

# Beyond a *“A Thousand Barrels a Second”*

By Peter Tertzakian

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ASPO-USA Conference

October 19<sup>th</sup>, 2007

Houston, Texas



# Edison Bulb

circa 1885



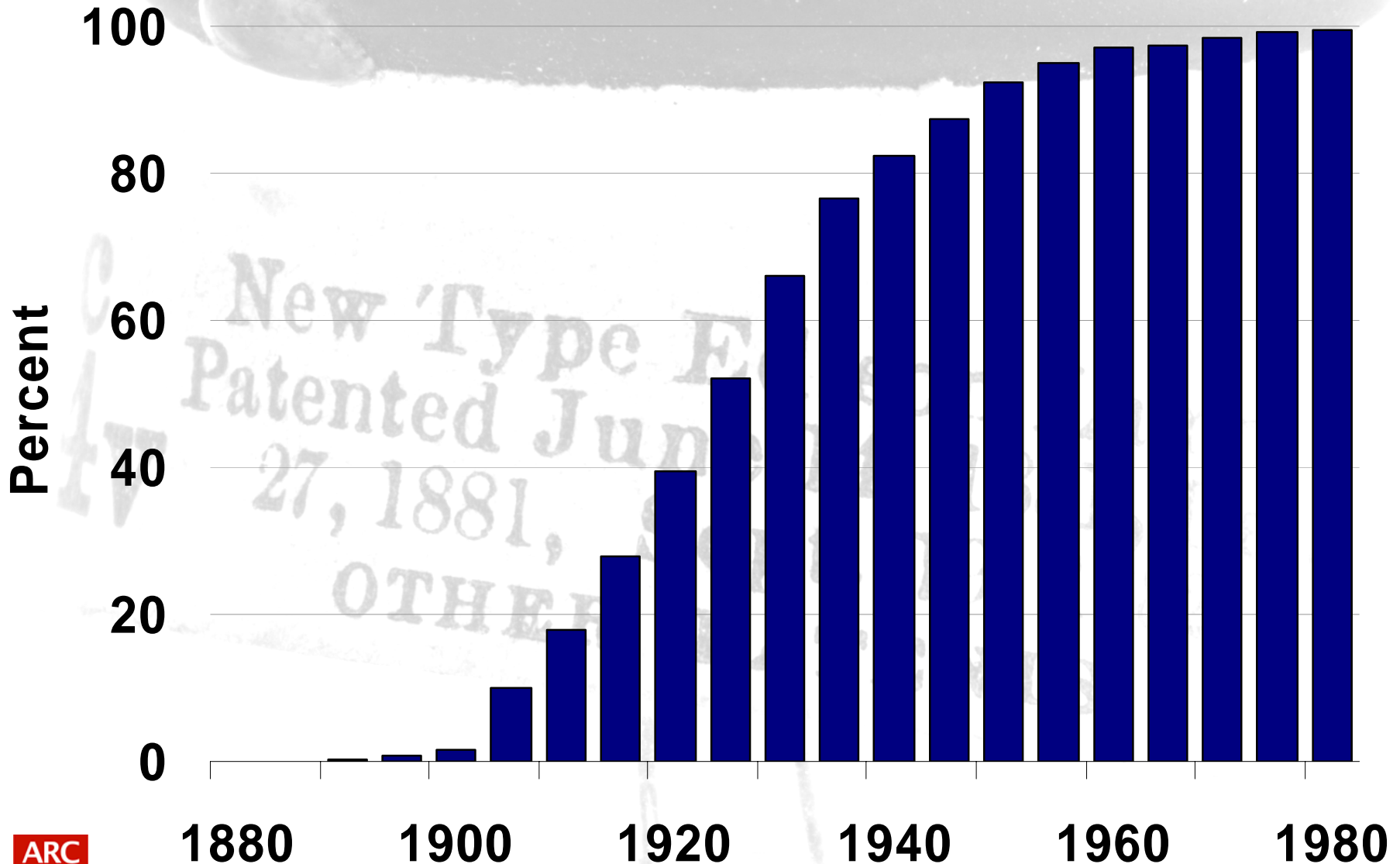
Photo credit: Peter Tertzakian

C  
A  
IV  
New Type Edison Lamp,  
Patented June 14, 1881, Dec.  
27, 1881, Sept. 19, 1882.

OTHER PATENTS.

# Adoption of Electric Lighting

## North America Penetration



# Metal Filament Bulb

circa 1907



Photo credit: Peter Tertzakian

Course WSW | dist 150 | diff Lat. 1-45 | Lat Act. 44-38 | Dep 46W | M. Dist 150 | L. Pls. 53.6

