

GUAM POWER AUTHORITY

Fuel Price Forecast & Key Drivers

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What is a fuel price forecast ?

- Types of fuel currently used
- Types of fuel that might be used in the future
- Understanding historical behavior
- How will prices behave in the future?

- What other fuel types should be considered?

How is a fuel price forecast done?

- Field investigation
 - What is the local and global development story?
 - What is the utility planning objective?

How is a fuel price forecast done?

- Determining the Drivers
 - Global economic growth especially the U.S. economy and the emerging economies of India and China
 - Currency Exchange especially the US dollar versus other currencies
 - Weather
 - Inventories versus production
 - Geopolitical events
 - New sources
 - Technology breakthroughs
 - Price of substitute fuels
 - Local Storage and Processing Capabilities
 - Shipping Costs and Availability

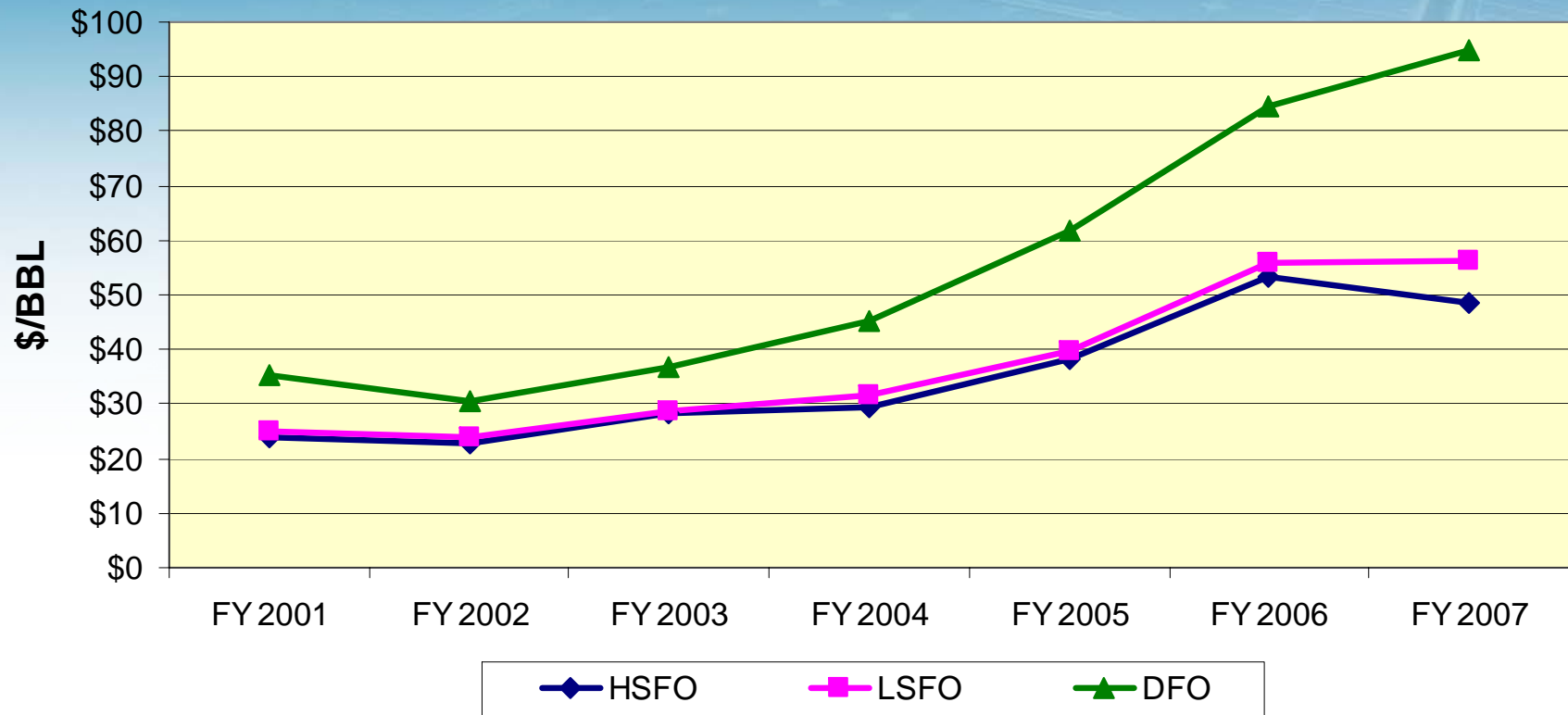
How is a fuel price forecast done?

