

*Prepared for:*

*Petroleum Products Pricing & Regulatory  
Commission (PPPRC),*

*Abuja, Federal Republic of Nigeria*

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## ***PETROLEUM PRODUCTS PRICING***

***Presentation on International Approaches  
& The Nigerian Model***

*Presented by:*

 **Nexant**

*October 2002*

# *Outline of Presentation*

- Definitions
- Essential Tenets of Product Pricing
- Key Components of Product Pricing
- Present/Past Approach to Product Pricing in Nigeria
- Other Country Models
- Crude & Product Market Characteristics
- Summary of Present Approach
- Proposed Model for Nigeria
- Summary
- Discussion / Feedback



*Definitions*

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## *Tenets of Petroleum Products Pricing*

Some of the abbreviations/acronyms used in the following presentation are described below.

| ACCRONYM | MEANING                                |
|----------|--|
| PMS      | Premium Motor Spirit (Petrol)          |
| AGO      | Atmospheric Gas Oil (Diesel)           |
| APK      | Aviation Purpose Kerosene (Jet Fuel)   |
| DPK      | Dual Purpose Kerosene (Kerosene)       |
| FO       | Fuel Oil a.k.a Residual Fuel Oil (RFO) |



*Essential Tenets of Petroleum Products Pricing*

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# Tenets of Petroleum Products Pricing

The Key Objectives of Pricing Mechanisms:

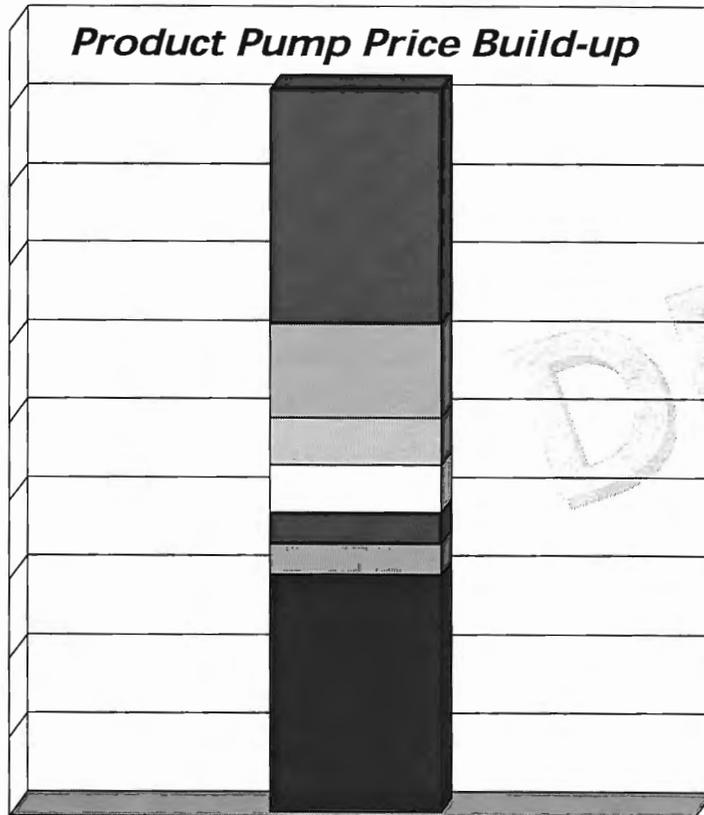
- Downstream operation full cost recovery
- Maximise government revenue. Schemes which maximise government revenue can be classified:
  - ✓ **BRONZE:** Funds road infrastructure
  - ✓ **SILVER:** Also funds mass transport infrastructure such as trains/trams
  - ✓ **GOLD:** Also funds other social services e.g. Health, Education etc.
- Promote economic activity by making fuel available at least cost
- Mitigate environmental damage
- Cater for the energy requirements of low income earners
  - e.g. through cross subsidies to kerosene by higher taxation of premium products (PMS) and other fuel grades (AGO & FO)



*Key Components of Petroleum Products Pricing*

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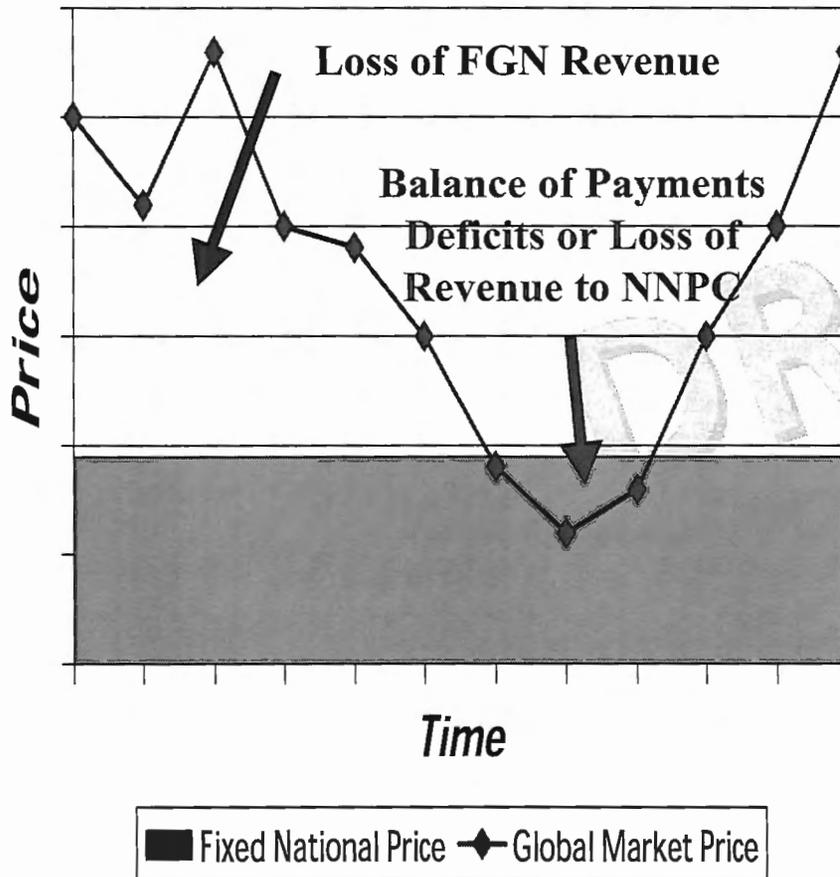
# Key Components of a Pricing Models



## Key Price Components:

- *Product Taxes*
- *Retailer's/Wholesaler's Margin*
- *Product Distribution Costs*
- *Refinery Margin*
- *Import Tariffs*
- *Crude Oil Transport Costs*
- *Crude Oil Price*

# Crude Oil Price



- Crude oil is the building block
- Proper pricing must start here to arrive at correct product pricing
- Crude sold to the refineries has traditionally been too low in price
- Fixed crude pricing distorts end product prices
- Input subsidy at US\$9.50/BBL against US\$22/BBL global price, is \$1.5b, **30% of FGN budget**
- Input subsidy to refineries:
  - Constitutes a huge loss of government revenue
  - Hides refinery inefficiency
  - Is not fully passed on to the target population

## *Crude Oil Transport Costs*

- Covers shipping and pipeline transportation (usually included in crude oil price at refinery gate)
- Should be a negligible cost for most refineries in Nigeria due to proximity to oil fields (on-shore & offshore)
- Exception is Kaduna is an exception as it is designed to partially process foreign crude oils, and is almost 1000km inland
  - Kaduna refinery costs difficult to ascertain without detailed information from NNPC
  - Nigerian light (high grade – low sulphur) crude is swapped for a heavier (low grade – high sulphur) crude
  - To cover shipping costs more premium Nigerian crude is swapped for the lower grade crude
  - Further element of transport cost for the dedicated crude pipeline to the Kaduna refinery is subsumed into PPMC's costs

## *Import Tariffs*

- Ordinarily this should not be an issue as Nigeria *should be product self-sufficient* if not in surplus
- However, product is in severe deficit with importation of 1.3bn litres between Jan – Mar 2002 on which levies apply (however, simply government to government transfer, no net effect on economy)
- Negligible contribution overall – can retain long term but removal will promote competition with imports, driving prices down (in a free market)

# Refinery Margins

Refinery margins needed to cover costs, profits and taxes:

- Margins are fixed in Nigeria, but in any event are constrained (bound by fixed crude prices and fixed product pump prices)
- Typical refinery operating costs are:

|                         | <i>Global Average</i> | <i>African</i> | <i>Nigerian</i>                         |
|-------------------------|-----------------------|----------------|---|
| <i>Refinery Margins</i> | US\$1.0 - 2.0/BBL     | US\$2.5 – 5.0  | US\$6.0-9.2/BBL *                       |
| Source                  | Nexant                | Kvaerner       | World Bank 1993/2000<br>PPPRC data 2001 |

\* Includes depot and distribution costs.

