

TOOLBOX:

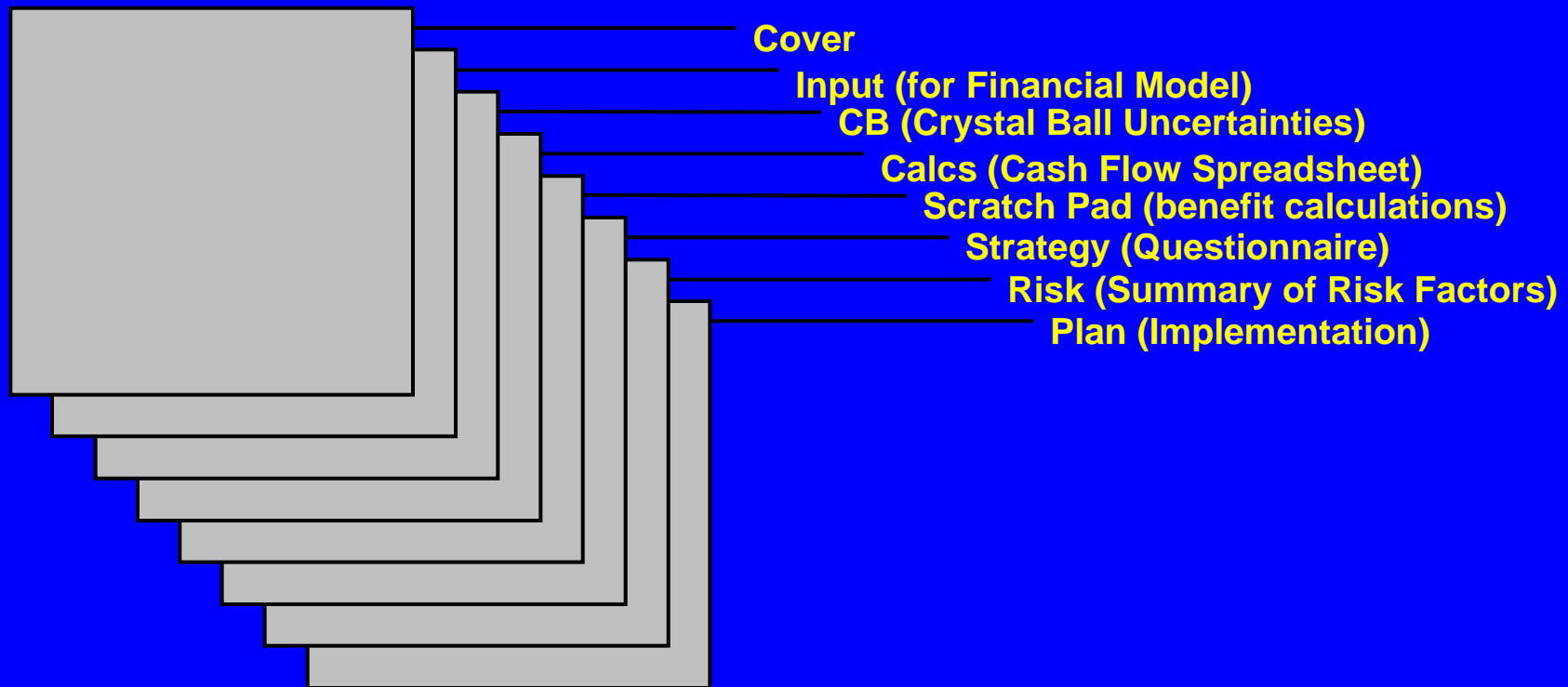
Nova Chemicals Business Case
Development Financial Model

Toolbox enables easy analysis of alternatives



- Foster creative thinking to develop unique alternatives
- Provide consistent analysis between project alternatives as well as for projects across the company
- Provide a better understanding of the benefits, risks, and strategic fit

Toolbox: A Complete Business Case Package



Toolbox Outputs

- Calculates median case NPV, PI, and IRR
- Calculates the expected NPV and PI through a monte carlo simulation with Crystal Ball and 10-50-90 data
- Generates tornado diagram and cumulative probability curves
- Provides graphs for each section (revenues, variable and fixed cost, cash flow, capital, etc)

Cover Sheet

PROJECT BUSINESS ANALYSIS TOOLBOX 2002

General project information

Business: Styrenics Site: Beaver Valley Unit: line 1

Project Title: Capacity expansion Number: 11001

Current Review Gate : 1. Idea Approval Mandatory (Y/N): Y

Completion Date: Dec-04 IRA Risk Points: N/A

Project Leader: Tom Fontana

Project description and benefits

Description:
Increase Capacity of Line 1 by improving the heat up rate with the installation of a new heat transfer system.