- Gathering Time Series Datasets and Data Checking
- Regression Analysis
- Testing the Model
- Developing the forecast based upon judgment and insight
- Updating the inputs and the Model

Fuel Types Guam Power Authority Uses

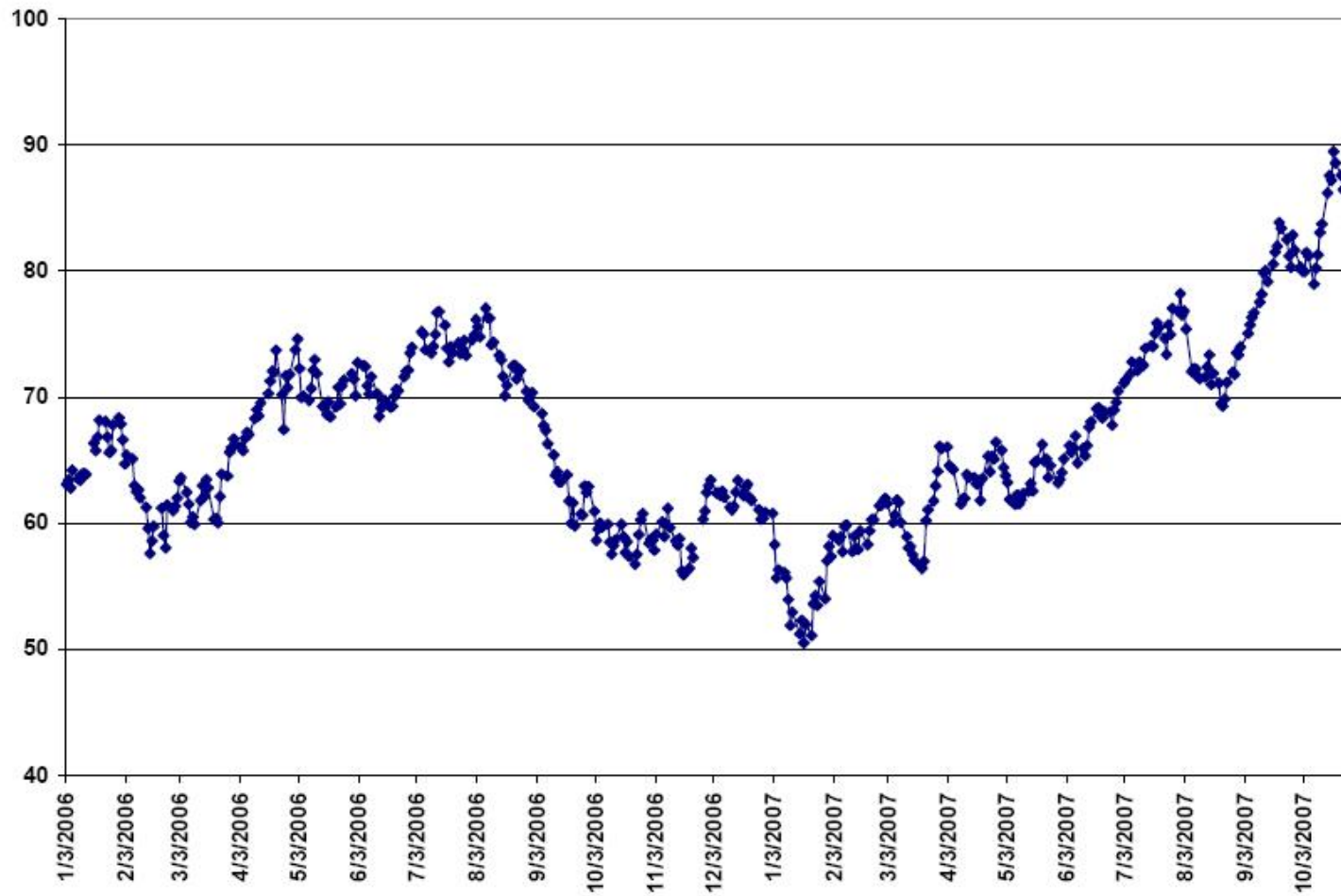
- Fuel types currently used
 - Residual Fuel Oils
 - High Sulfur Fuel Oil (2%)
 - Low Sulfur Fuel Oil (1.19%)
 - Diesel Fuel Oil
 - High Sulfur (0.5%)
 - Low Sulfur (0.3%)

Historical Price Behaviors



WTI Prices (Through October 2007)

