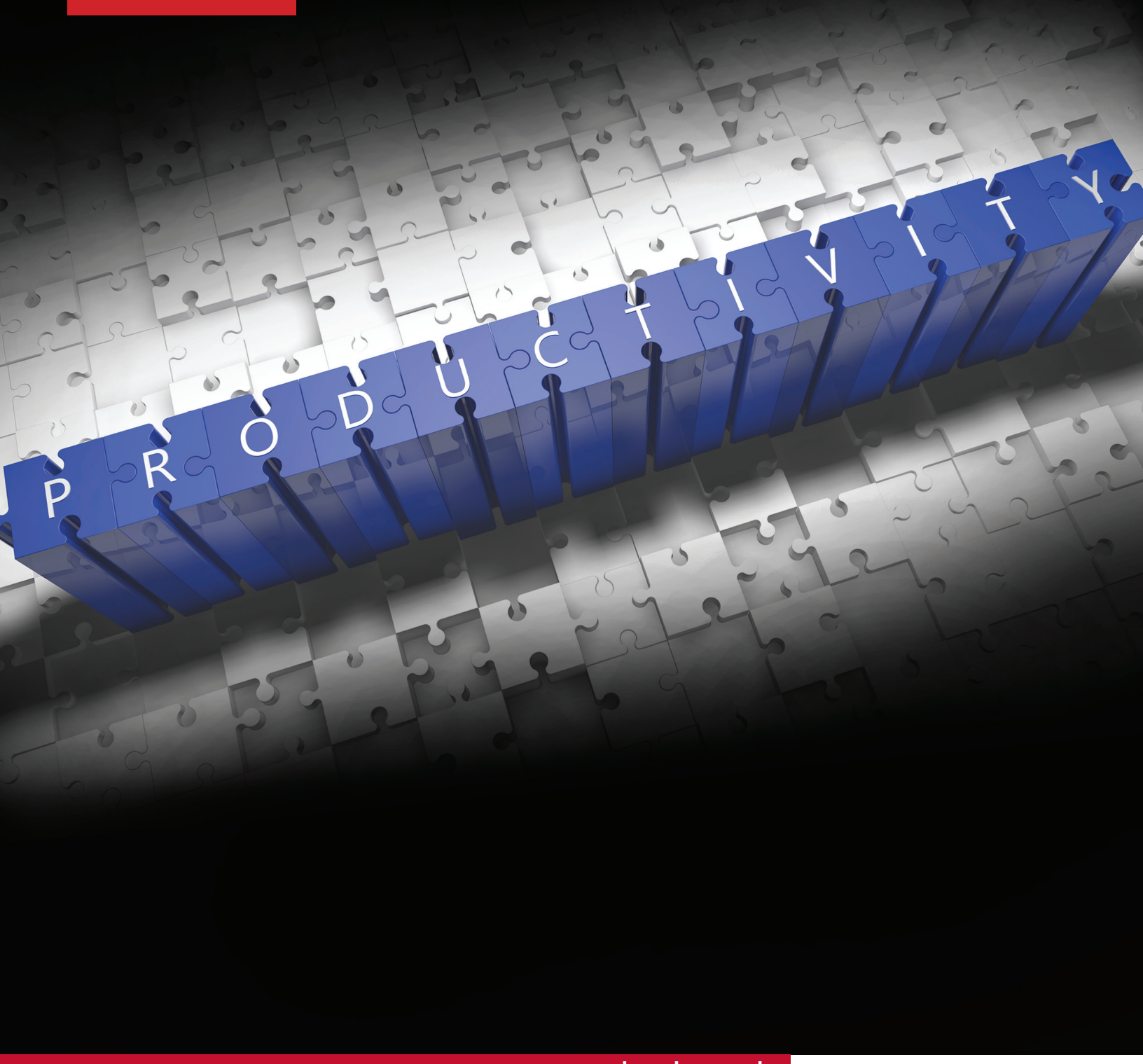
USER GUIDE

OEE BENEFIT CALCULATOR

Key Concepts & Instructions



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PMMI | 11911 Freedom Drive, Suite 600 | Reston, VA 20190 | **opxleadershipnetwork.org**

PMMI

OpX Leadership Network
Moving Operational Excellence Forward

OEE BENEFIT CALCULATOR Key Concepts & Instructions

TABLE OF CONTENTS

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PMMI is a trade association of more than 600 member companies that manufacture packaging, processing and related converting machinery in the United States or Canada; machinery components and packaging containers and materials. PMMI's vision is to be the leading global resource for the packaging and processing supply chain, and its mission is to improve and promote members' abilities to meet the needs of their customers. Learn more about PMMI and the PACK EXPO trade shows at PMMI.org and Packexpo.com.

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OEE BENEFIT CALCULATOR Key Concepts & Instructions

Overview

Statement of Purpose

OEE Defined

OEE Impact on Performance

OEE Benefit Calculator
- value • basis • scope

Inputs, Calculations and Outputs

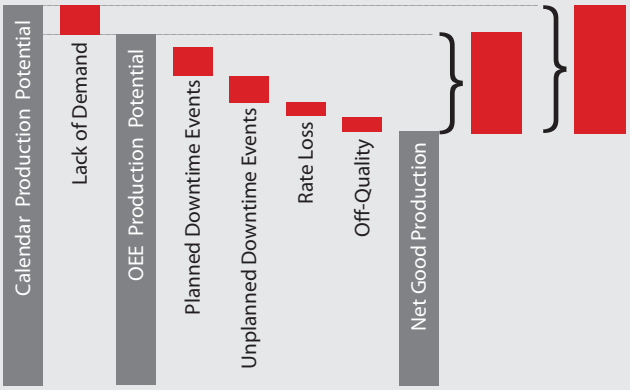
Step-by-Step Guide to Completing the Calculator

Purpose of the OEE Benefit Calculator

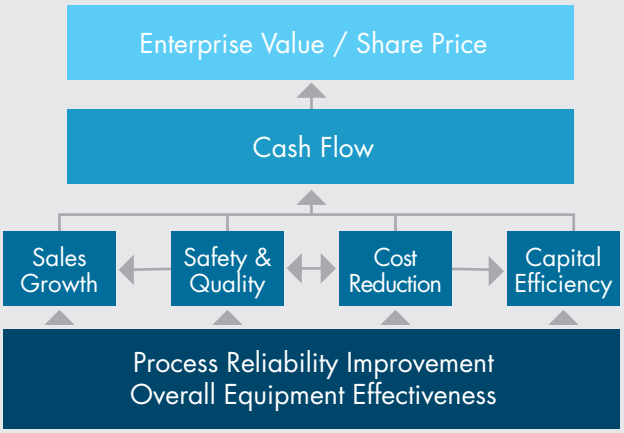
Calculate the product cost impact of target future performance improvements

Enable development and comparison of various improvement scenarios

OVERALL EQUIPMENT EFFECTIVENESS



OEE: A PERVASIVE IMPACT ON BUSINESS RESULTS



Why Focus on OEE?

OEE performance has a pervasive impact on key success factors for automated manufacturers

Customer service & delivery

Quality variation and defect loss

Raw material scrap & waste

Labor efficiency

Equipment repair & maintenance expense

Overhead spending and absorption

OEE BENEFIT CALCULATOR Key Concepts & Instructions

OEE Benefit Calculator Basis for Savings Calculations

Savings are attained in 2 key areas:

DIRECT LABOR WAGES & OVERTIME

Improvement in OEE will enable a line to meet production targets in fewer direct labor-crewed scheduled run hours

So improved OEE may enable a reduction in the number of weekend days that must be scheduled in order to meet the target production quantity

This will result in reduced direct labor expense related to fewer paid hours and reduced overtime premiums

RAW MATERIAL INGREDIENT AND PACKAGING YIELD

Unplanned stops on the production line result in scrap and waste

Quality variation and rejects caused by instability in the production process

Spilled, damaged or incomplete product that must be scrapped

Reductions in unplanned stops will result in improved yield

Scope of the OEE Benefit Calculator

OEE TRACKING

OEE data is captured and tracked at the production line level

OEE data can be rolled up to plant and multi-plant levels

OEE IMPROVEMENT

OEE improvement is most effective when it is prioritized to a specific line with a clear plan of action to deliver measurable results

Successful improvements and learnings may be reapplied across additional production lines

THE OEE BENEFIT CALCULATOR FOCUSES ON EVALUATING THE OPPORTUNITY ON A SINGLE PRODUCTION LINE

Pick a line where gaps in service, quality or costs are hurting your business

Evaluate improvement alternative scenarios to determine most valuable targets for focused improvement

Reapply the calculator and learnings to other line

Guide to Completing the OEE Benefit Calculator

The following pages present:

Inputs data points, definitions & guidance

Outputs & calculations

Pointers & step-by-step instructions

OEE BENEFIT CALCULATOR Key Concepts & Instructions

Inputs

INPUT CATEGORY	GUIDANCE
Decision Variable: Baseline Date Range	Pick a 3-month time frame that is representative of ongoing operations results
Line Performance	Baseline period units produced, target production rate, and OEE productivity losses
Product Cost	Baseline product cost with detail on raw material expense and yield loss, and direct labor wages & fringes
Direct Labor Crewed Hours for Planned Downtime Activities	Identify the amount of hours per week direct labor crews are scheduled to perform planned downtime activities such as changeover, sanitation, improvement events, etc.
Decision Variables: Target productivity Improvement	Use the model to develop various improvement scenarios. Improvement targets may include average weekly scheduled hours, production speed, OEE losses, and direct labor crewed hours for planned downtime activities
Target future production by quarter	Determine the production quantities needed in future quarters
Future quarter calendar restrictions	Identify the number of days in each future quarter where plant shutdowns or labor agreement restrictions prohibit scheduling production on the line

Outputs

OUTPUT DATA CATEGORY	DESCRIPTION & CALCULATION
Current State Pro-Forma Costs	Pro-forma annual product costs by quarter, based on forecasted production quantities and current state (baseline) productivity **CALCULATION:** Baseline productivity determines the number of crewed production days required in each quarter to meet forecast production needs. Taking into account restrictions related to plant shutdowns and labor agreements, the model calculates labor costs assuming labor will be scheduled to fill up available week days first, Saturdays next, and finally Sundays. The number of Saturdays and Sundays crewed impact labor overtime premium expense. If the number of days available for production crewing is inadequate to meet the forecast production quantity, the model calculates the largest quantity produced that is possible in that particular quarter.
Future State Pro-Forma Costs	Baseline period units produced, target production rate, and OEE productivity losses

OEE BENEFIT CALCULATOR Key Concepts & Instructions

UP-FRONT POINTERS

OEE Benefit Calculator©

PURPOSE OF THIS WORKSHEET: *Identify & assign responsibility for data collection required to complete this workbook*