- The World bank estimate immediate cost savings of US\$3/BBL are possible with improved production alone
- Fuel losses / maintenance costs for African refineries are double typical global levels, further constraining refinery profitability
- Nigerian refinery capacity utilisation (direct function of maintenance & management) are 1/3 to 1/2 global standards

## *Product Distribution Costs*

Cover Depots, pipeline and road distribution and are typically:

|                 |               | <i>Cash</i> | <i>Non-cash</i> | <i>Total</i> |
|-----------------|---------------|-------------|-----------------|--------------|
| <i>Depots</i>   | (US\$/ton)    | 1.4         | 0.4             | <b>1.8</b>   |
| <i>Pipeline</i> | (US\$/ton/km) | 0.02        | 0.02            | <b>0.04</b>  |
| <i>Roads</i>    | (US\$/ton/km) | 0.05        | 0.01            | <b>0.06</b>  |

*Nexant Data*

This assumes:

- Fully functional and well maintained depots
- Fully functional and well maintained pipelines and roads
- A reliable road haulage fleet

These do not apply in Nigeria (costs likely to be much higher)

## *Retailer/Wholesaler Margins*

Pricing mechanisms must allow for retail & wholesale marketing margins.

- Wholesale margins relate to bulk sales to industrial users (currently PPMC role and is rolled up into NNPC fixed pump price).
- Retail sales apply to sales through petrol stations

Margins are subject to variation depending on the level of market competition (a key, but unrealised strength of the Nigerian market is the sheer number of players).

Average margins for Western Europe range as follows:

|                   | <i>W Europe</i><br>(US\$/Ton) | <i>W Europe</i><br>(NGN/Litre) | <i>cf. Nigeria</i><br>(NGN/Litre) |
|-------------------|-------------------------------|--------------------------------|-----------------------------------|
| <i>Wholesaler</i> | 5 - 15                        | <b>0.5 - 1.5</b>               | 0.65                              |
| <i>Retailer</i>   | 30 - 50                       | <b>3.0 - 5.0</b>               | 2.86                              |

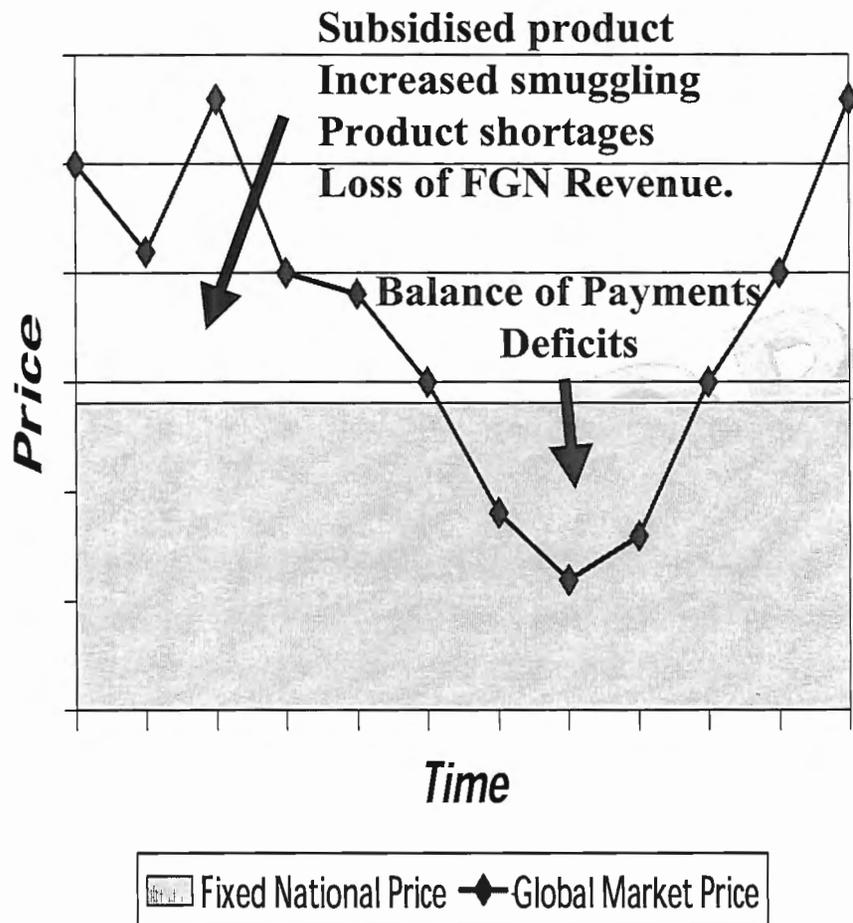
Basis: 1341 Litres / Tonne, NGN135/US\$1

**Nexant Data**

# Product Taxes

- Product taxes have a direct impact on:
  - Consumers (domestic, commercial and industrial)
  - Government financing
  - Transport infrastructure
  - Environment (tax clean fuels and those for the poor less)
- In most industrialised countries, taxes on liquid petroleum products rank as the 3<sup>rd</sup> or 4<sup>th</sup> highest source of government income after income taxes, VAT, and corporation taxes.
- For a developing nation with limited economic activity and little infrastructure, there is no economic sense in NOT applying product taxes.
- For comparison, taxes on liquid products as a percentage of pump price equate to 50-60% in Kenya (source: Nexant) and 30% in South Africa (source: SAPIA).
- Nigeria NEEDS product taxes. They are crucial to development.
- Rest of the world uses the modus operandi let "Transport finance Transport"

# End Product Price



- Petroleum products are a commodity. Should be market based pricing like any other
- Consumers differentiate on price, tending to promote competition
- Self regulating system except for quality and HSE issues
- Pricing problem is a Political *not an Economic* one in Nigeria
- Government must devise means of overcoming this issue first
- Subsidies in Nigeria deprive:
  - FGN of much needed revenue
  - Neighbouring Govts. of tax revenue (20-50% of fuel consumed in these countries is untaxed i.e. smuggled) – GTZ.
- Fuel import balance of payments loss Jan-Mar 2002 est.= US\$100m

# Key Components of a Pricing Model

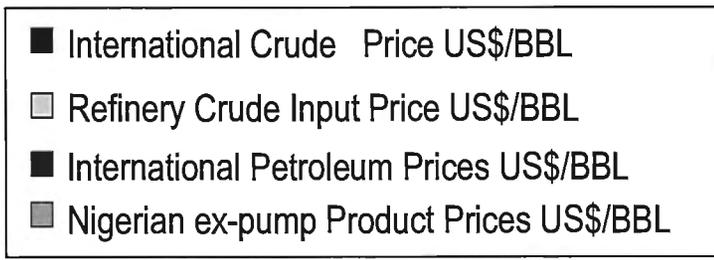
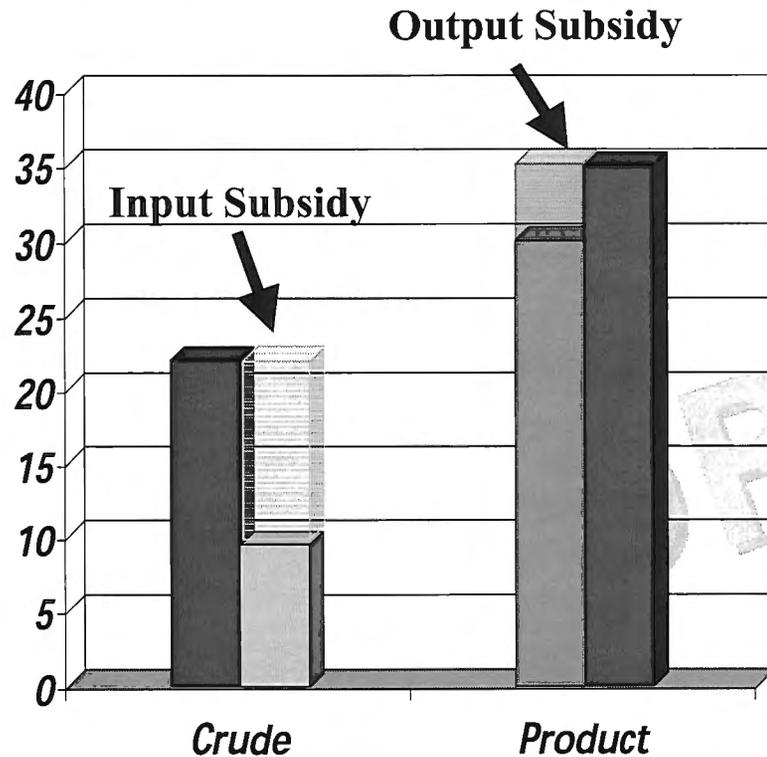
## Other Countries

## Nigeria

|  |                        |   |
|--|------------------------|---|
| Medium to High. Used to fund road, transport and other social facilities | <b>Taxes</b>           | None or negative (subsidy). Lack of funding for road, transport and other social infrastructure |
| Market self regulation   | <b>Retail</b>          | Fixed margins (inefficiency, many bogus outfits)  |
| Tariff based. Regulated  | <b>Distribution</b>    | Fixed / Monopoly Player   |
| Market self regulation   | <b>Refinery</b>        | Fixed / Monopoly Player   |
| Applied where imports exist  | <b>Import Tariffs</b>  | Should not apply  |
| Market self regulation   | <b>Crude Transport</b> | Should not apply  |
| Market self regulation   | <b>Crude Oil Price</b> | Fixed and low input price of crude oil. Loss of oil revenue                                     |

*Present/Past Approach to Product Pricing in  
Nigeria*

# Product Pricing Components



## Key Factors:

- Fixed crude price into refinery (formerly \$9.50/BBL).
- Fixed product prices ex-pump PMS @ NGN22/Litre & NGN115:\$1 = \$30/BBL
- Input subsidy ~ US\$1.5b (30% of Government Revenue)
- But product/crude world prices fluctuate.

