

VIETNAM'S BIOFUELS PROJECT TARGETING 2015 VISION 2020

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November 2005

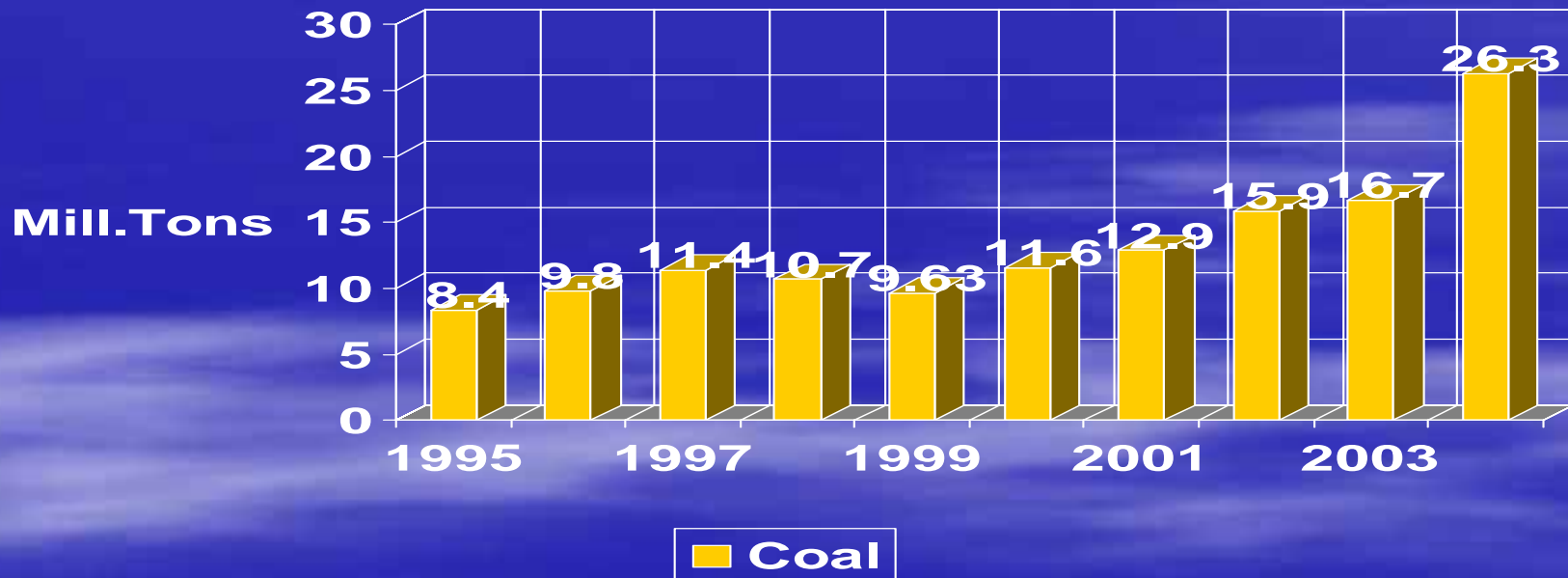
BIOMASS-ASIA 2005

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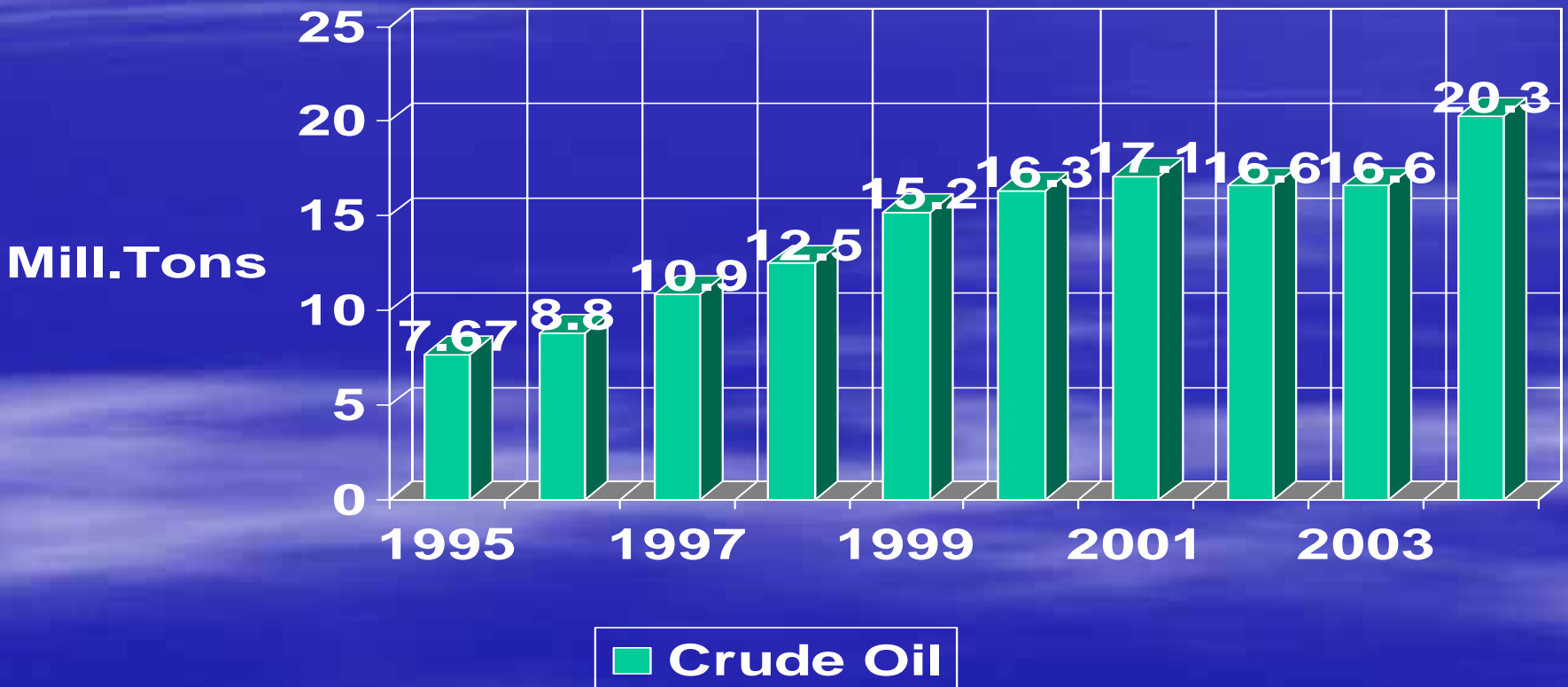
1) Vietnams' Energy Balance