Data Input Requirements & Assignment Tracker

Baseline Date Range Start Date: 5/26/2014

Baseline Date Range End Date: 8/25/2014

Worksheet Name	Input Data Range		Description	Typical Area of Functional Ownership	Assigned to	Due Date	Status
	Starting Cell	Ending Cell					
1. Header Info	G6		Plant Name	Performance Analysis & Improvement	PTH	7/21/2015	Good
1. Header Info	G8		Line Name		PTH	7/21/2015	Good
1. Header Info	G10		Prepared by		PTH	7/21/2015	Good
1. Header Info	G12		Version or file name		PTH	7/21/2015	Good
1. Header Info	G16		Baseline Date Range Start Date		PTH	7/21/2015	Good
1. Header Info	G18		Baseline Date Range End Date		PTH	7/21/2015	Good
2. Baseline Data	D11		Product costing unit of measure	Finance	PTH	7/21/2015	Good
2. Baseline Data	D12		Primary production unit of measure	Operations	PTH	7/21/2015	Good
2. Baseline Data	D13		Primary units per Product Costing Unit	Operations	PTH	7/21/2015	Good
2. Baseline Data	D15		Product Costing Units Produced	Finance	PTH	7/21/2015	Good
2. Baseline Data	E19		Total Scheduled Hours	Operations	PTH	7/21/2015	Good
2. Baseline Data	D22		Primary Units Produced per Production Line Records	Operations	PTH	7/21/2015	Good
2. Baseline Data	D25		Target Primary Units Target Production Rate	Operations	PTH	7/21/2015	Good
2. Baseline Data	E30	E34	Planned Downtime Hours	Operations	PTH	7/21/2015	Good
2. Baseline Data	C38	C42	Unplanned Downtime Reason	Operations	PTH	7/21/	
2. Baseline Data	E38	E42	Unplanned Downtime Hours	Operations	PTH	7/21/	
2. Baseline Data	I51	I55	Weekly PDT Hours Staffed by Indirect Labor Only	Operations	PTH	7/21/	
2. Baseline Data	E62		Raw Material Packaging Expense $	Finance	PTH	7/21/	
2. Baseline Data	E63		Raw Material Ingredients Expense $	Finance	PTH	7/21/	
2. Baseline Data	E65		Direct Labor Wages $	Finance	PTH	7/21/	
2. Baseline Data	E66		Direct Labor Payroll Taxes $	Finance	PTH	7/21/	
2. Baseline Data	E67		Direct Labor Vacation $	Finance	PTH	7/21/	
2. Baseline Data	E68		Direct Labor All Other Benefits $	Finance	PTH	7/21/	
2. Baseline Data	E71		Indirect & Fixed Overhead Cost $	Finance	PTH	7/21/	
2. Baseline Data	E75		Packaging Yield Loss $	Finance	PTH	7/21/	
2. Baseline Data	E76		Ingredient Yield Loss $	Finance	PTH	7/21/	
3. Target Performance	**Note: Entries on the Target Performance worksheet are based on increase/(decrease) versus current state**						
3. Target Performance	I13		Total Scheduled Hours	Operations	PTH	7/21/	
3. Target Performance	H15		Target Primary Units Target Production Rate	Operations	PTH	7/21/	
3. Target Performance	I18	I22	Planned Downtime Hours	Operations	PTH	7/21/	
3. Target Performance	I26	I30	Unplanned Downtime Hours	Operations	PTH	7/21/	
3. Target Performance	H33		Quality Reject Loss	Operations	PTH	7/21/	
3. Target Performance	I34		Rate Loss	Operations	PTH	7/21/	
3. Target Performance	J39		Packaging Yield Loss %	Operations	PTH	7/21/	
3. Target Performance	J40		Ingredient Yield Loss %	Operations	PTH	7/21/	
3. Target Performance	N45	N49	Future state average weekly PDT Hours Using Indirect Crews Only	Operations	PTH	7/21/	
4. Cost Pro Forma	F11		Forecast Quarter Start Date	Finance	PTH	7/21/	
4. Cost Pro Forma	F14	I14	Forecast Required Costing Units Produced	Finance	PTH	7/21/2015	Good
4. Cost Pro Forma	D19	I19	No. of Days in Qtr that Production Cannot be Scheduled	Finance	PTH	7/21/2015	Good

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

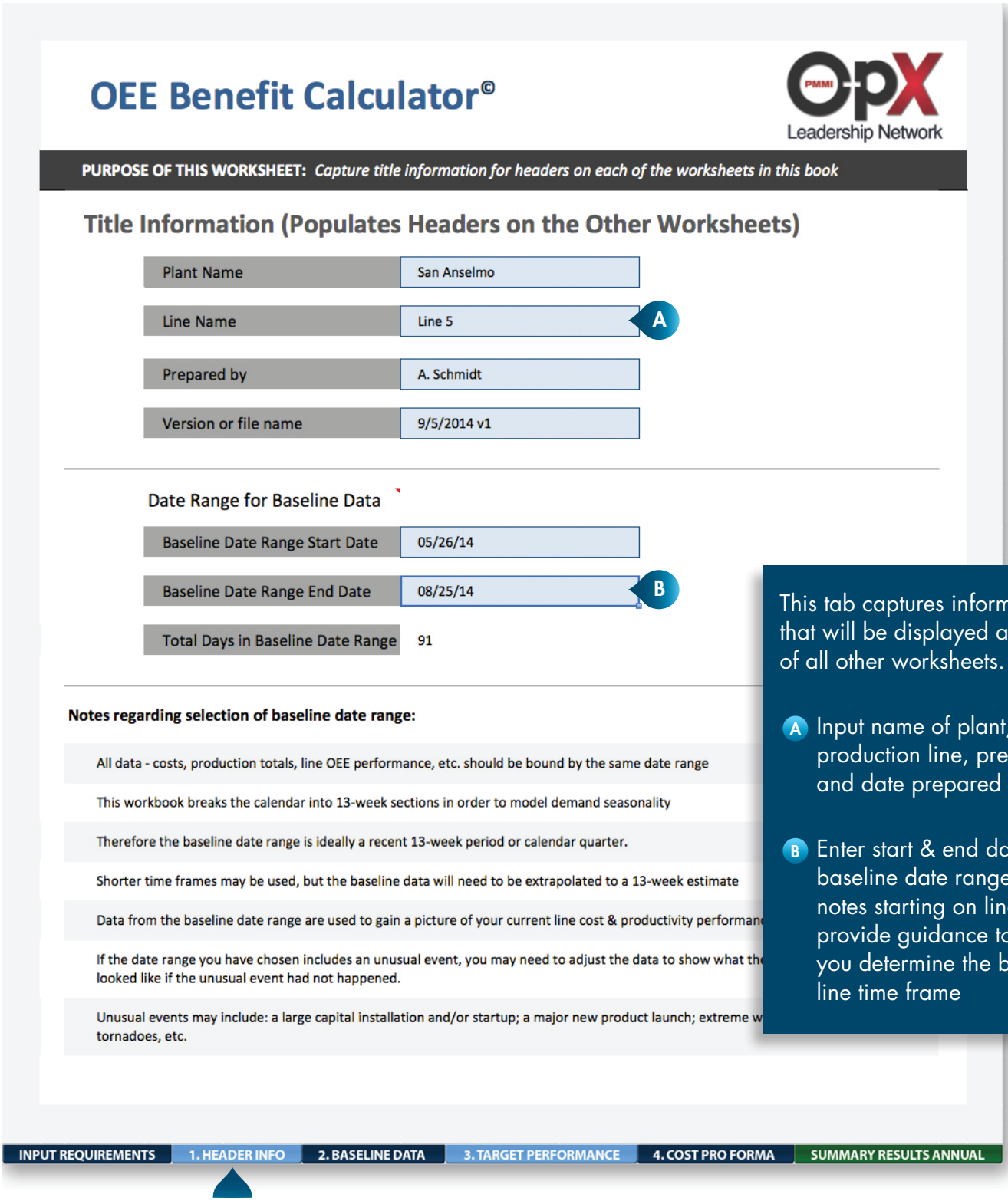
2

4

1. The workbook contains no macros
2. Input cells are highlighted in light-blue
3. All other cells are protected. Calculations & outputs are automatic
4. Hover your mouse pointer over cells with red corners to view comments and definitions
5. Print ranges are pre-set

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 1 Tab: 1. Header Info



OEE Benefit Calculator©

PMMI OpX Leadership Network

PURPOSE OF THIS WORKSHEET: *Capture title information for headers on each of the worksheets in this book*

Title Information (Populates Headers on the Other Worksheets)

Plant Name	San Anselmo
Line Name	Line 5
Prepared by	A. Schmidt
Version or file name	9/5/2014 v1

Date Range for Baseline Data

Baseline Date Range Start Date	05/26/14
Baseline Date Range End Date	08/25/14
Total Days in Baseline Date Range	91

Notes regarding selection of baseline date range:

All data - costs, production totals, line OEE performance, etc. should be bound by the same date range

This workbook breaks the calendar into 13-week sections in order to model demand seasonality

Therefore the baseline date range is ideally a recent 13-week period or calendar quarter.

Shorter time frames may be used, but the baseline data will need to be extrapolated to a 13-week estimate

Data from the baseline date range are used to gain a picture of your current line cost & productivity performan

If the date range you have chosen includes an unusual event, you may need to adjust the data to show what th looked like if the unusual event had not happened.

Unusual events may include: a large capital installation and/or startup; a major new product launch; extreme w tornadoes, etc.

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

This tab captures information that will be displayed at the top of all other worksheets.

A Input name of plant, production line, preparer and date prepared

B Enter start & end dates for baseline date range. The notes starting on line 14 provide guidance to help you determine the base-line time frame

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 2 Tab: 0. Input Requirements

OEE Benefit Calculator©

PURPOSE OF THIS WORKSHEET: *Identify & assign responsibility for data collection required to complete this workbook*

Data Input Requirements & Assignment Tracker

Baseline Date Range Start Date: 5/26/2014

Baseline Date Range End Date: 8/25/2014

Worksheet Name	Input Data Range		Description	Typical Area of Functional Ownership	Assigned to	Due Date	Status
	Starting Cell	Ending Cell					
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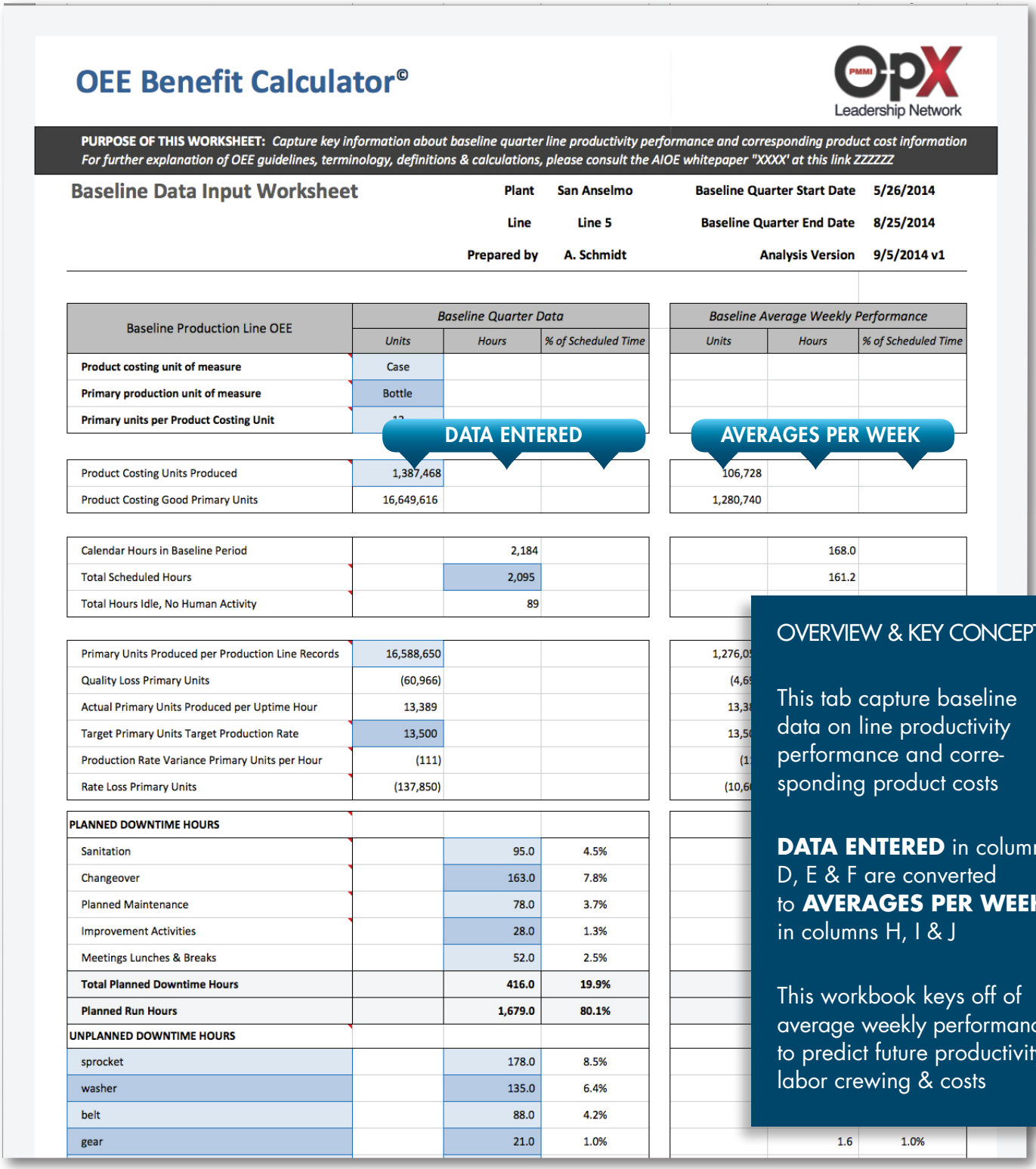
INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

This tab enables the project leader to assign data collection duties & deadlines to team members, and to track the status

C Fill in names and dates, keep track of what is completed and what is yet to be done

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 3 Tab: 2. Baseline Data



OEE Benefit Calculator©

Leadership Network

PURPOSE OF THIS WORKSHEET: *Capture key information about baseline quarter line productivity performance and corresponding product cost information*
For further explanation of OEE guidelines, terminology, definitions & calculations, please consult the AIOE whitepaper "XXXX' at this link ZZZZZZ

Baseline Data Input Worksheet

Plant	San Anselmo	Baseline Quarter Start Date	5/26/2014
Line	Line 5	Baseline Quarter End Date	8/25/2014
Prepared by	A. Schmidt	Analysis Version	9/5/2014 v1