## Outcome:

- Losses for FGN & Marketers
- Inefficiencies and corruption eat away at input subsidy. NNPC loss in 1998 was US\$700m+ (Source: World Bank)
- No efficiency drivers
- Increased smuggling
- Impossible to administer/police
- No benefit to target low income

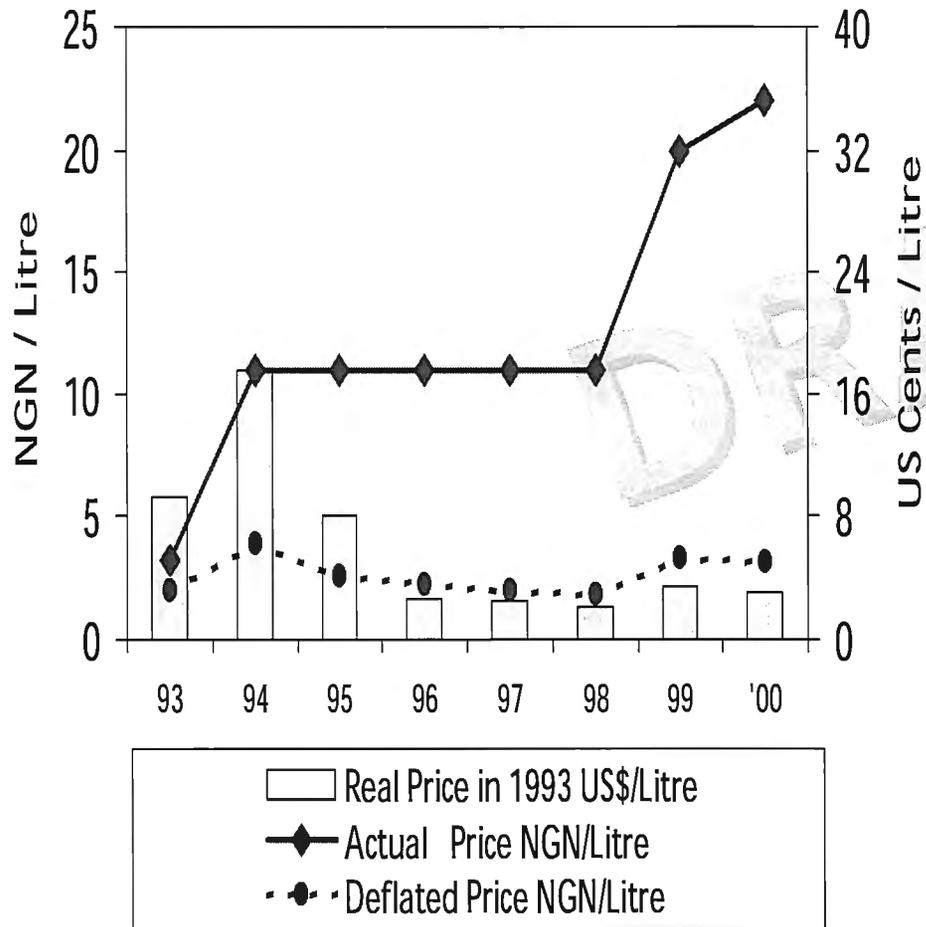
# Common Myths

| <i>Common Myths</i>  | <i>Reality</i> |
|--|----------------|
| Product prices have been rising consistently for 20 years.   |                |
| Oil is every Nigerian's birthright and must be available cheaply (i.e. subsidised).<br><br>Price rises are another form of embezzlement. |                |
| Fuel is not affordable anymore   |                |
| Prices <i>must be uniform</i> across the country   |                |

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# Product Pricing History

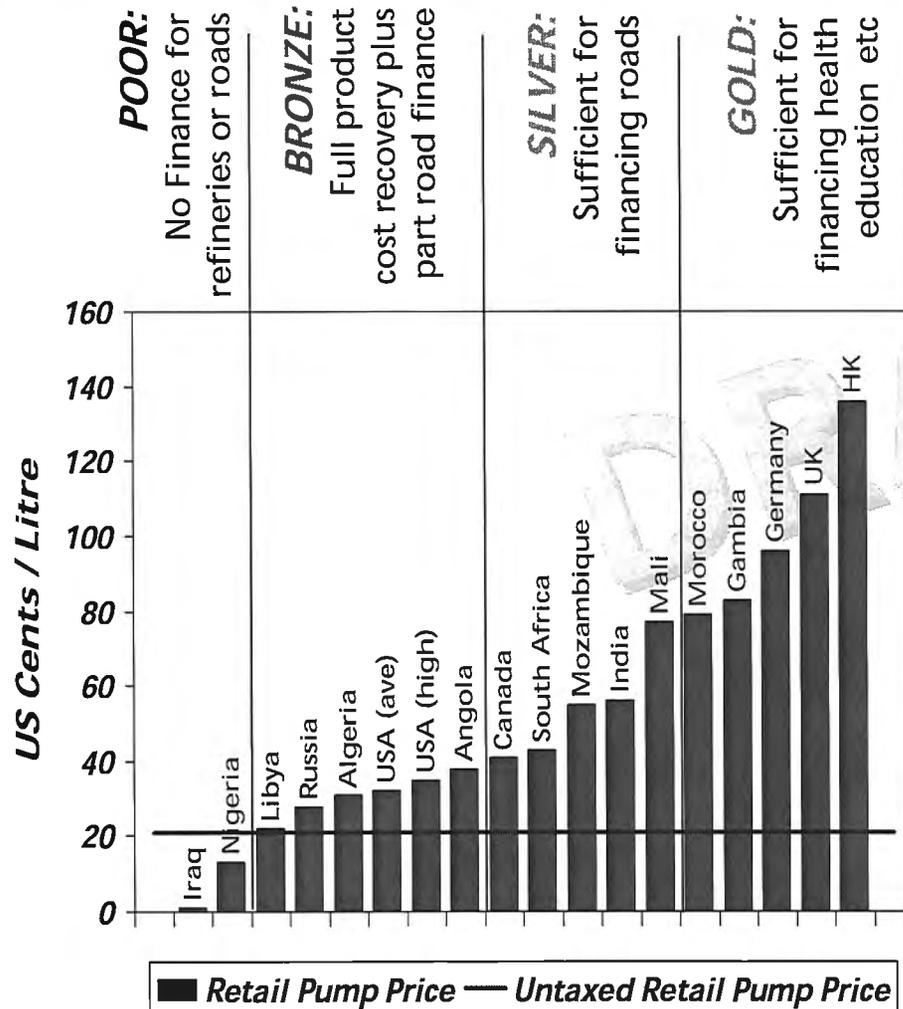
## PMS Price History



### Key Factors

- Pump prices have increased in nominal Naira terms.
- In reality they have remained steady in real Naira terms due to high inflation.
- And have in fact declined dramatically in real terms after exchange rate adjustments. Present PMS prices are ¼ 1994 value.
- This is true for all products