Fuel Oil Price is Volatile

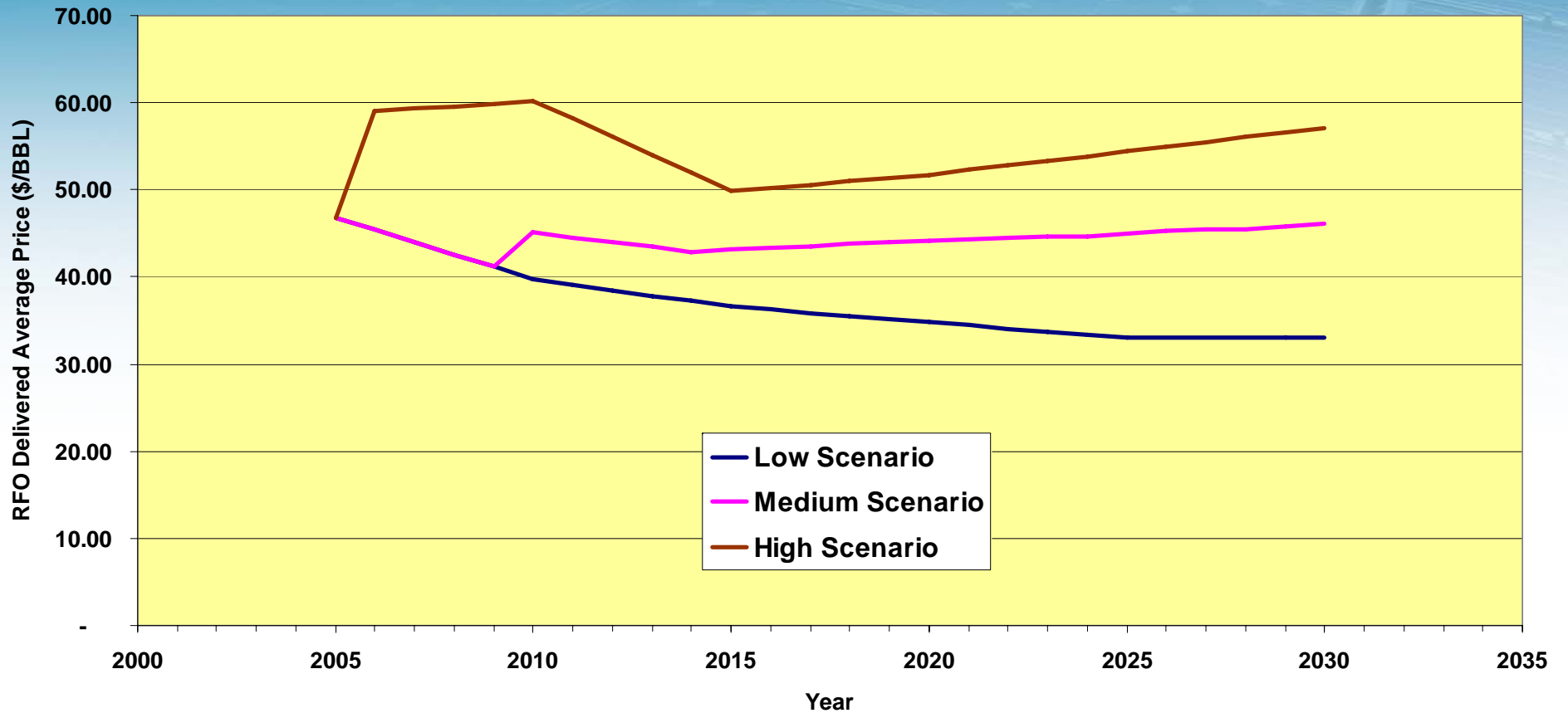


Key Drivers & Uncertainty for Oil based Fuels

- Global economic growth especially the U.S. economy and the emerging economies of India and China
- OPEC discipline
- Non-OPEC suppliers
- Global inventories and production expansion
- Currency Exchange especially the US dollar versus other currencies
- The effect of commodities traders and speculators
- Weather affecting winter heating oil demand and affecting refinery or crude production
- Geopolitical events especially in the Middle East or affecting crude oil production or refining capability

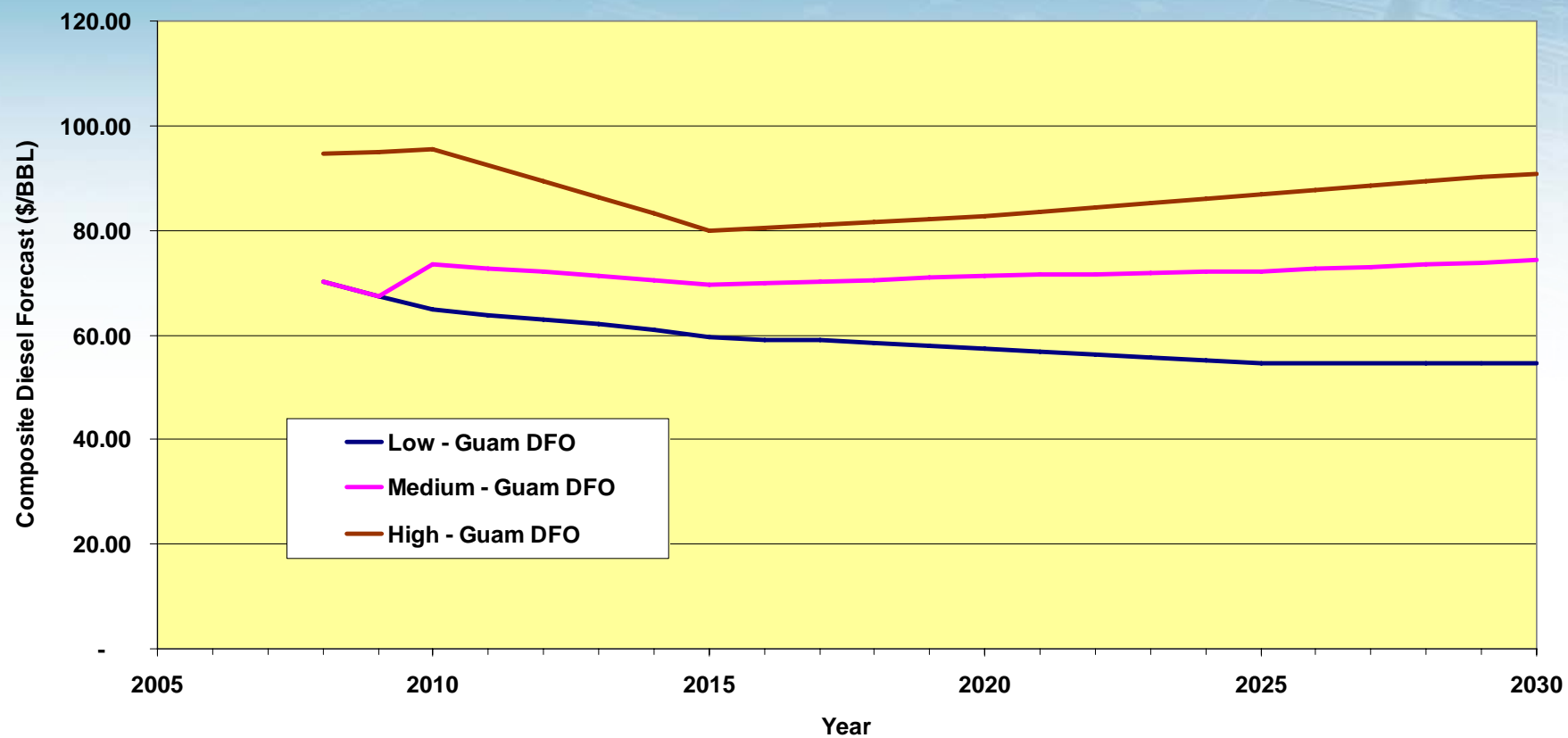
What factors do you feel are the most important?