Baseline Production Line OEE	Baseline Quarter Data			Baseline Average Weekly Performance		
	Units	Hours	% of Scheduled Time	Units	Hours	% of Scheduled Time
Product costing unit of measure	Case					
Primary production unit of measure	Bottle					
Primary units per Product Costing Unit						
Product Costing Units Produced	1,387,468			106,728		
Product Costing Good Primary Units	16,649,616			1,280,740		
Calendar Hours in Baseline Period		2,184			168.0	
Total Scheduled Hours		2,095			161.2	
Total Hours Idle, No Human Activity		89				
Primary Units Produced per Production Line Records	16,588,650			1,276,0		
Quality Loss Primary Units	(60,966)			(4,6		
Actual Primary Units Produced per Uptime Hour	13,389			13,3		
Target Primary Units Target Production Rate	13,500			13,5		
Production Rate Variance Primary Units per Hour	(111)			(1		
Rate Loss Primary Units	(137,850)			(10,6		
PLANNED DOWNTIME HOURS						
Sanitation		95.0	4.5%			
Changeover		163.0	7.8%			
Planned Maintenance		78.0	3.7%			
Improvement Activities		28.0	1.3%			
Meetings Lunches & Breaks		52.0	2.5%			
Total Planned Downtime Hours		**416.0**	**19.9%**			
Planned Run Hours		**1,679.0**	**80.1%**			
UNPLANNED DOWNTIME HOURS						
sprocket		178.0	8.5%			
washer		135.0	6.4%			
belt		88.0	4.2%			
gear		21.0	1.0%		1.6	1.0%

DATA ENTERED

AVERAGES PER WEEK

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

OVERVIEW & KEY CONCEPTS

This tab capture baseline data on line productivity performance and corresponding product costs

DATA ENTERED in columns D, E & F are converted to **AVERAGES PER WEEK** in columns H, I & J

This workbook keys off of average weekly performance to predict future productivity, labor crewing & costs

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 4 Tab: 2. Baseline Data

OEE Benefit Calculator©

OpX Leadership Network

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Baseline Data Input Worksheet

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Line	**Line 5**	**Baseline Quarter End Date**	**8/25/2014**
Prepared by	**A. Schmidt**	**Analysis Version**	**9/5/2014 v1**

Baseline Production Line OEE	Baseline Quarter Data			Baseline Average Weekly Performance		
	Units	*Hours*	*% of Scheduled Time*	*Units*	*Hours*	*% of Scheduled Time*
Product costing unit of measure	Case					
Primary production unit of measure	Bottle					
Primary units per Product Costing Unit	12					
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washer		135.0	6.4%			
belt		88.0	4.2%		6.8	4.2%
gear		21.0	1.0%		1.6	1.0%
carton		18.0	0.9%		1.4	0.9%

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

D Enter the unit of count for product costing, e.g., cases, hundred-weight, etc.

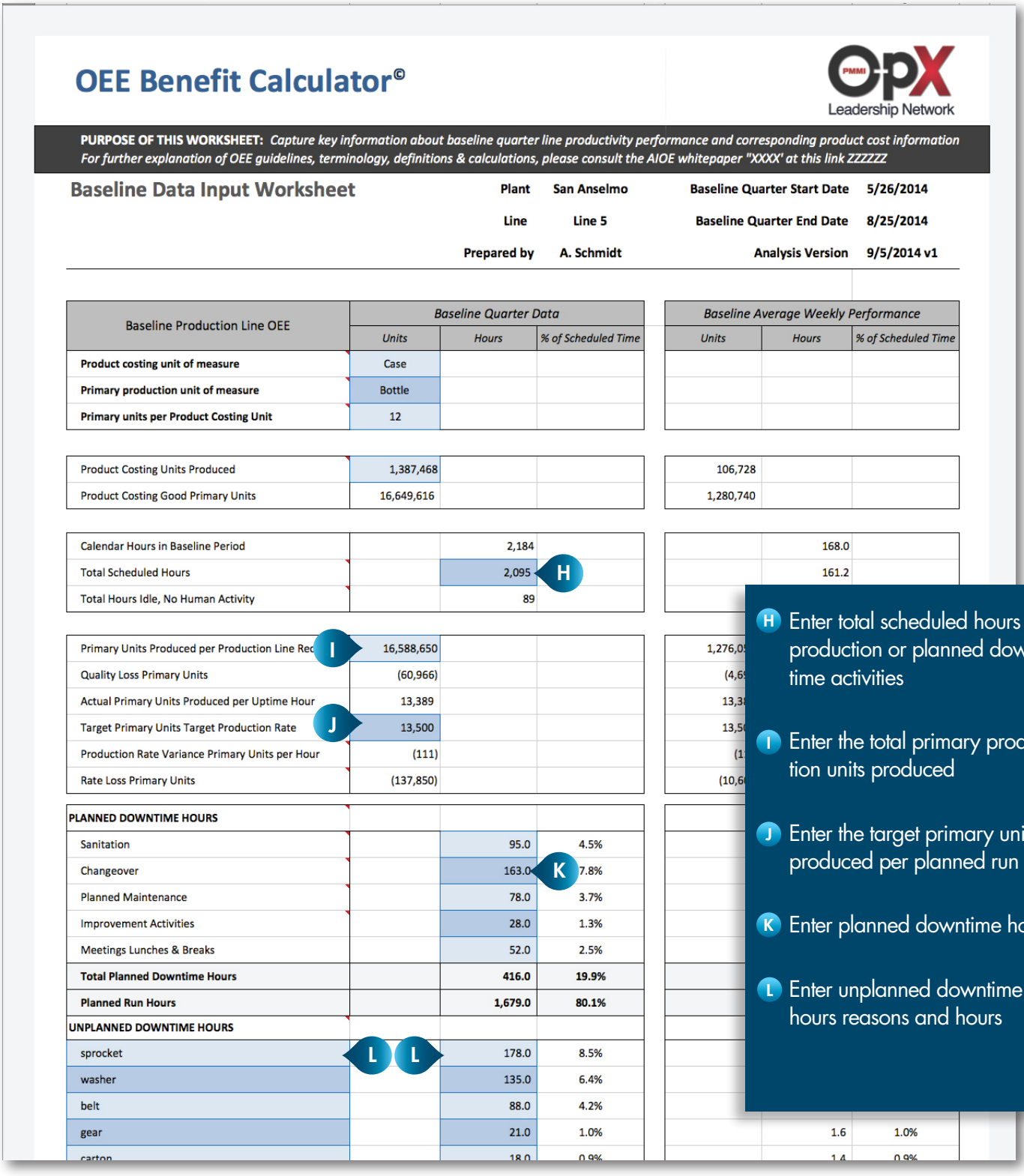
E Enter the primary production unit of measure on the line, e.g.., bottles, cartons, cases, etc.

F Enter the ratio of primary units to product costing units, e.g., 12 cartons per case

G Enter the total product costing units produced during the baseline period

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 5 Tab: 2. Baseline Data



OEE Benefit Calculator©

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Baseline Data Input Worksheet

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Total Planned Downtime Hours		**416.0**	**19.9%**			
Planned Run Hours		**1,679.0**	**80.1%**			
UNPLANNED DOWNTIME HOURS						
sprocket	L L	178.0	8.5%			
washer		135.0	6.4%			
belt		88.0	4.2%			
gear		21.0	1.0%		1.6	1.0%
carton		18.0	0.9%		1.4	0.9%

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

- **H** Enter total scheduled hours for production or planned down-time activities
- **I** Enter the total primary production units produced
- **J** Enter the target primary units produced per planned run hour
- **K** Enter planned downtime hours
- **L** Enter unplanned downtime hours reasons and hours

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 6 Tab: 2. Baseline Data

washer		135.0	6.4%		10.4	6.4%
belt		88.0	4.2%		6.8	4.2%
gear		21.0	1.0%		1.6	1.0%
carton		18.0	0.9%		1.4	0.9%
Unplanned Downtime		**440.0**	**21.0%**		**33.8**	**21.0%**
Line Uptime		**1,239.0**	**59.1%**		**95.3**	**59.1%**
Quality Loss	60,966.0	4.5	0.2%	4,689.7	0.3	0.2%
Rate Loss *Underspeed/(Overspeed)*		10.2	0.5%		0.8	0.5%
OVERALL EQUIPMENT EFFECTIVENESS			**58.4%**			**58.4%**
OPERATING EFFICIENCY %			**72.9%**			**72.9%**

Planned Downtime that is Completed Outside of the Direct Labor Crewing Schedule	Total PDT Hours	PDT Hours Done Outside of Direct Labor Crewed Time	PDT Hours With Direct Labor Crewing	Total PDT Hours	Weekly PDT Hours Staffed by Indirect Labor Only	PDT Hours With Direct Labor Crewing
Sanitation	95	26	69	7.3	2.0 (M)	5.3
Changeover	163	26	137	12.5	2.0	10.5
Planned Maintenance	78	0	78	6.0	0.0	6.0
Improvement Activities	28	5	23	2.2	0.4	1.8
Meetings Lunches & Breaks	52	0	52	4.0		4.0
Total Planned Downtime Hours	**416**	**57**	**359**	**32.0**	**4.4**	**27.6**
Planned Run Time Hours			**1,679**			**129.2**
Total Direct Labor Crewed Hours			**2,038**			**156.8**

Production Line Manufacturing Cost Data	Cost per Case	Dollars	%	Cost per Case		
MANUFACTURING COST OF GOODS						
Raw Material Packaging Expense $	$2.64	$3,664,700		$2.64		
Raw Material Ingredients Expense $	$2.38	$3,299,700		$2.38		
Total Raw Materials	*$5.02*	*$6,964,400*		*$5.02*		
Direct Labor Wages $	$0.31	$425,000	% of Wages	$0.31		
Direct Labor Payroll Taxes	$0.03	$42,500	10.0%	$0.03		
Direct Labor Vacation	$0.00	$6,000	1.4%	$0.00		
Direct Labor All Other Benefits	$0.09	$130,000	30.6%	$0.09		
Total Benefits	*$0.13*	*$178,500*	*42.0%*	*$0.13*		
Total Direct Labor & Benefits	*$0.43*	*$603,500*		*$0.43*	*$46,423*	
Indirect & Fixed Overhead Cost $	$0.10	$135,000		$0.10	$10,385	
Total Mfg Cost of Goods	**$5.55**	**$7,702,900**		**$5.55**	**$592,531**	
RAW MATERIAL YIELD LOSS						
Packaging Yield Loss	$0.20	$275,600	8.1%	$0.20	$21,200	8.1%
Ingredient Yield Loss	$0.09	$131,000	4.1%	$0.09	$10,077	4.1%
Total Yield Loss	**$0.29**	**$406,600**	**6.2%**	**$0.29**	**$31,277**	**6.2%**
ZERO LOSS REQUIREMENT FOR RAW MATERIALS						
Raw Material Packaging $	$2.44	$3,389,100		$2.44	$260,700	
Raw Material Ingredients $	$2.28	$3,168,700		$2.28	$243,746	
Total	**$4.73**	**$6,557,800**		**$4.73**	**$504,446**	

(M) Enter the average weekly number of hours in which direct labor crewing is used to perform planned downtime activities. Direct labor crew schedules are a key cost driver in this analysis.