# Subsidy & Implications - Selected Pricing Models

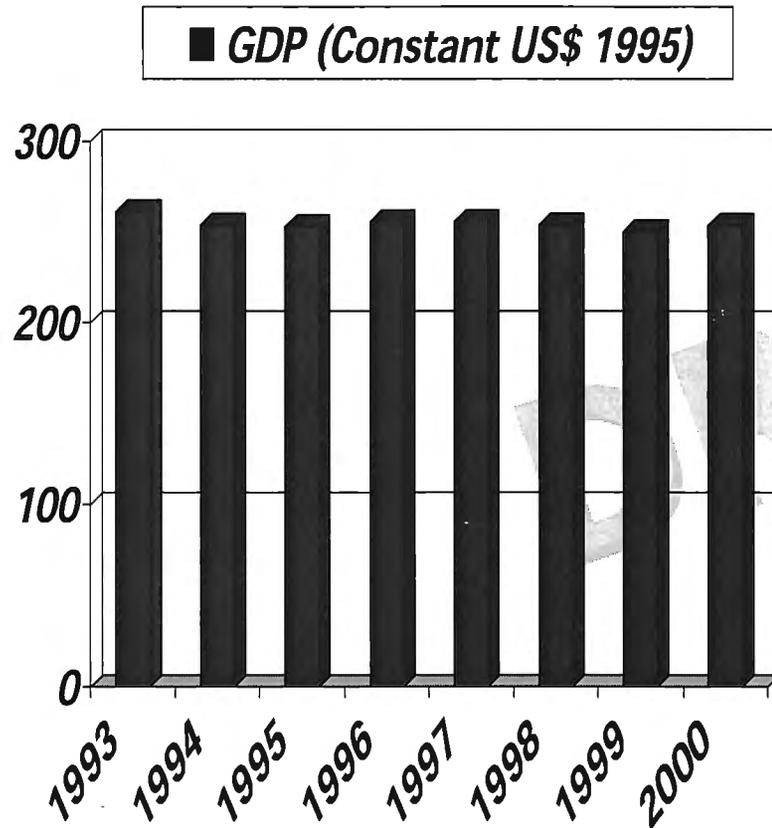


Calculated untaxed retail pump price of gasoline based on prevailing crude oil price and known refinery margins in 1998 = 21 US Cents / Litre.

## Implications of Under-recovery

- Lack of funds for maintenance of refineries and depots
- Lack of funds for road maintenance or new construction projects.
- Cross subsidy from government or other sectors
- Loss of needed investment in education, health etc.

# Fuel Affordability



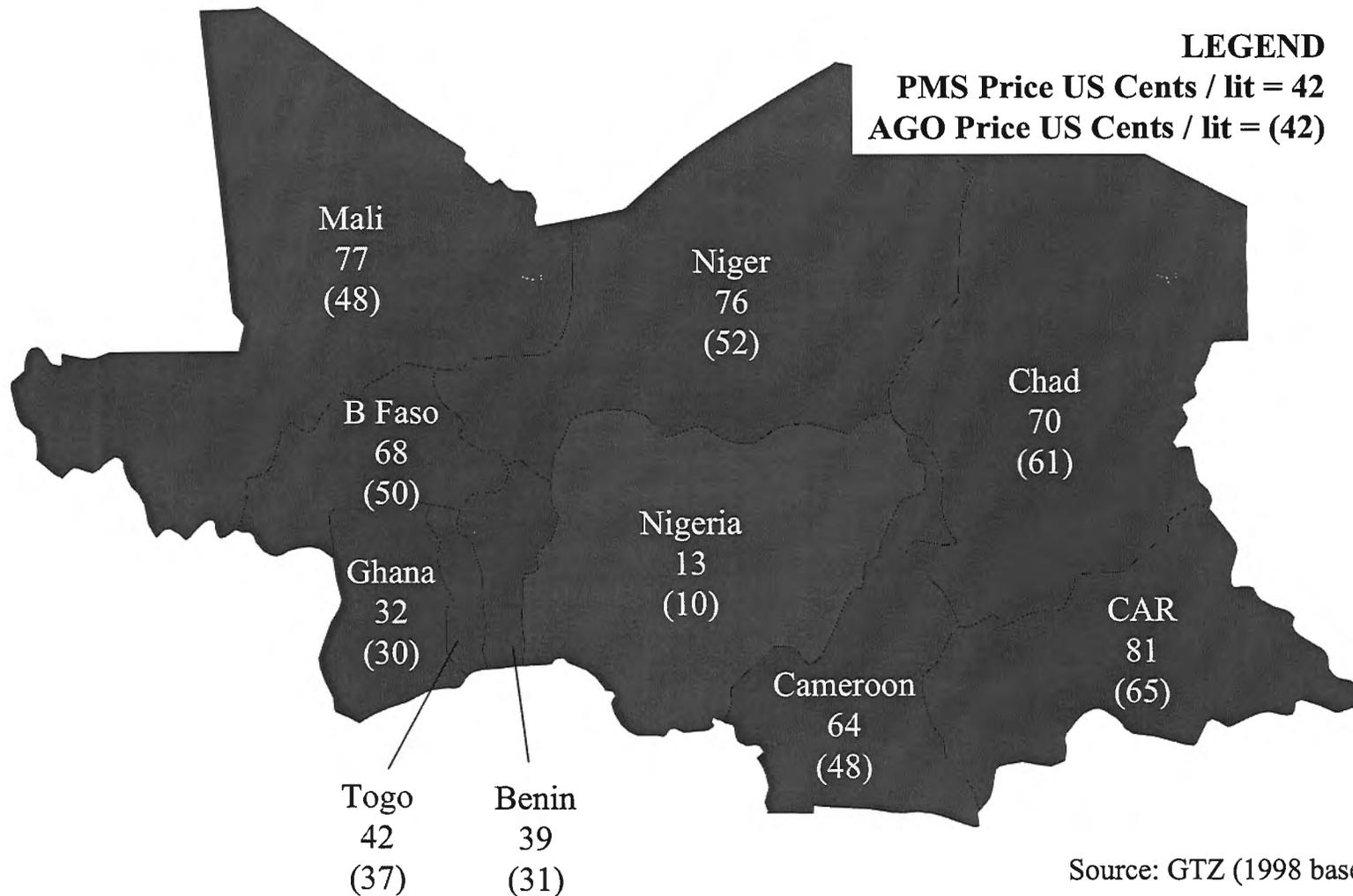
To put fuel price rises in context:

- Fuel prices have declined in real terms by a factor of 4 since 1993
- In the same period, per capita income has remained around US\$250
- Fuel is actually cheaper now than it has been in recent past (4:1 ratio)
- Without reform, further decline in the Nigerian Oil & Gas sector along with public infrastructure & facilities will occur
- Ultimately, economic development, standards of living and health will suffer further

Source: World Bank

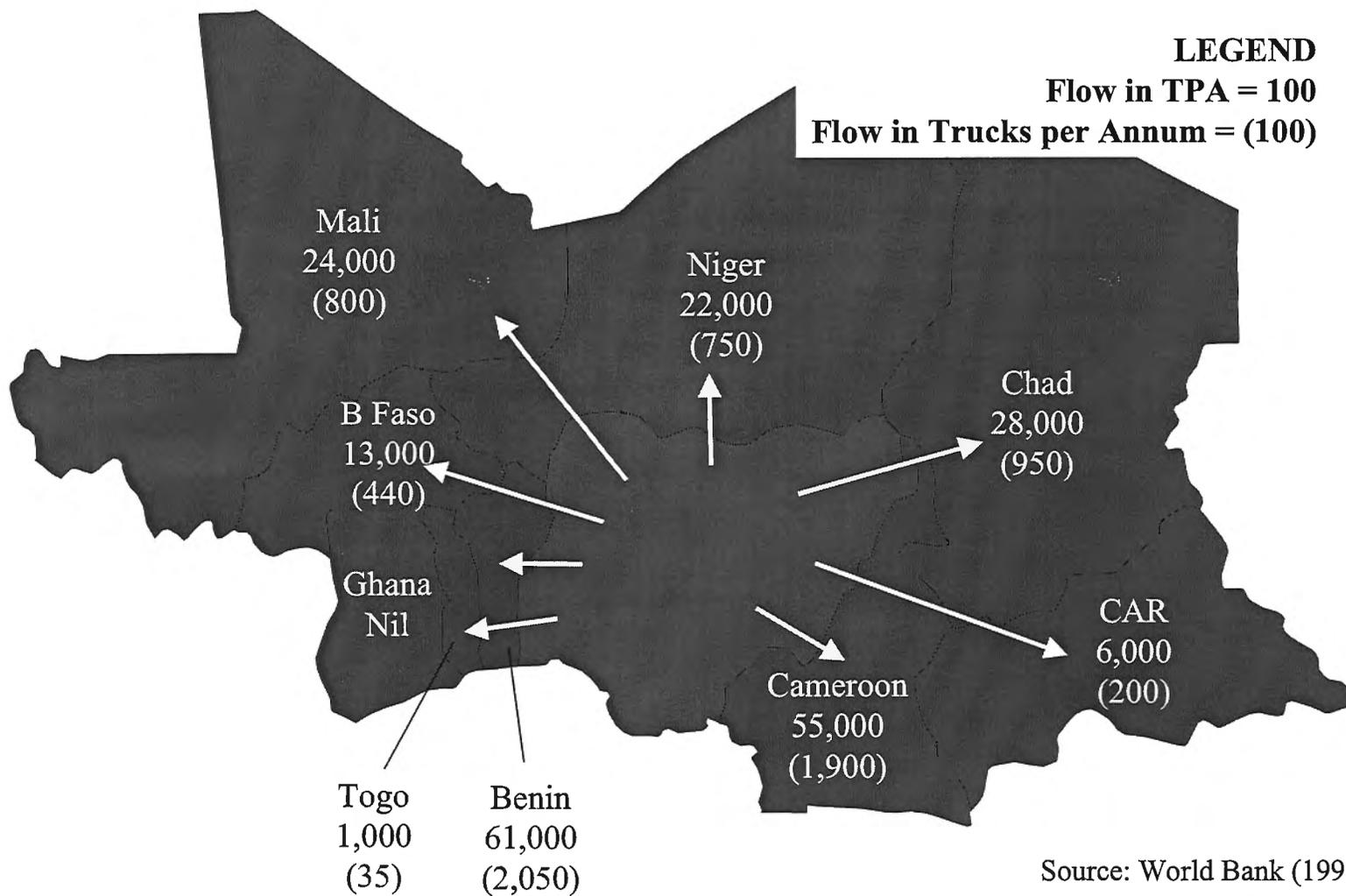
Presentation to PPPRC

# Nigerian vs. Regional Petroleum Product Prices



Source: GTZ (1998 base)