# Whaling Log

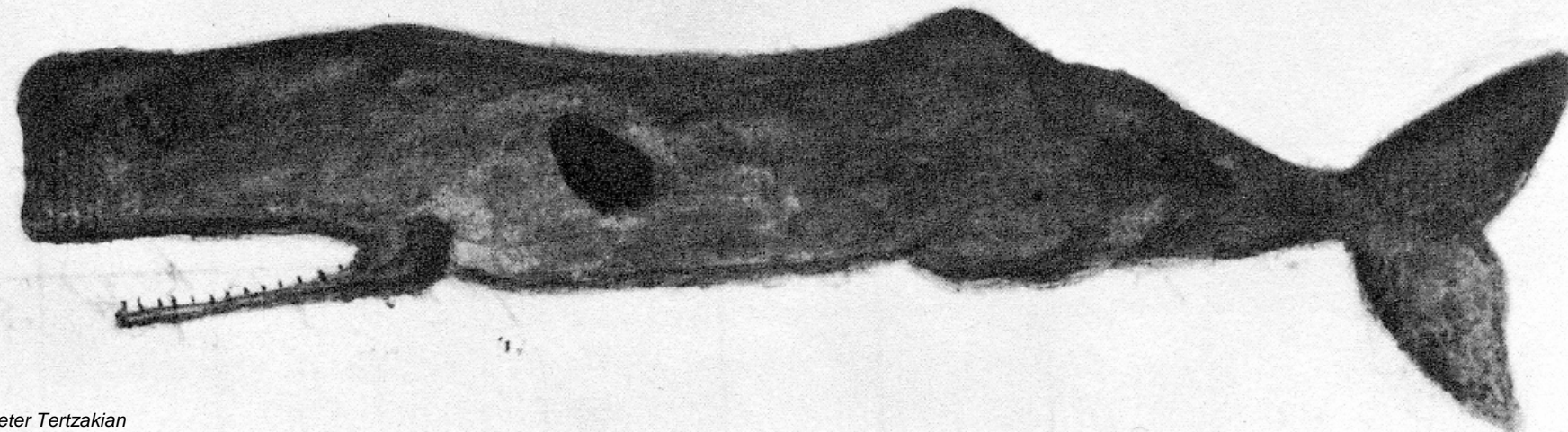
1754

H	K	W	C. Steerd	C. Allowed	Wind & Weather
2	-		Chued <del>one</del>	main tail	& mented him
4	3		SWW	SWW	NW
6	3				
8	3				
10	3				
12	3				
2	4		SW	SW	WNW
4	3				
6	3				
8	3				
10	2		Saw Black Fish		
12	1				

This 2<sup>d</sup> ho  
 & smooth l  
 Sail & at  
 Wind got round to the Westward.  
 Saw Black Fish

31 - 62

Date	Course	dist	diff Lat	Lat Act	L. Pls?	Dep	M. Dist	diff long	Longitude
2 Aug 15 VSA	S 30 W	58 <sup>m</sup>	53.1	43-48	—	30. W	200 W	42 W	55.48 W



BURN  
ROCKLIGHT  
LAMP OIL

EMERY, WENDELL GREEN & CO.