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 7 Tab: 2. Baseline Data

washer		135.0	6.4%		10.4	6.4%
belt		88.0	4.2%		6.8	4.2%
gear		21.0	1.0%		1.6	1.0%
carton		18.0	0.9%		1.4	0.9%
Unplanned Downtime		**440.0**	**21.0%**		**33.8**	**21.0%**
Line Uptime		**1,239.0**	**59.1%**		**95.3**	**59.1%**
Quality Loss	60,966.0	4.5	0.2%	4,689.7	0.3	0.2%
Rate Loss *Underspeed/(Overspeed)*		10.2	0.5%		0.8	0.5%
OVERALL EQUIPMENT EFFECTIVENESS			**58.4%**			**58.4%**
OPERATING EFFICIENCY %			**72.9%**			**72.9%**

Planned Downtime that is Completed Outside of the Direct Labor Crewing Schedule	Total PDT Hours	PDT Hours Done Outside of Direct Labor Crewed Time	PDT Hours With Direct Labor Crewing
Sanitation	95	26	69
Changeover	163	26	137
Planned Maintenance	78	0	78
Improvement Activities	28	5	23
Meetings Lunches & Breaks	52	0	52
Total Planned Downtime Hours	**416**	**57**	**359**
Planned Run Time Hours			**1,679**
Total Direct Labor Crewed Hours			**2,038**

Production Line Manufacturing Cost Data	Cost per Case	Dollars	%
MANUFACTURING COST OF GOODS			
Raw Material Packaging Expense $	$2.	$3,664,700	
Raw Material Ingredients Expense $	$2.38	$3,299,700	
Total Raw Materials	*$5.02*	*$6,964,400*	
Direct Labor Wages $	$0.31	$425,000	of Wages
Direct Labor Payroll Taxes	$0.03	$42,500	10.0%
Direct Labor Vacation	$0.	$6,000	1.4%
Direct Labor All Other Benefits	$0.09	$130,000	30.6%
Total Benefits	*$0.13*	*$178,500*	*42.0%*
Total Direct Labor & Benefits	*$0.43*	*$603,500*	
Indirect & Fixed Overhead Cost $	$0.10	$135,000	
Total Mfg Cost of Goods	**$5.55**	**$7,702,900**	

RAW MATERIAL YIELD LOSS			
Packaging Yield Loss	$0.20	$275,600	8.1%
Ingredient Yield Loss	$0.	$131,000	4.1%
Total Yield Loss	**$0.29**	**$406,600**	**6.2%**

ZERO LOSS REQUIREMENT FOR RAW MATERIALS		
Raw Material Packaging $	$2.44	$3,389,100
Raw Material Ingredients $	$2.28	$3,168,700
Total	**$4.73**	**$6,557,800**

N Enter total raw material packaging and ingredient expenses

O Enter total Direct Labor wages expense, including overtime premium

P Enter Direct Labor benefit expenses by category

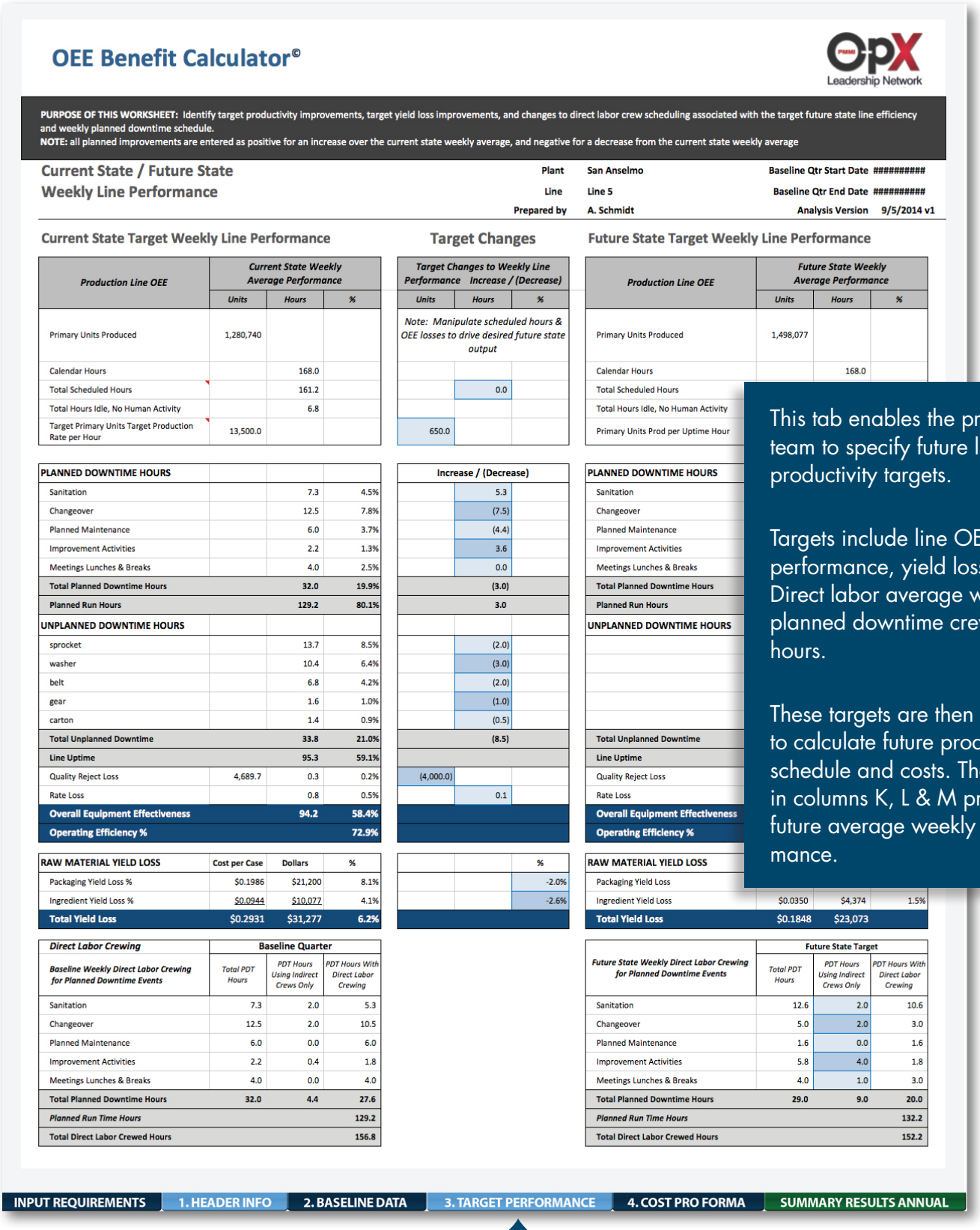
Q Enter Indirect and Fixed Overhead expenses that were charged to this line's product

R Enter the total dollar value of yield loss that is included in the raw material packaging & ingredient expenses in cells C62 & C63

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 8 Tab: 3. Target Performance



OEE Benefit Calculator©

PURPOSE OF THIS WORKSHEET: Identify target productivity improvements, target yield loss improvements, and changes to direct labor crew scheduling associated with the target future state line efficiency and weekly planned downtime schedule.
NOTE: all planned improvements are entered as positive for an increase over the current state weekly average, and negative for a decrease from the current state weekly average

Current State / Future State Weekly Line Performance

Plant: San Anselmo | Baseline Qtr Start Date: ########
Line: Line 5 | Baseline Qtr End Date: ########
Prepared by: A. Schmidt | Analysis Version: 9/5/2014 v1

Current State Target Weekly Line Performance

Production Line OEE	Current State Weekly Average Performance		
	Units	Hours	%
Primary Units Produced	1,280,740		
Calendar Hours		168.0	
Total Scheduled Hours		161.2	
Total Hours Idle, No Human Activity		6.8	
Target Primary Units Target Production Rate per Hour	13,500.0		
PLANNED DOWNTIME HOURS			
Sanitation		7.3	4.5%
Changeover		12.5	7.8%
Planned Maintenance		6.0	3.7%
Improvement Activities		2.2	1.3%
Meetings Lunches & Breaks		4.0	2.5%
Total Planned Downtime Hours		32.0	19.9%
Planned Run Hours		129.2	80.1%
UNPLANNED DOWNTIME HOURS			
sprocket		13.7	8.5%
washer		10.4	6.4%
belt		6.8	4.2%
gear		1.6	1.0%
carton		1.4	0.9%
Total Unplanned Downtime		33.8	21.0%
Line Uptime		95.3	59.1%
Quality Reject Loss	4,689.7	0.3	0.2%
Rate Loss		0.8	0.5%
Overall Equipment Effectiveness		94.2	58.4%
Operating Efficiency %			72.9%

RAW MATERIAL YIELD LOSS	Cost per Case	Dollars	%
Packaging Yield Loss %	$0.1986	$21,200	8.1%
Ingredient Yield Loss %	$0.0944	$10,077	4.1%
Total Yield Loss	$0.2931	$31,277	6.2%

Direct Labor Crewing	Baseline Quarter		
Baseline Weekly Direct Labor Crewing for Planned Downtime Events	Total PDT Hours	PDT Hours Using Indirect Crews Only	PDT Hours With Direct Labor Crewing
Sanitation	7.3	2.0	5.3
Changeover	12.5	2.0	10.5
Planned Maintenance	6.0	0.0	6.0
Improvement Activities	2.2	0.4	1.8
Meetings Lunches & Breaks	4.0	0.0	4.0
Total Planned Downtime Hours	32.0	4.4	27.6
Planned Run Time Hours			129.2
Total Direct Labor Crewed Hours			156.8

Target Changes

Target Changes to Weekly Line Performance Increase / (Decrease)		
Units	Hours	%
Note: Manipulate scheduled hours & OEE losses to drive desired future state output		
	0.0	
650.0		
Increase / (Decrease)		
	5.3	
	(7.5)	
	(4.4)	
	3.6	
	0.0	
	(3.0)	
	3.0	
	(2.0)	
	(3.0)	
	(2.0)	
	(1.0)	
	(0.5)	
	(8.5)	
(4,000.0)		
	0.1	
		%
		-2.0%
		-2.6%

Future State Target Weekly Line Performance

Production Line OEE	Future State Weekly Average Performance		
	Units	Hours	%
Primary Units Produced	1,498,077		
Calendar Hours		168.0	
Total Scheduled Hours			
Total Hours Idle, No Human Activity			
Primary Units Prod per Uptime Hour			
PLANNED DOWNTIME HOURS			
Sanitation			
Changeover			
Planned Maintenance			
Improvement Activities			
Meetings Lunches & Breaks			
Total Planned Downtime Hours			
Planned Run Hours			
UNPLANNED DOWNTIME HOURS			
Total Unplanned Downtime			
Line Uptime			
Quality Reject Loss			
Rate Loss			
Overall Equipment Effectiveness			
Operating Efficiency %			

RAW MATERIAL YIELD LOSS			
Packaging Yield Loss			
Ingredient Yield Loss	$0.0350	$4,374	1.5%
Total Yield Loss	$0.1848	$23,073	

	Future State Target		
Future State Weekly Direct Labor Crewing for Planned Downtime Events	Total PDT Hours	PDT Hours Using Indirect Crews Only	PDT Hours With Direct Labor Crewing
Sanitation	12.6	2.0	10.6
Changeover	5.0	2.0	3.0
Planned Maintenance	1.6	0.0	1.6
Improvement Activities	5.8	4.0	1.8
Meetings Lunches & Breaks	4.0	1.0	3.0
Total Planned Downtime Hours	29.0	9.0	20.0
Planned Run Time Hours			132.2
Total Direct Labor Crewed Hours			152.2

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

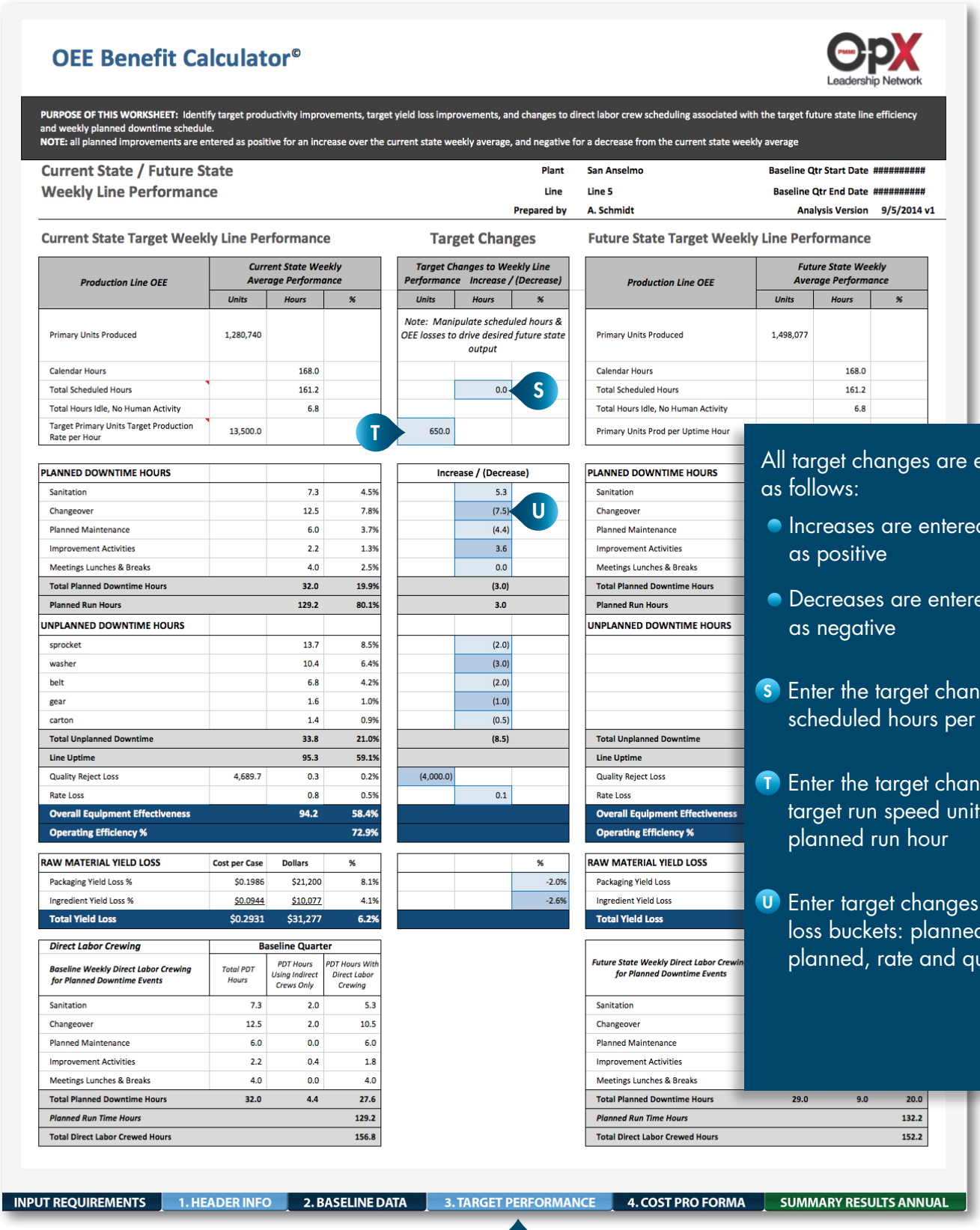
This tab enables the project team to specify future line productivity targets.