■ Coal Production 1995-2004



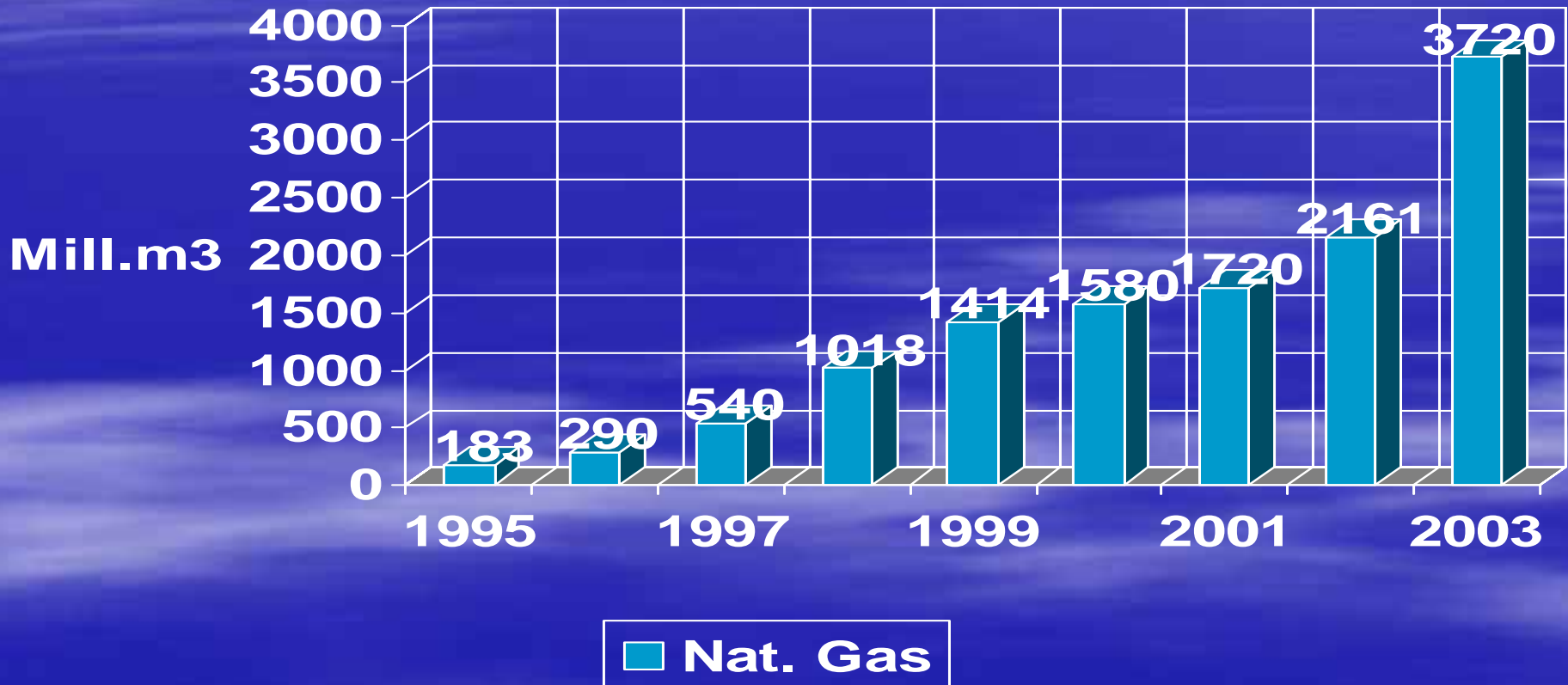
1) Vietnams' Energy Balance

■ Crude Oil Production



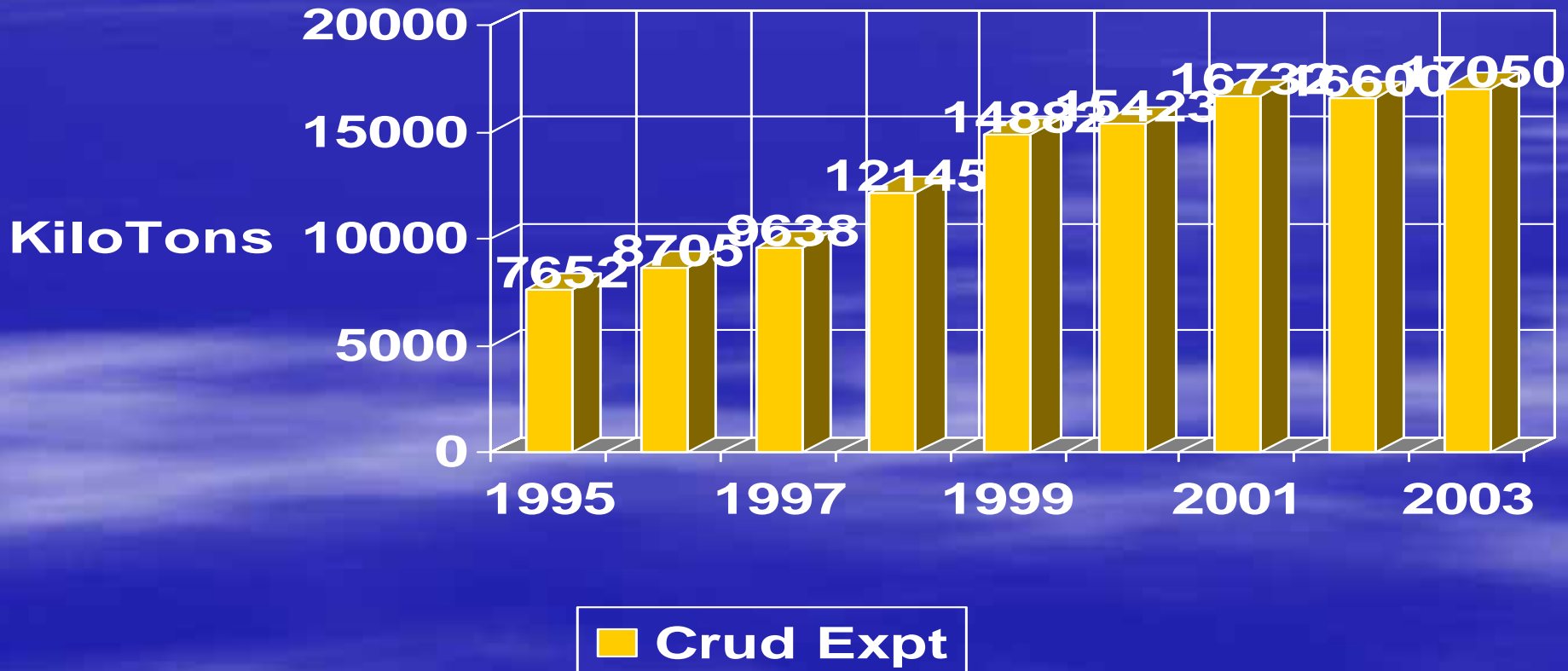
1) Vietnams' Energy Balance

■ Natural Gas Production