# “A Thousand Barrels a Second”

McGraw-Hill, NY, 2006

THE COMING  
OIL BREAK POINT  
AND THE CHALLENGES  
FACING AN ENERGY  
DEPENDENT WORLD

A THOUSAND BARRELS A SECOND



English



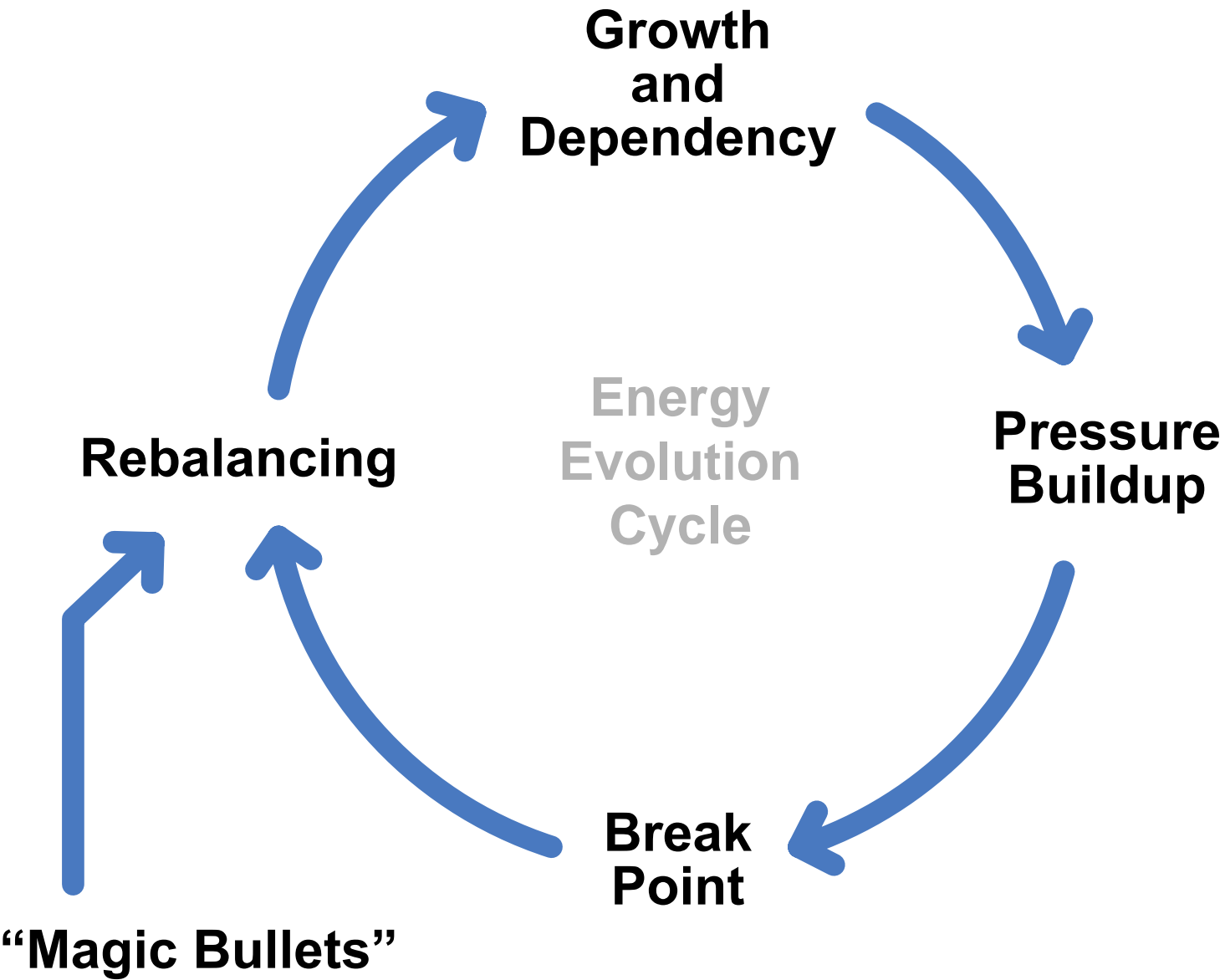
Chinese

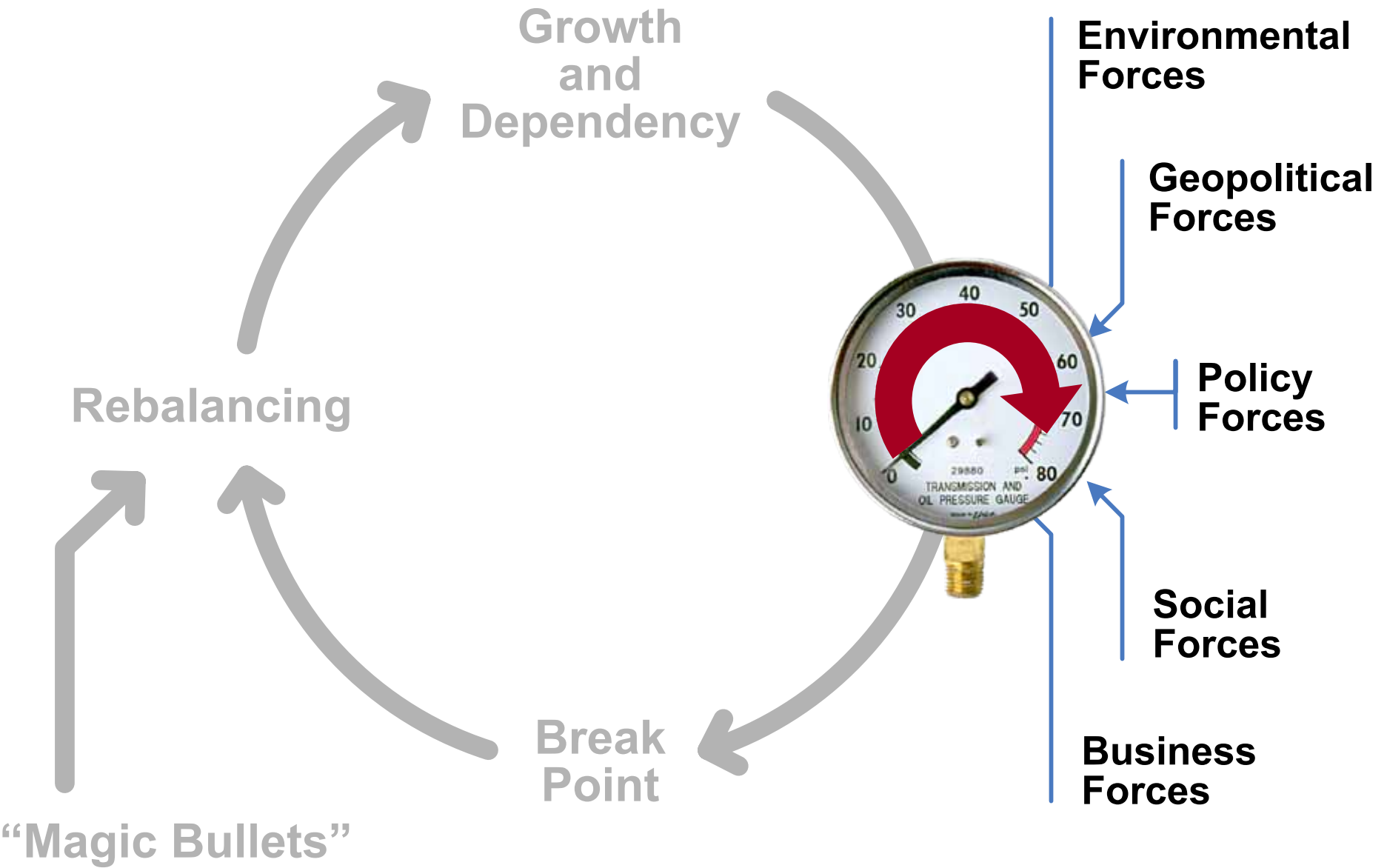


Japanese

*by Peter Tertzakian*

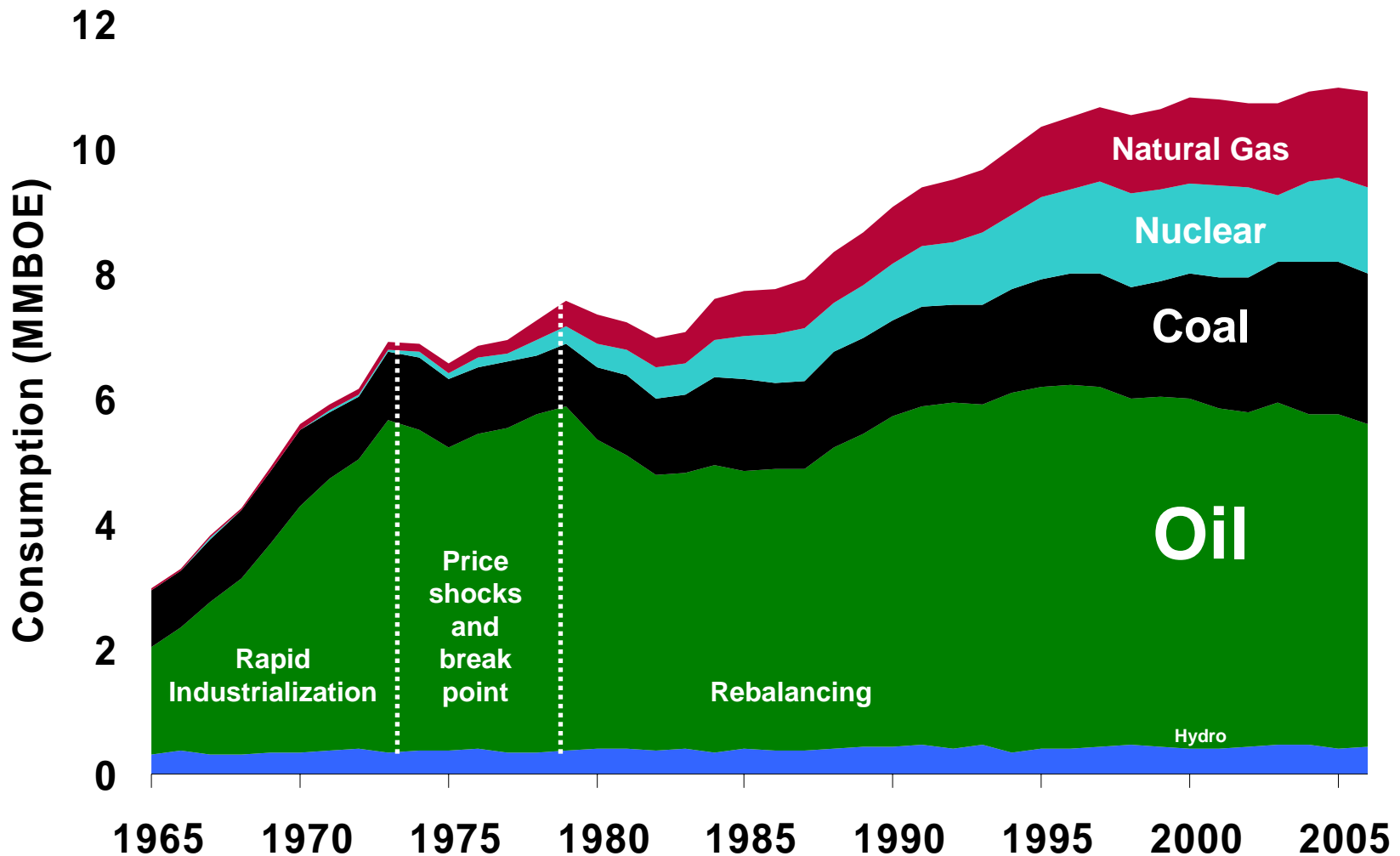






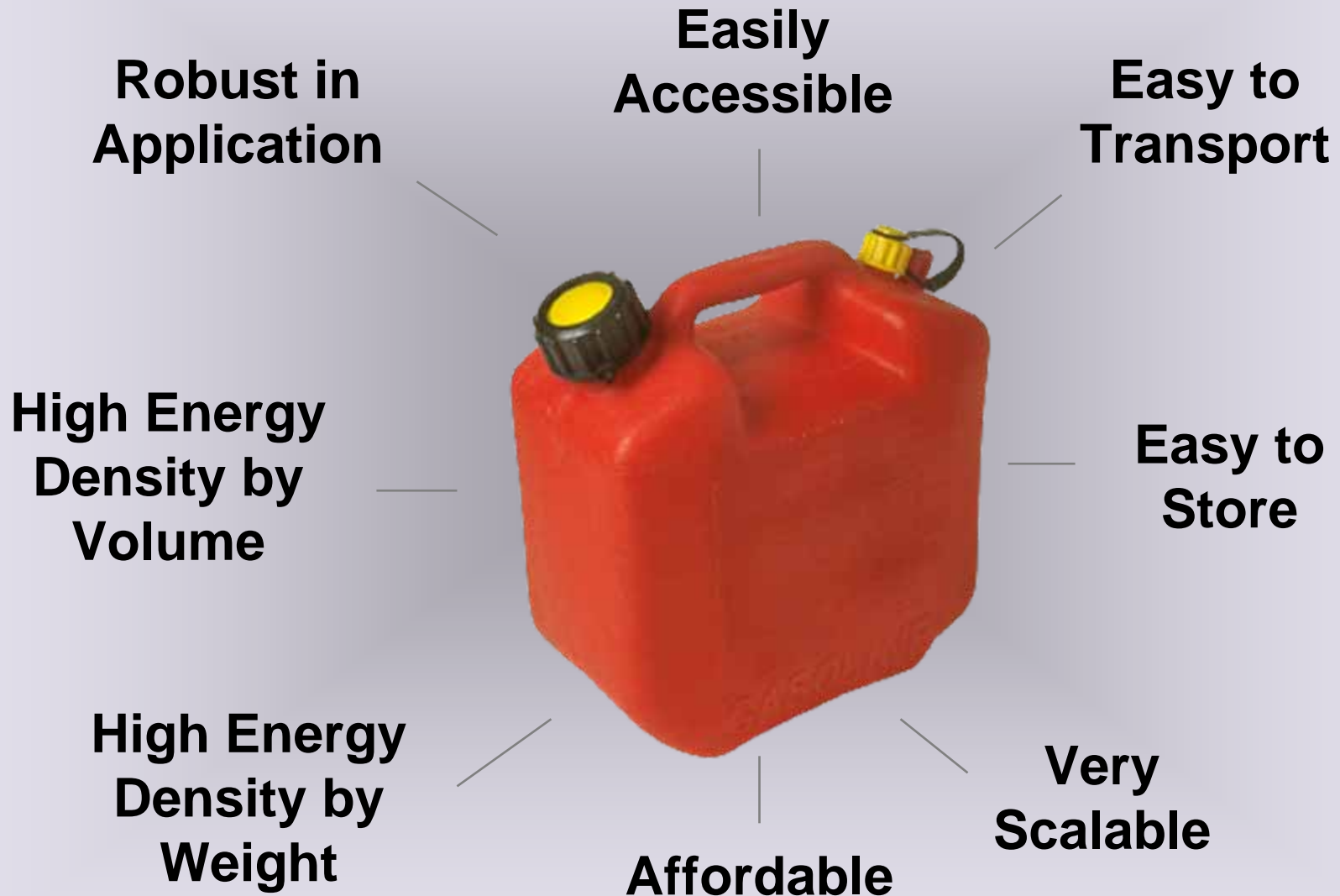
# Japan Energy Mix

## 1965 to 2006 Total Energy Consumption



Source: BP Statistical Review 2007, ARC Financial Research

