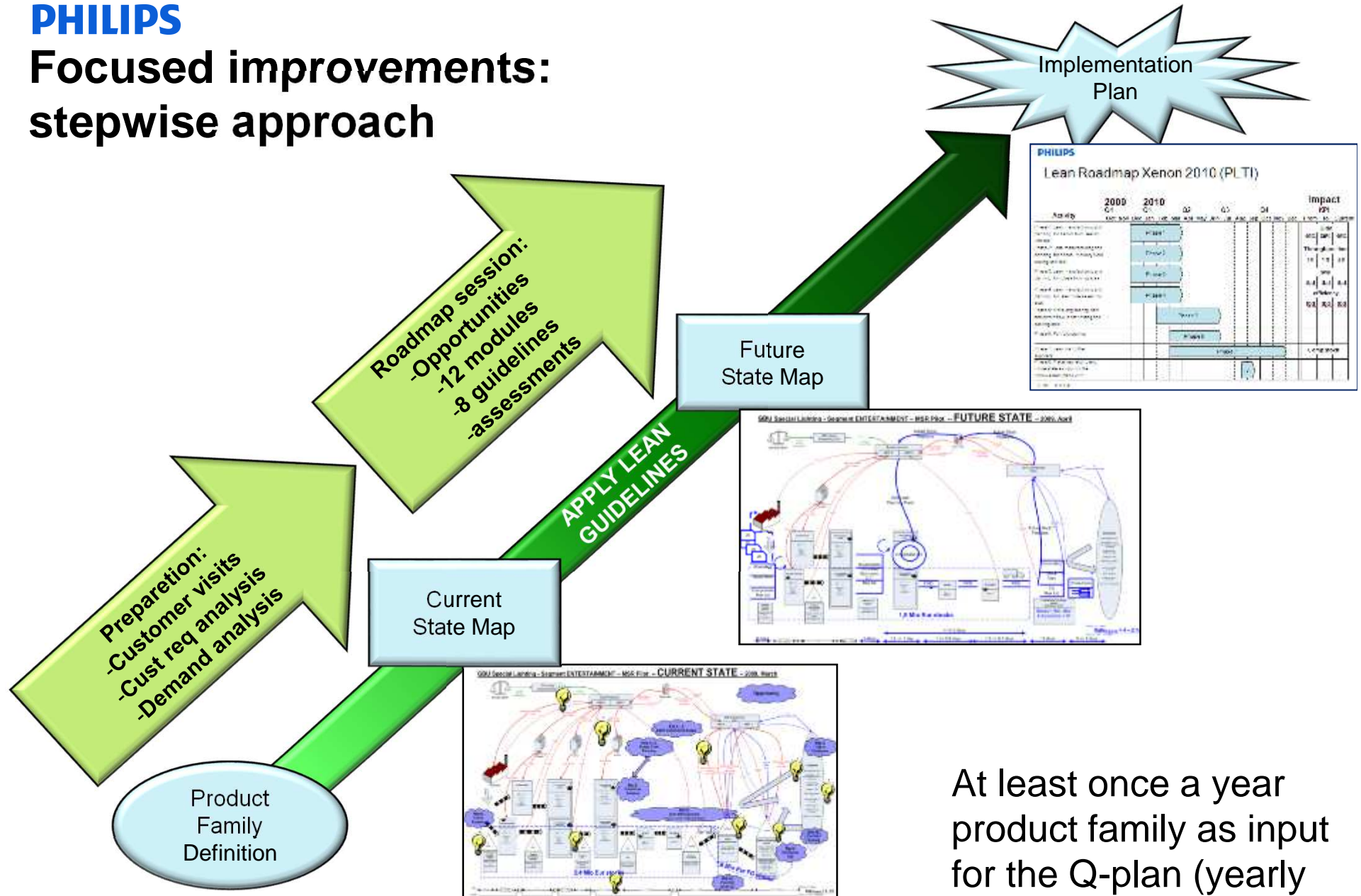
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Plant Turnhout Lean approach in operations:



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Focused improvements: stepwise approach



At least once a year
product family as input
for the Q-plan (yearly
improvement plan)
process

PHILIPS

Lean 8 guidelines (stepwise approach)

1. Tact time
2. Finished good strategy
3. Continuous flow
4. FIFO
5. Supermarket
6. Schedule only 1 point
7. Interval
8. Pitch

The Key Success Factors

Lean starts and ends at the **CUSTOMER**

Lean is all about the **End-to-End approach**

- “Think Global – Act Local”

Cut the whole initiative into **eatable pieces**, where the existing organization can take up a **clear roles !**

Don't try to boil the ocean in one go → **FOCUS !**

PHILIPS Before...



PHILIPS After : flow with Trilogiq racks



PHILIPS

Visual planning board

Planning



Latest standard: 'digital planning'



External



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[Profile](#)

[Products](#)

- [Manufacture](#)

[Contact Us](#)

Donghai Pacific Quartz Products Co.,Ltd

Company Profile

Established in 1992 in China, we are the largest quartz tubing manufacturer in China and one of the leading quartz glass tube manufacturers in the world.

In 2000 we obtained ISO9001 quality system accreditation and in 2004 we achieved environmental management systems accreditation ISO14001..

Pacific Quartz Group is offering a full range of products for 1 lighting, domestic appliances, chemicals, communication and electronics, including Ø2-260mm normal clear tube, translucent tube, ...

Products List



Contact Us

Company:	Donghai Pacific Quartz Products Co.,Ltd
Contact:	Mr. Gerry Jia
Address:	118# Pingta Road,Pingming Town, Donghai, Lianyungang, Jiangsu, China