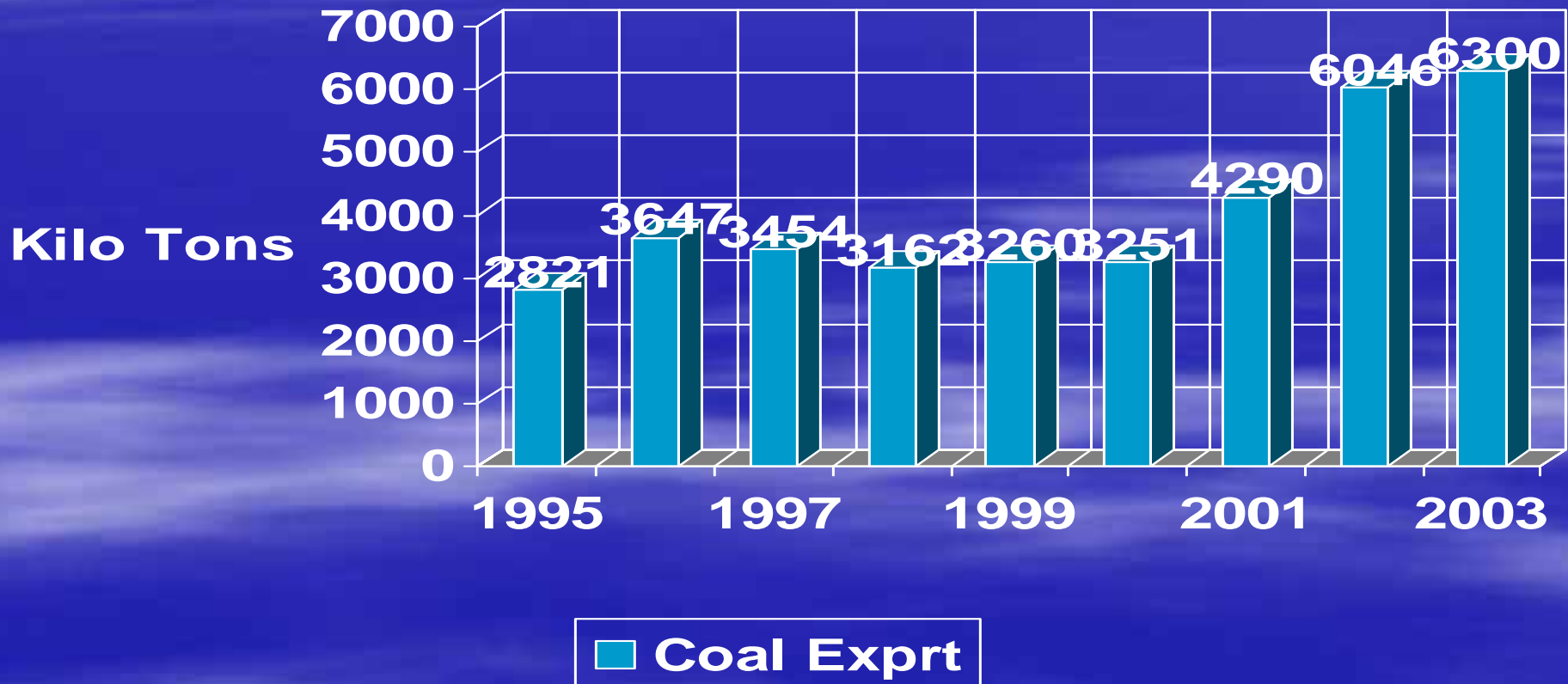
1) Vietnams' Energy Balance

- Crude Oil Export



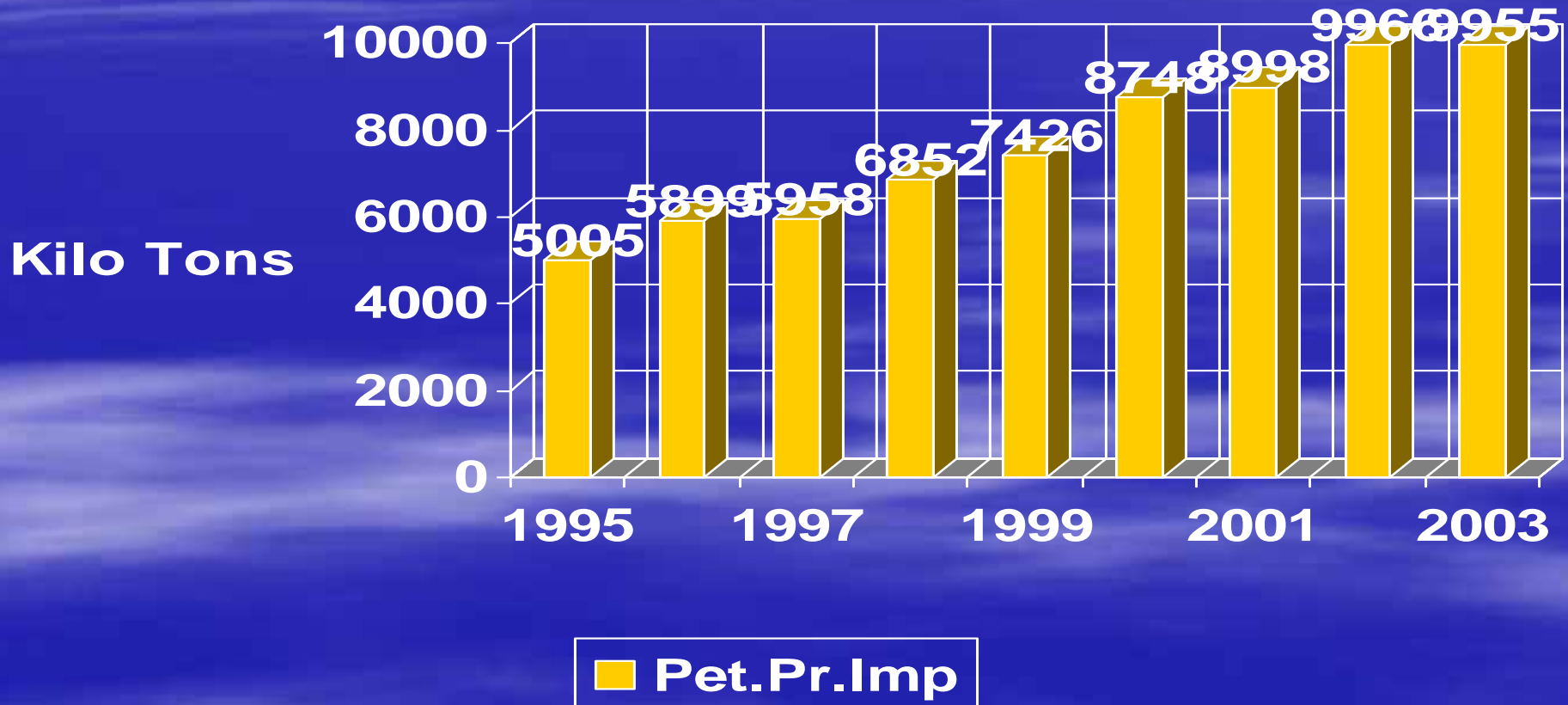
1) Vietnams' Energy Balance

■ Coal Export



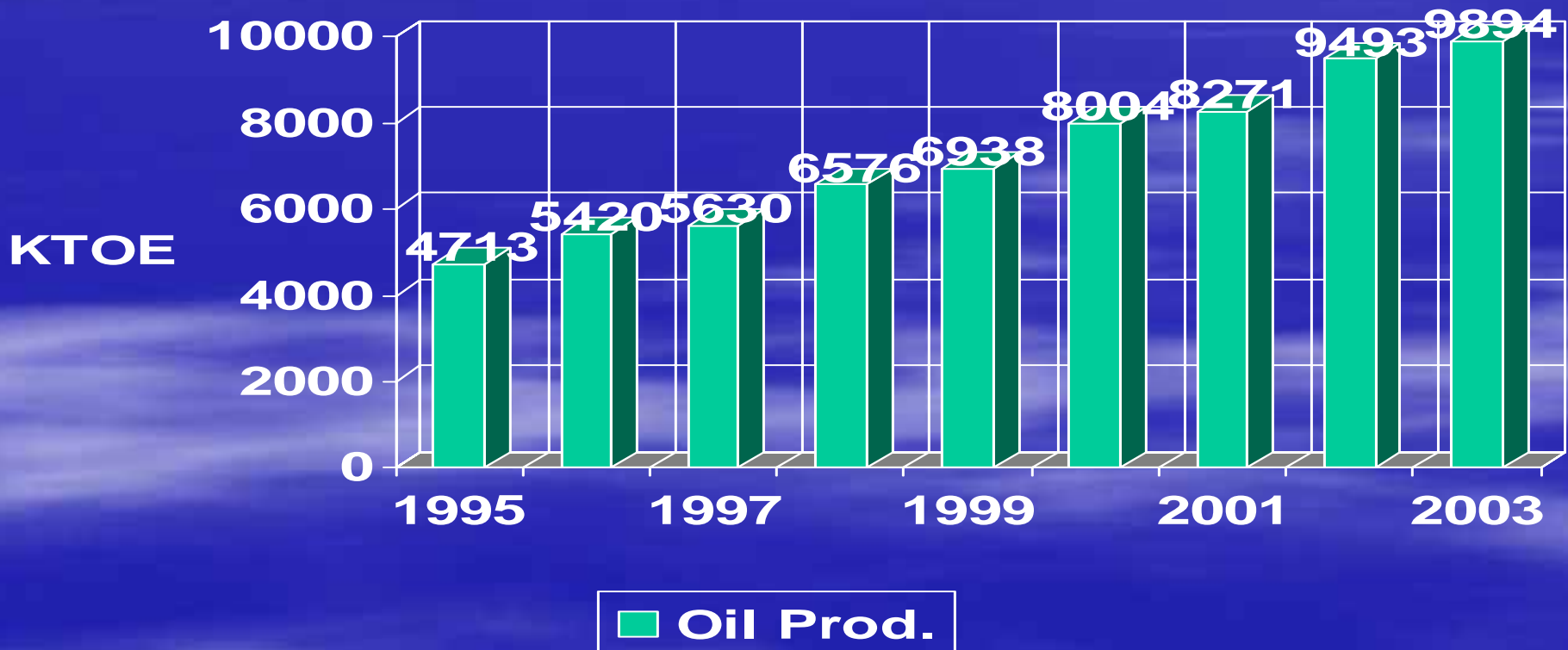