# Characteristics of a Wonder-Fuel



**“Not a wheel turns without petroleum”**



**Traffic Jam, 1919**



# Traffic Congestion Houston, Texas

# Urban Sprawl

Las Vegas, Nevada



# Vehicle Obesity

## Hummer H6





**“Not a wheel turns without petroleum”**

*The Sequel*

**Traffic Congestion**  
Beijing, China

Photo credit: Peter Tertzakian

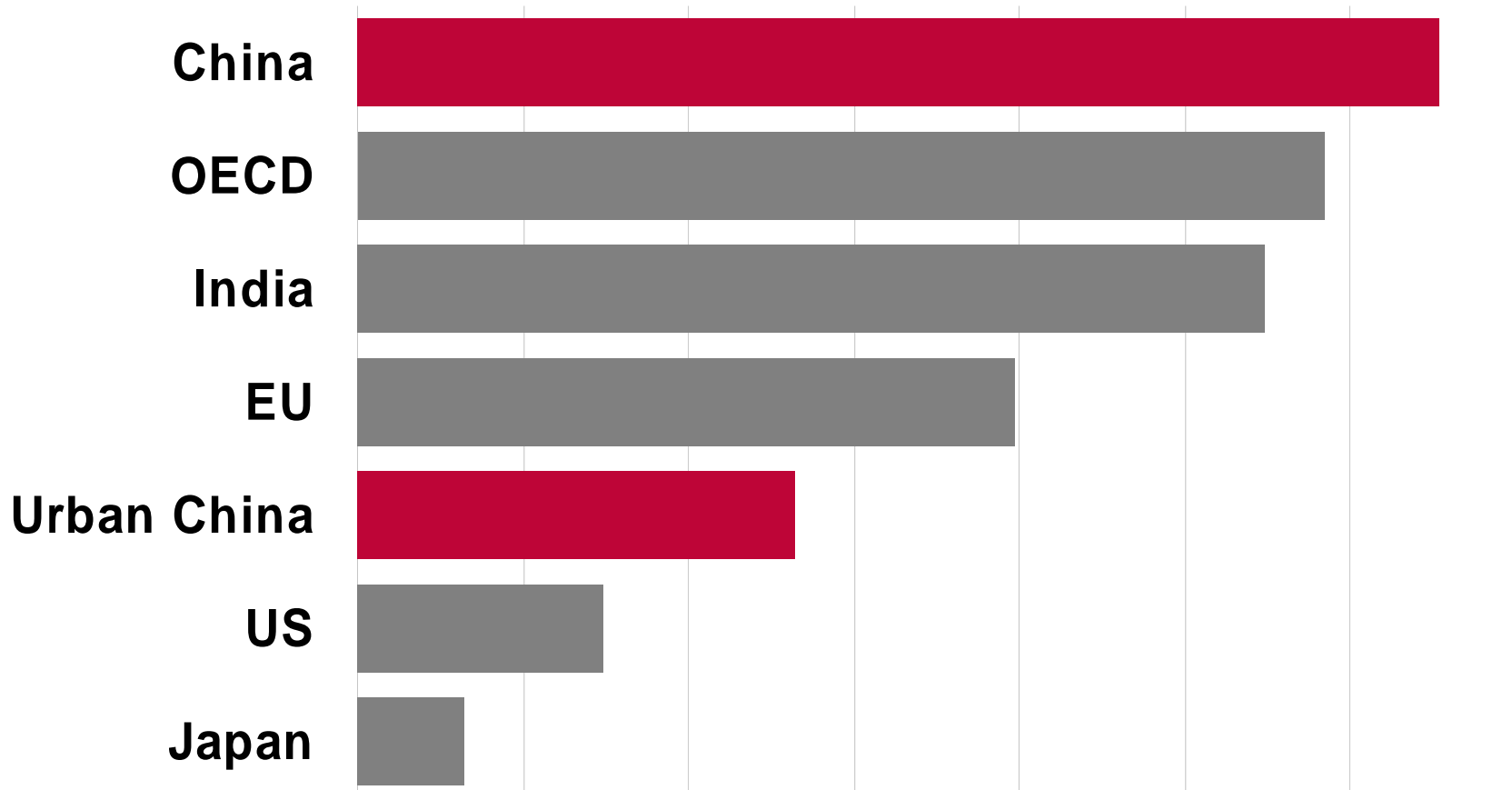


# Number of People in Perspective

## Relative Size

Population (millions)