Products & Applications

Steps to World Class Manufacturing

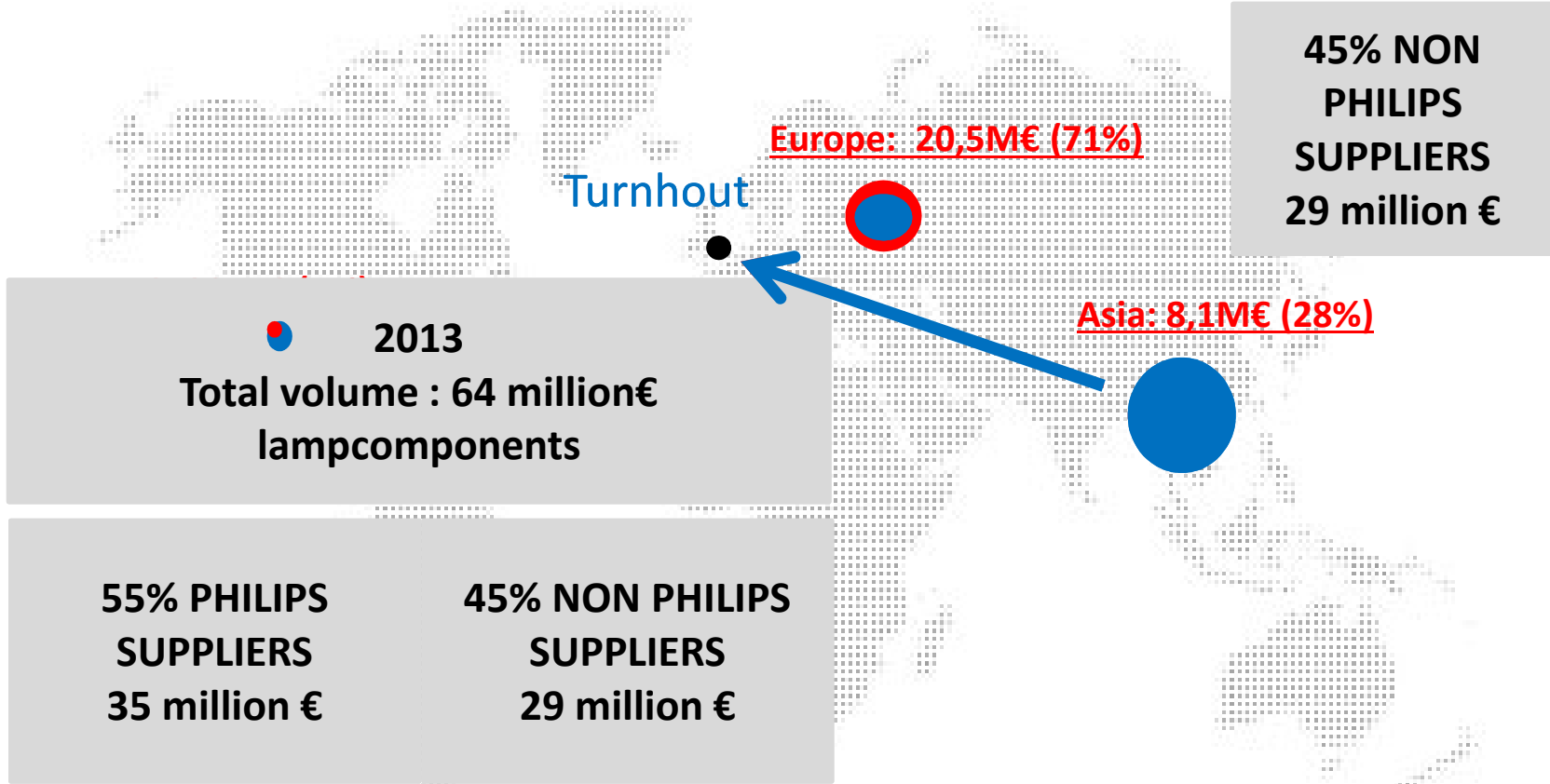
Link w Business Strategy

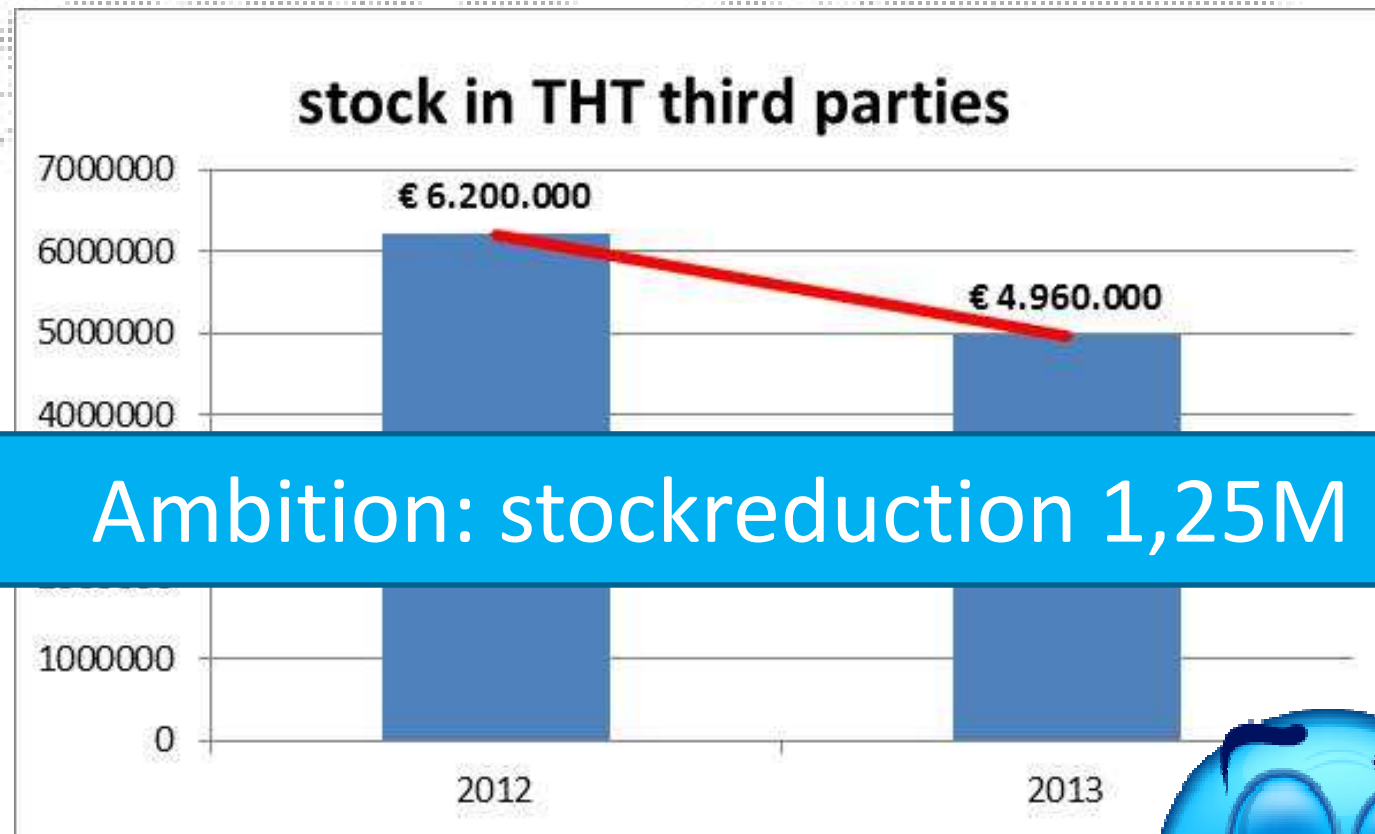
Lean @ Philips Turnhout

External supplier (PQ)

Internal supplier (Ph Uden)

Purchasing volumes





Ambition: stockreduction 1,25M

TARGET = 95%



Pilot : PACIFIC QUARTZ



Total value : 2 million €

Stock on hand in THT warehouse : 720.000 €

Delivery reliability 61%

Turnhout



Pacific Quartz

China sourcing group

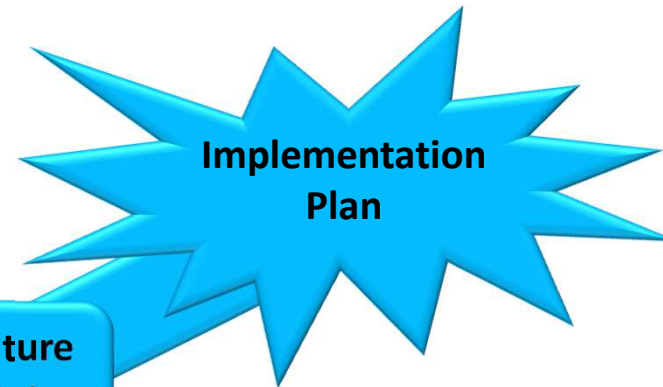
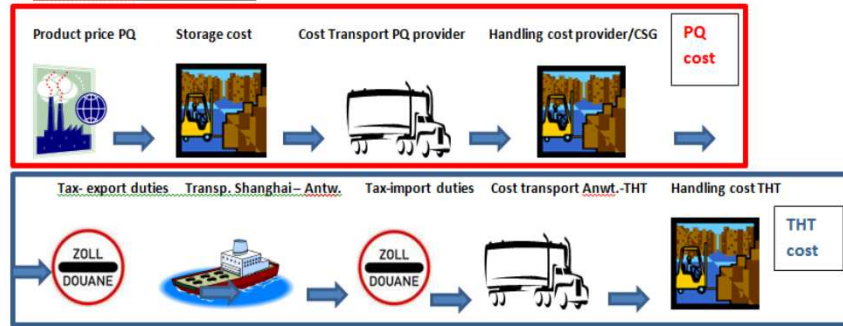


Local Philips organization

From current state to future state



Goodsflow cost current

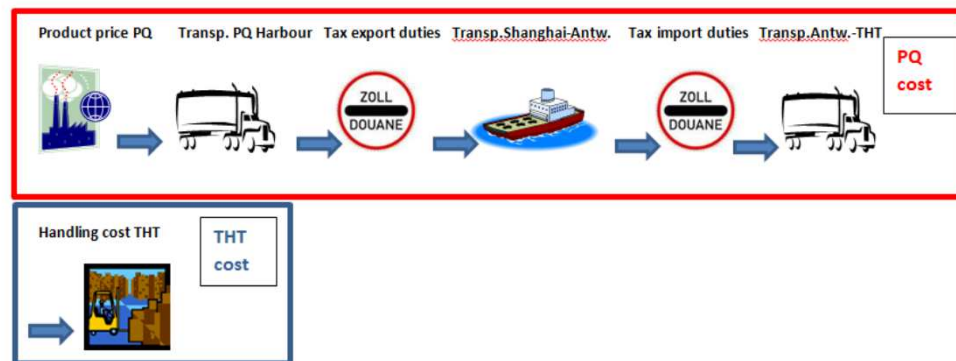


Future State Map

Current State Map

APPLY LEAN GUIDELINES

Goodsflow cost new process



Implementation new way of working



Supermarkt calculation file (in pcs)