1) Vietnams' Energy Balance

- Petroleum Products Import



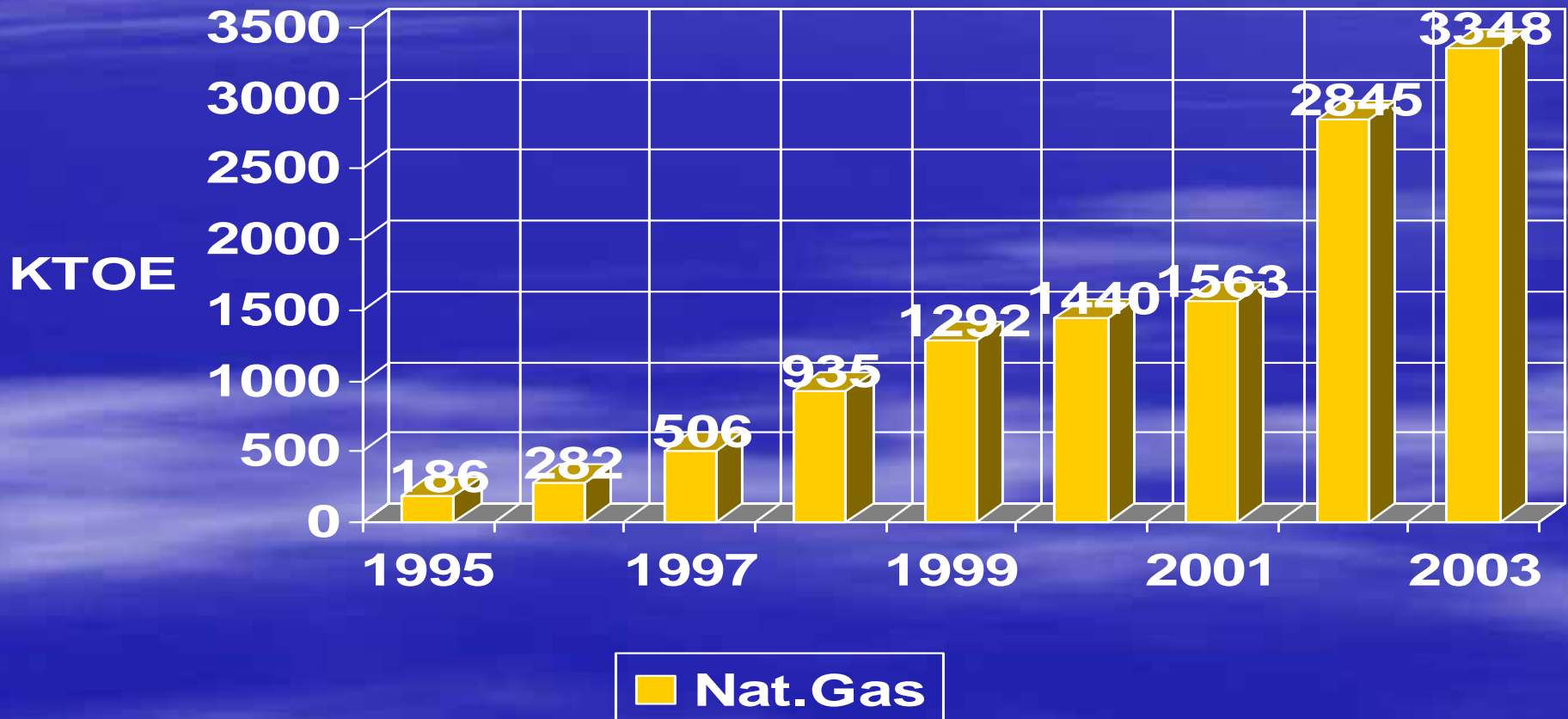
1) Vietnams' Energy Balance

- Primary Energy Consumption: Oil Products



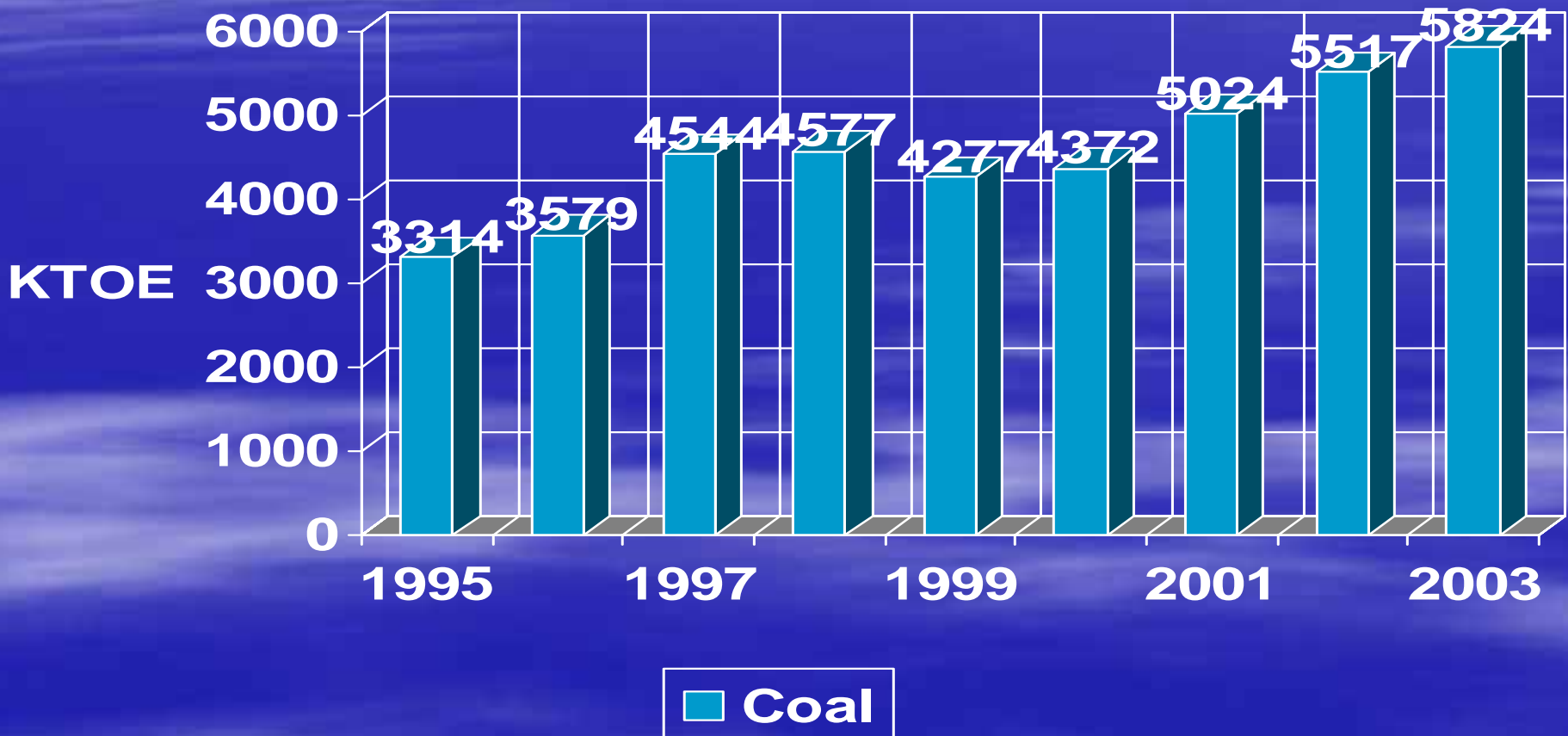
1) Vietnams' Energy Balance