0 200 400 600 800 1000 1200 1400



# Taking Flight

## Kunming, China





# Economy on the Move

## Yunnan Province, China

*Photo credit: Peter Tertzakian*



# Moving Coal

## Yunnan Province, China



松园桥加油站

0# 4.93

90# 4.69

93# 5.05

97# 5.48



**Regular**

**65.4¢ / litre**

**Mid-Grade**

**70.4¢ / litre**

**Premium**

**76.4¢ / litre**

開發區松園橋經營部  
0887-8308216  
獨龍江啤酒



**Freeway Interchange**  
**Shanghai, China**

*Photo credit: Peter Tertzakian*

# Suburbanization

Near Lijiang, China





# Tata Motors and the RS 1 Lakh

*“We one billion people in India anxiously waiting for that car. It's not just a dream project of Tata group but it also the dream of one billion people living here.”*

*An anonymous blogger from India*



# Advanced Economies OECD Countries



Tokyo, Japan

Photo credit: Peter Tertzakian

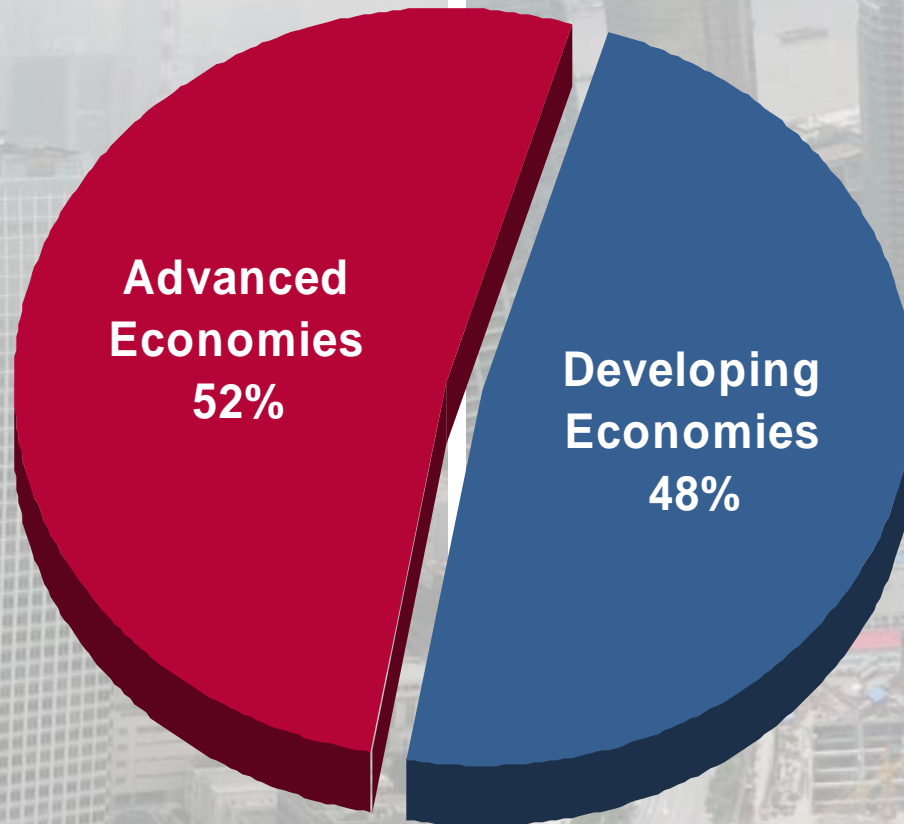
# Developing Economies Non-OECD Countries