# Regional Smuggling Flows



Source: World Bank (1990)

## Common Myths

| <i>Myths</i>   | <i>Reality</i>  |
|--|---|
| Product prices have been rising consistently for 20 years.   | Product prices have in fact declined in real constant US\$ terms since 1994   |
| Oil is every Nigerian's birthright and must be available cheaply (i.e. subsidised).<br><br>Price rises are another form of embezzlement. | Subsidised fuels benefit the well-off more as they are able to afford cars, generator sets etc. Vehicle Density per 1000 people is 30 (i.e. 3%)<br><br>Mass subsidies deprive government of funds for education, health, roads etc.<br><br>More people (mostly the poor) are killed on Nigeria's dilapidated roads now than ever before |
| Fuel is not affordable anymore   | Per capita income has declined at a slower rate than fuel prices i.e. fuel is really cheaper now  |
| Prices <b>must be uniform</b> across the country   | Petroleum products are a commodity. Take food, a more essential one, price fluctuates depending on proximity to the producer. Market self regulates. The same must apply to fuel. Retaining PEF to ex-depot may be compromise.  |



*Other Country Models*

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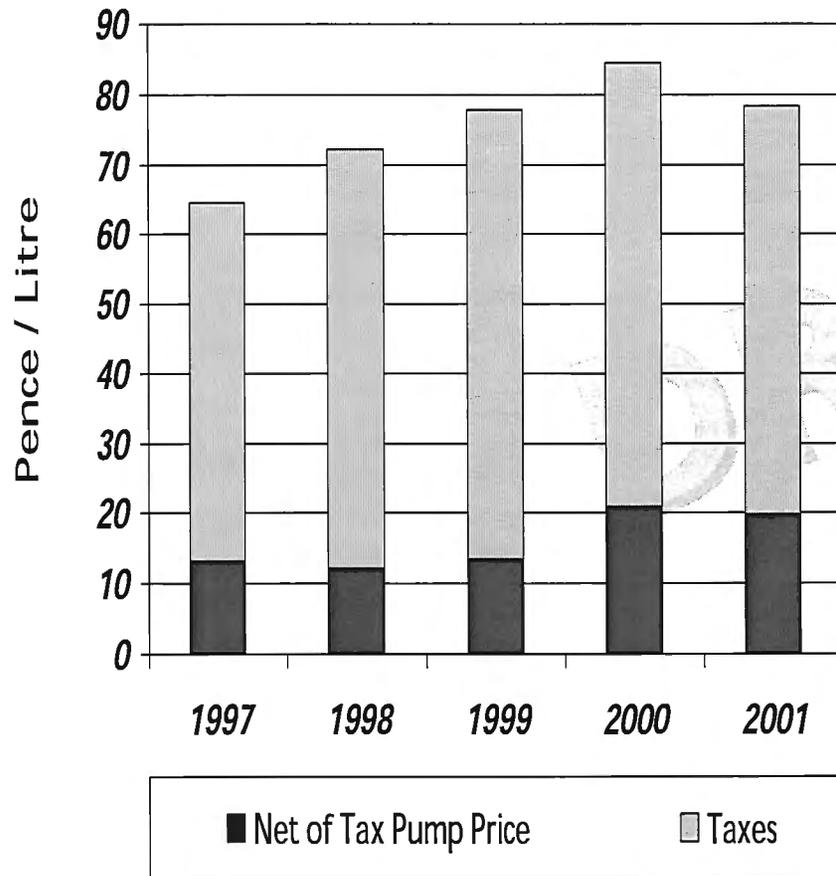
## *Other Country Models*

- Countries with Deregulated Markets
  - United Kingdom
  - Canada
  - Peru
  
- Countries with Transitional Systems
  - South Africa
  - India

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## Deregulated Markets (UK)

UK Pump Prices

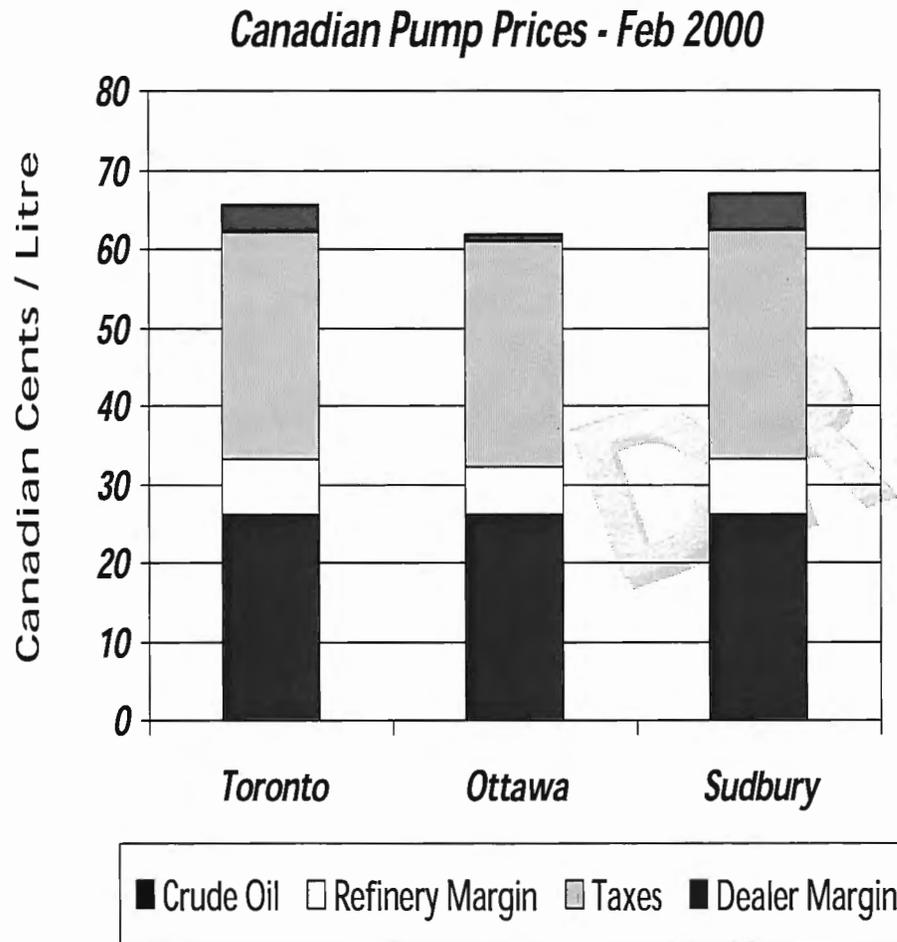


- An example of Product price variation over time with varying crude oil prices
- Tax in the UK now accounts for 75% of pump price
- Proceeds used to fund roads as well as other social infrastructure
- System is less susceptible to international crude and product price fluctuations since it is largely made up of duties

Source: FuelFax Gasoline Price Monitor

Presentation to PPPRC

## Deregulated Markets (Canada)



- An indication of product price variations due to geography
- This also shows a typical formulation of product prices for various Canadian cities having the same crude price input
- Price differences are quite minimal despite the significant distances involved between these areas due to adequate distribution infrastructure and market competition
- Price difference is mainly dealer margin fluctuation (despite same base cost) in order to maintain volume of sales
- Note:
  - Majors more able to absorb differential margins on account of numerous outlets
  - Single outlet operations are much less able to sustain long periods of low returns on investment

