



# **NATIONAL ENERGY CORPORATION OF TRINIDAD & TOBAGO LIMITED**

## **BUSINESS PLANS FOR DERIVATIVE MELAMINE MANUFACTURING BUSINESS OPPORTUNITIES**

Q1 2012



# MELAMINE MOULDING COMPOUND AND DINNERWARE



# Contents

- Introduction
- Economic Outlook
- Market Analysis
- Technical Requirements
- Business Strategy
- Financial Analysis
- Recommendations



# INTRODUCTION



# Introduction

- In May 2010, Methanol Holdings Trinidad Limited (MHTL) began producing melamine from its 60,000 tpy production facility, which forms part of its AUM I Complex.
- The production of this commodity, downstream of ammonia, provides an opportunity to leverage the strengths of the energy sector in order to develop linkages with the manufacturing sector.
- Subsequent to the Melamine Symposium held on November 17<sup>th</sup> 2010, the Government of the Republic of Trinidad and Tobago (GORTT), initiated the development of melamine manufacturing profiles.



# Introduction

- These profiles are designed to be used by manufacturers and potential investors in developing business opportunities for melamine derivatives.
- Profiles were launched in June 2011 at CBF and TIC.
- Based on the profiles, business plans were prepared for specific project opportunities.
- Business Plan for Melamine Moulding Compound (MMC)/Dinnerware and Adhesives were completed end 2011.



# ECONOMIC OUTLOOK

# Economic Outlook



Annual% Change

	<i>ANNUAL</i>			<i>ESTIMATE</i>	<i>FORECAST</i>	
	2007	2008	2009	2010	2011	2012
<b>World</b>						
<b>Output</b>	5.3	2.9	-0.5	5.1	4.3	4.5
<b>Advanced economies</b>	2.7	0.2	-3.4	3.0	2.2	2.6
<b>Emerging and developing economies</b>	8.7	6.1	2.8	7.4	6.6	6.4
<b>Domestic Economy</b>						
<b>Real GDP</b>	4.8	2.4	-3.5	-0.6	1.2	2.7
<b>Energy</b>	1.7	-0.2	2.6	1.7	1.5	3.0
<b>Non-energy</b>	7.6	4.2	-7.2	-2.3	1.0	2.5
<b>Inflation</b>	7.9	12.1	7.2	10.5	6.0	4.9
<b>Unemployment rate</b>	5.6	4.6	5.3	5.6	5.5	5.0
<b>Credit to private sector</b>	21.7	13.7	-4.4	0.5	2.0	4.2