– Primary Energy Consumption: Natural Gas



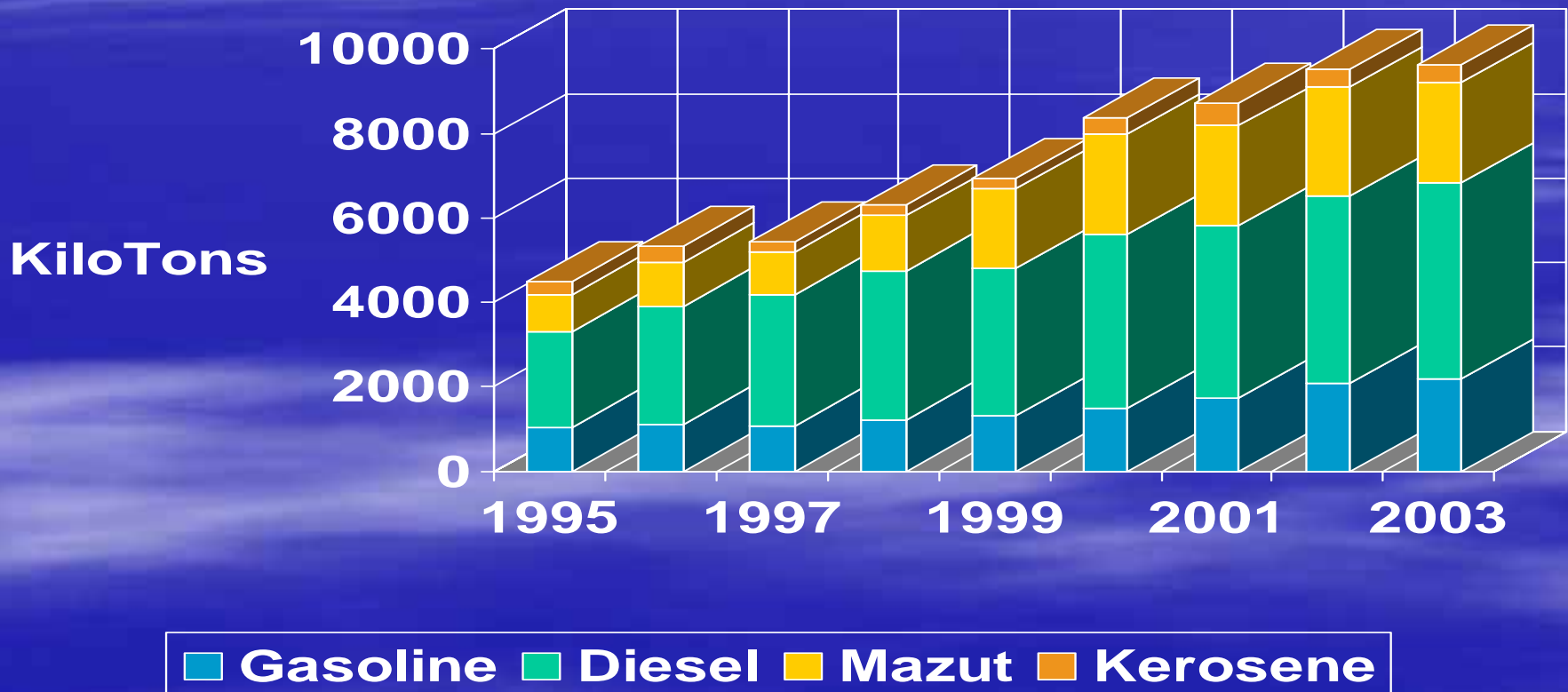
1) Vietnams' Energy Balance

- Primary Energy Consumption: Coal



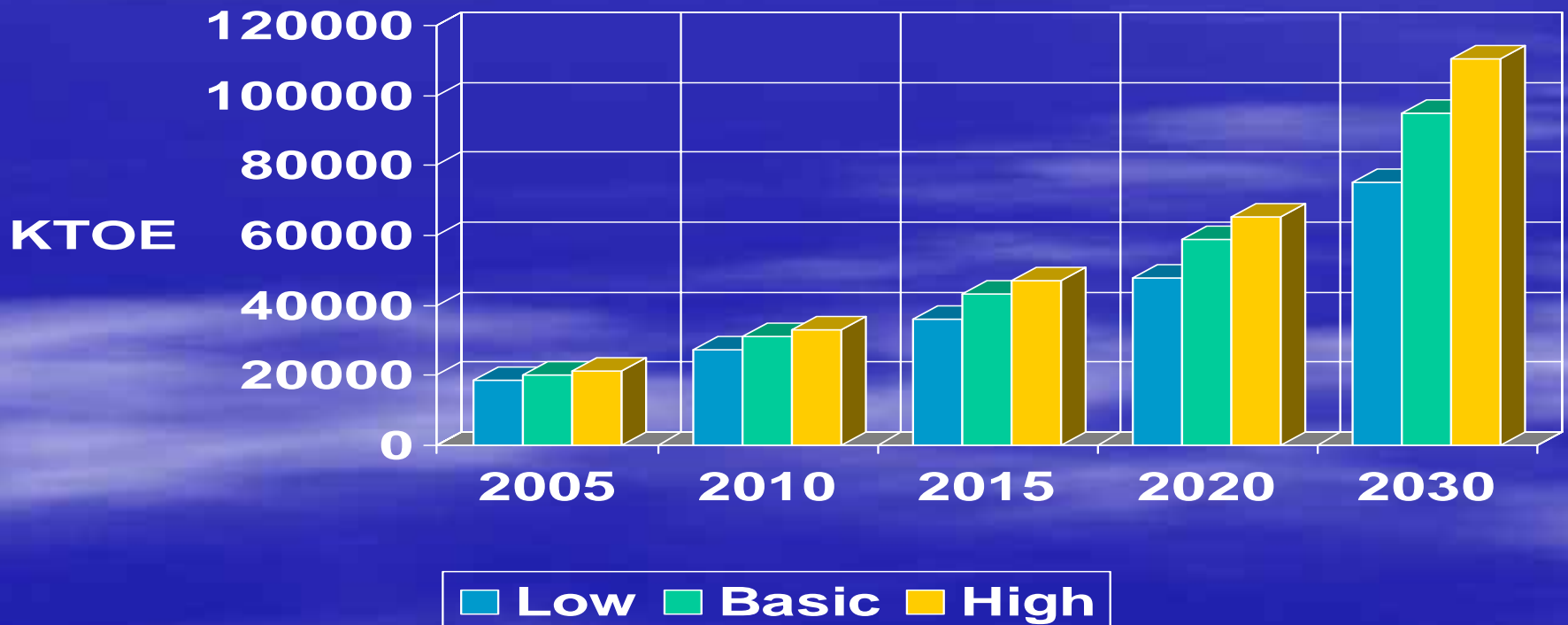
1) Vietnams' Energy Balance