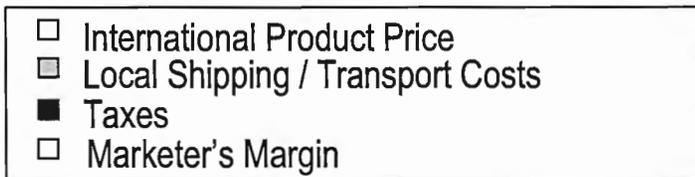
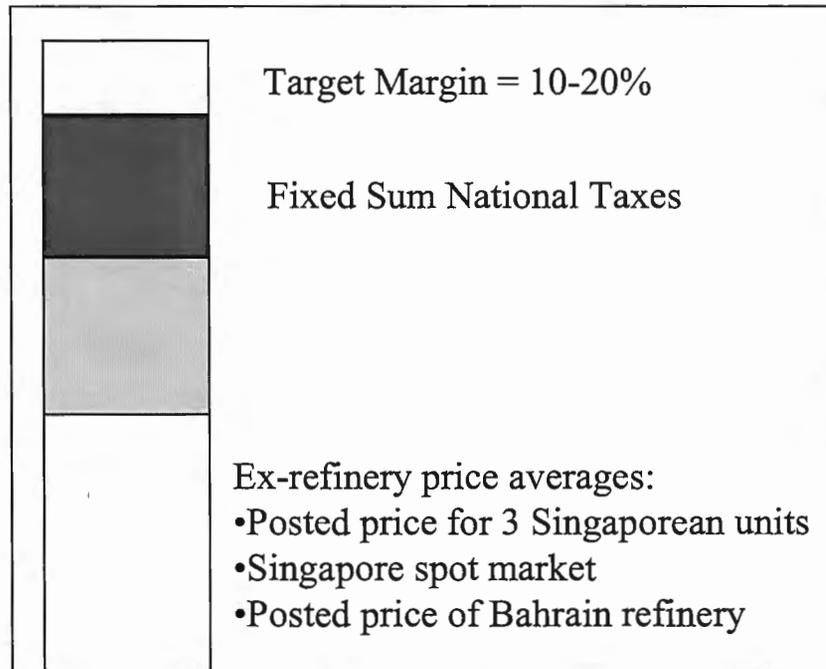
Source: FuelFax Gasoline Price Monitor

## *Deregulated Markets (Peru)*

- Fujimore Govt. elected early 1990. "Single shock" applied to sector 91-92:
  - PetroPeru monopoly ended and free entrance to all aspects of oil / gas chain granted to private companies
  - Fuel subsidies eliminated, taxes raised, margins deregulated
  - 4x increase in fuel price in real terms (30x in nominal terms)
- Price was high unemployment, immediate recession, and early failure of refinery privatisation
  - Not enough time allowed for market to see evidence of benefits of market reform
- But allowed solid financial footing for former state monopoly companies
- Peru's economy rebounded with highest growth rate in region after 5 years
- Competition in market now determines pump price after initially high margins
- Fuel taxes raised annually now = US\$1.0b.

# Transitional Markets (South Africa)

## South African Pump Price Build-up



Source: SAPIA (www.sapia.co.za)

Presentation to PPPRC

## Key components:

- SA imports crude to refine
- Import parity product pricing
- Monthly price change on 1<sup>st</sup> Wed
- US\$ basis converted to Rand
- Pump prices capped
- Over/under recovery adjustments by simple formula

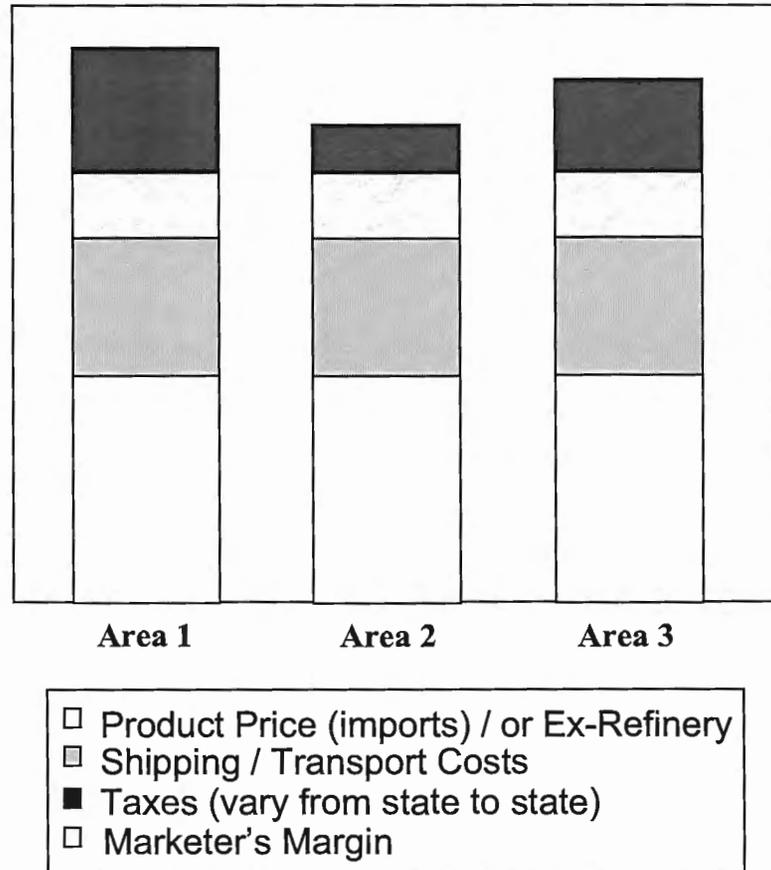
Aggregate last Year industry income / total industry assets = 15%

## Future plans:

- 2002: amendments to energy bill
- 2002-4: Policy direction clarification
- 2005-10: Managed liberalization

# Transitional Markets (India)

Indian Petroleum Products Price Build-up



Source: Internet (various)

Presentation to PPPRC

## Present Position / Key Components:

- "Uniform" pump prices across country
- Vary from state to state only due to taxes
- APM (introduced after 1973/74 oil shocks)
- Oil Pool Account in deficit for some years now

## Issues:

- Marketers incurring heavy losses
- System deters foreign investment in sector
- Indian economy constrained as a result

## *Transitional Markets (India contd.)*

### ***Reforms:***

- Culmination of a 4 year process starting in '98
- Removal of administered pricing mechanism
- Staged implementation of new Variable Pricing System until import parity reached
- System recovers cost of transport for inland areas from consumers
- New more robust regulatory body to replace Oil Coordination Committee
- New system to compensate marketers for costs of holding strategic stocks

Source: Internet (various)

*Presentation to PPPRC*

## Summary of Other Country Models

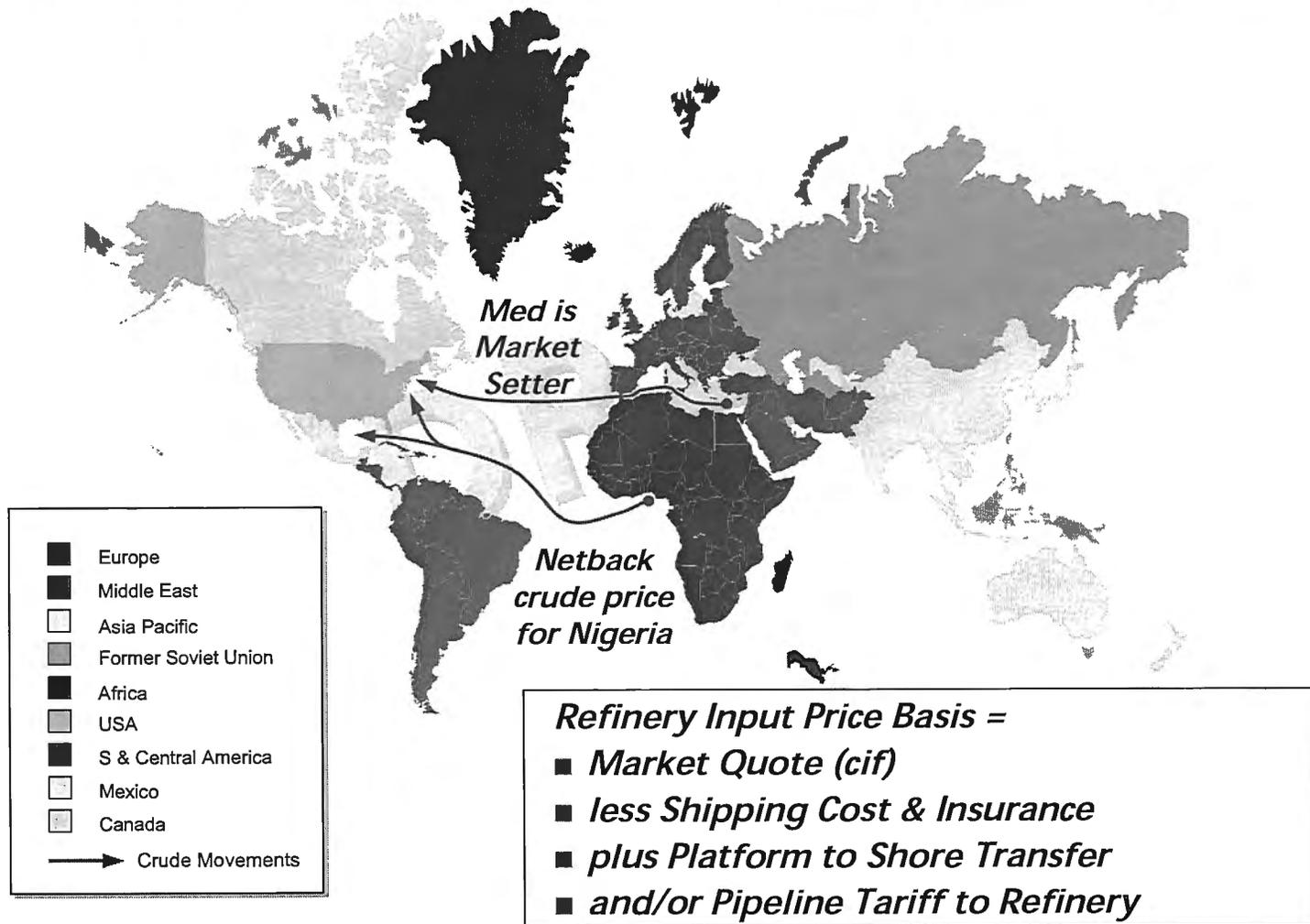
| <i>Other Countries</i>   | <i>Nigeria</i>   |
|--|--|
| Taxes often constitute the single largest component of pump prices, enabling funding of social infrastructure  | No end-user taxation exists on petroleum products, consequently transport infrastructure development and maintenance is non-existent   |
| Crude oil is the second largest component of pricing and its pricing is based on international markets   | This is not the case in Nigeria. Recent reforms have improved this but the refinery price is still FIXED!  |
| Refinery margins are market determined: <ul style="list-style-type: none"> <li>■ Encourages competition</li> <li>■ Improves efficiency</li> <li>■ Lower product prices result</li> </ul> | Refinery margins are fixed and are too low: <ul style="list-style-type: none"> <li>■ Discourages efficiency</li> <li>■ Maintenance costs are unaffordable</li> <li>■ Frequent breakdowns result</li> </ul> |
| Retailers margins are razor thin due to level of competition.<br>Regulation focused on product quality and HSE standards   | Margins are guaranteed<br>Retailers profit even with minimum quality standards, often hoarding to further gain from black-market prices<br>Regulation is focused on price cheats                           |