Source: Central Bank of Trinidad and Tobago

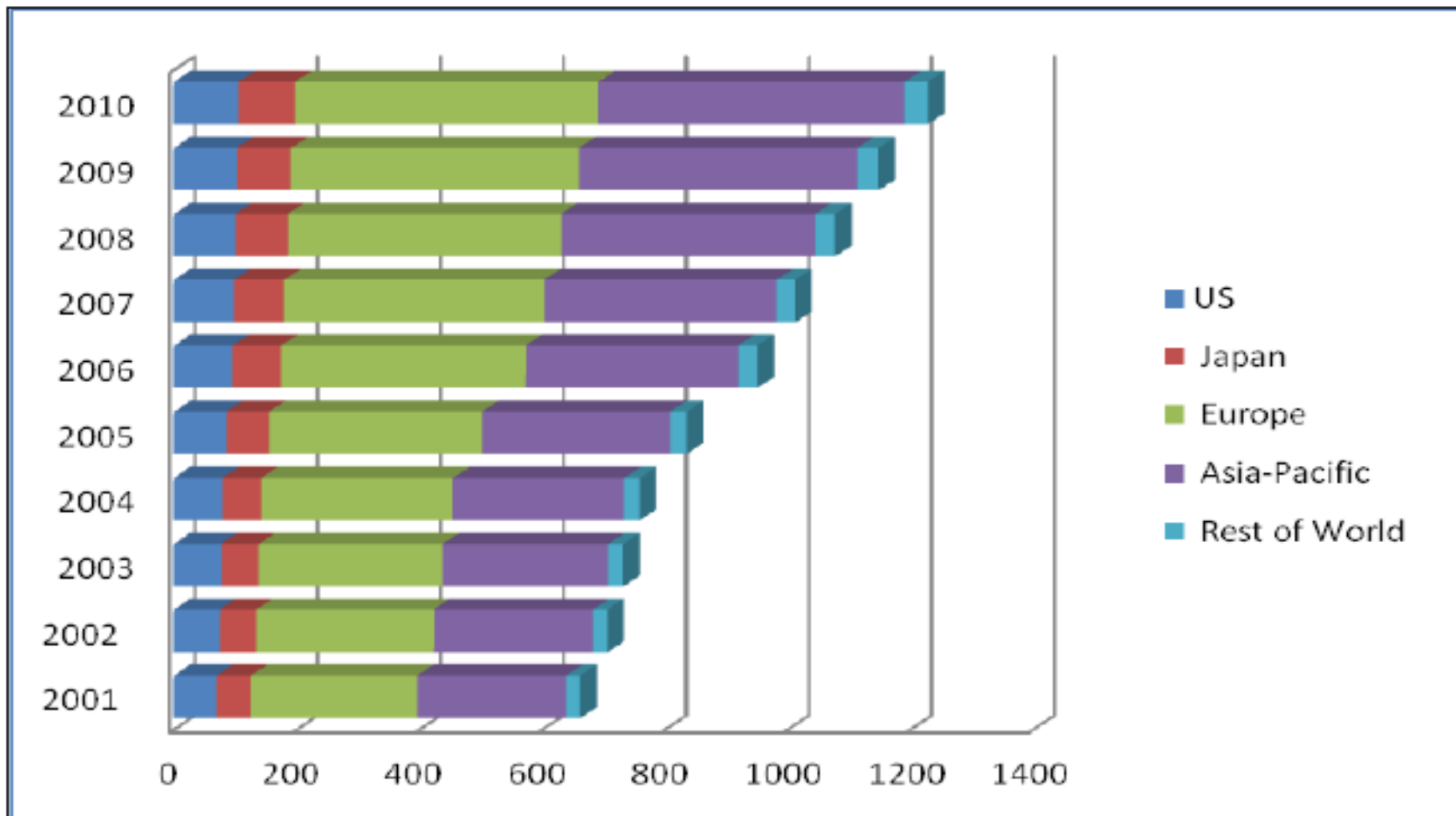


# Economic Outlook

- The growth in melamine consumption has been strong in all regions. In Europe and the US where the economic downturn was severe, melamine consumption still grew at a steady pace over the past ten years (Europe – 73%, US – 47%).
- Growth was strongest in China (2001-2009) expanding by 105%.
- Japan and the rest of the world experienced growth of 59% and 50 % respectively.
- The US and rest of Asia also recorded strong growth, albeit less than the other regions at 47% and 45% respectively.
- With relatively strong growth in the rest of the world dominated by Latin America and the Caribbean. These markets, with their close proximity, should be receptive to melamine products from Trinidad and Tobago.
- Although further away, the European market now provides an excellent opportunity with its strong growth and new EPA free trade agreement with CARICOM
- At the domestic macroeconomic level, investment in melamine downstream manufacturing and its consequent output could have lasting effects on the labour market and GDP.



## Global Melamine Consumption by Region 2001-2010



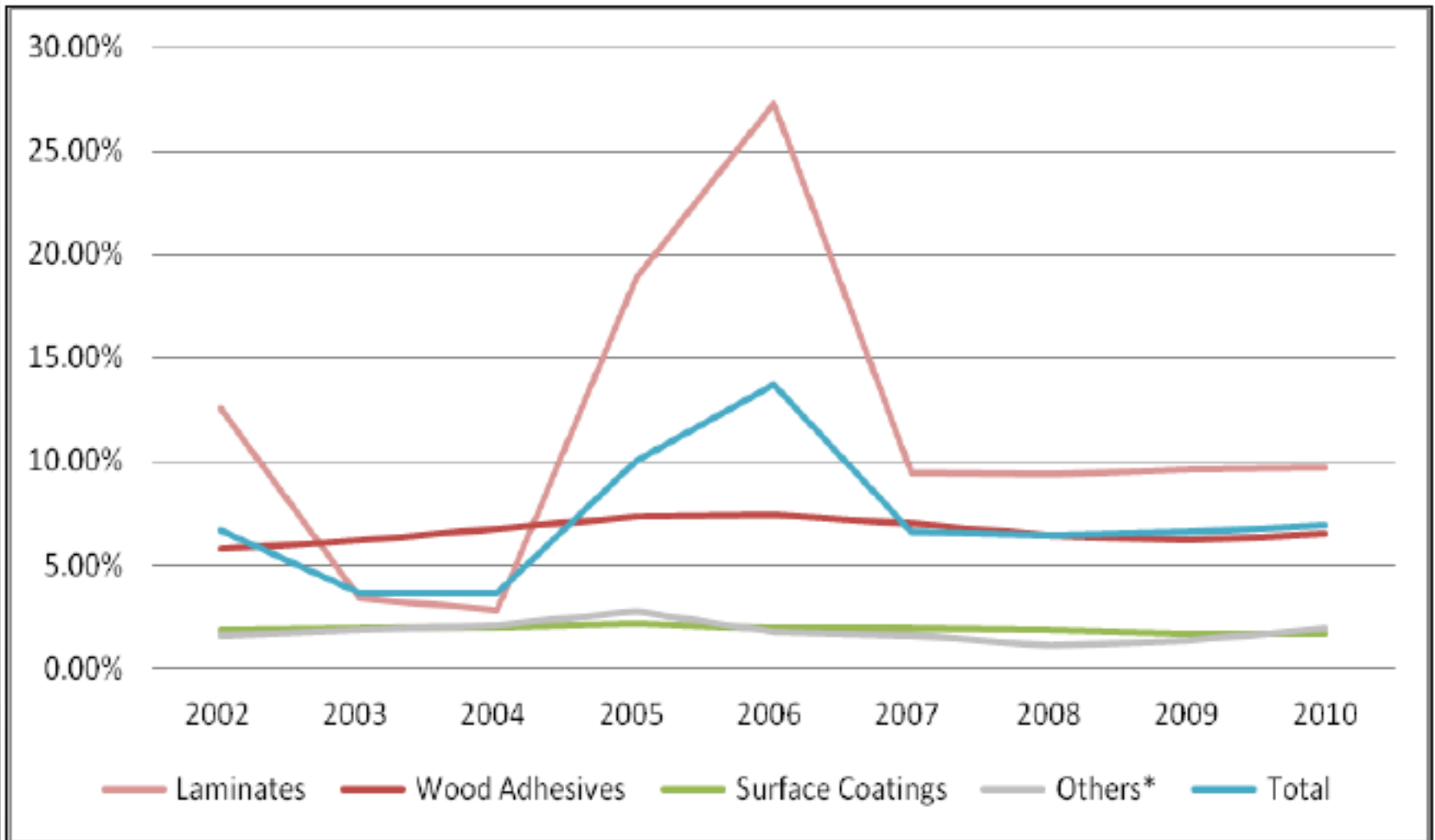
(Source: Global Industry Analysts Inc.)