2003 sales are expected to increase by 10 % and will be limited by the current capacity.

Financial analysis and crystal ball summary

Shareholder Value

	PI	NPV (k\$)		
High (90%)	3.60	4,627	Expected NPV (k\$) - (Mean)	3119
Median (50%)	2.70	3,351	Expected PI - (Mean)	2.7
Low (10%)	1.70	1,329	IRR ₅₀ (%) - (@ 50% Values)	33
			Median Capital (k\$) - (50% pt.)	1400

Expected quarterly capital spending

Capital Spending by Quarter (k\$)

Year	2003	2003	2003	2003	2004	2004	2004	2004
Quarter	1	2	3	4	1	2	3	4
	0	0	50	200	200	400	500	50

Input Page - Cash Flow

Project Business Case Analysis Tool

Project: Project Name - Project Name

Item	Units	Value		
		10 %	50 %	90 %
Section 1 - Project Timeline				
1.0	Section 1 - Proj	Set project timeline sliders		
1.1	Current year	<input type="text"/>	2002	
1.2	Start of Technical Development	<input type="text"/>	2002	
1.3	Start of Commercial Development	<input type="text"/>	2003	
1.4	Start of Revenue	<input type="text"/>	2005	
1.5	Peak Revenue Date	<input type="text"/>	2008	
1.6	Final Revenue Date	<input type="text"/>	2014	
Section 2 - Incremental Revenue				
2.0	Section 2 - Incremental Revenue	Select 1 of 4 model:		
	Peak Revenue	<ul style="list-style-type: none"> Cash flow Price volume Flexible price volume Product replacement 		
2.1	Cash Flow	Use Cash Flow	1000.0	2300.0
	Final Revenue	1600.0	3000.0	Enter 10-50-90 data
2.2	Cash Flow			
Section 3 - Incremental Variable Cost Savings				
3.0	Section 3 - Incremental Variable Cost Savings			
3.1	Cash Flow ('-' is Increase)	k\$(US)/year	0.0	0.0
3.3	Fixed Cost Savings, from start ('-' is Increase)	k\$(US)/year	-80.0	-70.0

Input Page (cont'd)

4.0	Section 4 - Commercial Capital				
4.1	Total Capital Cost, from start of facilities	k\$ (US)	1200.0	1400.0	1700.0
	Cost Profile				
4.2	Year 1	% of Total	2003	50%	<input type="text"/>
4.3	Year 2	% of Total	2004	50%	<input type="text"/>
4.4	Year 3	% of Total	2005	0%	<input type="text"/>
4.5	Year 4	% of Total	2006	0%	<input type="text"/>
5.0	Section 5 - R&D Capital Cost and Timeline				
5.1	Total R&D Capital Cost		0	600.0	850.0
	Cost Profile				
5.2	Year 1	% of Total	2002	100%	<input type="text"/>
5.3	Year 2	% of Total	2003	0%	<input type="text"/>
5.4	Year 3	% of Total	2004	0%	<input type="text"/>
5.5	Year 4	% of Total	2005	0%	<input type="text"/>
5.6	Total R&D Capital Cost		0.0	0.0	
	Cost Profile				
5.7	Year 1	% of Total	2002	100%	<input type="text"/>
5.8	Year 2	% of Total	2003	0%	<input type="text"/>
5.9	Year 3	% of Total	2004	0%	<input type="text"/>
5.10	Year 4	% of Total	2005	0%	<input type="text"/>
5.11	Probability of technical success			100%	<input type="text"/>
6.0	Section 6 - Commercialization Costs				
6.1	Project Expense and Startup Costs	k\$ (US)	20.0	20.0	30.0
	Cost Profile				
6.2	Year 1	% of Total	2003	0%	<input type="text"/>
6.3	Year 2	% of Total	2004	0%	<input type="text"/>
6.4	Year 3	% of Total	2005	100%	<input type="text"/>
6.5	Year 4	% of Total	2006	0%	<input type="text"/>
6.6	Probability of commercial success			100%	<input type="text"/>