*Crude & Product Market Characteristics*

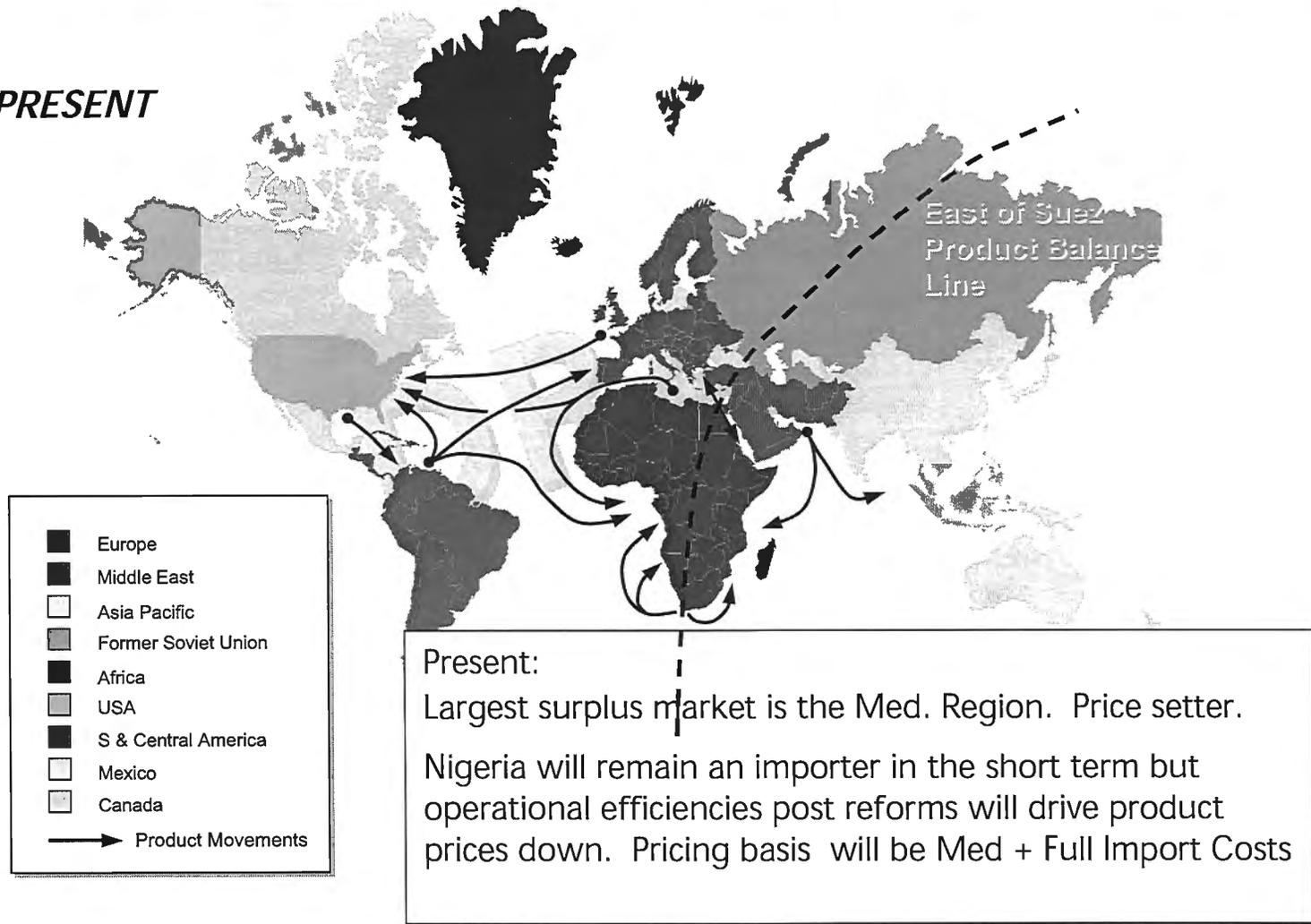
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# Crude Price Market Determinant