Targets include line OEE performance, yield loss, and Direct labor average weekly planned downtime crewed hours.

These targets are then used to calculate future production schedule and costs. The data in columns K, L & M present future average weekly performance.

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 9 Tab: 3. Target Performance



OEE Benefit Calculator©

PURPOSE OF THIS WORKSHEET: Identify target productivity improvements, target yield loss improvements, and changes to direct labor crew scheduling associated with the target future state line efficiency and weekly planned downtime schedule.
NOTE: all planned improvements are entered as positive for an increase over the current state weekly average, and negative for a decrease from the current state weekly average

Current State / Future State Weekly Line Performance

Plant: San Anselmo | Baseline Qtr Start Date: ########
Line: Line 5 | Baseline Qtr End Date: ########
Prepared by: A. Schmidt | Analysis Version: 9/5/2014 v1

Current State Target Weekly Line Performance

Production Line OEE	Current State Weekly Average Performance		
	Units	Hours	%
Primary Units Produced	1,280,740		
Calendar Hours		168.0	
Total Scheduled Hours		161.2	
Total Hours Idle, No Human Activity		6.8	
Target Primary Units Target Production Rate per Hour	13,500.0		

Target Changes

Target Changes to Weekly Line Performance Increase / (Decrease)		
Units	Hours	%
Note: Manipulate scheduled hours & OEE losses to drive desired future state output		
	0.0	
650.0		

Future State Target Weekly Line Performance

Production Line OEE	Future State Weekly Average Performance		
	Units	Hours	%
Primary Units Produced	1,498,077		
Calendar Hours		168.0	
Total Scheduled Hours		161.2	
Total Hours Idle, No Human Activity		6.8	
Primary Units Prod per Uptime Hour			

PLANNED DOWNTIME HOURS				Increase / (Decrease)			PLANNED DOWNTIME HOURS
Sanitation		7.3	4.5%		5.3		Sanitation
Changeover		12.5	7.8%		(7.5)		Changeover
Planned Maintenance		6.0	3.7%		(4.4)		Planned Maintenance
Improvement Activities		2.2	1.3%		3.6		Improvement Activities
Meetings Lunches & Breaks		4.0	2.5%		0.0		Meetings Lunches & Breaks
Total Planned Downtime Hours		32.0	19.9%		(3.0)		Total Planned Downtime Hours
Planned Run Hours		129.2	80.1%		3.0		Planned Run Hours
UNPLANNED DOWNTIME HOURS							UNPLANNED DOWNTIME HOURS
sprocket		13.7	8.5%		(2.0)		
washer		10.4	6.4%		(3.0)		
belt		6.8	4.2%		(2.0)		
gear		1.6	1.0%		(1.0)		
carton		1.4	0.9%		(0.5)		
Total Unplanned Downtime		33.8	21.0%		(8.5)		Total Unplanned Downtime
Line Uptime		95.3	59.1%				Line Uptime
Quality Reject Loss	4,689.7	0.3	0.2%	(4,000.0)			Quality Reject Loss
Rate Loss		0.8	0.5%		0.1		Rate Loss
Overall Equipment Effectiveness		94.2	58.4%				Overall Equipment Effectiveness
Operating Efficiency %			72.9%				Operating Efficiency %

RAW MATERIAL YIELD LOSS	Cost per Case	Dollars	%			%	RAW MATERIAL YIELD LOSS
Packaging Yield Loss %	$0.1986	$21,200	8.1%			-2.0%	Packaging Yield Loss
Ingredient Yield Loss %	$0.0944	$10,077	4.1%			-2.6%	Ingredient Yield Loss
Total Yield Loss	$0.2931	$31,277	6.2%				Total Yield Loss

Direct Labor Crewing	Baseline Quarter		
Baseline Weekly Direct Labor Crewing for Planned Downtime Events	Total PDT Hours	PDT Hours Using Indirect Crews Only	PDT Hours With Direct Labor Crewing
Sanitation	7.3	2.0	5.3
Changeover	12.5	2.0	10.5
Planned Maintenance	6.0	0.0	6.0
Improvement Activities	2.2	0.4	1.8
Meetings Lunches & Breaks	4.0	0.0	4.0
Total Planned Downtime Hours	32.0	4.4	27.6
Planned Run Time Hours			129.2
Total Direct Labor Crewed Hours			156.8

Future State Weekly Direct Labor Crewin for Planned Downtime Events			
Sanitation			
Changeover			
Planned Maintenance			
Improvement Activities			
Meetings Lunches & Breaks			
Total Planned Downtime Hours	29.0	9.0	20.0
Planned Run Time Hours			132.2
Total Direct Labor Crewed Hours			152.2

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

All target changes are entered as follows:

- Increases are entered as positive
- Decreases are entered as negative

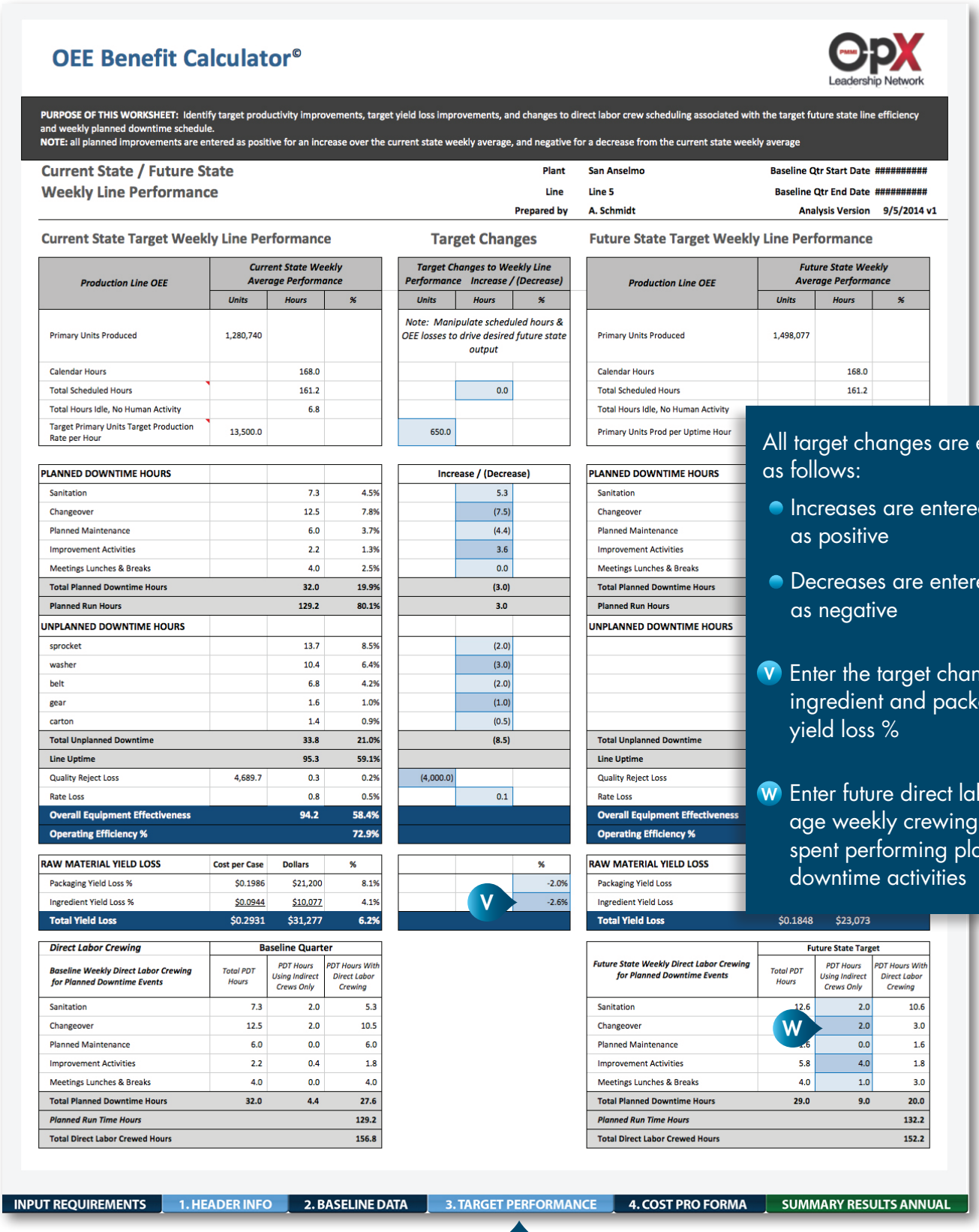
S Enter the target change in scheduled hours per week

T Enter the target change in target run speed units per planned run hour

U Enter target changes in OEE loss buckets: planned, un-planned, rate and quality

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 10 Tab: 3. Target Performance



OEE Benefit Calculator©

OpX Leadership Network

PURPOSE OF THIS WORKSHEET: Identify target productivity improvements, target yield loss improvements, and changes to direct labor crew scheduling associated with the target future state line efficiency and weekly planned downtime schedule.
NOTE: all planned improvements are entered as positive for an increase over the current state weekly average, and negative for a decrease from the current state weekly average

Current State / Future State Weekly Line Performance

Plant: San Anselmo | Baseline Qtr Start Date: ########
Line: Line 5 | Baseline Qtr End Date: ########
Prepared by: A. Schmidt | Analysis Version: 9/5/2014 v1

Current State Target Weekly Line Performance

Production Line OEE	Current State Weekly Average Performance		
	Units	Hours	%
Primary Units Produced	1,280,740		
Calendar Hours		168.0	
Total Scheduled Hours		161.2	
Total Hours Idle, No Human Activity		6.8	
Target Primary Units Target Production Rate per Hour	13,500.0		
PLANNED DOWNTIME HOURS			
Sanitation		7.3	4.5%
Changeover		12.5	7.8%
Planned Maintenance		6.0	3.7%
Improvement Activities		2.2	1.3%
Meetings Lunches & Breaks		4.0	2.5%
Total Planned Downtime Hours		32.0	19.9%
Planned Run Hours		129.2	80.1%
UNPLANNED DOWNTIME HOURS			
sprocket		13.7	8.5%
washer		10.4	6.4%
belt		6.8	4.2%
gear		1.6	1.0%
carton		1.4	0.9%
Total Unplanned Downtime		33.8	21.0%
Line Uptime		95.3	59.1%
Quality Reject Loss	4,689.7	0.3	0.2%
Rate Loss		0.8	0.5%
Overall Equipment Effectiveness		94.2	58.4%
Operating Efficiency %			72.9%

RAW MATERIAL YIELD LOSS	Cost per Case	Dollars	%
Packaging Yield Loss %	$0.1986	$21,200	8.1%
Ingredient Yield Loss %	$0.0944	$10,077	4.1%
Total Yield Loss	$0.2931	$31,277	6.2%

Target Changes

Target Changes to Weekly Line Performance Increase / (Decrease)		
Units	Hours	%
Note: Manipulate scheduled hours & OEE losses to drive desired future state output		
	0.0	
650.0		
Increase / (Decrease)		
	5.3	
	(7.5)	
	(4.4)	
	3.6	
	0.0	
	(3.0)	
	3.0	
	(2.0)	
	(3.0)	
	(2.0)	
	(1.0)	
	(0.5)	
	(8.5)	
(4,000.0)		
	0.1	
		%
		-2.0%
V		-2.6%