# MARKET ANALYSIS

# Market Analysis

## Growth of Melamine Consumption by End-Product 2002-2010



Source: Global Industry Analysts Inc.

# Market Analysis



## Moulding Compound

- Demand for moulding compound was determined by reviewing the demand for melamine products.
- These end product applications are diverse – they range from domestic consumer use to industrial and commercial applications.
- Moulded melamine components are found, inter alia, in dinnerware, utensils, toys, etc.
- Accordingly, income per capita, the propensity to consume and economic growth are reasonable predictors of demand.

# Market Analysis



## Dinnerware

- Developing markets and price conscious consumers may be more inclined toward these goods, especially if offered in modern or fashionable patterns. In addition because these items are practically unbreakable (but not microwavable), the following niche market segments may be targeted over in-home use:
  - Catering items – serving dishes and utensils
  - Outdoor dining – plates, cups, utensils
  - Children’s dining – plates, cups, bowls and utensils
  - Institutional usage (hospitals, prisons, armed forces) – tableware, serving dishes and utensils
  - Novelty markets - seasonal patterned plates, cups, mugs, trays
- Demand for these goods should track income per capita, the propensity to consume and economic growth.

# Market Analysis



## Regional Market Demand for Selected Products (tpy)

<b>LIKELY MARKETS</b>	<b>MELAMINE MOULDING COMPOUND</b>	<b>PLASTIC TABLEWARE</b>
South America	8,855	75,066
Caribbean	2,998	2,029
West Africa	536	5,515
<b>Total</b>	<b>12,389</b>	<b>82,610</b>

## Potential Market Share - Close Proximity Markets (tpy)

<b>POTENTIAL MARKET SIZE</b>	<b>MELAMINE MOULDING COMPOUND</b>	<b>PLASTIC TABLEWARE</b>
<b>Pessimistic</b>	124	826
<b>Base</b>	619	4,131
<b>Optimistic</b>	1,239	8,261