■ Petroleum Products Import Break Down



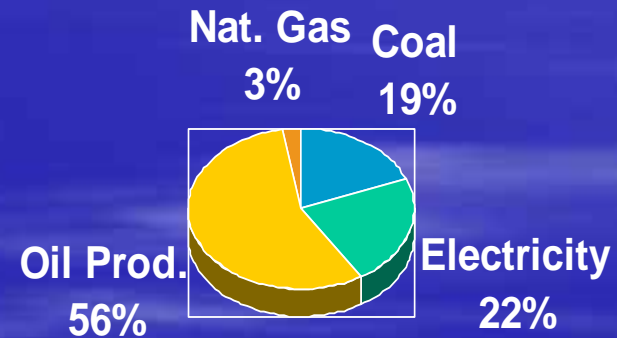
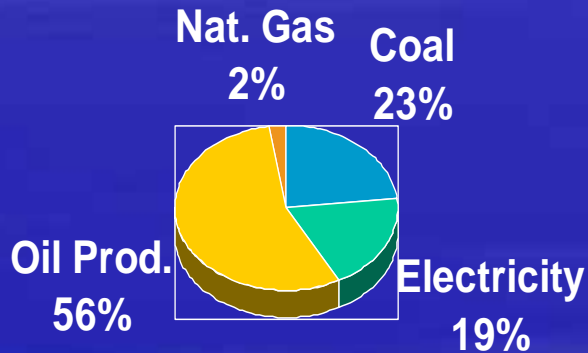
1) Vietnams' Energy Balance

- Total Energy Demand Forecast to 2030



1) Vietnams' Energy Balance