Future State Target Weekly Line Performance

Production Line OEE	Future State Weekly Average Performance		
	Units	Hours	%
Primary Units Produced	1,498,077		
Calendar Hours		168.0	
Total Scheduled Hours		161.2	
Total Hours Idle, No Human Activity			
Primary Units Prod per Uptime Hour			
PLANNED DOWNTIME HOURS			
Sanitation			
Changeover			
Planned Maintenance			
Improvement Activities			
Meetings Lunches & Breaks			
Total Planned Downtime Hours			
Planned Run Hours			
UNPLANNED DOWNTIME HOURS			
Total Unplanned Downtime			
Line Uptime			
Quality Reject Loss			
Rate Loss			
Overall Equipment Effectiveness			
Operating Efficiency %			

RAW MATERIAL YIELD LOSS		
Packaging Yield Loss		
Ingredient Yield Loss		
Total Yield Loss	$0.1848	$23,073

Direct Labor Crewing — Baseline Quarter: Baseline Weekly Direct Labor Crewing for Planned Downtime Events	Total PDT Hours	PDT Hours Using Indirect Crews Only	PDT Hours With Direct Labor Crewing
Sanitation	7.3	2.0	5.3
Changeover	12.5	2.0	10.5
Planned Maintenance	6.0	0.0	6.0
Improvement Activities	2.2	0.4	1.8
Meetings Lunches & Breaks	4.0	0.0	4.0
Total Planned Downtime Hours	32.0	4.4	27.6
Planned Run Time Hours			129.2
Total Direct Labor Crewed Hours			156.8

Future State Target — Future State Weekly Direct Labor Crewing for Planned Downtime Events	Total PDT Hours	PDT Hours Using Indirect Crews Only	PDT Hours With Direct Labor Crewing
Sanitation	12.6	2.0	10.6
Changeover		2.0	3.0
Planned Maintenance		0.0	1.6
Improvement Activities	5.8	4.0	1.8
Meetings Lunches & Breaks	4.0	1.0	3.0
Total Planned Downtime Hours	29.0	9.0	20.0
Planned Run Time Hours			132.2
Total Direct Labor Crewed Hours			152.2

W

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

All target changes are entered as follows:

- Increases are entered as positive
- Decreases are entered as negative

V Enter the target change in ingredient and packaging yield loss %

W Enter future direct labor average weekly crewing hours spent performing planned downtime activities

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 11 Tab: 4. Cost Pro Forma

OEE Benefit Calculator©

OpX Leadership Network

PURPOSE OF THIS WORKSHEET: Identify forecast production requirements for four quarters into the future
Identify any quarters in which forecast production requirements cannot be met due to schedule & line performance constraints
For the forecast constrained production quantity, calculate production costs at current state performance and at target future state performance
Identify the $ value of future state improvements

Pro Forma Production and Cost

Plant San Anselmo | Baseline Qtr Start Date 5/26/2014
Line Line 5 | Baseline Qtr End Date 8/25/2014
Prepared by A. Schmidt | Analysis Version 9/5/2014 v1

	Baseline Qtr Performance	Forecast Year at Baseline Performance					Forecast Year at Target Future State Performance					Value of Improvement Future vs. Current
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total Forecast Year@ Baseline	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total Forecast Year @ Target	Increase / (Decrease)
Forecast Quarter Start Date	5/26/14	10/1/14	1/1/15	4/3/15	7/4/15		10/1/14	1/1/15	4/3/15	7/4/15		
Forecast Quarter End Date	8/25/14	12/31/14	4/2/15	7/3/15	10/3/15		12/31/14	4/2/15	7/3/15	10/3/15		
Forecast Required Costing Units Produced		1,340,012	1,196,843	1,390,000	1,134,195	5,061,050	1,340,012	1,196,843	1,390,000	1,134,195	5,061,050	
Forecast Constrained Costing Units Produced	1,387,468	1,340,012	1,196,843	1,342,018	1,134,195	5,013,068	1,340,012	1,196,843	1,390,000	1,134,195	5,061,050	47,982
Gap - Required vs. Constrained		0	0	(47,982)	0	(47,982)	0	0	0	0	0	
Input Data for Labor Crew Schedule Calculation												
No. of Days in Qtr that Production Cannot be Scheduled	1	2	1	6	2		2	1	6	2		
COST FORECAST SUMMARY $000												
Raw Material Packaging	$3,665	$3,539	$3,161	$3,545	$2,996	$13,241	$3,474	$3,103	$3,603	$2,940	$13,120	($121)
Raw Material Ingredients	$3,300	$3,187	$2,846	$3,192	$2,697	$11,922	$3,107	$2,775	$3,223	$2,630	$11,736	($186)
Direct Labor Wages & Variable Benefits	$474	$455	$369	$475	$349	$1,650	$338	$291	$369	$274	$1,273	($377)
Direct Labor Fixed Benefits	$130	$130	$130	$130	$130	$520	$130	$130	$130	$130	$520	$0
Indirect & Overhead Costs	$135	$135	$135	$135	$135	$540	$135	$135	$135	$135	$540	$0
Total	**$7,703**	**$7,447**	**$6,642**	**$7,477**	**$6,307**	**$27,873**	**$7,184**	**$6,434**	**$7,461**	**$6,110**	**$27,189**	**($684)**
COST FORECAST SUMMARY $ PER COSTING UNIT												
Raw Material Packaging	$2.64	$2.64	$2.64	$2.64	$2.64	$2.64	$2.59	$2.59	$2.59	$2.59	$2.59	($0.05)
Raw Material Ingredients	$2.38	$2.38	$2.38	$2.38	$2.38	$2.38	$2.32	$2.32				
Direct Labor Wages & Variable Benefits	$0.34	$0.34	$0.31	$0.35	$0.31	$0.33	$0.25	$0.24				
Direct Labor Fixed Benefits	$0.09	$0.10	$0.11	$0.10	$0.11	$0.10	$0.10	$0.11				
Indirect & Overhead Costs	$0.10	$0.10	$0.11	$0.10	$0.12	$0.11	$0.10	$0.11				
Total	**$5.55**	**$5.56**	**$5.55**	**$5.57**	**$5.56**	**$5.56**	**$5.36**	**$5.38**				

DIRECT LABOR CREW SCHEDULE	Total Hours	Total Hours	Total Hours	Total Hours	Total Hours	Total Hours	Total Hours	Total Ho
Calculate Calendar Constraints								
Plant Shutdown/Labor Agreement Holiday Hours	24.0	48.0	24.0	144.0	48.0	48.0	24.0	
Sunday Hours Avail	312.0	312.0	312.0	312.0	312.0	312.0	312.0	
Saturday Hours Avail	312.0	312.0	312.0	312.0	312.0	312.0	312.0	
Weekday Hours Avail	1,536.0	1,512.0	1,536.0	1,416.0	1,512.0	1,512.0	1,536.0	1
Total Calendar Hours Available	**2,160.0**	**2,136.0**	**2,160.0**	**2,040.0**	**2,136.0**	**2,136.0**	**2,160.0**	2
CALCULATE TIME AVAILABLE FOR RUNNING AFTER PLANNED DOWNTIME EVENT EXECUTION								
Indirect PDT Total Hours	57.2	57.2	57.2	57.2	57.2	117.0	117.0	
Direct Labor Crewed PDT Total Hours	358.8	358.8	358.8	358.8	358.8	260.0	260.0	
Subtotal PDT Hours	*416.0*	*416.0*	*416.0*	*416.0*	*416.0*	*377.0*	*377.0*	
Sunday Hours Consumed by PDT	312.0	312.0	312.0	312.0	312.0	312.0	312.0	
Saturday Hours Consumed by PDT	104.0	104.0	104.0	104.0	104.0	65.0	65.0	
Weekday Hours Consumed by PDT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Max Avail Sunday Hours for PRT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Max Avail Saturday Hours for PRT	208.0	208.0	208.0	208.0	208.0	247.0	247.0	
Maximum Avail Weekday Hours for PRT	1,536.0	1,512.0	1,536.0	1,416.0	1,512.0	1,512.0	1,536.0	1
Maximum Avail Planned Run Time Hrs/Week	*134.2*	*132.3*	*134.2*	*124.9*	*132.3*	*135.3*	*137.2*	
DIRECT LABOR CREW SCHEDULED HOURS								
Direct Labor Crew Planned Run Time								
Target Product Costing Units	1,387,468	1,340,012	1,196,843	1,390,000	1,134,195	1,340,012	1,196,843	1,390,000	1,134,195
Product Costing Units Produced per Planned Run Hour	826.4	826.4	826.4	826.4	826.4	944.7	944.7	944.7	944.7
Target Planned Run Time	1,679.0	1,621.6	1,448.3	1,624.0	1,372.5	1,418.5	1,267.0	1,471.4	1,200.6
Weeks Scheduled for Production	13.0	13.0	11.0	13.0	11.0	11.0	10.0	12.0	9.0
Direct Labor Crew Weekday Planned Run Hours	1,536.0	1,512.0	1,448.3	1,416.0	1,372.5	1,418.5	1,267.0	1,416.0	1,200.6

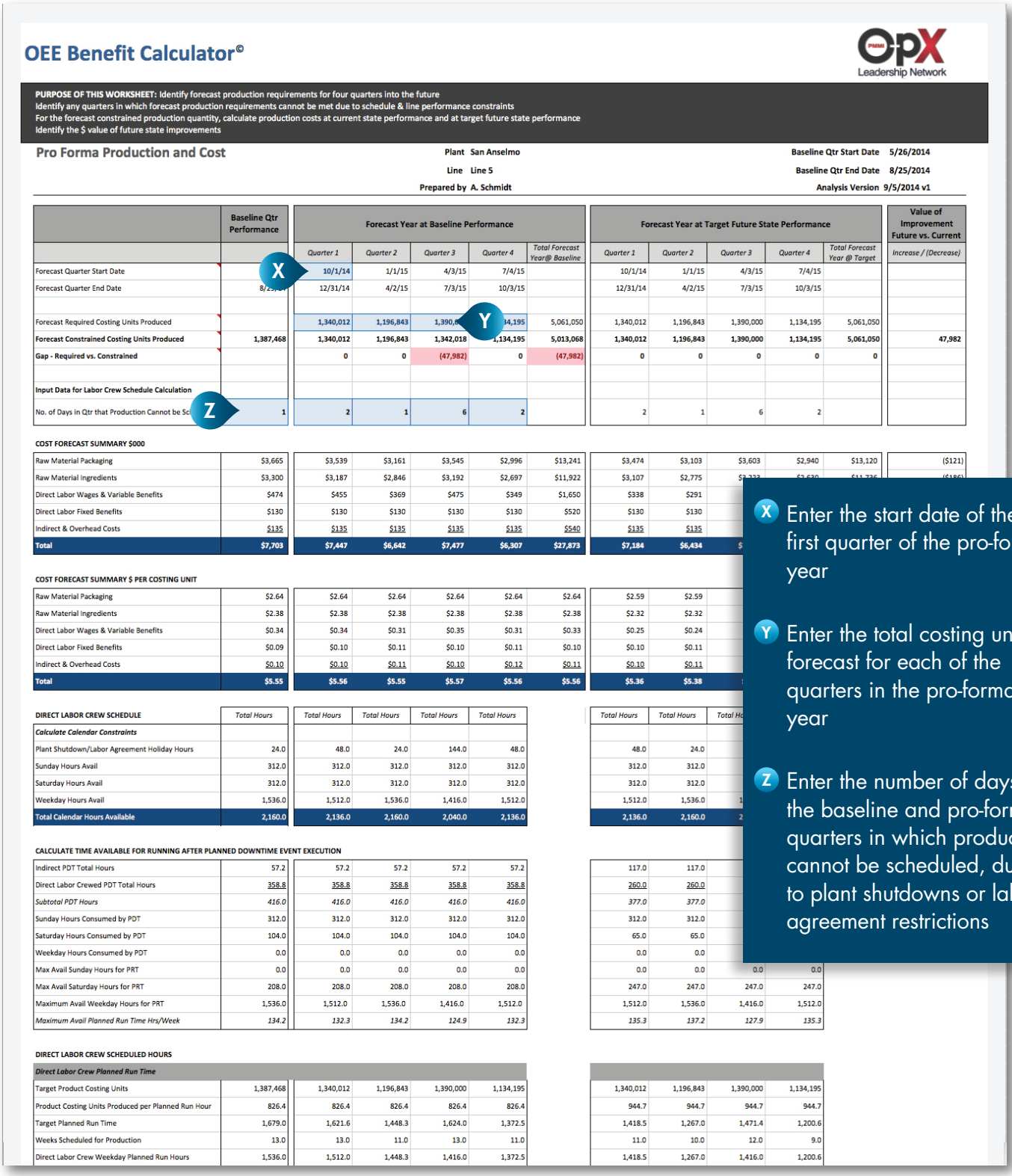
This tab calculates the future production crew schedule and product costs based on target performance improvements entered on the tab "3. Target Performance".