RFO Forecast



Where do you see prices going?

Diesel Fuel Oil Forecast



Coal as a fuel choice

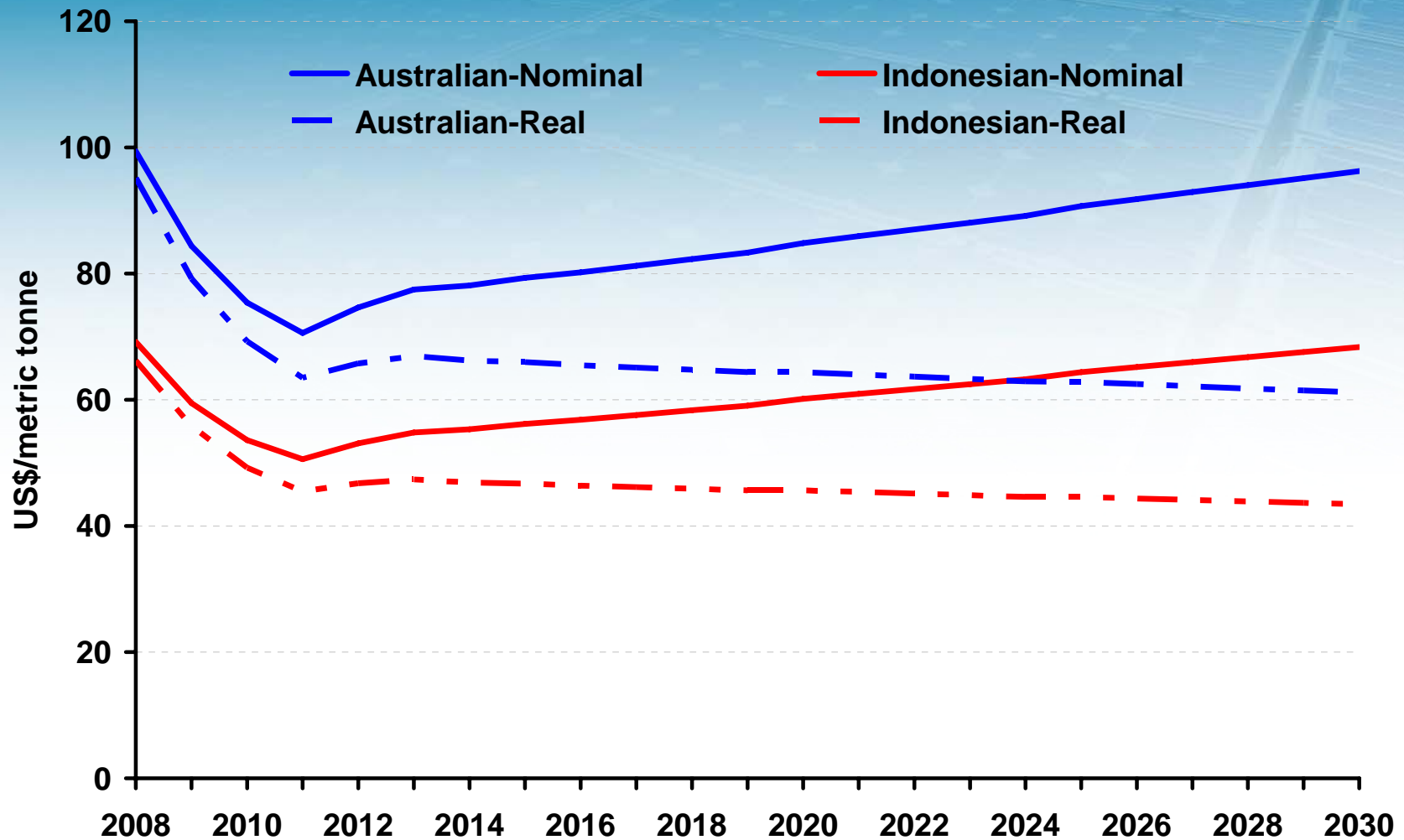
- Majority of the coals from Australia are mid-volatile bituminous coals with low sulphur and calorific values of around 11,300 Btu/lb
- Coals from Indonesia are very wide-ranging but the majority of future production will be of a sub-bituminous nature with high levels of inherent moisture, high volatiles, mostly low in ash and sulphur but also having a calorific value of around 9,100 Btu/lb
- Requires Large Infrastructure Investments
 - Land
 - Porting
 - Handling and Storage
- Environmental Issues