Capital cost and timeline
(timeline start date from above)

R&D capital cost and timeline

Probability of technical success

R&D expenses and timeline

Probability of commercial success

and timeline

Input Page (cont'd)

7.0 **Section 7 - Facts & Global Parameters**

7.1 Inflation Rate % 1.4% 2.5% 3.3%

7.3 Discount Rate % 12%

7.4 Tax Rate % 40%

7.5 Tax Depreciation Method 7 Year MACRS

8.0 **Section 8 - Strategic Value** (k\$ (00)) 0.0 0.0 0.0

9.0 **Section 9 - Risk Reduction Value** (k\$ (U) /year) 0.0 0.0 0.0

10.0 **Section 10 - Working Capital** (% of revenue) 15.0

11.0 **RES**

Simulation Results

	PI	NPV
High (90%)	3.6	4,627
Median (50%)	2.7	3,351
Low (10%)	1.7	1,329
Mean - Expected	2.7	3,119

Project NPV (k\$ US) 3,551

Productivity Index 2.9

IRR₅₀ (%) 33.00

R&D Productivity Index 6.92

NPV of R&D Expenses (600.00)

NPV of All Investments (1,842)

Run Crystal Ball

Print Sheets

Input Simulation Results

Strategic value

Risk reduction

Working Capital

50 case values

Run Crystal Ball

Print Sheets

Simulation results

Facts and Global Parameters

Input Crystal Ball Results

Create / Recalculate

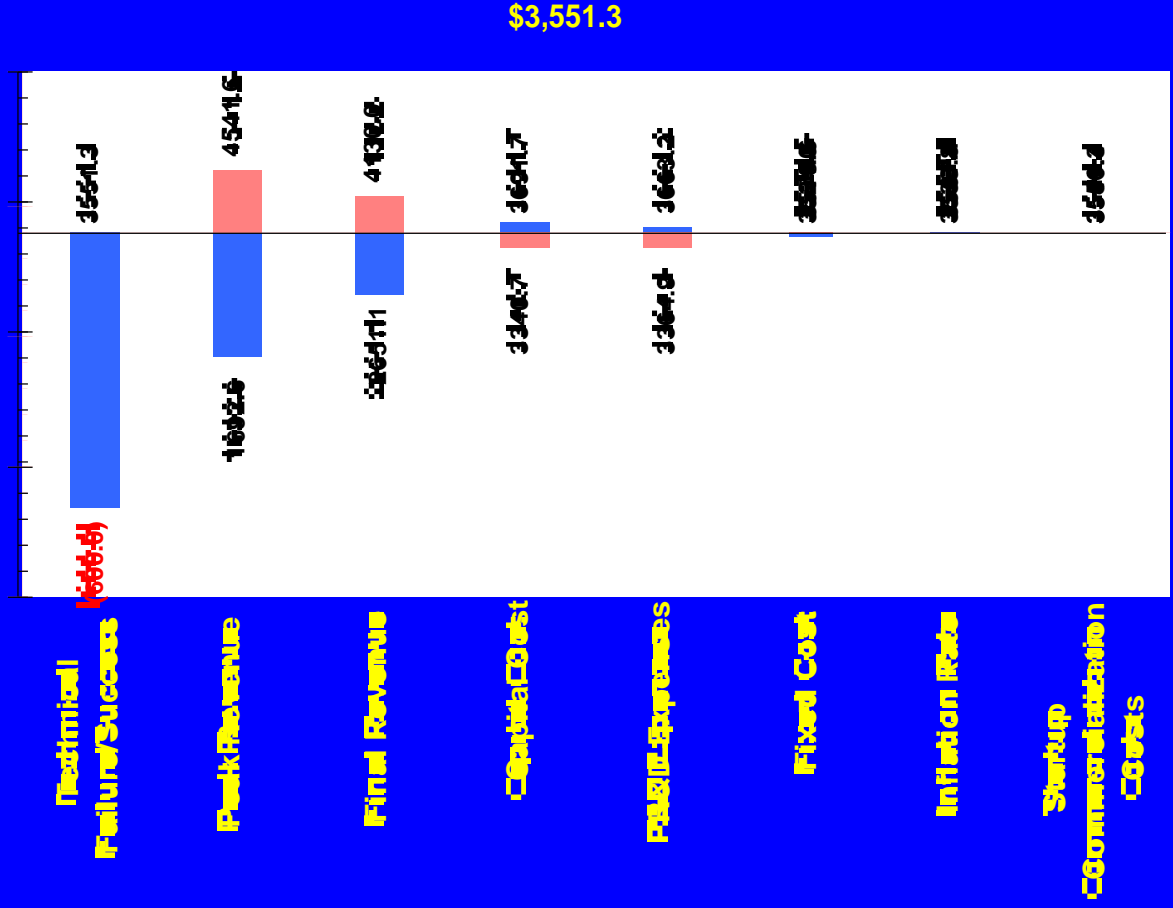
OK

Print

Tornado Diagram

149,135

-\$20,000 0 \$20,000 \$40,000 \$60,000

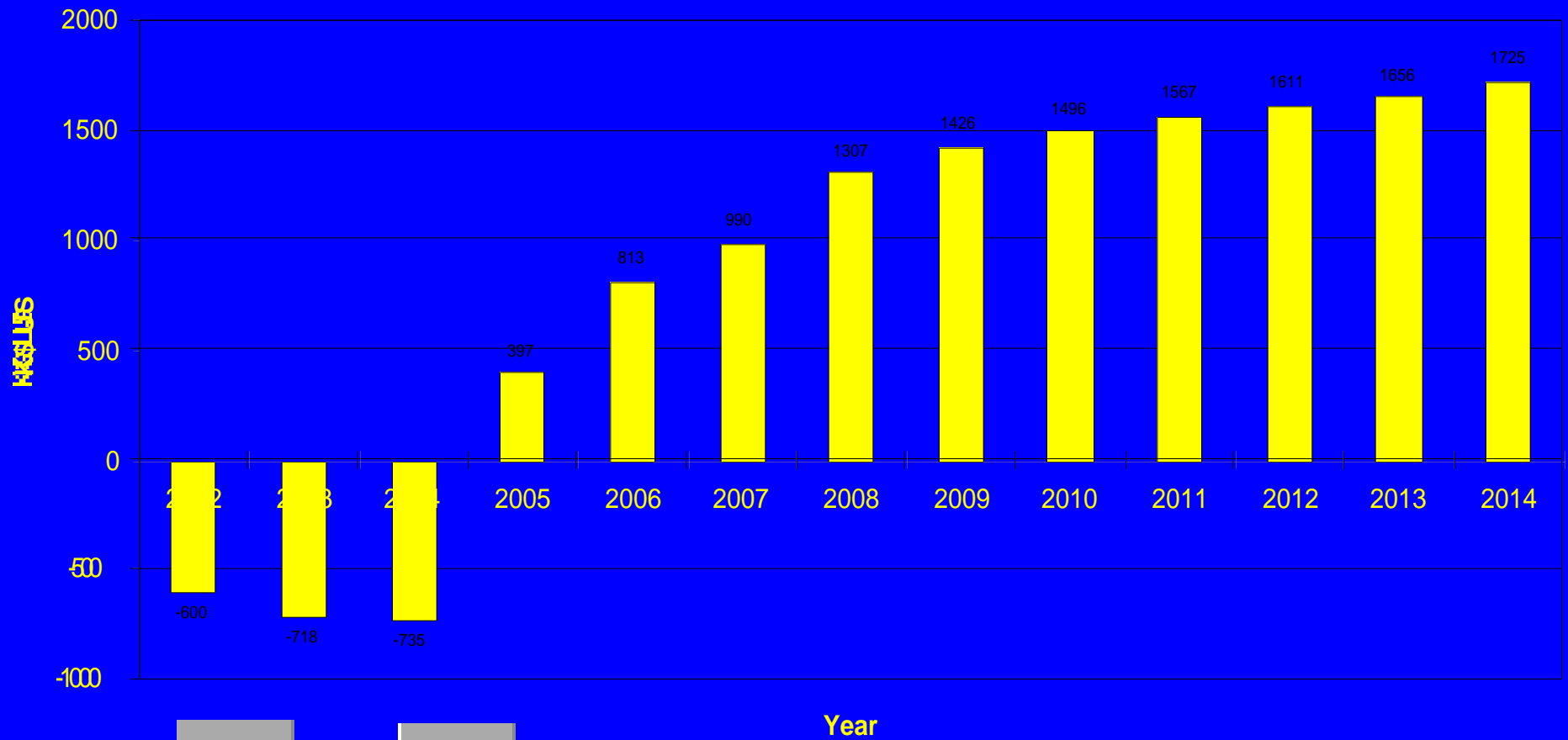


\$3,551.3

10%
90%

Net Cash Flow

All Variables Area Their 50% Points and All Figures Include Inflation



OK

Print

Net Cash Flow

Input Page - Flexible Price-Volume

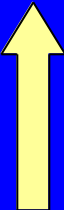
Project Business Case Analysis Tool

Project: Project Name - Project Name