Shanghai, China

Photo credit: Peter Tertzakian

# Percent of Global Economy



Source: IMF, ARC Financial

**Tokyo, Japan**

Photo credit: Peter Tertzakian

**Shanghai, China**

Photo credit: Peter Tertzakian

# GDP Growth Rates

USA 2.6%  
UK 2.9%  
Japan 2.6%  
Canada 2.5%  
Euro Area 2.6%

**2.6%**



**Advanced Economies**

Source: IMF, ARC Financial

**Tokyo, Japan**

Photo credit: Peter Tertzakian

**8.0%**

Africa 6.4%  
CE Europe 5.7%  
Russia 7.0%  
Developing Asia 9.6%  
China 11.2%  
India 9.0%  
Middle East 5.4%

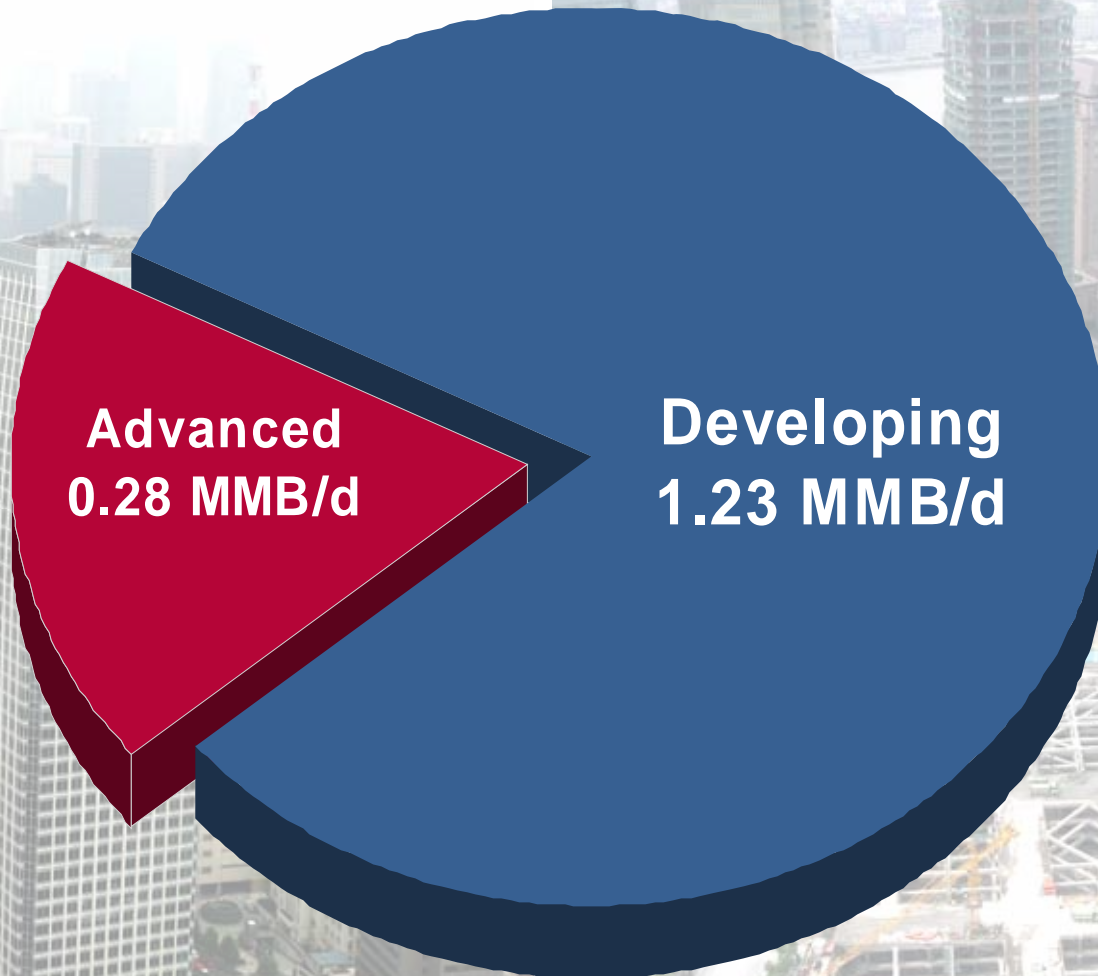


**Developing Economies**

**Shanghai, China**

Photo credit: Peter Tertzakian

# 2007 Oil Demand Growth



Source: International Energy Agency, ARC Financial

Tokyo, Japan

Shanghai, China

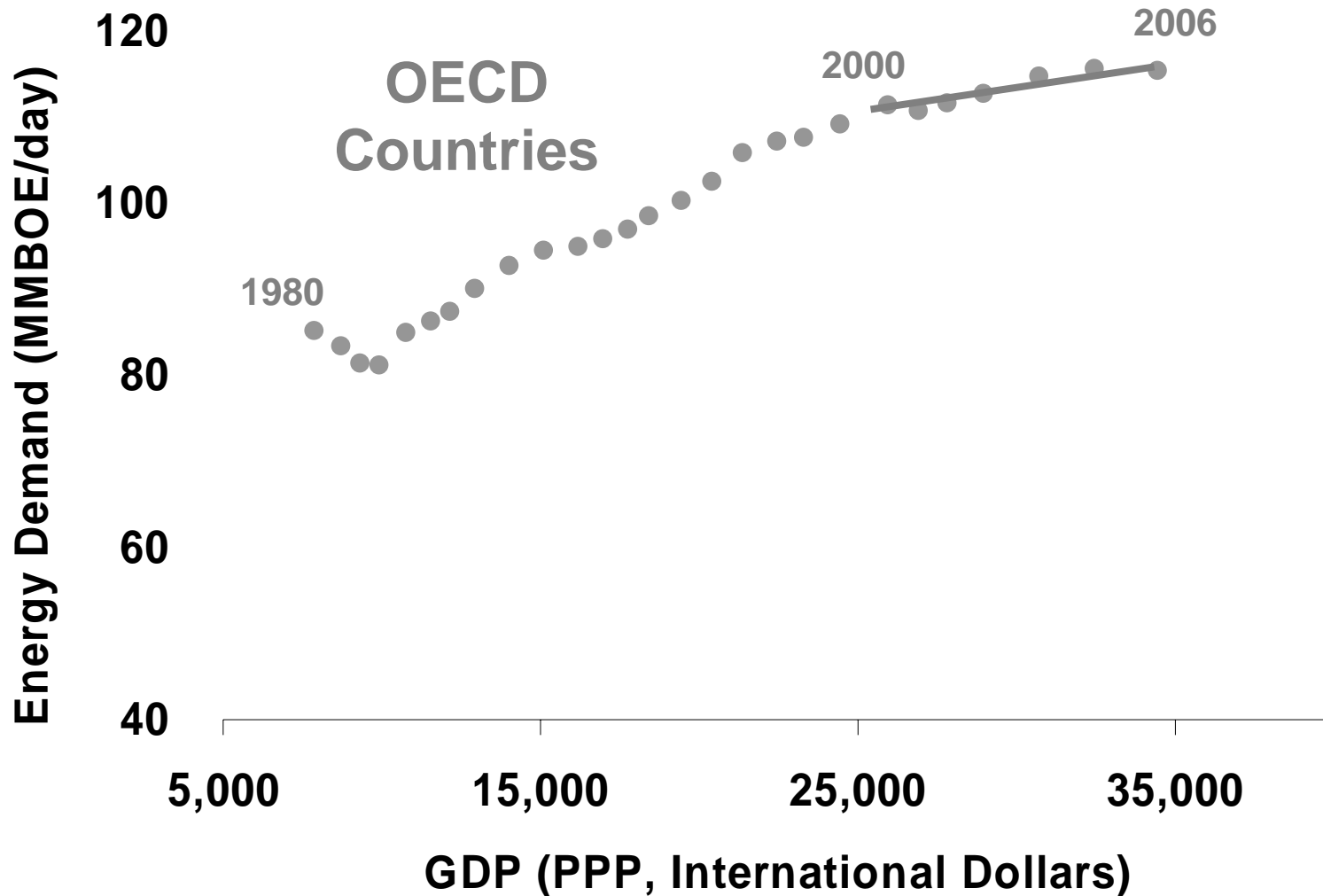
# Energizing Cities

## Shanghai, China



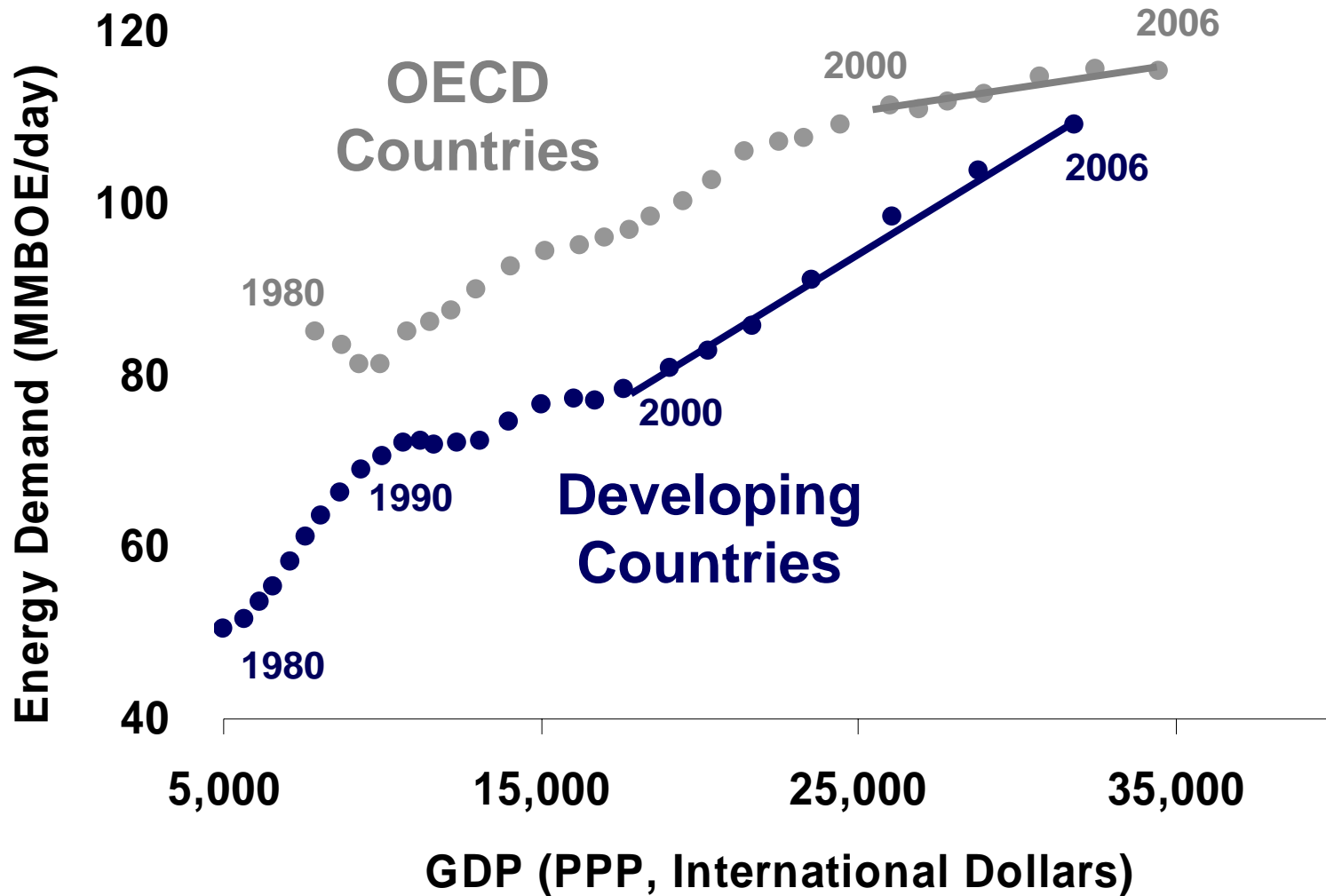