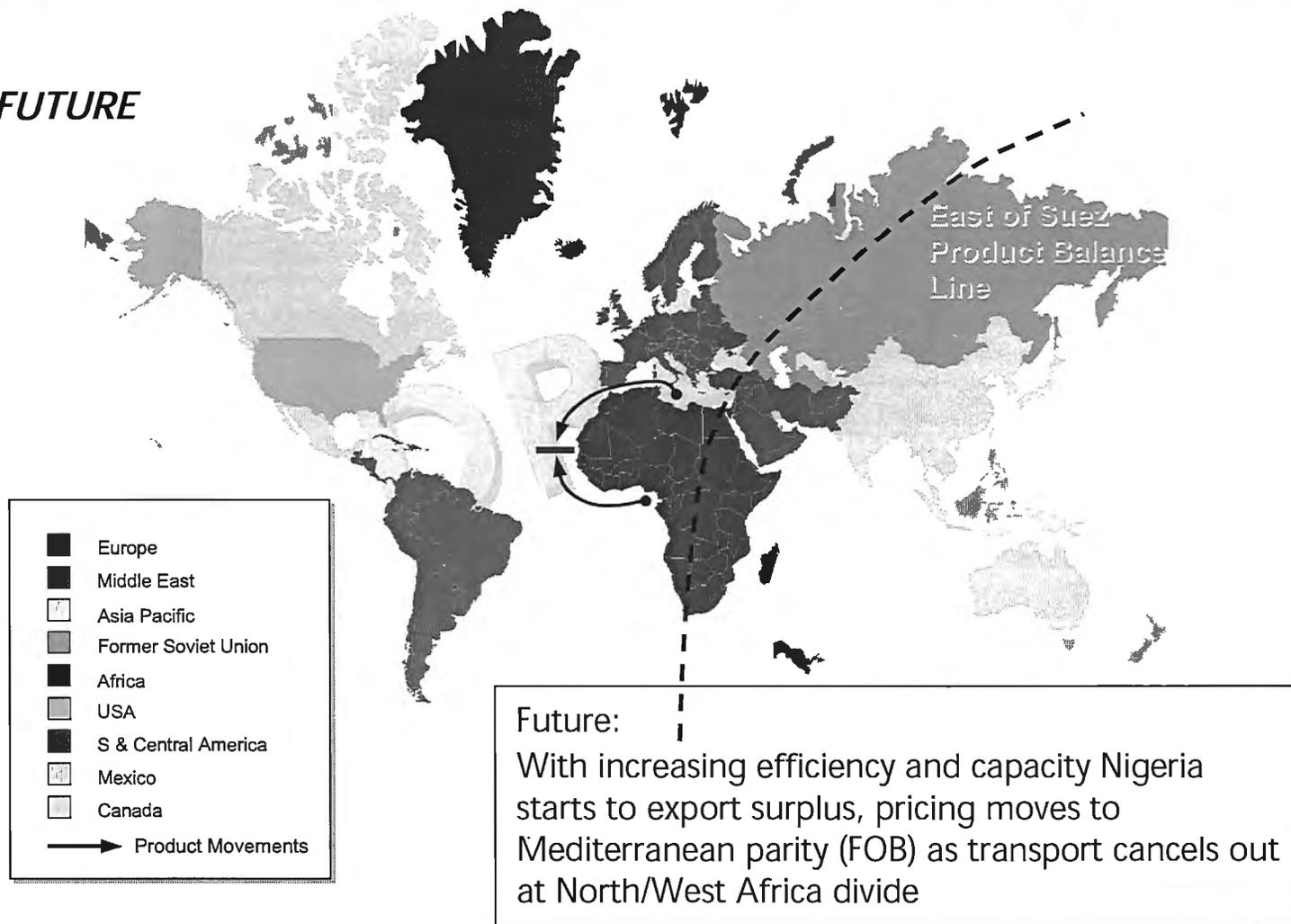
# Product Price Market Determinant

**PRESENT**



# Product Price Market Determinant

**FUTURE**





*Summary of Present Approach*

# *Present Approach*

- **Crude Oil Pricing into Refineries**
  - Fixed crude costs
  - Sub-optimal cost recovery
  - Insufficient funding for infrastructure maintenance/growth
- **Refinery Operation**
  - State owned parastatal, Ministry controlled
  - Margins are fixed
  - Insufficient funding to finance regular maintenance resulting in long down times and loss of productivity
- **Bulk Storage & Pipeline Transportation**
  - Tariffs based on a fixed margin per litre irrespective of distance moved
  - PPMC facilities currently poorly maintained, leading to frequent breakdowns and costly distribution of product by road ("bridging").
- **Taxes & Duties**
  - Import duties apply and may be significant due to volume of importation presently (about 10m litres per day). Zero sum (Govt to Govt).
  - Taxes are marginal or non-existent

# *Present Approach*

- Dealer Margins
  - Dealer margins are fixed by a pricing formula
  - Encourages sub optimal operation of facilities (under staffing, minimum number of pumps etc.) as profits can be maximised that way.
- Product Prices
  - Fixed pump prices
  - Subsidised product
  - Encourages smuggling as pricing contrasts with policy of neighbouring countries
  - Sub-optimal cost recovery
  - Insufficient funding for infrastructure maintenance/growth
  - Severe product shortages
- Other Country Models
  - International crude prices into refineries
  - Import parity product price setting (deficit markets)
  - Export parity product pricing (surplus markets)
  - Road fuel is taxed (user pays concept for infrastructure maintenance / development)
  - Regulatory body is autonomous of political establishments and regulates on standards and HSE issues, rarely pricing



## *Proposed Model for Nigeria*

*There is no reason why Nigeria should not be the primary source of products for the West Africa region.*

# *Proposed Model*

## *Crude Oil Pricing into Refineries*

- Refinery crude oil pricing MUST be on Export Parity basis to ensure FGN recovers the full economic value of oil, and that the refineries have a true cost basis for accounting
- Recommendation is for Bi-monthly adjustments to refinery Crude Oil price in order to avoid excessive loses or gains to refineries due to external crude price movements.

## *Refinery Operations / Margins*

- Refineries to be allowed to set product prices at refinery gates (proviso is that refinery section has been opened up to competition from imports)
- Else refineries are set a Margin to cover operating costs and profit, so as to allow them more autonomy to make their own maintenance investment decisions
- Margin review for refineries to be yearly or twice yearly in the latter event

## *Bulk Storage & Pipeline Transportation*

- Privatised facilities or redefine PPMC ownership (move away from NNPC monopoly)
- Open petroleum products pipeline and depots up to third party access.
- Allow facilities to earn a margin sufficient to maintain facilities and make a profit for reinvestment in new infrastructure.
- Minimise bridging
- Introduce tariffs and base on a fee for storage and a volume-distance (/Tonne/km) calculation for transport. This to be determined against PPMC cost of operation.

## *Proposed Model*

### *Import Duties*

- In a properly functioning energy sector, Import duties will not constitute a significant burden on consumers (as little or no product import)
- Removal of duties as presently proposed only serves to mask real issues i.e. product pricing and commercial structure of NNPC/PPMC. They are not the solution and may be counter productive, i.e. they encourage importation as opposed to local production.

### *Product Prices*

- Move prices to Import Parity basis due to volume of importation, gradual market move to Export Parity as local production increases.
- Subsidies to be retained for sensitive fuels (i.e. DPK)
- Retain PEF but limit to ex-depot basis. Beyond that let prices float. Marketers margins are thin enough for to mean insignificant differences within zones.
- Publish prices ex-depot regularly. Let consumers be price watchdogs.

# Proposed Model

## *Product Taxes*

- For any nation, particularly a developing nation, petroleum product taxation is a key area of funding necessary to finance transport and other social infrastructure expenditure.
- Sooner rather than later taxes will need to be introduced to arrest continued economic decline and fund public projects. A gradual introduction would be prudent.
- Example. NGN1 in product taxes ~ 1% increase in FGN budgetary revenue.
- Tax components whenever introduced must be immediate pass through – prevents hoarding
- Tax clean fuels and those for the poor less

## *Dealer / Marketing Margins*

- Nigerian marketing and retail margins appear reasonable – no action essential
  - In countries with deregulated product markets, dealer margins are comparatively small and can be negative in years of high crude oil prices and relatively low international product prices. The key to profitability in the industry is volume and market share.
  - Marketers need incentives to make capital investment to their outlets:
    - In order to achieve high volume sales necessary to stay in business
  - This incentive is the ability to earn a decent margin (10-15% on an IRR basis)
  - The nature of petroleum product retailing is such that competition will regulate the market to “sensible margins”.

# Proposed Model

## *Regulatory*

- ***Regulation must be robust and well funded.***
- ***Without effective regulation, a deregulated market with a large number of independent suppliers will lead to total product degradation (e.g Pakistan prior).***
- ***Roles of PPPRC and DPR to be reviewed consolidated***
- Regulatory focus to shift from price to quality and HSE standards. Note:
  - Kerosene can be adulterated into gasoline by up to 5% and into diesel by up to 20% without consumers noticing, regulations is only protection.
  - A large differential in treatment of kerosene from gasoline and diesel encourages this practice, particularly with ineffective or inadequate regulation.
  - Real social cost in loss of revenue, damage to cars, accidents and loss of life.
  - Kerosene pricing policy must be balanced in view of above and social responsibility of government to provide affordable fuel for the poor
- Regulator to be autonomous but guided by Ministry of Petroleum through laws etc.
- Funding of regulator may be through fuel taxes i.e. industry pays for its own watchdog.

## *Proposed Model*

### ***SEQUENCE OF EVENTS***

- 1) Import parity pricing for products (allows refineries earn a better margin to finance upgrades, and improve performance)
- 2) Then move crude pricing to export parity into refineries
- 3) ?

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# *Proposed Model*

## *PLANNED OUTCOMES*

### *Short Term*

- Improved funding, maintenance and operation of existing NNPC/PPMC facilities
- Increased product availability country wide
- Resultant drop in fuel costs / prices with more efficient refinery sector
- Eliminate NNPC losses of US\$700m (1998 figures)
- FGN budgetary funds increase for wages, health etc.
- Arrest economic stagnation / economic growth

### *Longer Term*

- New more efficient (world scale) refineries
- Export earnings from surplus product
- Improved transport infrastructure through tax funds
- Generate profits of US\$250m from refinery operations



*Discussion / Feedback*

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## TIME LINE FOR THE PRISMS

| S/No | Date                | Activity   |
|------|---------------------|--|
| 1    | August 18, 2003     | Closing date for Comments  |
| 2    | August 22, 2003     | Final RFP  |
| 3    | September 19, 2003  | Proposal due date  |
| 4    | September 26, 2003  | Evaluation of Proposal   |
| 5    | September 29, 200   | Evaluation memo to CO  |
| 6    | September 30, 2003  | Request BAFO from pre-selected bidders                           |
| 7    | October 14, 2003    | BAFO due date  |
| 8    | October 15-21, 2003 | BAFO review date   |
| 9    | October 23, 2003    | Evaluation memo (BAFO) to CO                                     |
| 10   | October 23, 2003    | Congressional Award Notification prepared by CTO and given to CO |
| 11   | October 24-28, 2003 | Notification + Award preparation/issuance by CO                  |
| 12   | October 29, 2003    | Award signed   |