- Total Energy Demand Forecast Break Down
2005 2010



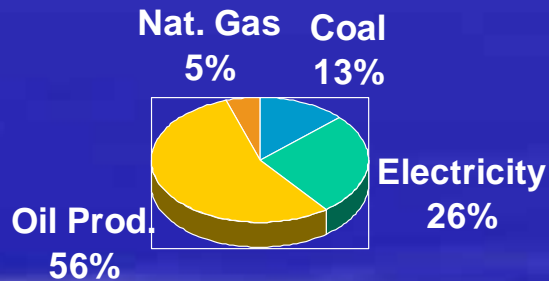
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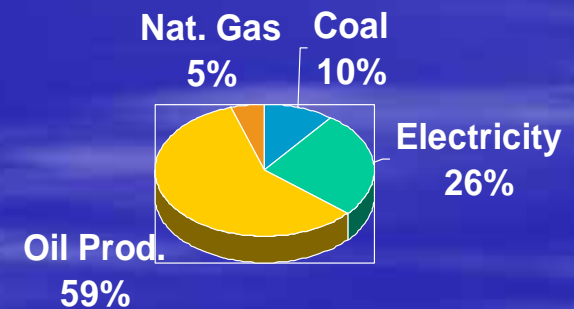
1) Vietnams' Energy Balance

