



## Update on Pipeline and Infrastructure Projects

Trinidad and Tobago Petroleum Conference

25<sup>th</sup>-26<sup>th</sup> January 2010

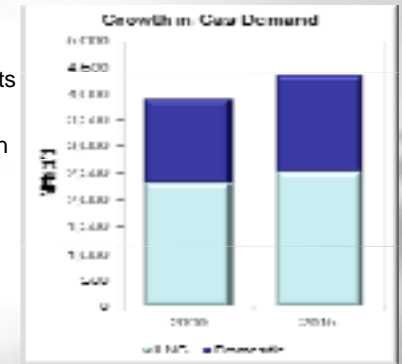
Presented by:

Wade Hamilton –

Vice president Technical Services

## Natural Gas Demand Growth

- Forecasted demand growth
  - Start up of new Metals plants
  - Increased power generation requirements
  - Debottlenecking of existing plants
  - Increase in LIC Sector & CNG expansion
- New Gas fields being developed
  - BHP Billiton
- New Estate development
  - Union Industrial Estate
  - Tamana EnTech Park
  - Cove Industrial Estate



## Network

Network Gas Pipelines Total of 799 Km  
Transmission Capacity of 4.4 Bcf/d

- Offshore Transmission Gas Pipelines 198 Km
- Onshore Transmission Pipelines 360 Km
- Large Diameter Distribution Pipelines 155 Km
- Small Diameter Distribution Pipeline 65 Km
- **New gas pipeline additions @ end of 2010 177 Km**

## Pipeline Network



## Major Ongoing Projects

- North-East Offshore (NEO) Transmission Pipeline
- Transmission Pipeline to Cove Estate, Tobago
- Distribution Pipeline to Union Industrial Estate
- Liquid Fuels Pipeline Network
- Distribution Pipeline to Tamana In-Tech Park
- Expansion of the Distribution System



## NEO Project Overview

### • The Project

- The construction of 36 inch offshore pipeline from the BHP Billiton field to the 36 inch Bud Offshore pipeline

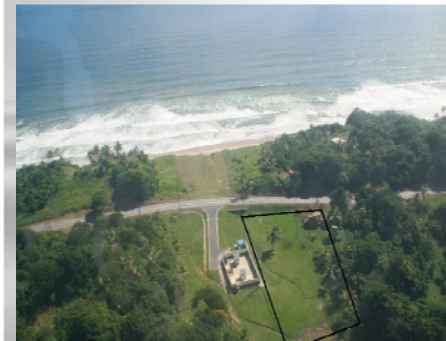
### • Project Drivers

- Open access to new field where there is no gas pipeline infrastructure
- Opportunity to develop other marginal fields as it lowers the infrastructure development cost for other players.
- New source of gas from BHP for Domestic market

Key Data	
Capacity	1000 mmscfd
Length	94 km
Diameter	36-inch
Capex	US\$ 350 Million
Completion Date	



## NEO Progress

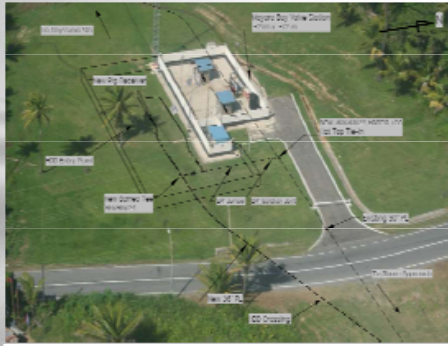


HDD Shore Approach Mayaro



HDD Mayaro

## NEO Progress



Mayaro Bay Regulator Station



Abyssinia Facility



## Tobago Pipeline Project

11/04/2009

## Tobago Pipeline Project Overview

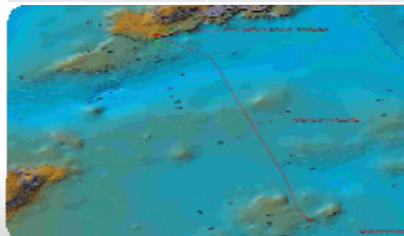
### • The Project

- The construction of a 12 inch diameter line from BHP Billiton field to Cove Estate Tobago

### • Project Drivers

- Gas Supply to Power Generation Plant at Cove.
- Gas Supply to Light Industry at Cove
- Transportation of gas for Eastern Caribbean Gas Pipeline Co.
- Domestic supply to Tobago