Goods in transit

Consignment stock in THT

Work in progress at PQ

Codenummer	Description	Max. Stock	Nom. stock	Stock in Tu	GIT	WIP at PQ	Stock in THT a Nom. level	does PQ needs to start up new batch?
324164002141	TPY 181N SD 16X2X82, 2ppm	611.596	383.367	1423800	0	0	371,4%	no
324164000470	QUARTZ TUBE TPY 321A 14.0/1.25/67.5	2.091.779	1.382.725	1297371	929070	1800000	93,8%	no
324164001511	TUBE GLAZED TPY321A 32.5/1.25/324	112.690	87.154	110592	41472	130000	126,9%	no
324164000330	CUT TUBE 409 3.95/0.8/90	5.269.121	3.295.907	7372000	0	0	223,7%	no
324164000480	QUARTZ TUBE TPY 321A 14.0/1.25/75.5	807.025	553.977	839160	29970	600000	151,5%	no
324164002131	TPY 181N SD 16X2X73, 2ppm	243.713	346.933	244080	142380	0	100,2%	no
324164000410	CUT TUBE 409 5.0/1.0/139	1.451.635	888.387	3333000	0	0	375,2%	no
324164001621	QUARTZ TUBE TPY 321A 22.5/1.25/123	260.010	134.010	128475	0	0	95,9%	yes
324164002291	TPY 181N SD 13.5X1.75X76, 2ppm	165.876	103.248	304920	0	0	295,3%	no
324164000310	Cut tube 361 19.0/1.25/106	147.745	95.512	73214	163296	0	76,7%	no
324164002491	TPY 181N SD 18X1.75X83,2PPM	345.623	253.843	487350	0	0	192,0%	no
324164002251	TUBE TPY 181N SD 18X1.75x125, 2ppm	13.766	7.283	36011	0	0	494,5%	no
324164002261	TUBE TPY 181N SD 26.3X1.4X143, 2ppm	50.244	36.261	99828	0	0	275,3%	no
324164002271	TUBE TPY 181N SD 33X2.25X186, 2ppmm	23.636	16.503	82400	0	0	499,3%	no
324164002281	TUBE TPY 181N SD 38X2X1070, 2ppm	1.394	875	3276	0	0	374,2%	no
324164003231	TPY 321A 24X1.25X109, 10ppm	13.754	10.597	4704	12000	0	44,4%	no
324164002581	Quartz UV 321A 19,00/1,25/107,00, 5PPM	110.774	66.774	129912	93312	0	194,6%	no
324164002591	Quartz UV 321A, 19,00/1,25/122,00, 5PPM	48.907	31.973	81026	0	0	253,4%	no
324164003301	Quartz UV 321A 19,00/1,25/115,50, 5PPM	38.183	24.136	30132	24336	0	124,8%	no
				0				no
		11.807.471	7.719.464	16.081.251	1.435.836	2.530.000		no
								no

Standardwork via secured instructions:



ISO documented – procedures

Contractual agreement Philips -PQ

Vrijgeven van stock uit consignment | 2013

Version	date	change
1	17 January 2013	draft version
2	20 April 2013	Final version

Module

PHILIPS	Functional area:	Warehouse Control - AB - PAK
Comp	TRG:	
No Stamp	Change Category:	Local change
NBC1		03/20/14 11:17 AM
Responsibility:	CLoad / L. G. v. d. W.	Edited: 28/02/2013 09:55:00 PM
	Editor:	ALV20130303010001

Transaction: CASH Receipt for Purchase Order - Initial Screen

Menu path: Net via boomsysteem

Transaction: AB01

Screen 1

By going to the 'OK' button, you can see the 'OK' button in the 'OK' button. This is the 'OK' button in the 'OK' button. This is the 'OK' button in the 'OK' button.

Supermarket way of working between Turnhout and PQ | 2013

Version	date	change
1	12 March 2013	Final version

The document describes the way of working between THT and PQ. The file described in this document is weekly updated by Turnhout and PQ, and is used as a communication document between both parties.

The file can be found in the MDS database:
 QSALGADMINVAT_MAN/Inseel/01_MDS/01_reporte_MDS_supplierCtrl-Pa-Bi-SuperVAT-1_PQ-consignment

1. UPDATE THE STOCK LEVEL IN TURNHOUT

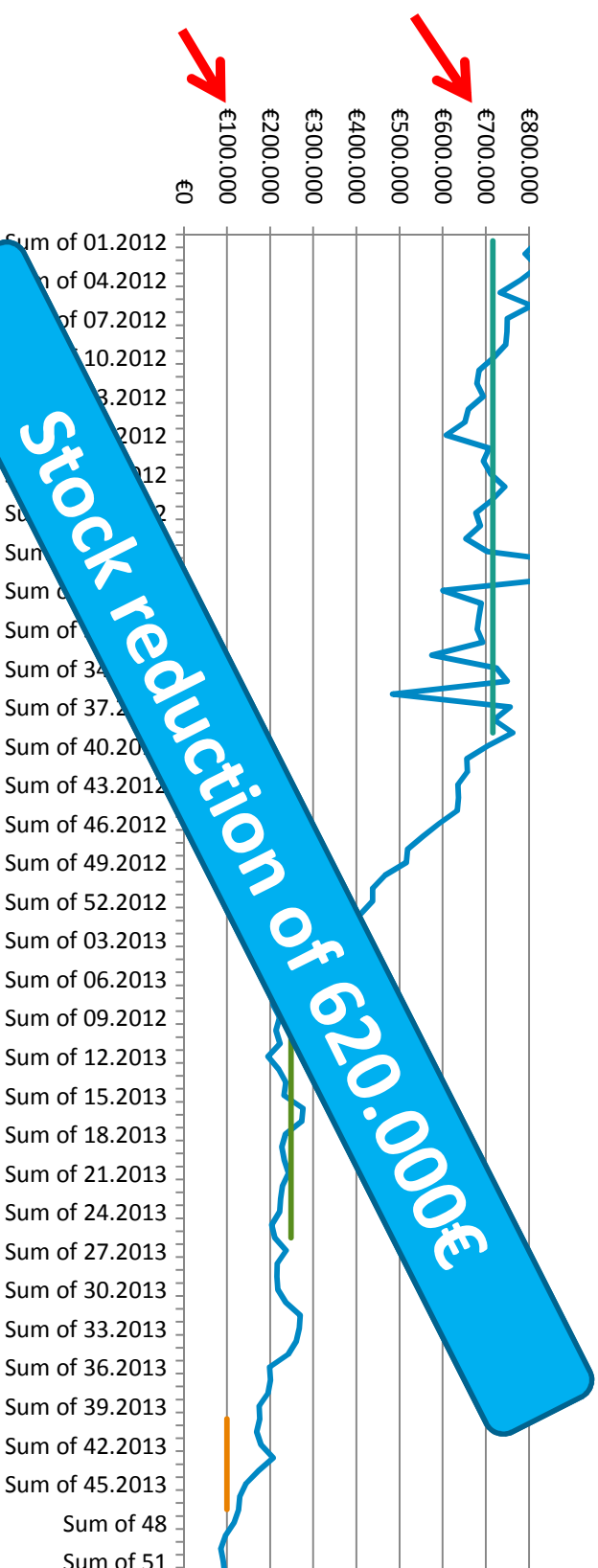
RESPONSIBLE: THT PROCUREMENT PLANNER

- Transaction: CX 02 get value PQ stock in THT
- GL → report → report stock

Result



Stock reduction from Q1-Q3/2012 → 2013



Consignment Stock value reduction results 2012-2013

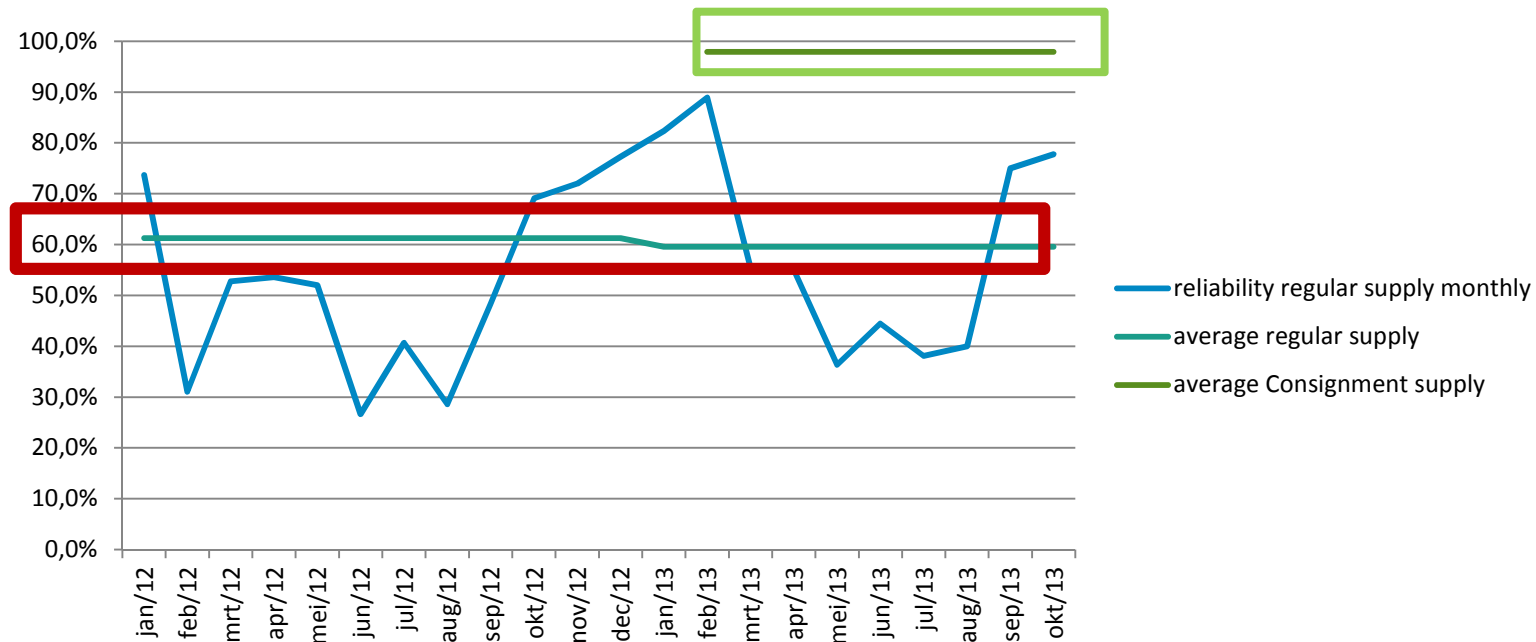
- reference 2012 Q1-Q3 = 720 K EUR average value for 19 selected quartz items
- stockturn = 2,8 turns on 2 mio EUR turnover or 36% of yearly turnover = stock
- result = below 100 K EUR average value for the 19 selected quartz items
- stockturn = 20 turns on 2 mio EUR turnover or 5% of yearly turnover = stock