<u>Item</u>	<u>Units</u>	<u>Value</u>		
		<u>10 %</u>	<u>50 %</u>	<u>90 %</u>
1.0 Section 1 - Project Timelines				
1.1 Current year	<input type="text"/>		2002	
1.2 Start of Technical Development	<input type="text"/>		2002	
1.3 Start of Commercial Development	<input type="text"/>		2003	
1.4 Start of Revenue	<input type="text"/>		2005	
	<input type="text"/>		2008	
1.6 Final Revenue Date	<input type="text"/>		2014	
	<input type="text"/>		2005	
2.0 Section 2 - Incremental Project Revenue				
Peak Revenue				

Use Flexible Price*Volume

Select flexible price-volume model



Input Page - Flexible Price Volume

2.0 Select 10 and 90 case relationship

Use Flexible Price*Volume

2.1 Enter Price (or margin) data

Price \$(US)/unit

0.800 0.900 1.000

2005 0.75

2006 0.85

Graph depicts data

Adjust rate sliders for each year

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 +

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 +

2.2 Enter volume data

Volume k-units/year

2500.0 3000.0 4500.0

2005 0.25

2006 0.50

2007 0.75

2008 1.00

2009 1.05

2010 1.10

Graph depicts data

Adjust rate sliders for each year

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 +

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 +

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 +

3.0 Section 3 - Incremental Facilities Costs

Variable Cost Savings, from start of revenue

3.1 Price ('-' is Increase) \$(US)/unit 0.000 0.000 0.000

3.3 Fixed Cost Savings, from start of revenues k\$(US)/year -80.0 -70.0 -60.0

("-" is Increase)