Key Drivers & Uncertainty for Coal

- Exchange Movements
- Atlantic and Pacific Markets
 - Demand
 - Supply
 - Cross-Supply
- Rapid development of Coal-fired power plants in China and India
- Shipping Availability and Costs

What other factors do you feel are the most important?

Forecast of Coal Prices



Where do you see prices going?

Natural Gas as a fuel choice

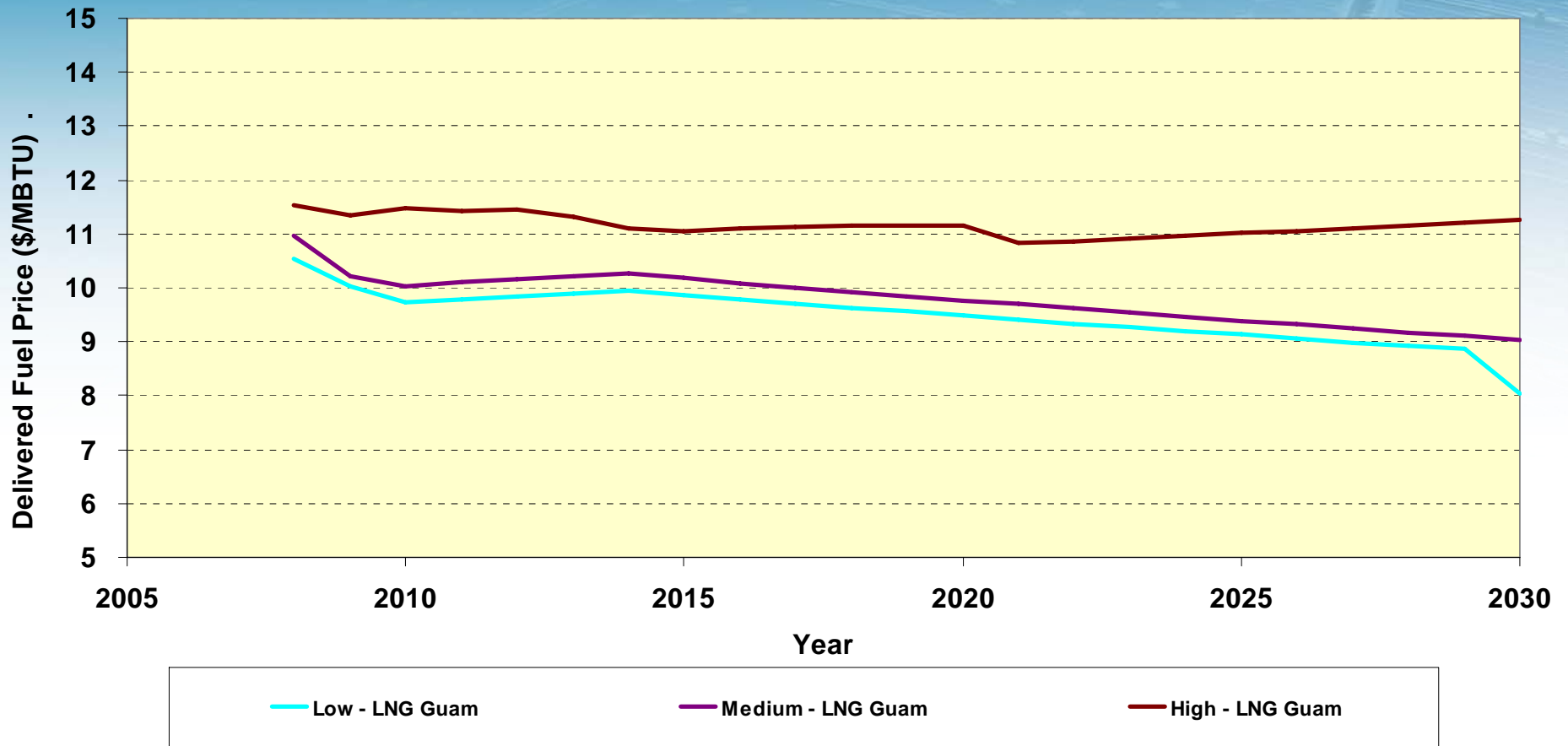
- Liquefied Natural Gas (LNG)
- Cleaner Energy Production
- Requires Large infrastructure Investments
 - Porting
 - Storage
 - Regasification

Key Drivers & Uncertainty for LNG

- Competitive LNG market
- Slight changes in global supply - demand balance can cause dramatic price changes
- LNG supply is driven by high capital costs and lead times of five years or more.
- Occurrence of a brief low price bubble between now and 2011
 - Substantial number of LNG projects will come on line
- The LNG market is likely to become very tight with high prices from 2011 to 2015.
- Contracting with Tangguh project in Indonesia
 - 4,000 cubic meter tanker on dedicated service
 - A crude estimate of the ship cost is about 40 million dollars
- Substantial scale penalty for such a small regasification facility.
 - \$205 million dollars for Facility
 - Regasification margin of \$3.20/MBTU versus \$0.50 to \$0.75/MBTU for Large Facilities

What factors do you feel these are the most important?