	K EUR	% vs ref
	720	
	100	-620

Result



Delivery reliability from Q1-Q3/2012 → 2013



Consignment Reliability improvement results 2012-2013

- reference 2012 = PQ 61,3% delivery reliability for regular supply
- for items not supplied under Consignment, ytd 2013 = 59,6%
- for items under Consignment, ytd 2013 = 97,9% reliable

Result



Cost improvements and potentials

Consignment Cost improvement results 2013		
- direct & permanent exclusion of CSG uplift, 2,4 %	⇒	48 K EUR financial
- one time reduction of cash out (stock decrease) at 5%WACC	⇒	31 K EUR financial
NB. Other cost elements do not change		
TOTAL of PILOT	⇒	79 K EUR financial
- Phase 2 = roll -out pilot		
- extend with TOP 5 of Overseas + TOP 5 of High spend suppliers = +/- 50% of SPEND & STOCK		
scope = 14000 K EUR SPEND		
2500 K EUR STOCK --> reduce 80% =		2000 K EUR stockreduction
- direct cost effect of , 1,5 % on 14,000 EUR	⇒	210 K EUR financial
- one time reduction of cash out (stock decrease) at 5%WACC	⇒	100 K EUR financial
FURTHER "TOP 10" POTENTIAL	⇒	310 K EUR financial
	⇒	389 KEUR

TOTAL PROJECT SAVINGS 389.000€



Spin off



Roll out to other Suppliers



- Implement for E40/45 lampcap from Philips Bielsko Januari 2014.
- Philips Aken → Pacific Quartz
- Philips Turnhout → Plansee

Internal

- Philips Uden

Products &
Applications

Steps to World Class
Manufacturing

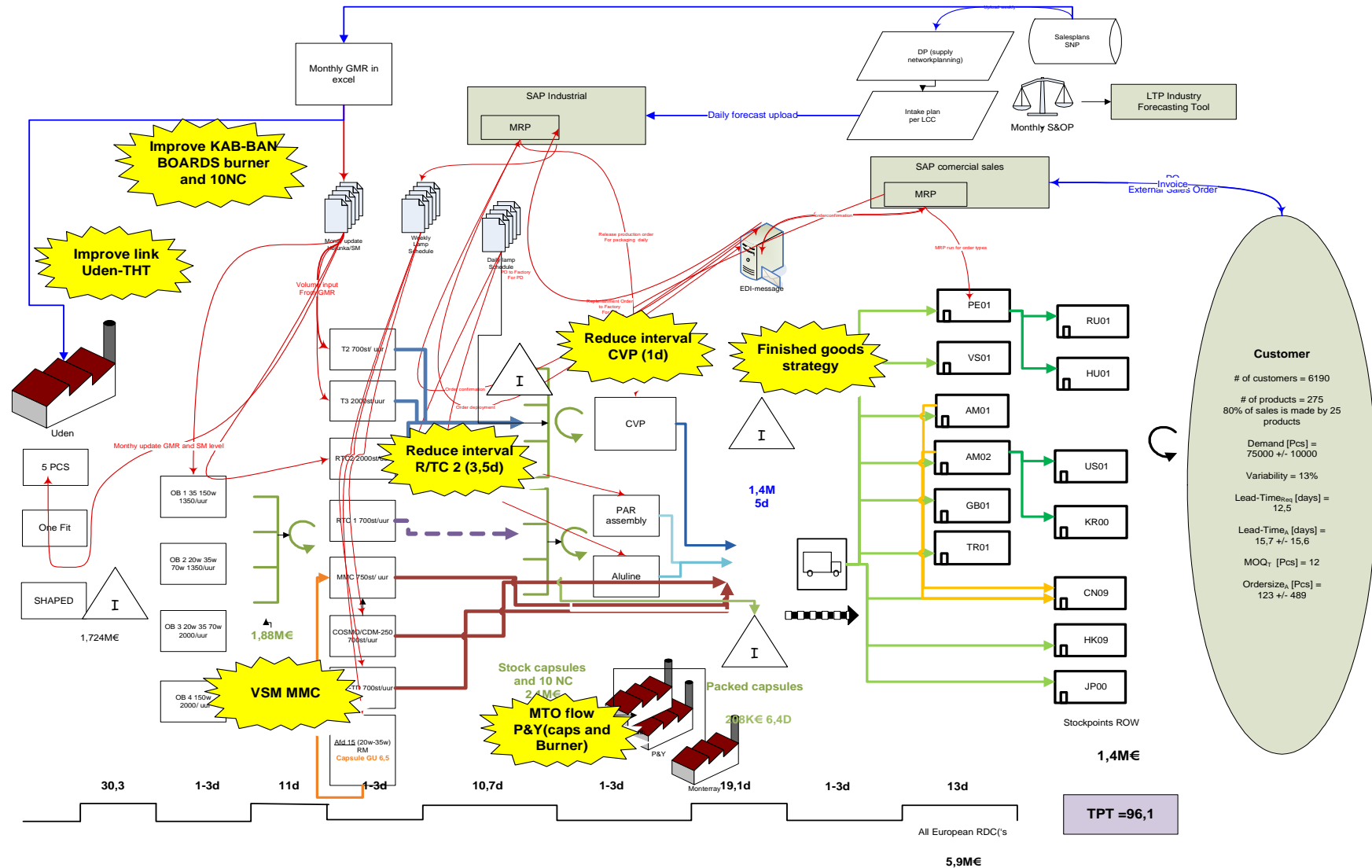
Link w Business
Strategy

Lean @ Philips
Turnhout

External supplier (PQ)

Internal supplier (Ph
Uden)

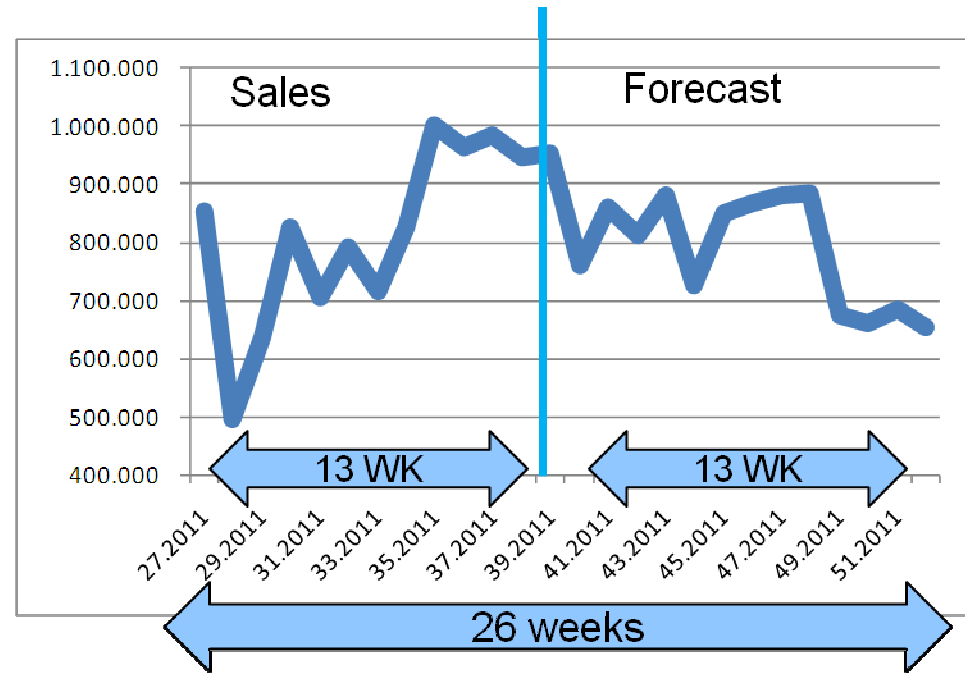
Value stream indoor- current state March 2011