Key Data	
Capacity	110-120 mmscfd
Length	54 km
Diameter	12-inch
Capex	US\$ 164 Million
Completion Date	



## Tobago Pipeline Progress



Pipeline Shore Approach Tobago



HDD Tobago



HDD Tobago Completion

## Tobago Pipeline Progress



Pipelay BargeTobago



Pipelay Supply Barge

## Tobago Pipeline Progress



Pipe being Lowered into the Water



Pipe being Lowered into the Water

## Tobago Gas Processing Facility

- Plant Capacity
- Single train
  - min. 15 mmscfd
  - max. 100 mmscfd
- Metering system



## Tobago Gas Processing Facility





Control & MCC Foundation



Firewater

# Building Works At Cove Estate



Odorization Building Foundation



Tank Bases

## Tobago Gas Processing Facility Progress



## Tobago Gas Processing Facility Progress



## Concrete Coating Process at la Brea



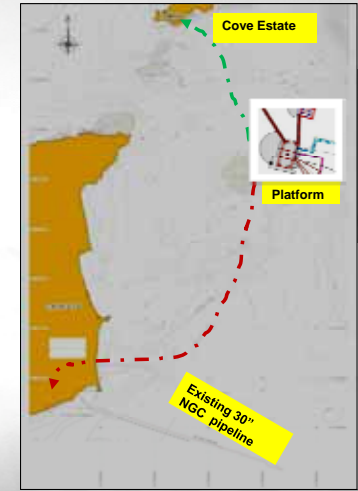
# NEO/Tobago Local Content

Total local Content 18%

Service Type	Contractor
Civil works	Carillion
Mechanical	API
Sub-sea Geotechnical/Geophysical	Capital Signal
Horizontal Directional Drilling Support	OTSL
Concrete Coating	Bredero Shaw/TCL
Pressure Vessels	Mustapha Engineering Works

# Project Overview

- **Tobago Receiving/Metering Station**
  - > Cove Industrial Estate, Tobago
  - > Processing Capacity: 100MMSCFD
- **Tobago Pipeline**
  - > Start: BHPB Gas Export Platform, Offshore
  - > Ends: Cove Industrial Estate, Tobago
  - > 54km long
  - > Water depth: 34-92m
  - > Size: 12"
- **North East Offshore (NEO) Pipeline**
  - > Start: BHPB Gas Export Platform, Offshore
  - > Ends: New Abyssinia, Trinidad
  - > 94km long
  - > Water depth: 12m-62m
  - > Size: 36"



# Overall Project Status

Tobago	
Engineering Design	100%
Civil Works Facility	65%
HDD Installation of 12 inch pipe	100%
Overall	60%
NEO	
Engineering Design	100%
HDD Installation of 36 inch pipe	65%
9 km of onshore 36" pipeline	0%
Overall	60%



## Distribution Pipeline to Union & Labidco Industrial Estates

## Project Overview

- New Supply to Union and LABIDCO Estates
  - Construction of 11 km 24 inch diameter spur pipeline, Inlet Receiving Station , metering and regulation station to deliver 250 mmscfd
  - Construction of 2 km low pressure HDPE distribution pipeline for tenants in the Labidco estate
  - Capex US\$ 42 million

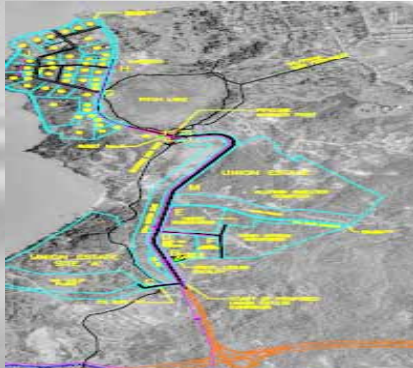
## Union Estate

- Current Status
- Engineering Design Completed
  - Universal Pegasus Enesco
  - EIA Contractor REAL - CEC awarded
  - Material procurement May 08 – Aug 09
    - Pipe contract for 24 Inch & 16 Inch - Tubecero Mexico

## Union Estate

- Construction Feb 2010
  - Pipeline Contract awarded API Pipeline Company
  - Civil works contract pending award Jan 2010
  - Mechanical Works to Tender Feb 2010
- Expected First Gas Commissioning to Estate July 1<sup>st</sup> 2010