Forecast of LNG Prices



Where do you see prices going?

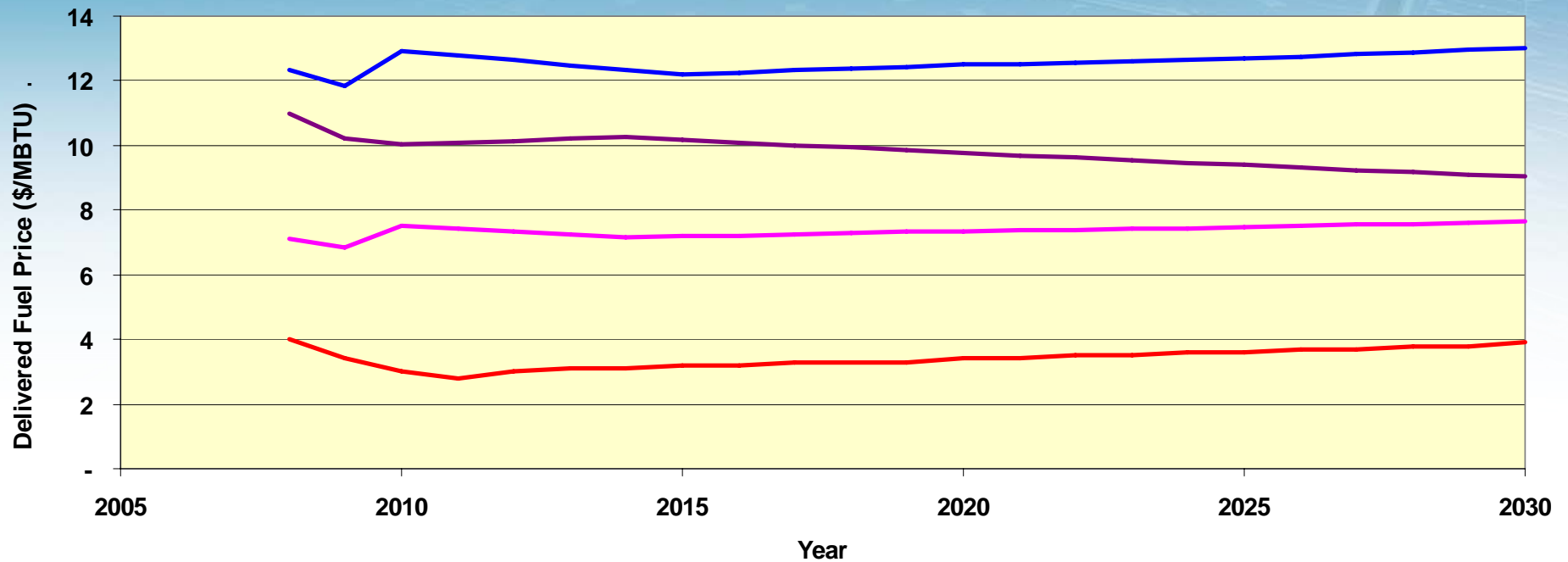
BioFuels

- Solid, Liquid, or Gas Fuels Created from Renewable sources such as plants
- Types
 - Ethanol
 - Biodiesel
- Environmental Issues
 - Nitrous Oxide (N₂O)
 - Concern
 - Biodiesel from rapeseed
 - Bioethanol from corn (maize)
 - Less Concern
 - Fuels from grasses and woody coppice species
 - Carbon Neutral

Biofuels Price Forecast

- GPA believes that Biodiesel prices will track diesel prices given current price subsidies