Finished Goods Strategy: parameters

Turnover on 12NC/Region level

Variability	Turnover on 12NC/Region level		
	A 80% of value	B 15% of value	C 5% of value
X Var. coef <0,2	Stock	Stock	Order
Y Var. coef 0,6 > 0,2	Stock	Check (Consider CSP)	Order
Z Var coef >0,6	Check	Check	Order



Material	Description	Plant	CA G	CA G desc	MRP Type	MRP Group	Fore cast Horizon	Safety Stock Method	SS	ST	AQF
10928084505131	MASTERC CDM-T 70W/842 G12 1CT/12	10AM01	10032351	CDM-T	ZY	10A2	6 5B		14.352	-	7.042
10928088505131	MASTERC CDM-TC 70W/830 G8.5 1CT/12	10AM01	10032354	CDM-TC	ZY	10C1	6 5B		13.150	-	6.477
10928082305125	MASTERC CDM-T 70W/830 G12 1CT/12	10GB01	10032351	CDM-T	ZY	10A1	8 5B		10.953	-	5.562
10928183505130	MASTERC CDM-Tm Mini GU8.5 20W/830 1CT/12	10PE01	10027853	CDM-Tm Mini	ZY	10B	17 5B		14.931	-	6.583
10928087905130	MASTERC CDM-Tm Mini 20W/830 PGJ5 1CT/12	10PE01	10032359	CDM-Tm Mini	ZY	10A2	9 5B		7.851	-	3.714
10928082205125	MASTERC CDM-TD 70W/830 RX7s 1CT/12	10PE01	10032352	CDM-TD	ZY	10A2	6 5B		2.737	4	823
10928084505175	MASTERC CDM-T 70W/842 G12 1CT/12	10PE01	10032351	CDM-T	ZY	10A2	10 5B		5.812	-	2.818
10928093905130	MASTERC CDM-Tm Mini 35W/830 PGJ5 1CT/12	10VS01	10032359	CDM-Tm Mini	ZY	10A2	11 5B		2.453	12	978

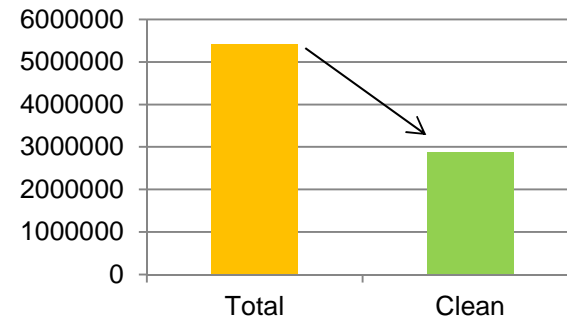
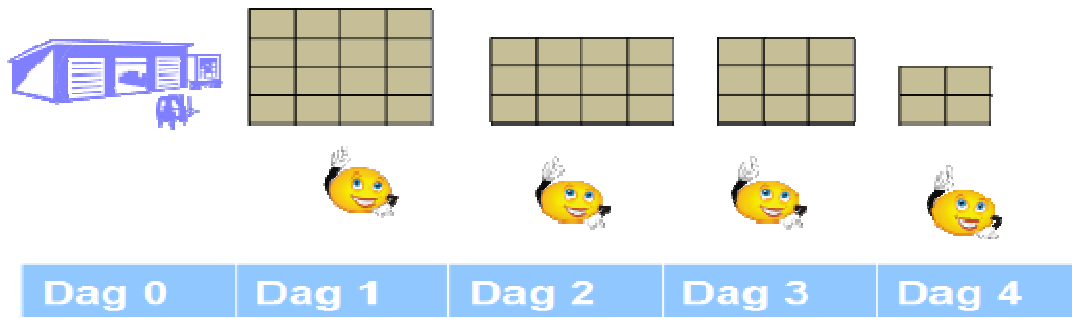
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Finished Goods: other improvements

- Remove forward orders (clean sales)

50% of the sales doesn't have to be planned on stock.

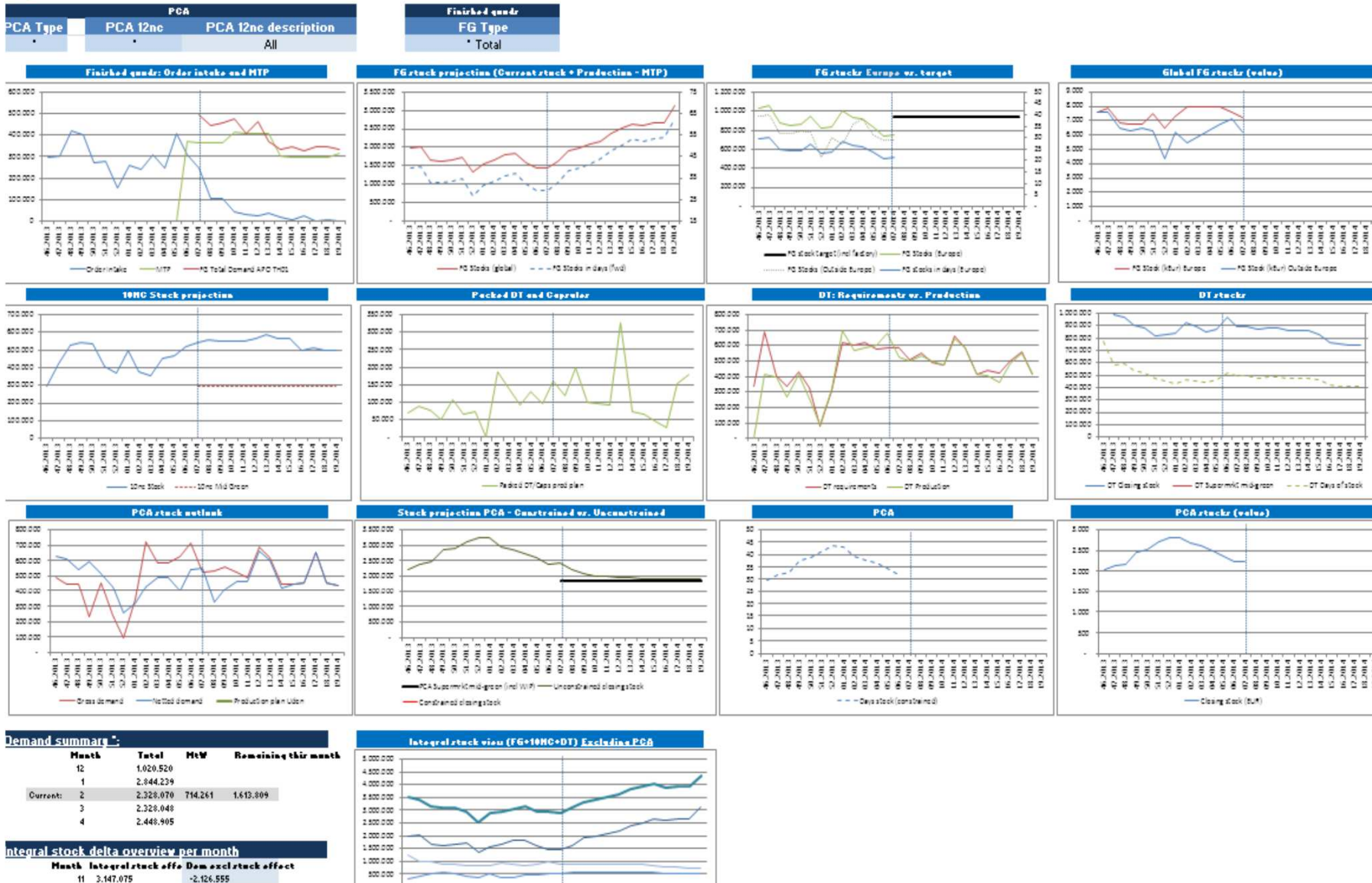
- Elephant order (AQF)



- From Push production to Pull production

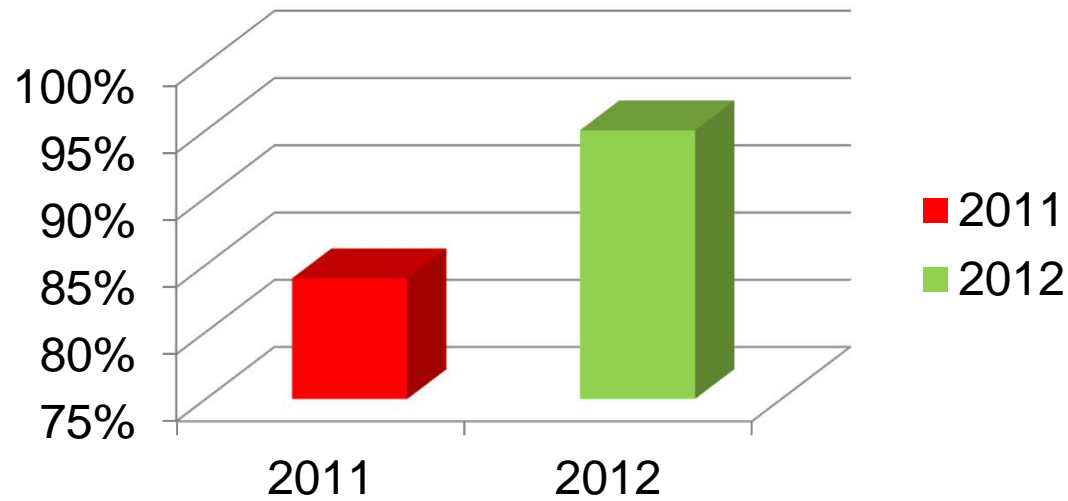
– The forecast is not reliable, so we implemented supermarkets in the RDC's, production is triggered by the replenishment orders (based on real consumption).