# Market Analysis

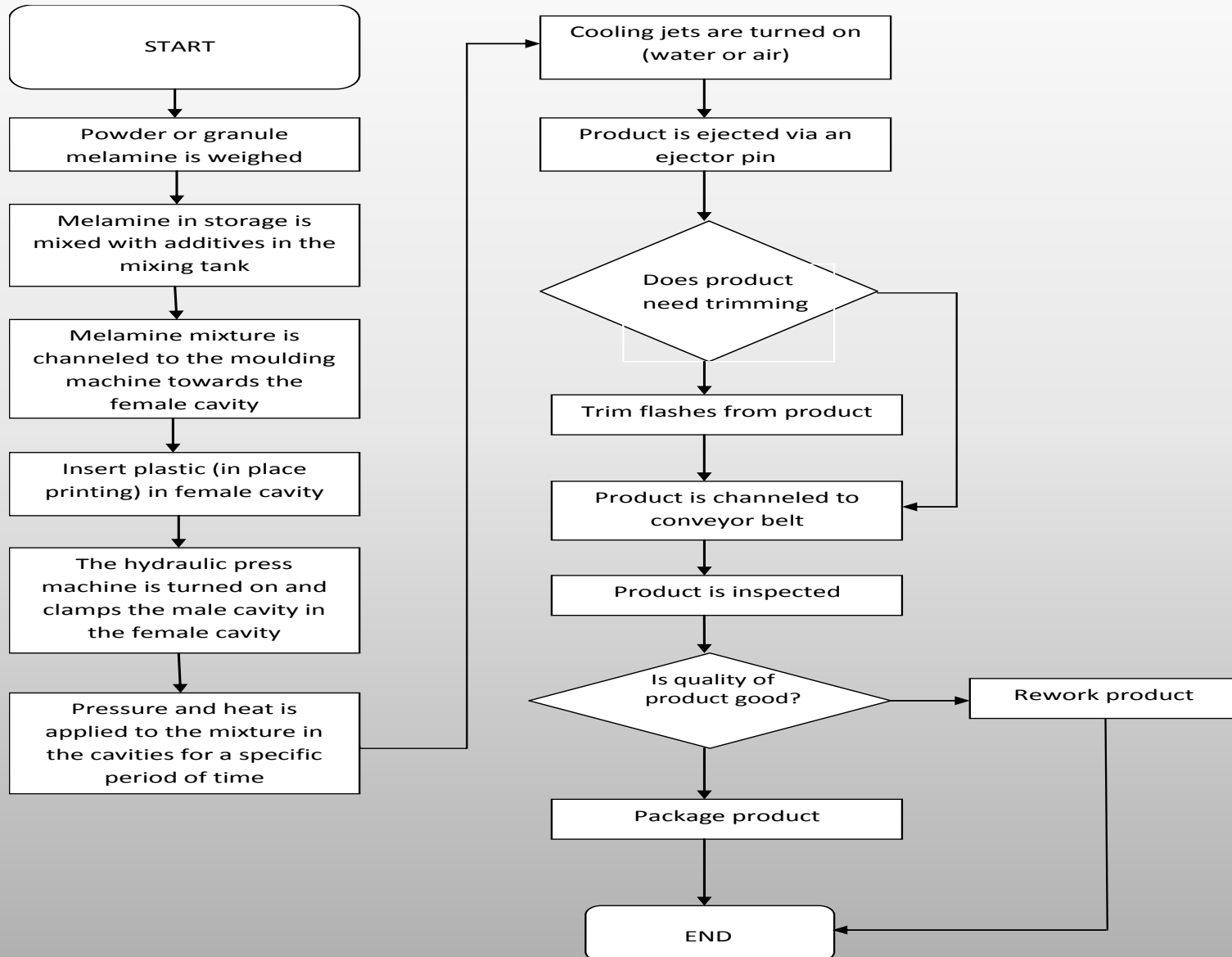
## Target Markets

PRODUCTS	SOUTH AMERICA	CENTRAL AMERICA	NORTH AMERICA	EUROPE	PACIFIC	ASIA	CARIBBEAN	AFRICA
<b>Dinnerware</b>	Chile, Brazil, Colombia, Bolivia, Uruguay, Paraguay	Costa Rica, Guatemala, Mexico	USA, Canada	France, Germany, United Kingdom, Belgium, Italy, Spain,	Japan, Australia, Thailand	Hong Kong	Jamaica, Cayman Islands, Bermuda	South Africa, Côte d'Ivoire, Kenya, Rwanda, Botswana, Nigeria
<b>Melamine Moulding Compound</b>	Brazil, Chile, Peru		USA	Germany, France, Italy, Spain, Turkey	Malaysia,	China, Rep. of Korea		



# TECHNICAL REQUIREMENTS

# Technical Requirements



# Technical Requirements



## Manpower

<i><b>PERSONNEL</b></i>	<i><b>NUMBER</b></i>
<b>Dinnerware</b>	
Engineers	1
Technicians	2
Operators per shift	8
Attendants warehouses and packaging	10
Supervisors	1
Administration	1
Accountant	1
Marketing	1
Administration	1
<b>Subtotal</b>	<b>26</b>
<b>Moulding Compound</b>	
Supervisors	1
Operators	2
Attendants	2
Administration	1
<b>Subtotal</b>	<b>6</b>
<b>Total</b>	<b>32</b>

# Technical Requirements

## Indicative Equipment Listing



- Chill Tower
- Moulds
- Air Compressor
- Generator
- Transformer
- Melamine Moulding Compound Machines
- Silos For Raw Materials
- Pre Heater
- Moulding Machine
- Dryer
- Trimming Machine
- Packaging Machine
- Truck
- Forklift
- Bags, Cartons