Forecast Summary



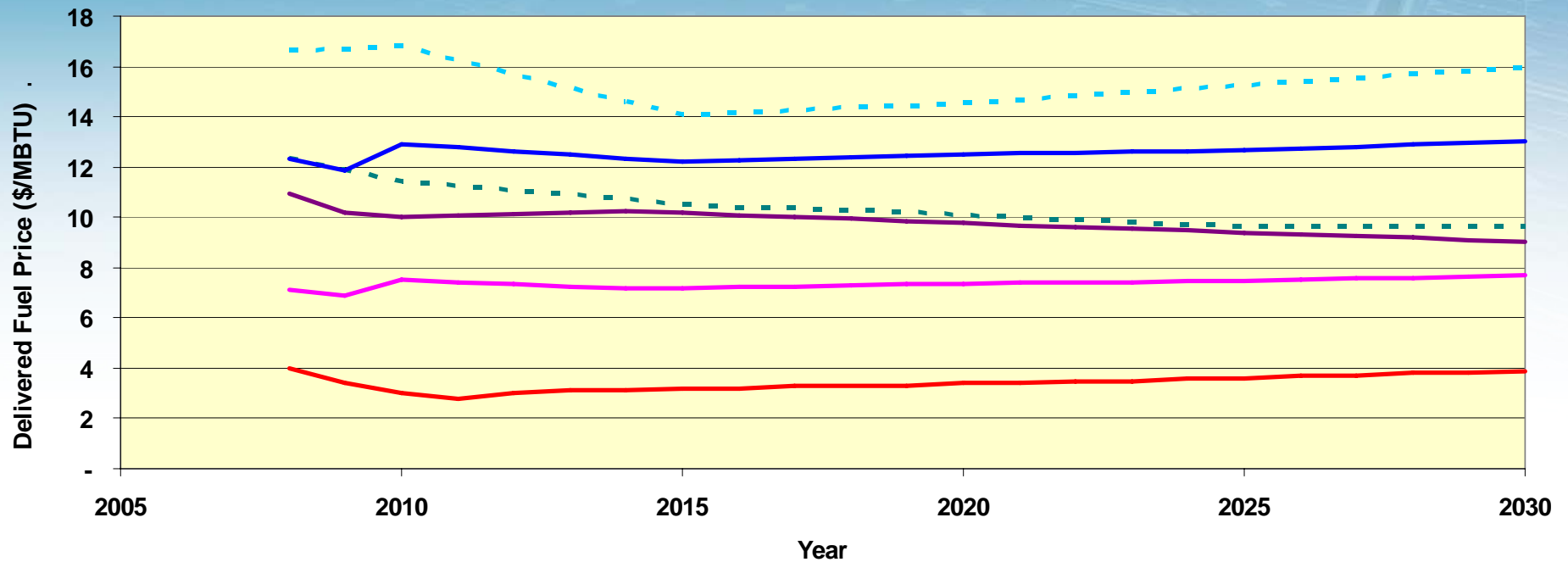
Medium - Guam RFO

Medium - LNG Guam

Medium - Guam DFO

Coal - Guam (via Australia)

Forecast Summary



Medium - Guam RFO

Medium - LNG Guam

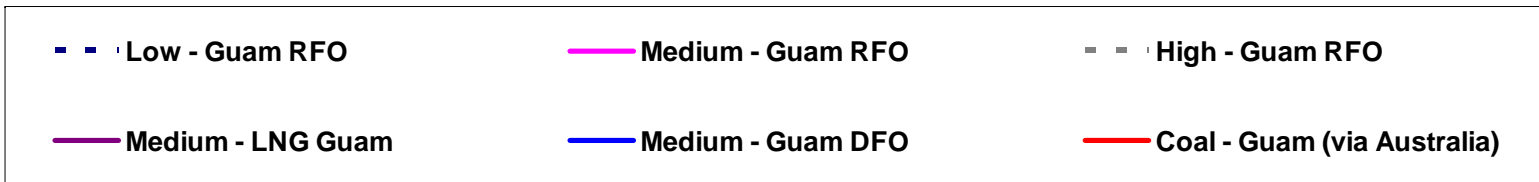
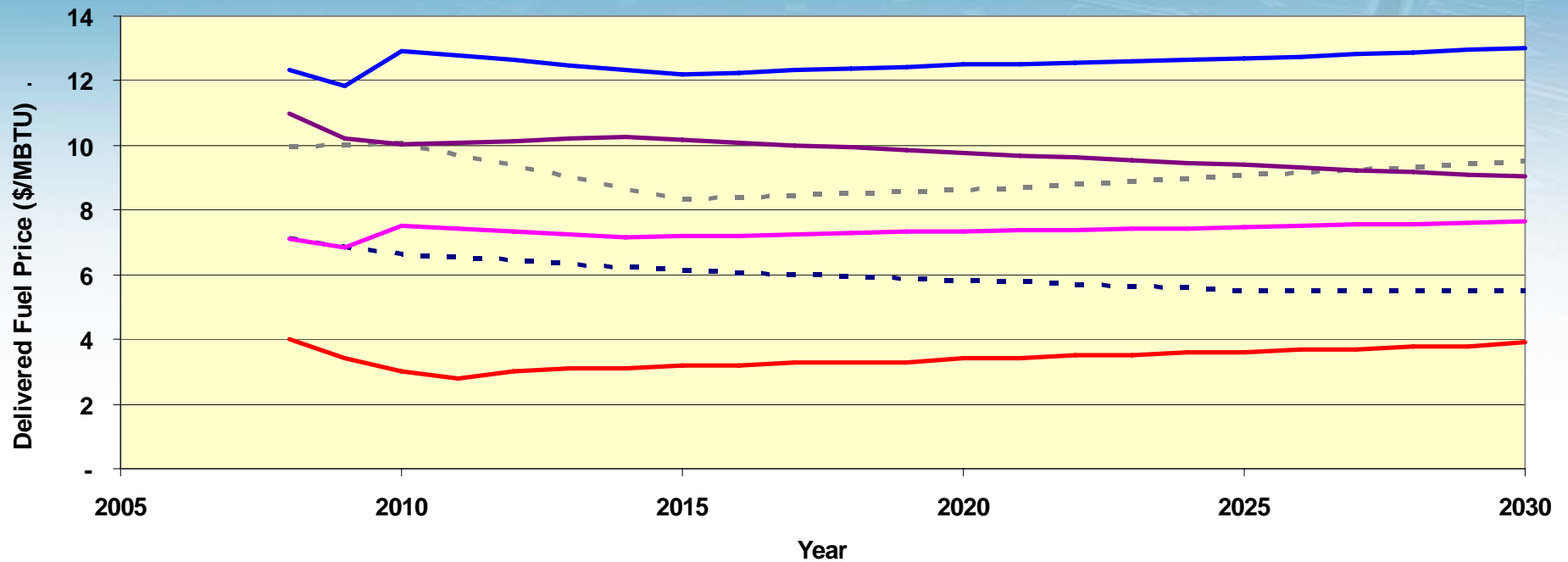
Low - Guam DFO