Enter variable and fixed cost savings

Input Page - Flexible Volume

Initialize Revenues and Operating Costs

7.0 **Section 7 - Facts & Global Parameters**

7.1 Inflation Rate %

7.3 Discount Rate %

7.4 Tax Rate %

7.5 Tax Depreciation Method

8.0 **Section 8 - Strategic Value** k\$ (US)

9.0 **Section 9 - Risk Reduction Value** k\$ (US)/year

10.0 **Section 10 - Working Capital** % of Revenue

11.0 **RESULTS:**

	Results Using 50% Values	Simulation Results
<input type="button" value="Run Crystal Ball"/>	Project NPV (k\$ US) 8,456	High (90%) PI 3.6 NPV 4,627
	Profitability Index 5.6	Median (50%) PI 2.7 NPV 3,351
	IRR ₅₀ (%) 50.00	Low (10%) PI 1.7 NPV 1,329
	R&D Productivity Index 15.09	Mean - Expected PI 2.7 NPV 3,119
<input type="button" value="Print Sheets"/>	NPV of R&D Expenses (600.00)	
	NPV of All Investments (1,842)	

Business Case Training

- Provide two day Business Case Development training course across the company
- Stress Framing/Alternatives Generation
- Work through examples of each of the four financial models within Toolbox
- Discuss uncertainty and expert interviews
- Provide ongoing support throughout the organization

Toolbox provides many benefits for Nova Chemicals:

- A wide range of alternatives can easily be explored and evaluated for all projects at the project team level (without a DRA facilitator)
- Consistency of project evaluation across the company
- Decision makers have the correct information to make a good decision
- Allows trained DRA facilitators to focus on large and complex decision analysis projects