Single Point of Planning



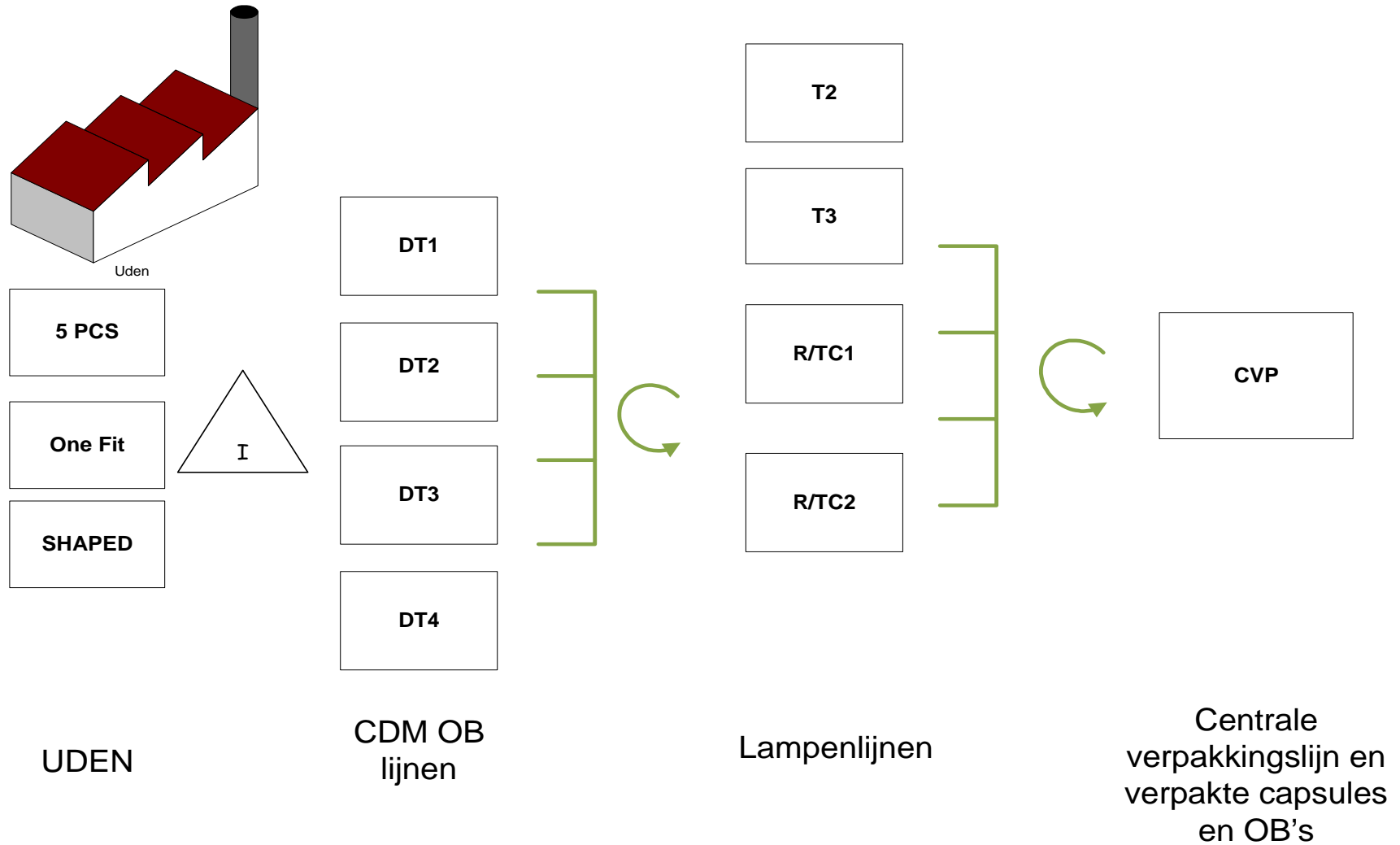
Results:

Delivery reliability



Stock reduction FG
2.740.000€

Improved Hejunka (KAN-BAN) – way of working SCOOP



Other improvements

- BURNER SUPERMARKET AT LAMP LINES → 2 CENTRAL SM's at BURNERLINE
(lay out- visual management)
- Different "STEMPELREGIMES "
(variation reduction) → one "STEMPELREGIME" in whole indoor
- Production orders in SAP → REPETITIVE MANUFACTURING
(waste reduction)
- INTERVAL RTC2, 7days → INTERVAL RTC2, 3,5 days
(stock reduction)
- INTERVAL CVP TC 3days → Daily INTERVAL
(stock reduction)
- Magnets collected daily by operators at CVP → VIA EDI file to the lamp line
(waste reduction)
- CDM burners on stock in THT and P&Y → One stock point in P&Y
(stock reduction)
- Packed capsules on stock in THT and P&Y → One stock point in P&Y
(stock reduction)
- Standard work for planners
- Digital planningboards (increased visibility in value chain)