Medium - Guam DFO

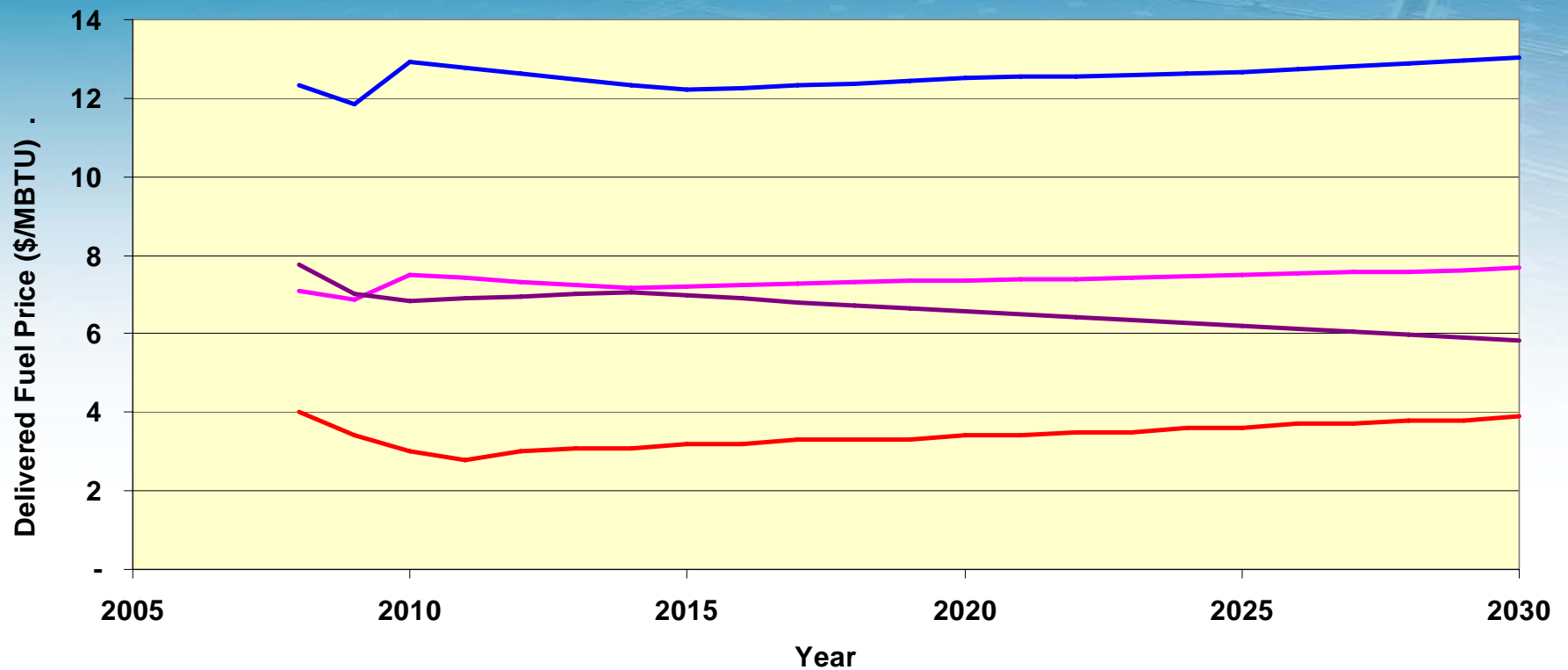
High - Guam DFO

Coal - Guam (via Australia)

Forecast Summary



Forecast Summary



Medium - Guam RFO

Medium - LNG Capital Grant

Medium - Guam DFO

Coal - Guam (via Australia)

Possible Greenhouse Gas legislation on impact on fuel choices

- Carbon legislation (Greenhouse Gases) of some sort may likely be adopted
- A carbon tax or trading legislation is likely to be in force by 2009
- Will likely be an “escalating” approach
 - Carbon caps will decrease over time
 - Tax or trade values will increase over time
- Impacts will apply to all fossil based generation
 - Coal
 - Oil Based
 - Natural Gas based
 - Biofuels (?)
- Europe already has a system in place
- China and India are listed as emerging economies and are resisting adoption of greenhouse gas caps
 - Their growing economies mean they will be the greatest sources for increases in greenhouse emissions.

What do you see as future legislation?

Fuel and New Generation

- Generation additions
 - Total system cost reduction, or
 - Fuel diversity policy

Closing Slide

- Questions?