# Technical Requirements

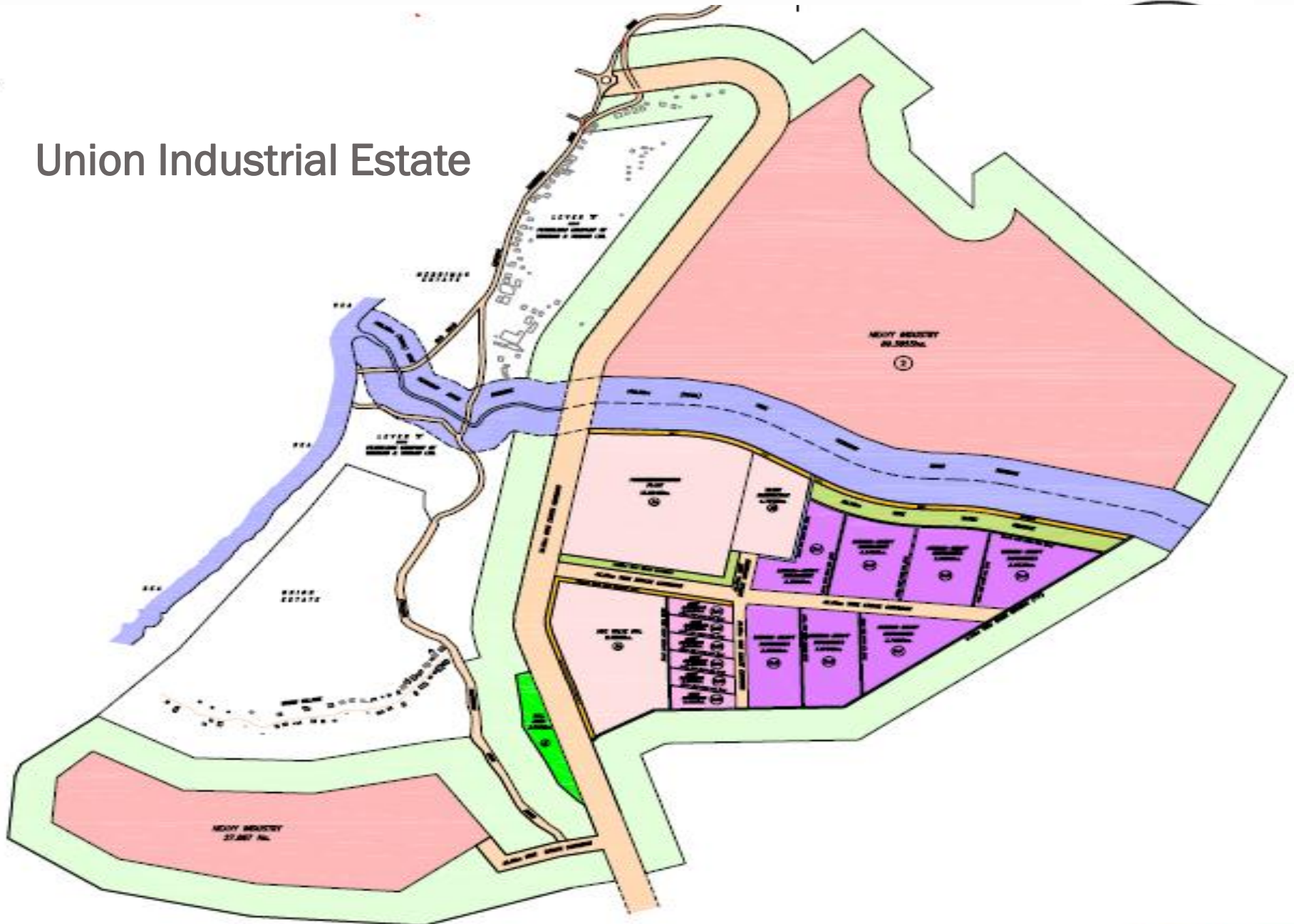


## Plant Location

### Criteria:

- Cost
- Space
- Shipping & Logistics
- Infrastructure
- Suppliers
- Environmental Concerns

# Union Industrial Estate





# BUSINESS STRATEGY



# Business Strategy

## PESTLE Analysis

- Political
- Economic
- Social
- Technological
- Legal
- Environmental

# Risk Assessment



<b>AREA</b>	<b>RISKS</b>	<b>LIKELIHOOD</b>	<b>IMPACT</b>	<b>MITIGATION</b>
<b>POLITICAL</b>	Change in Policy direction	LOW	MEDIUM	Advocacy through TTMA and the Energy Chamber
<b>ECONOMIC</b>	Negative Economic Growth	MEDIUM	LOW	Obtain guaranteed off-take contracts for manufactured goods to hedge against challenges with market downturn
	Low costs supplies from China and other countries	HIGH	HIGH	Targeted market strategy to proximate markets in the region  Registration with reputable business to business portals