Calculations are driven by target production quantities for the next 4 quarters, and by how many days will be available for direct labor production crewing in each future quarter

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

OEE BENEFIT CALCULATOR Key Concepts & Instructions

STEP-BY-STEP 12 Tab: 4. Cost Pro Forma



OEE Benefit Calculator©

PURPOSE OF THIS WORKSHEET: Identify forecast production requirements for four quarters into the future
Identify any quarters in which forecast production requirements cannot be met due to schedule & line performance constraints
For the forecast constrained production quantity, calculate production costs at current state performance and at target future state performance
Identify the $ value of future state improvements

Pro Forma Production and Cost

Plant San Anselmo | Line Line 5 | Prepared by A. Schmidt
Baseline Qtr Start Date 5/26/2014 | Baseline Qtr End Date 8/25/2014 | Analysis Version 9/5/2014 v1

	Baseline Qtr Performance	Forecast Year at Baseline Performance					Forecast Year at Target Future State Performance					Value of Improvement Future vs. Current
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total Forecast Year@ Baseline	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total Forecast Year @ Target	Increase / (Decrease)
Forecast Quarter Start Date		X 10/1/14	1/1/15	4/3/15	7/4/15		10/1/14	1/1/15	4/3/15	7/4/15		
Forecast Quarter End Date	8/2	12/31/14	4/2/15	7/3/15	10/3/15		12/31/14	4/2/15	7/3/15	10/3/15		
Forecast Required Costing Units Produced		1,340,012	1,196,843	1,390,0	Y 4,195	5,061,050	1,340,012	1,196,843	1,390,000	1,134,195	5,061,050	
Forecast Constrained Costing Units Produced	1,387,468	1,340,012	1,196,843	1,342,018	1,134,195	5,013,068	1,340,012	1,196,843	1,390,000	1,134,195	5,061,050	47,982
Gap - Required vs. Constrained		0	0	(47,982)	0	(47,982)	0	0	0	0	0	
Input Data for Labor Crew Schedule Calculation												
No. of Days in Qtr that Production Cannot be Sc	Z 1	2	1	6	2		2	1	6	2		

COST FORECAST SUMMARY $000

Raw Material Packaging	$3,665	$3,539	$3,161	$3,545	$2,996	$13,241	$3,474	$3,103	$3,603	$2,940	$13,120	($121)
Raw Material Ingredients	$3,300	$3,187	$2,846	$3,192	$2,697	$11,922	$3,107	$2,775				
Direct Labor Wages & Variable Benefits	$474	$455	$369	$475	$349	$1,650	$338	$291				
Direct Labor Fixed Benefits	$130	$130	$130	$130	$130	$520	$130	$130				
Indirect & Overhead Costs	$135	$135	$135	$135	$135	$540	$135	$135				
Total	**$7,703**	**$7,447**	**$6,642**	**$7,477**	**$6,307**	**$27,873**	**$7,184**	**$6,434**				

COST FORECAST SUMMARY $ PER COSTING UNIT

Raw Material Packaging	$2.64	$2.64	$2.64	$2.64	$2.64	$2.64	$2.59	$2.59				
Raw Material Ingredients	$2.38	$2.38	$2.38	$2.38	$2.38	$2.38	$2.32	$2.32				
Direct Labor Wages & Variable Benefits	$0.34	$0.34	$0.31	$0.35	$0.31	$0.33	$0.25	$0.24				
Direct Labor Fixed Benefits	$0.09	$0.10	$0.11	$0.10	$0.11	$0.10	$0.10	$0.11				
Indirect & Overhead Costs	$0.10	$0.10	$0.11	$0.10	$0.12	$0.11	$0.10	$0.11				
Total	**$5.55**	**$5.56**	**$5.55**	**$5.57**	**$5.56**	**$5.56**	**$5.36**	**$5.38**				

DIRECT LABOR CREW SCHEDULE	Total Hours	Total Hours	Total Hours	Total Hours	Total Hours	Total Hours	Total Hours	Total Ho
Calculate Calendar Constraints								
Plant Shutdown/Labor Agreement Holiday Hours	24.0	48.0	24.0	144.0	48.0	48.0	24.0	
Sunday Hours Avail	312.0	312.0	312.0	312.0	312.0	312.0	312.0	
Saturday Hours Avail	312.0	312.0	312.0	312.0	312.0	312.0	312.0	
Weekday Hours Avail	1,536.0	1,512.0	1,536.0	1,416.0	1,512.0	1,512.0	1,536.0	1
Total Calendar Hours Available	**2,160.0**	**2,136.0**	**2,160.0**	**2,040.0**	**2,136.0**	**2,136.0**	**2,160.0**	2

CALCULATE TIME AVAILABLE FOR RUNNING AFTER PLANNED DOWNTIME EVENT EXECUTION

Indirect PDT Total Hours	57.2	57.2	57.2	57.2	57.2	117.0	117.0		
Direct Labor Crewed PDT Total Hours	358.8	358.8	358.8	358.8	358.8	260.0	260.0		
Subtotal PDT Hours	*416.0*	*416.0*	*416.0*	*416.0*	*416.0*	*377.0*	*377.0*		
Sunday Hours Consumed by PDT	312.0	312.0	312.0	312.0	312.0	312.0	312.0		
Saturday Hours Consumed by PDT	104.0	104.0	104.0	104.0	104.0	65.0	65.0		
Weekday Hours Consumed by PDT	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Max Avail Sunday Hours for PRT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Avail Saturday Hours for PRT	208.0	208.0	208.0	208.0	208.0	247.0	247.0	247.0	247.0
Maximum Avail Weekday Hours for PRT	1,536.0	1,512.0	1,536.0	1,416.0	1,512.0	1,512.0	1,536.0	1,416.0	1,512.0
Maximum Avail Planned Run Time Hrs/Week	*134.2*	*132.3*	*134.2*	*124.9*	*132.3*	*135.3*	*137.2*	*127.9*	*135.3*

DIRECT LABOR CREW SCHEDULED HOURS

Direct Labor Crew Planned Run Time									
Target Product Costing Units	1,387,468	1,340,012	1,196,843	1,390,000	1,134,195	1,340,012	1,196,843	1,390,000	1,134,195
Product Costing Units Produced per Planned Run Hour	826.4	826.4	826.4	826.4	826.4	944.7	944.7	944.7	944.7
Target Planned Run Time	1,679.0	1,621.6	1,448.3	1,624.0	1,372.5	1,418.5	1,267.0	1,471.4	1,200.6
Weeks Scheduled for Production	13.0	13.0	11.0	13.0	11.0	11.0	10.0	12.0	9.0
Direct Labor Crew Weekday Planned Run Hours	1,536.0	1,512.0	1,448.3	1,416.0	1,372.5	1,418.5	1,267.0	1,416.0	1,200.6

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

X Enter the start date of the first quarter of the pro-forma year

Y Enter the total costing units forecast for each of the quarters in the pro-forma year

Z Enter the number of days in the baseline and pro-forma quarters in which production cannot be scheduled, due to plant shutdowns or labor agreement restrictions

OEE BENEFIT CALCULATOR Key Concepts & Instructions

REPORT-OUT Tab: 5a & 5b Summary Results

OEE Benefit Calculator©

PURPOSE OF THIS WORKSHEET: Summarize the results of the OEE benefit analysis. Summarize the results of the OEE benefit analysis. Annualized costs & savings (OEE benefit)

OEE Benefit Summary — Annual

San Anselmo | Prepared by A. Schmidt

Line 5 | Analysis Version 9/5/2014 v1

	Baseline Qtr Performance	Forecast Year at Current State Performance	Forecast Year at Target Future State Performance	Value of Improvement Future vs. Current
Forecast Quarter Start Date	5/26/14	10/1/14	10/1/14	
Forecast Quarter End Date	8/25/14	10/3/15	10/3/15	
Forecast Required Costing Units Required		5,061,050	5,061,050	
Forecast Constrained Costing Units Produced	1,387,468	5,013,068	5,061,050	47,982
Gap - Required vs. Constrained		(47,982)	0	

Cost Forecast Summary $000

Raw Material Packaging	$3,665	$13,241	$13,120	($121)
Raw Material Ingredients	$3,300	$11,922	$11,736	($186)
Direct Labor Wages & Variable Benefits	$474	$1,650	$1,273	($377)
Direct Labor Fixed Benefits	$130	$520	$520	$0
Indirect & Overhead Costs	$135	$540	$540	$0
Total	**$7,703**	**$27,873**	**$27,189**	**($684)**

Cost Forecast Summary $ per Costing Unit

Raw Material Packaging	$2.64	$2.64	$2.59	($0.05)
Raw Material Ingredients	$2.38	$2.38	$2.32	($0.06)
Direct Labor Wages & Variable Benefits	$0.34	$0.33	$0.25	($0.08)
Direct Labor Fixed Benefits	$0.09	$0.10	$0.10	$0.00
Indirect & Overhead Costs	$0.10	$0.11	$0.11	$0.00
Total	**$5.55**	**$5.56**	**$5.37**	**($0.19)**

Total Direct Labor Crewed Schedule Hours

Weekdays		5,976.0	5,775.6	
Saturdays		1,004.0	422.0	(582.1)
Sundays		411.2	0.0	(411.2)
Total Direct Labor Crewed Schedule Hours		**7,391.2**	**6,197.6**	**(1,193.6)**

LINE PRODUCTIVITY

Production Line OEE	**58.4%**	**65.7%**	**7.3%**
Production Line Efficiency	**72.9%**	**80.1%**	**7.2%**

INPUT REQUIREMENTS | 1. HEADER INFO | 2. BASELINE DATA | 3. TARGET PERFORMANCE | 4. COST PRO FORMA | SUMMARY RESULTS ANNUAL

This tab presents a summary of the projected annual cost impact of productivity improvements for the pro-forma quarters.

There are 2 versions of this tab:

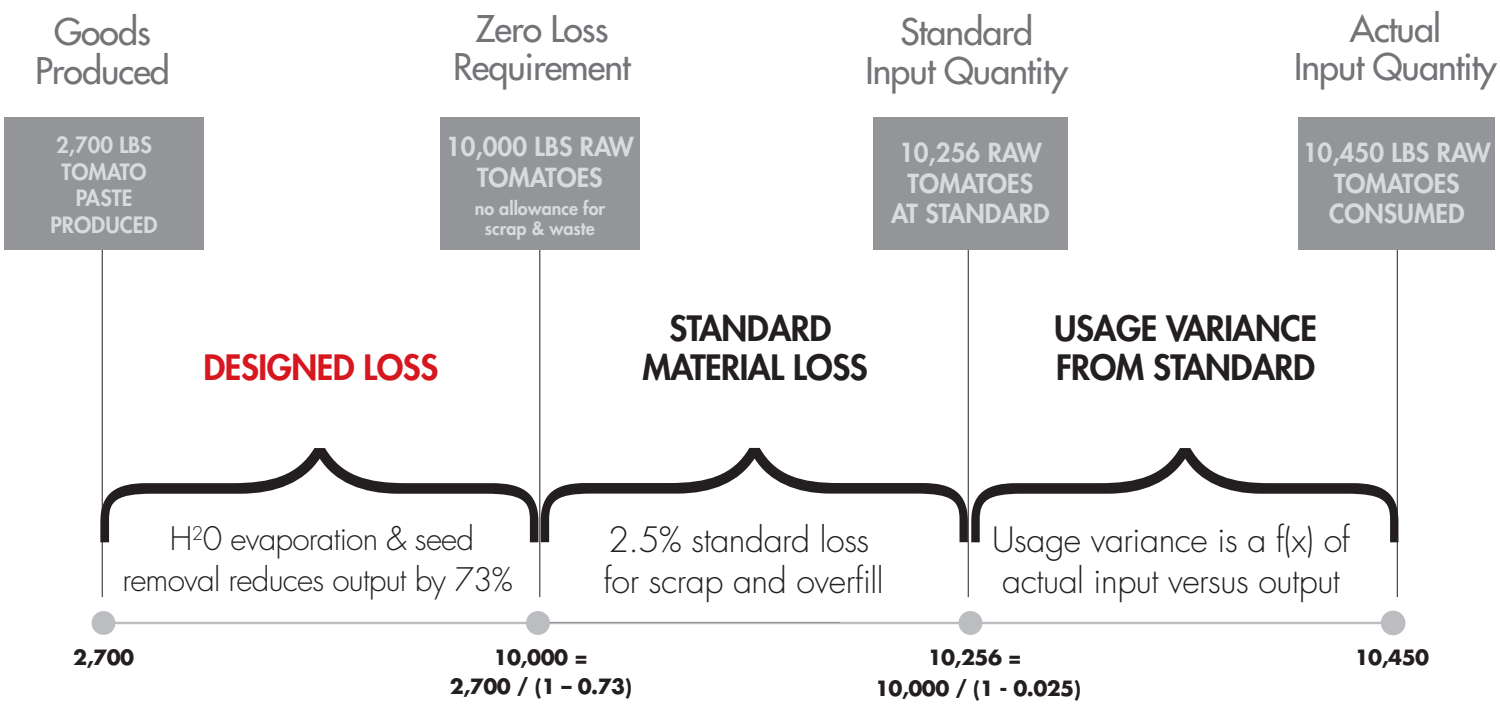
- Tab 5a provides an annual summary.
- Tab 5b provides quarterly detail.