Stock in days in the chain

Supermarket PCA



Supermarket burners



Supermarket 10NC's



Stock packed capsules



From: 30,3days

11days

10,7days

19,1days

To 30,5days

11,6days

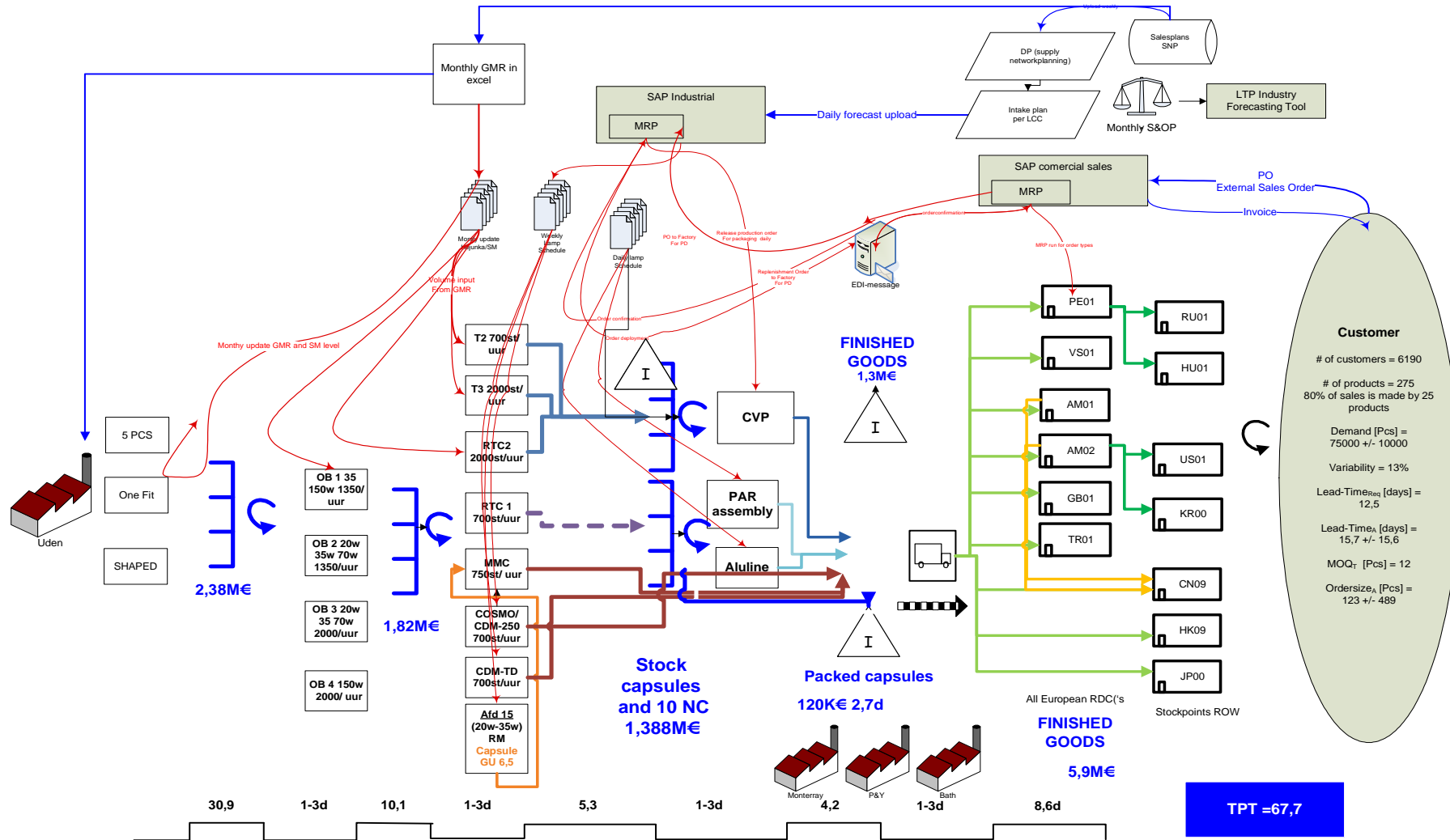
5,6days

2,6 days

Stock reduction
1.700.000€

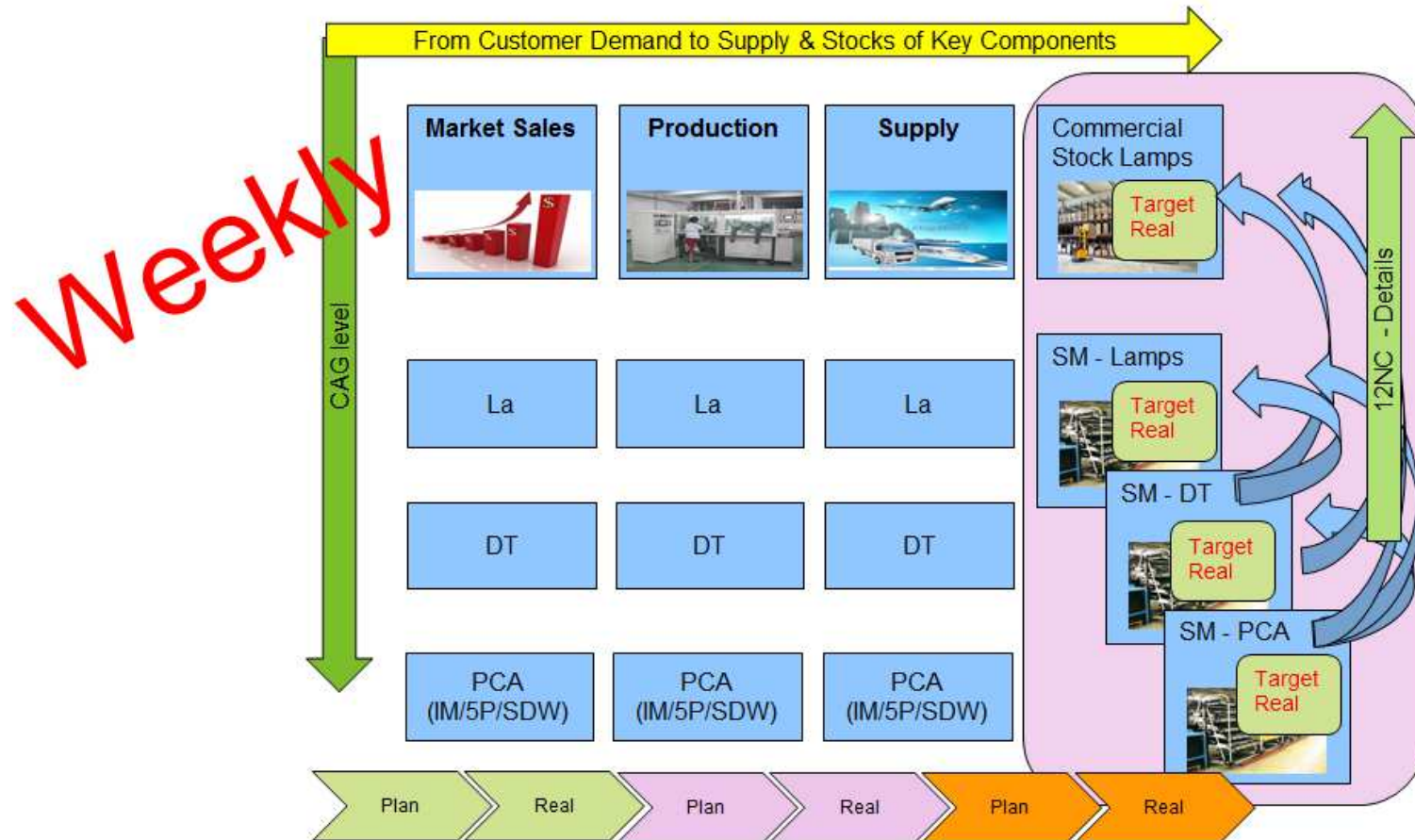
Value stream indoor- current state Dec 2012

BU HID lamp & specialties – segment INDOOR -CURRENT STATE – Q4 2012



TPT =67,7

Visibility Direction



Create visibility on demand, supply, stocks over total value stream
"All stock points, production, supplies, demand must be visible for all"

Take aways

Think End-2-End over the total value chain

“Lean manufacturing” is key

Detect ‘non-added’ value (Waste) and eliminate as much as possible

Questions ?

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1. Tact time

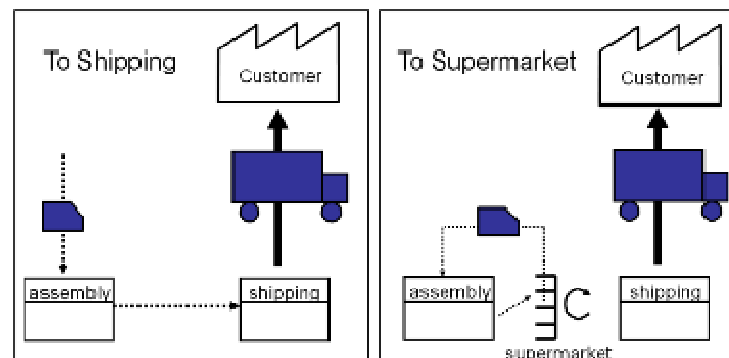
- Definition: customer demand rate
- Why: To know how fast your value stream has to flow
- Is your value stream the bottleneck or your customer?
- Calculate:
 - Time your company is open for business divided customer demand in the same time frame

$$\begin{aligned} \text{Takt time} &= \frac{\text{Effective working time per time period}}{\text{Customer demand per time period}} \\ &= \frac{450 \text{ minutes}}{150 \text{ pieces}} = 3 \text{ minutes/unit} \end{aligned}$$

- Remark: seasonality means everytime another takt time so also a new future state Value stream

2. Finished good strategy

- A **choice** you need to make regarding your FG strategy
- Choice depends on:
 - How fast you can react an customer orders (order realibility, THPT)
 - Diversity in products
 - Realiability of your Value stream
 - Cost of end products
 - ...
- Why: By this decision you decide how manufacturing receives planning:
 - Through kanban signal in case of « build to supermarket »
 - Through customer orders direct in case of « build to order »

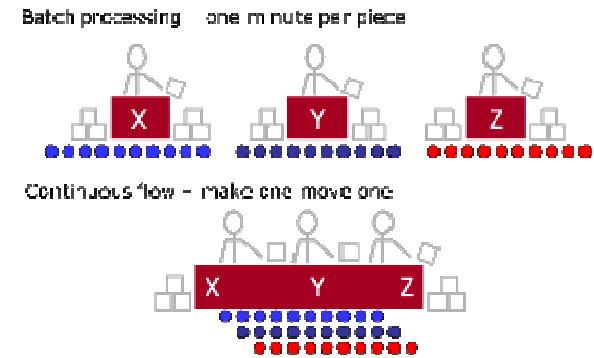


3/4/5. 1 piece flow/ FIFO/Supermarkets

- How to connect 2 processes with minimum waste

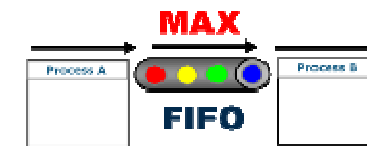
- 1 piece flow is the form with the least waste:

- Fast Q-loop
- Shortest throughput time
- Minimum inventory(1piece)
- Easiest way to connect 2 processes