# Risk Assessment



<b>AREA</b>	<b>RISKS</b>	<b>LIKELIHOOD</b>	<b>IMPACT</b>	<b>MITIGATION</b>
<b>SOCIAL</b>	High levels of activism with respect to environmental issues	MEDIUM	MEDIUM	Appropriate Communications Policy  CSR  Appropriate Engagement of the community
<b>TECHNOLOGICAL</b>	Challenge of acquiring Proprietary Technology	HIGH	HIGH	Form partnership and acquire technology from reputable suppliers

# Risk Assessment



<b>AREA</b>	<b>RISKS</b>	<b>LIKELIHOOD</b>	<b>IMPACT</b>	<b>MITIGATION</b>
<b>LEGAL</b>	Penalties due to non compliance with legal requirements of OSH Act, and Environmental Laws and Regulations	LOW	HIGH	Periodic Internal and External Audits for OSH Act and Environmental Laws and Regulations
<b>ENVIRONMENTAL</b>	Exposure to Melamine	LOW	LOW	Appropriate Health, Safety and Environmental Policies and Controls
	Exposure to Formaldehyde	LOW	HIGH	Buffer Zones from the community and other facilities on the estate. Appropriate handling and strong procedures.

# SWOT Analysis



## POTENTIAL STRENGTHS

- Strong technical capabilities
- Experience in manufacturing

## POTENTIAL WEAKNESSES

- Lack of experience in manufacture of melamine moulding compound and dinnerware
- Limited experience in marketing melamine derivative products

# SWOT Analysis



## OPPORTUNITIES

- Availability of main raw materials (melamine and formaldehyde)
- Proximity of Trinidad and Tobago to South and Central America provides a competitive advantage via reduced costs of transportation compared to suppliers out of China
- Availability of land, port facilities
- Strong government support for diversification of the economy throughout the energy value chain

## THREATS

- Poor public image of melamine because of misuse in babies' milk and other food products by Chinese companies.
- Increased activism with respect to environmental issues which results in tighter Government controls.
- Worldwide recession leading to reduced demand and/or growth and low investor/business confidence.



# FINANCIAL ANALYSIS

# Financial Analysis

## Assumptions



ITEM	DESCRIPTION / VALUE	DINNERWARE	MOULDING COMPOUND
Capital Cost	TT\$	6.6 million	
Working Capital	TT\$ PRESENT VALUE	1.65 million	
Financing	100 % Debt		
Interest Rate on Loan Payment	Percentage	11	
Loan Repayment Period	Years	20	
Corporate Tax Rate	Percentage	25%	
Operational Costs (per annum)	TT\$ average over 25 years	7.2 million	5.0 million
Depreciation Method	Straight Line		
Project Life	Years	25	
Construction Period	Years	2	
Plant Capacity (Output)	Tonnes / Annum	220	440
Land Requirement	hectares	2.0	
Number of employees		26	6



# Financial Analysis

## Summary

<b>MMC &amp; DINNERWARE</b>	<b>Debt Financing</b>	<b>Equity Financing</b>
IRR (%)	8.0	9.0
NPV (TT\$Mn)	0.8	10.5

<b>MMC</b>	<b>Debt Financing</b>	<b>Equity Financing</b>
IRR (%)	17	25
NPV (TT\$Mn)	6.1	8.9



# RECOMMENDATIONS

# Recommendations



- *Employ multiple marketing strategies:* Melamine moulding compound targets industrial and commercial markets. Accordingly, arrangements for marketing should be largely based on business to business arrangements. For dinnerware, targeting institutional clientele and international retail housewares distributors may be more appropriate.
- *Obtain guaranteed off take contracts:* In tandem with the business to business approach, this strategy offers a critical hedge against challenges related to market downturn, market penetration and established competitors.
- *Increasing the level of production automation:* In as much as the technology will allow, automation will reduce labour and operating cost, which are a substantial factor for these plants and, thus, improve the financial viability.
- Conduct a more in-depth financial analysis, in order to confirm assumptions and estimates.



# MELAMINE- BASED ADHESIVES



# Contents

- Market Analysis
- Technical Requirements
- Business Strategy
- Financial Analysis
- Recommendations



# MARKET ANALYSIS



# Market Analysis

## Adhesives

- All categories of melamine end products are expected to experience growth in demand in the next five years.
- Wood adhesives will grow between 7% and 9% in the five year period.
- The “Rest of the World” is projected to grow over 46% between 2010 and 2015.