■ Total Energy Demand Forecast Break Down

2020



2030

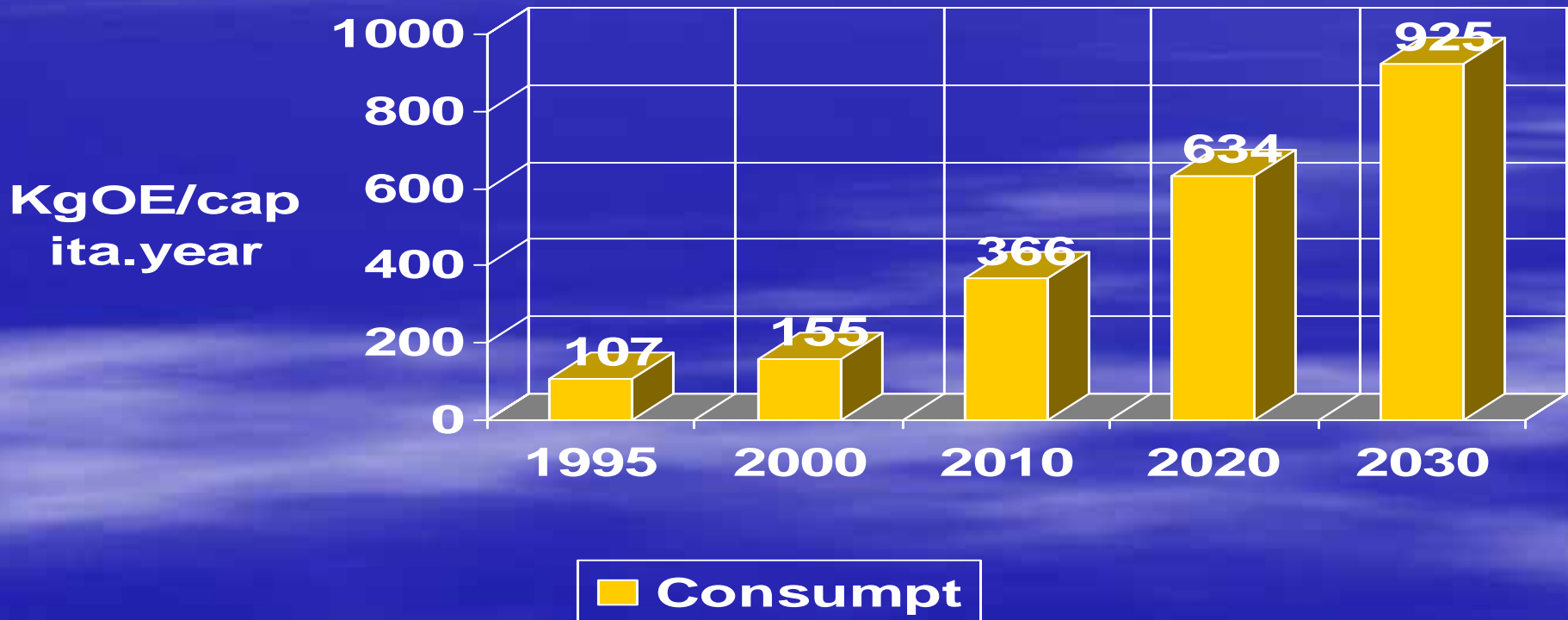


■ Coal ■ Electricity ■ Oil Prod. ■ Nat. Gas

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1) Vietnams' Energy Balance

- Average Per Capita Energy Consumption



1) Vietnams' Energy Balance

- General Assessment of Vietnam's Energy System
 1. Natural energy resources potential of the country can basically meet the demand. Average GDP growth 6-7% over last decade, energy elasticity 1.49.
 2. For primary energy: Lack of adequate facilities for processing and conversion of energy. Backward technology leading to ineffectiveness of mining and conversion of energy. High percentage (47%) of noncommercial energy by biomass, which is being spontaneously developing in countryside, affecting negatively environment.

(to be continued)

1) Vietnams' Energy Balance

- General Assessment of Vietnam's Energy System
3. Energy export in raw form nonefficient, meanwhile nearly all petroleum products (covering 60% energy demand) are imported.
 4. Power sources system is being diversified but still unreasonable. Power grid not fit to power sources causing high losses and low grid stability and safety.
 5. Low efficiency in energy use. High potential for energy conservancy (up to 20% in some surveyed cases).
 6. Need of environmental measures to be foreseen in the near future.

2) Moves Towards Biofuels

- Potential of biofuels production in Vietnam:
 - i. Raw material for production of Ethanol:
 1. Rice'
 2. Maze,
 3. Pattate (sweet potato),
 4. Tapioca,
 5. Sugar cane.
 - ii. Raw material for plant oil:
 1. Soya bean,
 2. Ground nut,
 3. Coconut.

2) Moves Towards Biofuels

- APP, Saigon Petrol, Lam Son Sugar Mill:
Pilot scale use of gasoline mixed with Ethanol for internal combustion engines, use of Methyl Ester as biodiesel in lab scale.
- I. **Potentials of Biofuels Production :**
 - i. **Raw material for Ethanol:**
 - 1. Rice production: in 2003 there are 7.45 mill.ha of rice fields producing 34.5 mill.T of rice.
(to be continued)

2) Moves Towards Biofuels

Average yield 4.63 T/ha. Possibility for intensive cultivation, new rice varieties reaching higher yield per ha in order to reduce rice field area giving room for other industrial plants.

- Maze production: in 2003 about 910,000 ha producing 2.933 mill.T of maze, yield per ha 3.22T. Used as foodstuff or fodder. Need of new varieties, cultivation technology with higher yield to increase fodder production.

(continued)....

2) Moves Towards Biofuels

- General assessment of raw material basis for alcohol production:
 - i. Vietnam has big potential for developing large area of raw material for alcohol production like rice, maize, tapioca, potato, sugar cane.
 - ii. Present cultivation area does not allow to produce alcohol in large scale. But medium and small scale production are suitable.
 - iii. It is advisable to develop large scale cultivation area of tapioca and sugar cane, using high yield varieties, new cultivation technology. By 2010 sugar cane area increased to 356,500 ha, producing 20 mil. T. If all planning measures be realized Vietnam may produce 5 bill. Liters/year of alcohol.

Biofuels Project Goals

- **General Goals:** Biofuels to replace partly conventional fuels, to attend energy safety and environment protection, contribute to change pattern of agriculture plants.
- 1. **Period 2006-2010:**
 - Public awareness of biofuels benefits, approach appropriate technology of biomass convergence into fuels, blending technology.

(continued).....

Biofuels Project Goals

- Building biofuels distribution infrastructure in some selected cities, provinces.
- Human resources development for production. Tuning of production trial module of 30 mill. litres of E10 and 20 mill. liters of B5.
- Zoning of raw material area, production of new high yield breeds.

Biofuels Project Goals

□ Period 2011-2015:

- Expansion of biofuels production facilities, distribution infrastructure.
- Introduction of new varieties developed by gene technology.
- Application of modern fermentation technology in order to diversify raw material sources.
- Mastering of additives and molecular mesh production.

Biofuels Project Goals

□ Vision 2020:

Vietnam would have modern biofuels production technology. Production would reach 5 bill. Liters of Ethanol/year and 500 mil.liters of biodiesel/year.

Project Strategy

- **For Gasohol:**

1. Zoning of raw material cultivation
2. Developing harvesting and after harvest technology
(machinery, transport, processing, container) firstly for tapioca, sugar cane...
3. Using biotechnology to develop new high yield varieties.
4. Developing modern fermentation and distillation for Ethanol production.

(continued).....

Project Strategy

5. Developing technology for 99.5%V Ethanol
6. Developing of blending technology for blending gasoline, condensate, naphtha with Ethanol and additives to produce E10.
7. Building technical regulations and standards.

(continued)..

Project Strategy

2. For Bio-diesel:

- Zoning of raw material cultivation area for plant oils (coconut, ground nut,soya bean,sesame...),
- Creating new high yield varieties by biotechnology (gene technology).
- Improvement of pressing of oil from oil plants.
- Developing biodiesel production technology.Modul test 100,000 liters/day, B5 blending technology.
- Building technical regulations and standards.
(continued)....

Project Strategy

3. Building of Biofuels Distribution Infrastructure:

- Master plan of infrastructure,
- 2006-2010: Building infrastructure according to the Master plan.

Policy Measures

- Government financing for R&D and training activities.
- Pilot scale subproject entitle for 40% of government financing,
- Government support for technology transfer from abroad.
- Incentives to attract leading specialist for the project.
- Enforcement of IPR issues.
- Tax, investment incentives for the project.

THANK YOU !