## Photos of Union & Labidco



Map Showing Union & Labidco Estates



ROWs being cleared at Union Estate



## Liquid Fuels Pipeline Network

11/04/2009

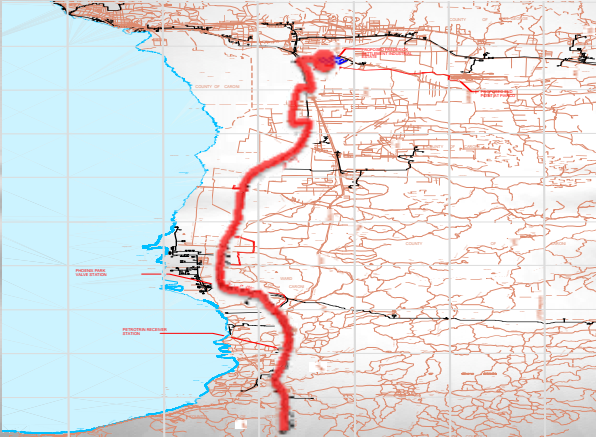
## Liquid Fuel Pipeline Network Project

- Construct an 8" Steel Multiproduct Pipeline from PAP to Caroni (35km Long) to transport two (2) grades of gasoline (95 Octane; 92 Octane) Diesel Fuel & Jet Fuel.
- Construct a new state of the art Road Tank Wagon Loading Facility at eTeck's Industrial Estate at Caroni.
- Construct a dedicated Jet Fuel Pipeline (11 km Long) from Caroni to Piarco Airport
- Capex US\$ 115 Million
- Target Completion Q4 2010





## Liquid Fuel Pipeline Route



## Liquid Fuel Pipeline

- Replacement of existing antiquated loading facilities at Sea Lots and PAP with new state of the art facilities.
- Increased security of supply from either of two (2) loading facilities at Caroni or Sea Lots.
- Reduced Road Tank Wagon traffic on the highways.
- Elimination of emissions from loading facilities.
- Phased-out, expensive marine and Jet Fuel handling from PAP.

## Carbon Footprint Reduction

The benefit of the project is that the pipeline will eliminate the use of Road tanker wagon for transportation of jet fuel as well as the elimination of the use of the Ship for transportation of products to SeaLots

**Carbon Reduction - 3.5 million tonnes/yr**

## Liquid Fuel Pipeline Network Project

- Engineering Contact awarded to KBR
  - Engineering Design 100% completed
  - Procurement being handled by KBR 90% completed
- Pipe Supply - Ansa Technologies 100% completed
- Control Building & Utilities Engineering – LeeYoung & Partners 98% completed
- Pipeline Construction completed
- Main Mechanical works to be awarded Q1 2010
- Expected Commissioning latter part Q4 2010

# Local Content

- Overall Local Content Value approx. 37%

Environmental	Kaizen Trinidad Ltd
Building & Utilities	Lee Young & Partners
Site prep	Namalco
Pipeline from PAP to Pierre Facility Rd	South M Contractors Ltd-
Pipeline from Pierre Rd to Caroni and Caroni to Piarco	Trinweld Contractors Ltd
Tanks Foundations	Jagmohan
Main Product Storage tanks-	Damus
Site Inspectors & Project management Service	Trinidad Project Management Services
In PAP - Product Tanks	Chicago Bridge Iron Works (CBI)

# Project Progress Pictures

Pipeline Construction



# HDD Along the Route



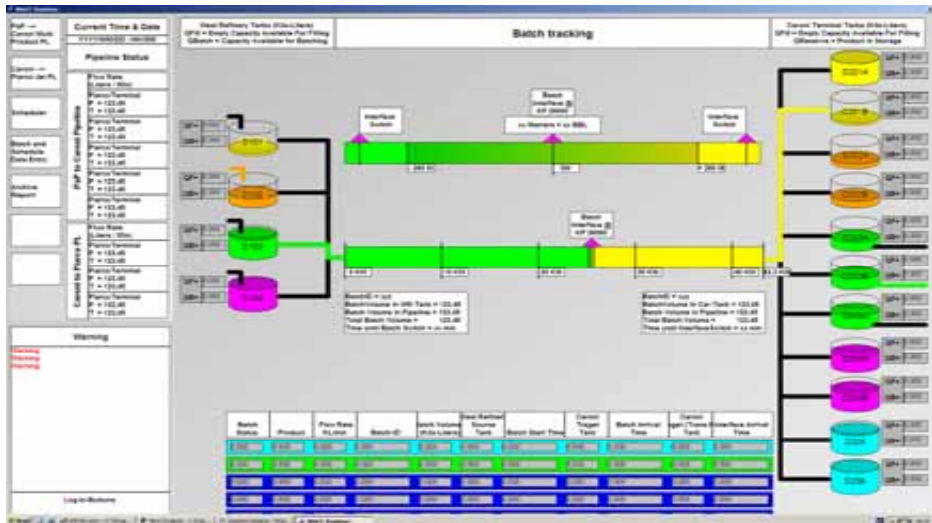
# Aerial View of Pipelay Along the Route