APPENDIX Key Concepts:

Yield Loss Defined | Tomato Paste Example

Designed Loss Included in Zero Loss Requirement:
Elements that are a natural part of the raw material input, but are removed in order to meet consumer requirements.

Examples include: *excess moisture, impurities, bones, husks, seeds, etc.*



See note at top right regarding designed losses. Designed losses do not include any allowances for process inefficiencies, waste or scrap loss.

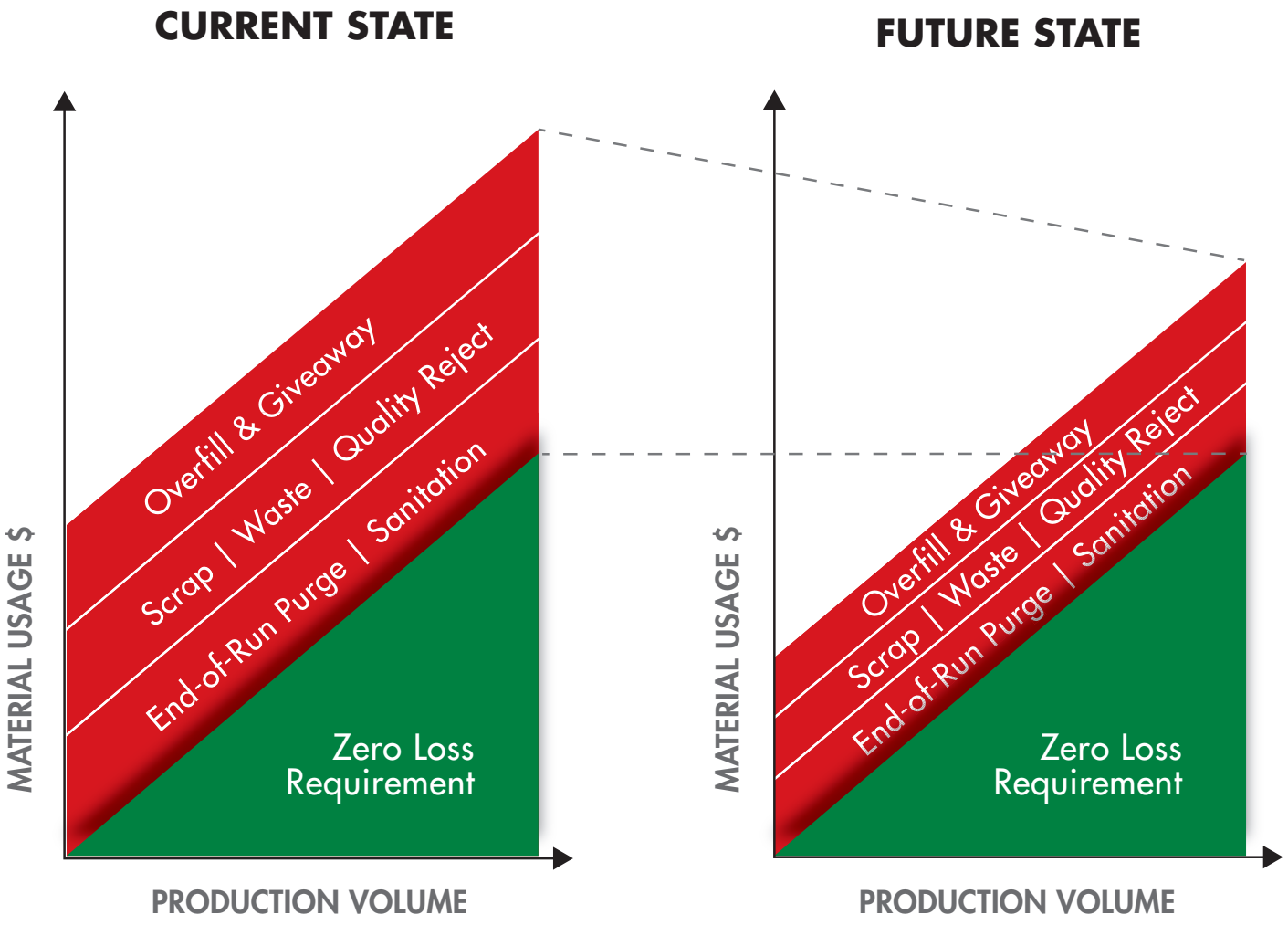
We "gross up" the goods produced amount in order to arrive at the zero loss input quantity

Standard loss % is pre-determined. The loss % is in comparison to the input quantity, so we "gross up" Gold Qty to arrive at Standard Input Qty

In this example, Yield Loss is (450 lbs) versus Gold; Material Usage Variance is (194 lbs)

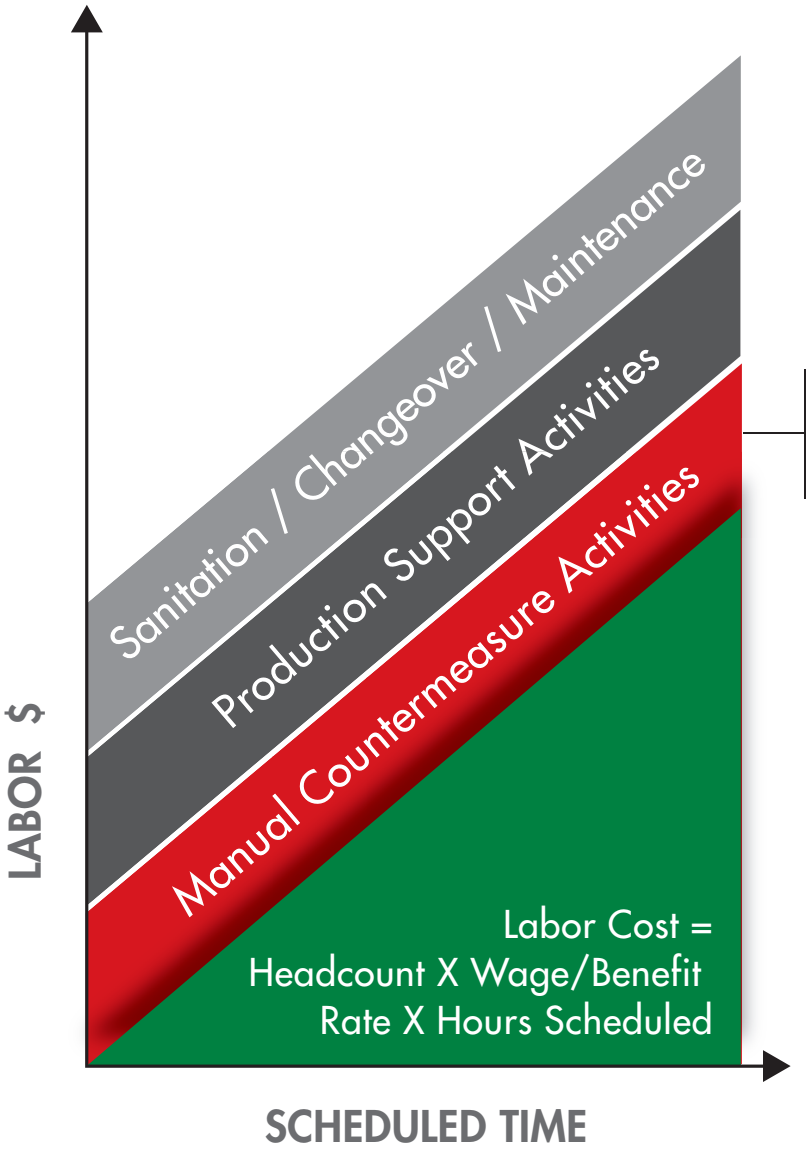
APPENDIX Key Concepts:

Driving Yield Loss Improvement



APPENDIX Key Concepts:

Labor Cost Elements



Labor costs are driven by the production & crewing schedule

Scheduled time is a f(x) of

- Demand volume & mix
- System productivity

Management is accountable for system productivity and decisions on crewing, duties and wage rates

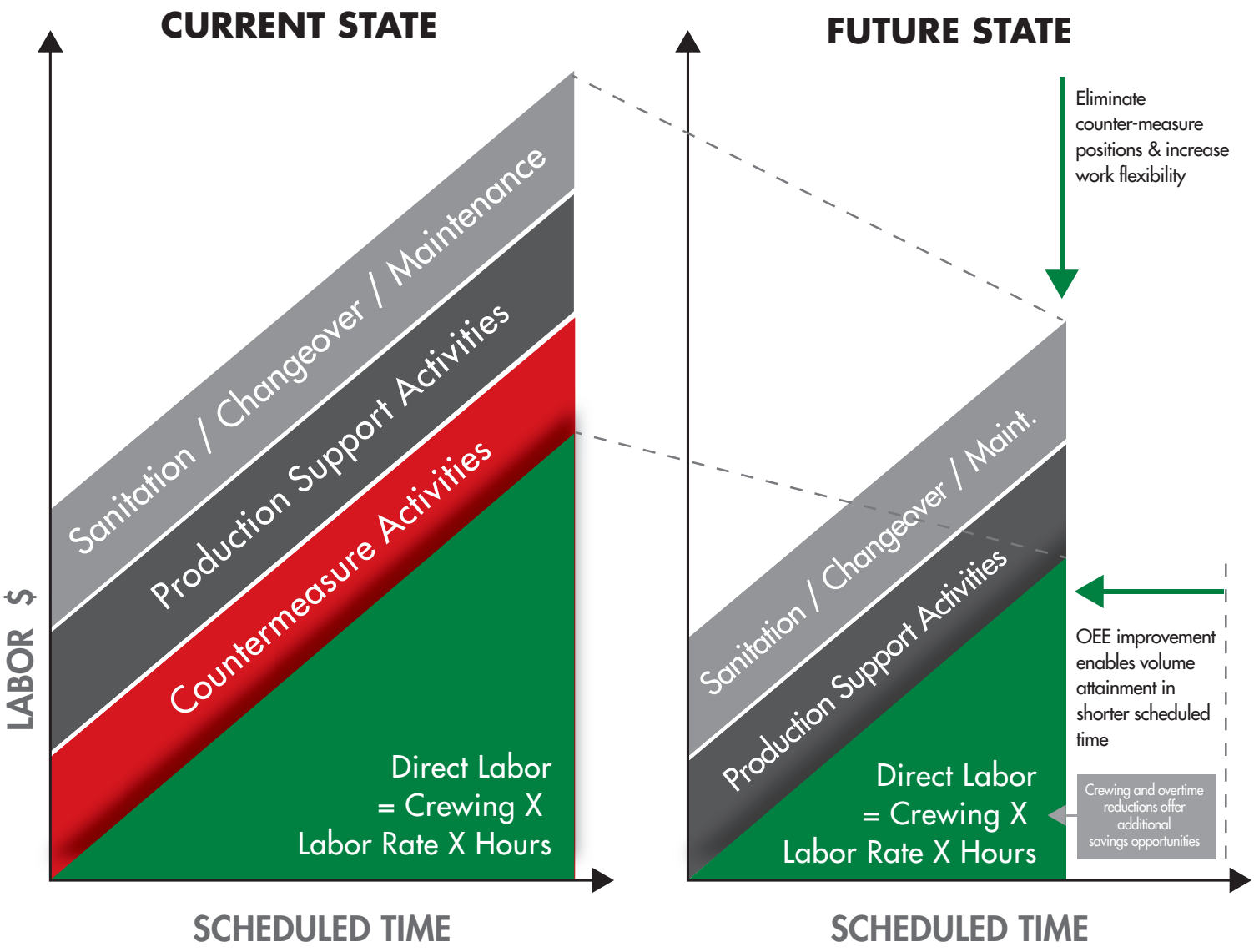
MANUAL COUNTERMEASURE ACTIVITIES

Work done responding to upsets, correcting defects, etc.

These may require full-time positions or make up a portion of an FTE's duties

APPENDIX Key Concepts:

Labor Cost Savings Opportunities



OEE BENEFIT CALCULATOR Key Concepts & Instructions

The Association for Packaging and Processing Technologies

Leadership Network
Moving Operational Excellence Forward

opxleadershipnetwork.org