# Market Analysis

## Regional Market Demand for Adhesives (tpy)

<b>LIKELY MARKETS</b>	<b>ADHESIVES</b>
South America	56,922
Caribbean	426
West Africa	55,809
<b>Total</b>	<b>113,157</b>

## Potential Market Share - Close Proximity Markets (tpy)

<b>POTENTIAL MARKET SIZE</b>	<b>ADHESIVES</b>
Pessimistic	1,132
Base	5,658
Optimistic	11,316



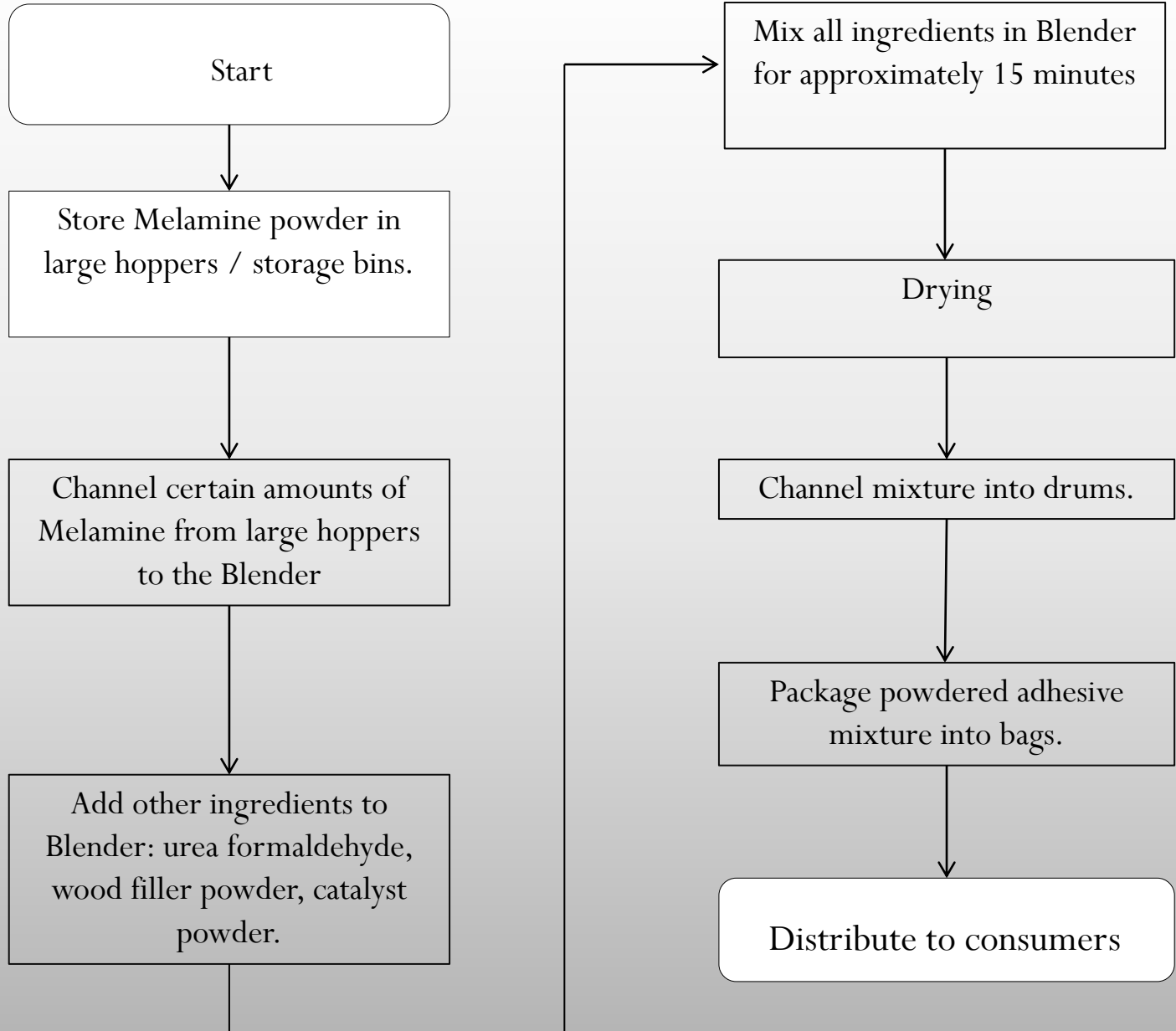
# Market Analysis

## Target Markets

PRODUCTS	SOUTH AMERICA	CENTRAL AMERICA	NORTH AMERICA	EUROPE	PACIFIC	ASIA	CARIBBEAN	AFRICA
Adhesives	Brazil, Ecuador, Colombia	Mexico	USA, Canada	Germany, France, Poland, Russia	Indonesia, Malaysia, Thailand	China, Hong Kong, Taiwan, Rep. of Korea, India, Iran	Haiti, Barbados, Dominican Republic	Nigeria, Algeria,