# Site Preparation At Caroni



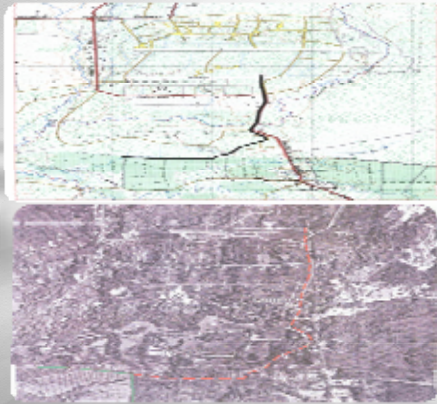
# The Caroni Facility



# Expansion of Distribution System

11/04/2009

## Tamana InTech Park



- Construction of 3 km 6 inch supply line and 10 km of 6 inch low pressure distribution network within the Estate.
- Contractor API
- Commissioning Feb 2010

## Tamana InTech Park Progress



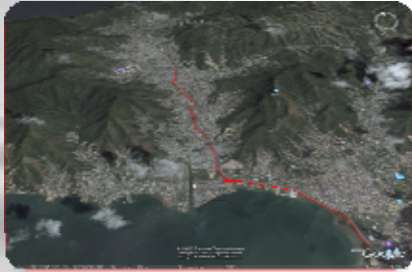
## eTech Tamina Park Progress



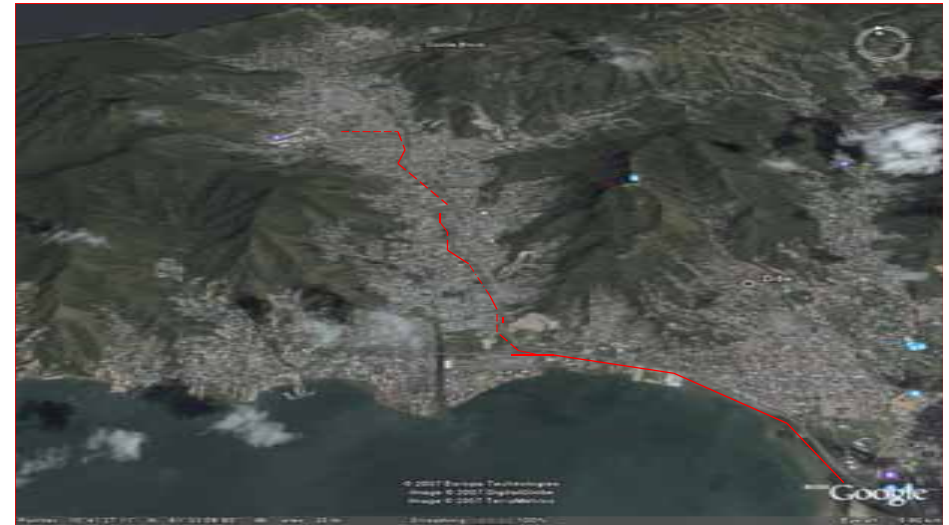
## New Projects 2010 -2013

- Aggressive Development programme for LIC sector
  - Diego Martin pipeline extension
  - CNG Expansion Programme
  - Gas to Secondary Schools
  - Promotion of Gas Cooling

## Distribution System Expansion



- eTeck Diamond Vale Industrial Estate
  - Construction of 6 km of 6 in diameter pipeline from Westmoorings to Diamond Vale
  - CEC Awarded
  - Construction to commence Q2 2010



## Reforestation

- Additionally, NGC has adopted a “No Net Loss” Principle with regard to forest removal.
- NGC has committed to replant 315 ha of critically degraded forest areas
- In 2009 38 ha was replanted bringing us to a total of 88 ha to date

## NGC’s “No Net Loss” Principle



THE NATIONAL GAS COMPANY  
OF TRINIDAD AND TOBAGO LIMITED