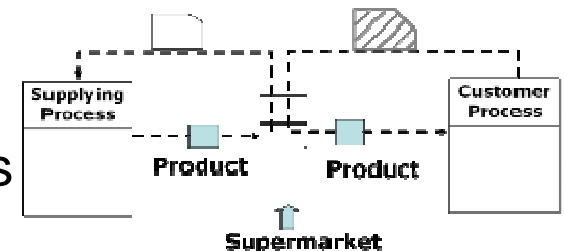
- If 1 piece not possible(unreliable process, batch process, shared resources) than FIFO:

- Controlled inventory with max capacity
- In the same order(mix IN=mix OUT)



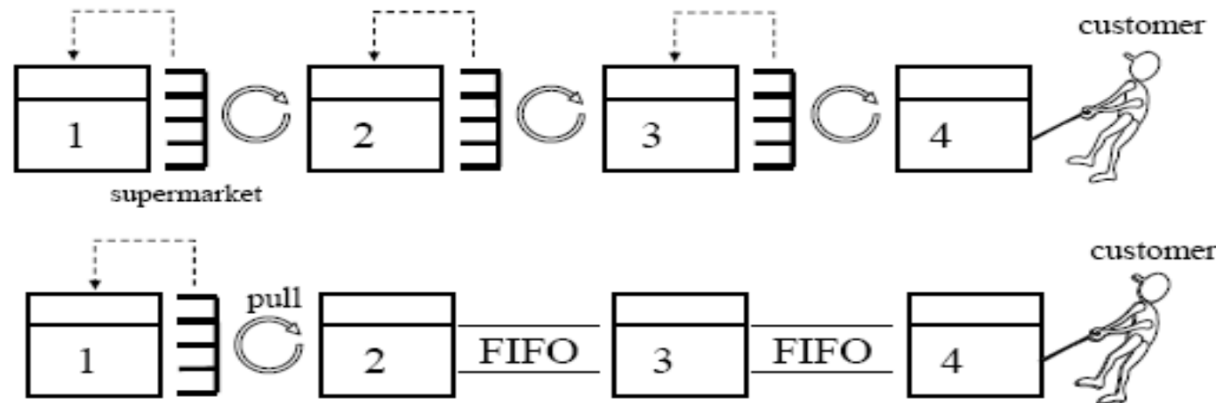
- If FIFO not possible (ex. shared resources) than last form of controlled inventory is Supermarkets

- Final option to connect 2 processes



6. Try to schedule 1 point


- By scheduling 1 point(pacemaker):
 - No multiple plannings
 - Only produce what is needed
 - Control on shopfloor
 - Pacemaker not always the bottleneck, process where to flow stops (first supermarket, ex finished goods supermarket)



7. EPEI=every part every interval

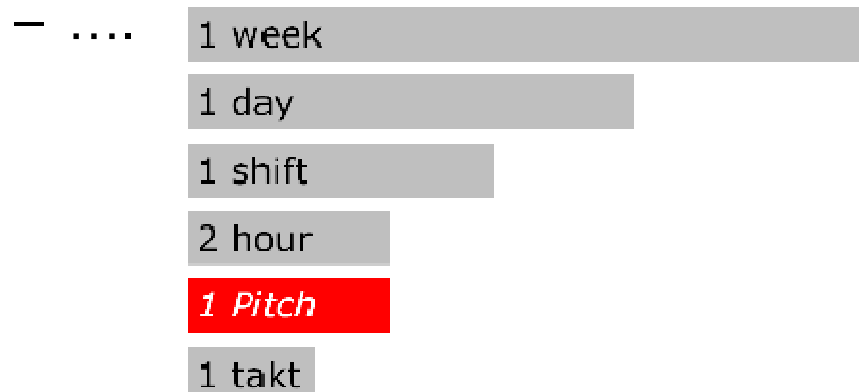
- In which interval can I produce my mix of products: 1 week, 1 day
- By decreasing interval, the lower the inventory, Q feedback loop,...
- The interval depends on how many change-overs you can make (SMED is important tool to achieve small intervals!)

Product		M	T	W	T	F
A	V 125	200	200	200	200	200
B	V 128	120	120	120	120	120
C	V 133	60	60	60	60	60
D	V 145	20	20	20	20	20
	Total:	400	400	400	400	400



8. Pitch

- Multiple of takt time
- Ensures that your planning is realized
- How?
 - the time frame how quickly we identify and solve problems
 - The smaller the frame, the faster we can react;
 - Problems start small and grow fast
 - Problems need to be solved quickly!



The 12 Behaviours of Simply Philips Leadership

How do we want our Leaders to behave?

Traditional Leadership Behaviour	Lean Leadership Behaviour
Short-term results focus	Long-term focus on purpose
Get the product out (push)	Market-in (flow & pull)
Local optimization (speed things up)	Overall optimization (reduce waste)
Standards limit creativity	Standards enable continuous improvement
Hide the problem	Make the problem visible
We can't afford to stop the process	Stop and fix the problem
People as cost	People as assets
A leader is a boss	A leader is a teacher
Go to the online dashboard	Go see for yourself on the gemba
Who's to blame?	Why? Why? Why? Why? Why?
Plan quickly, act slowly	Plan slowly, act quickly
Experts & specialists solve problems	Everybody solves problems

Implementation new way of working

Stock tracking file



Codenummer	Description	Safetystock (= 1 week demand)	Safetystock (= 1 week demand)	Bufferstock	Max. Stock	Nom. stock	stock wk 2	stock wk3	weeks of coverage
Codenummer	Description					Cyclestock	Max. Stock		Nom. stock
32416-002141	TPY 181N SD 16X2X82, 2ppm	49.157	105.981	456.458	611.596	383.367	1505160	1423800	29,0
324164002141	TPY 181N SD 16X2X82, 2ppm	49.157	105.981	456.458	611.596	383.367	1505160	1423800	29,0
324164000470	QUARTZ TUBE TPY 321A 14.0/1.25/67.5	152.719	49.157	105.981	611.596	456.458	611.596	611.596	383.367
324164000470	TUBE GLAZED TPY 321A 32.5/1.25/324	5.500	49.157	105.981	611.596	456.458	611.596	611.596	383.367
324164000470	QUARTZ TUBE TPY 321A 14.0/1.25/67.5	152.719	49.157	105.981	611.596	456.458	611.596	611.596	383.367
324164001311	TPY 181N SD 16X2X73, 2ppm	22.232	5.500	56.118	56.118	51.072	112.690	112.690	87.154
324164000330	CUT TUBE 409 3.95/0.8/90	425.000	425.000	897.692	897.692	3.946.429	5.269.121	5.269.121	3.295.907
324164000480	QUARTZ TUBE TPY 321A 14.0/1.25/67.5	54.503	54.503	246.426	246.426	506.097	807.025	807.025	553.977
32416-002271	TUBE TPY 181N SD 33X2.25X186, 2ppmm	1.264	11.250	32.029	32.029	104.466	147.745	147.745	95.512
324164000310	Cut tube 361 19.0/1.25/106	92	11.250	32.029	32.029	104.466	147.745	147.745	95.512
324164002281	TUBE TPY 181N SD 38X2X1070, 2ppm	92	19.768	142.295	142.295	183.560	345.623	345.623	253.843
324164002251	TUBE TPY 181N SD 18X1.75X83, 2PPM	559	19.768	142.295	142.295	183.560	345.623	345.623	253.843
324164002251	TUBE TPY 181N SD 18X1.75X83, 2ppm	559	800	0	0	12.966	13.766	13.766	7.283
324164002261	TUBE TPY 181N SD 26.3X1.4X143, 2ppm	3.079	3.012	19.266	19.266	27.966	50.244	50.244	36.261
324164002271	QUARTZ UV 321A 19.00/1.25/122.00, 5PPM	2.554	3.012	19.266	19.266	27.966	50.244	50.244	36.261
324164002271	TUBE TPY 181N SD 33X2.25X186, 2ppmm	1.264	8.105	14.267	14.267	23.636	23.636	23.636	16.503
324164002281	TUBE TPY 181N SD 38X2X1070, 2ppm	92	264	1.038	1.038	1.394	1.394	1.394	875
324164003231	TPY 321A 24X1.25X109, 10ppm	559	6.880	6.314	6.314	13.754	13.754	13.754	10.597
324164002581	Quartz UV 321A 19,00/1,25/107,00, 5PPM	8.000	8.000	14.774	14.774	88.000	110.774	110.774	66.774
324164002591	Quartz UV 321A, 19,00/1,25/122,00, 5PPM	3.079	3.079	11.959	11.959	33.869	48.907	48.907	31.973
324164003301	Quartz UV 321A 19,00/1,25/115,50, 5PPM	2.554	7.535	28.094	28.094	38.183	38.183	38.183	24.136
		<12 weken coverage							
		>12 weken coverage			902.303	2.419.493	8.588.893	11.807.471	7.719.464
		above max							

Supermarket with new forecast update every 8 weeks

PHILIPS Supermarket for shaped tubes

FROM



SM with fifo