# TECHNICAL REQUIREMENTS





# Technical Requirements

## Manpower

<b><i>PERSONNEL</i></b>	<b><i>NUMBER</i></b>
<b>Adhesives</b>	
<b>Engineers</b>	<b>1</b>
<b>Technicians</b>	<b>2</b>
<b>Operators per shift</b>	<b>6</b>
<b>Attendants warehouses and packaging</b>	<b>4</b>
<b>Supervisors</b>	<b>1</b>
<b>Administrator</b>	<b>1</b>
<b>Accountant</b>	<b>1</b>
<b>Marketing</b>	<b>1</b>
<b>Total</b>	<b>17</b>



# Technical Requirements

## Indicative Equipment Listing

- Blender
- Hoppers
- Conveyor Belt
- Mixing Tower
- Storage Tanks for Raw Materials
- Transformer
- Generator
- Air Compressor
- Storage Drums for Powder Adhesive
- Packaging Machine



# Technical Requirements

## Main Raw and Packaging Materials for Adhesive Manufacturing

- Melamine
- Urea Formaldehyde
- Bags



# Technical Requirements

## Plant Location

### Criteria:

- Cost
- Space
- Shipping
- Infrastructure
- Suppliers





# BUSINESS STRATEGY



# Business Strategy

## PESTLE Analysis

- Political
- Economic
- Social
- Technological
- Legal
- Environmental

# Risk Assessment



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<b>POLITICAL</b>	Change in Policy direction	LOW	MEDIUM	Advocacy through TTMA and the Energy Chamber
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	Low costs supplies from China and other countries	HIGH	HIGH	Targeted market strategy to proximate markets in the region  Registration with reputable business to business portals

# Risk Assessment



<b>AREA</b>	<b>RISKS</b>	<b>LIKELIHOOD</b>	<b>IMPACT</b>	<b>MITIGATION</b>
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<b>TECHNOLOGICAL</b>	Challenge of acquiring Proprietary Technology	HIGH	HIGH	Form partnership and acquire technology from reputable suppliers

# Risk Assessment



<b>AREA</b>	<b>RISKS</b>	<b>LIKELIHOOD</b>	<b>IMPACT</b>	<b>MITIGATION</b>
<b>LEGAL</b>	Penalties due to non compliance with legal requirements of OSH Act, and Environmental Laws and Regulations	LOW	HIGH	Periodic Internal and External Audits for OSH Act and Environmental Laws and Regulations
<b>ENVIRONMENTAL</b>	Exposure to Melamine	LOW	LOW	Appropriate Health, Safety and Environmental Policies and Controls
	Exposure to Urea-Formaldehyde	LOW	HIGH	Buffer Zones from the community and other facilities on the estate. Appropriate handling and strong procedures.

# SWOT Analysis



## POTENTIAL STRENGTHS

- Strong technical capabilities
- Experience in manufacturing

## POTENTIAL WEAKNESSES

- Adhesives technology is challenging to master
- Lack of experience in manufacture of melamine adhesives
- Limited experience in marketing melamine derivative products

# SWOT Analysis



## OPPORTUNITIES

- Availability of main raw materials (melamine and urea formaldehyde)
- Proximity of Trinidad and Tobago to South and Central America provides a competitive advantage via reduced costs of transportation compared to suppliers out of China
- Availability of land, port facilities
- Strong government support for diversification of the economy throughout the energy value chain

## THREATS

- Poor public image of melamine because of misuse in babies' milk and other food products by Chinese companies
- Increased activism with respect to environmental issues which results in tighter Government controls
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# FINANCIAL ANALYSIS



# Financial Analysis

## Assumptions

ITEM	DESCRIPTION / VALUE	ADHESIVES
Capital Cost	TT\$	7.0 million
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Financing	100% Debt	
Interest Rate on Loan Payment	%	11
Loan Repayment Period	Years	20
Corporate Tax Rate	%	25%
Operational Costs (per annum)	TT\$ average over 25 years	15.4 million
Depreciation Method	Straight Line	
Project Life	Years	25
Construction Period	Years	2
Plant Capacity (Output)	Tonnes	440 per annum
Land Requirement	hectares	2.0
Number of employees		17



# Financial Analysis

<b>Adhesives</b>	<b>Debt Financing</b>	<b>Equity Financing</b>
IRR (%)	<b>9.0</b>	<b>10.0</b>
NPV (TT\$Mn)	<b>-1.1</b>	<b>8.0</b>

# Recommendations



- *An adhesives manufacturing facility should be considered for development.*
- *A diverse range of adhesives can be manufactured.*
- *Obtain guaranteed off take contracts:* In tandem with the business to business approach, this strategy offers a critical hedge against challenges related to market downturn, market penetration and established competitors.
- *A more in-depth financial analysis be conducted.*
- *Consideration of economies of scale for a larger facility.*



**THANK YOU**