# Energy to Make a GDP Dollar

## Total Annual Energy Demand vs GDP; 1980 to 2006



# Energy to Make a GDP Dollar

## Total Annual Energy Demand vs GDP; 1980 to 2006





# Infrastructure for Growth and Dependency

## Beijing, China



Photo credit: Peter Tertzakian



# Oil Wells

Petrolia, Ontario, *circa* 1885

# Off Sakhalin Island

Russia



# A Sage Prophecy



*“Very many years must elapse before natural petroleum resources will be unable to meet the greater part of the world’s requirements. The time will eventually come when the world may have to look for a great part of its supplies from **secondary and synthetic sources**, but he would indeed be an optimist who imagined that – on the reaching of such a stage – prices would remain as low as those existing in the past.”*

Sir John Cadman  
November 2, 1927

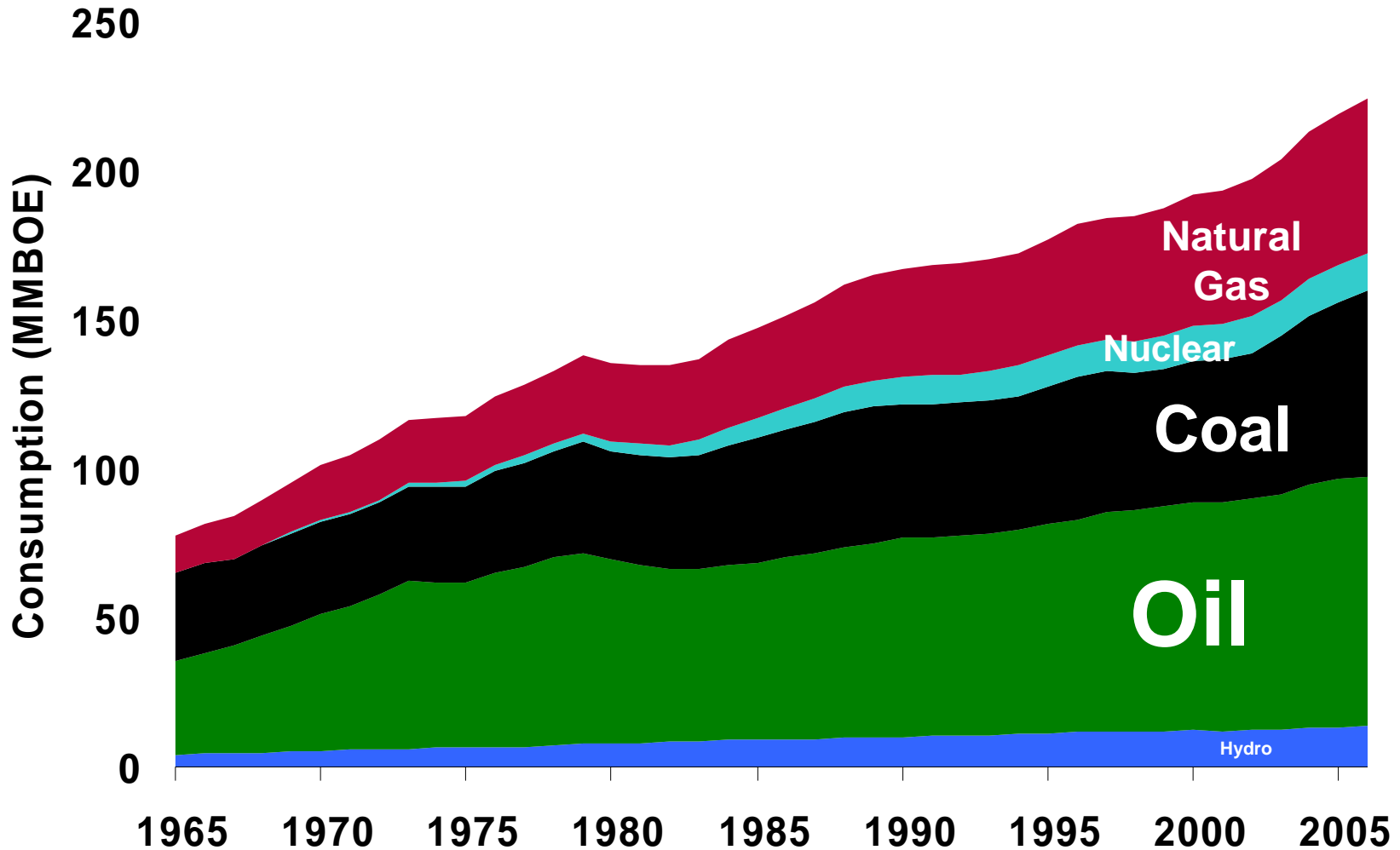
# Oil Sands Development

## Fort McMurray, Alberta



# World Energy Mix

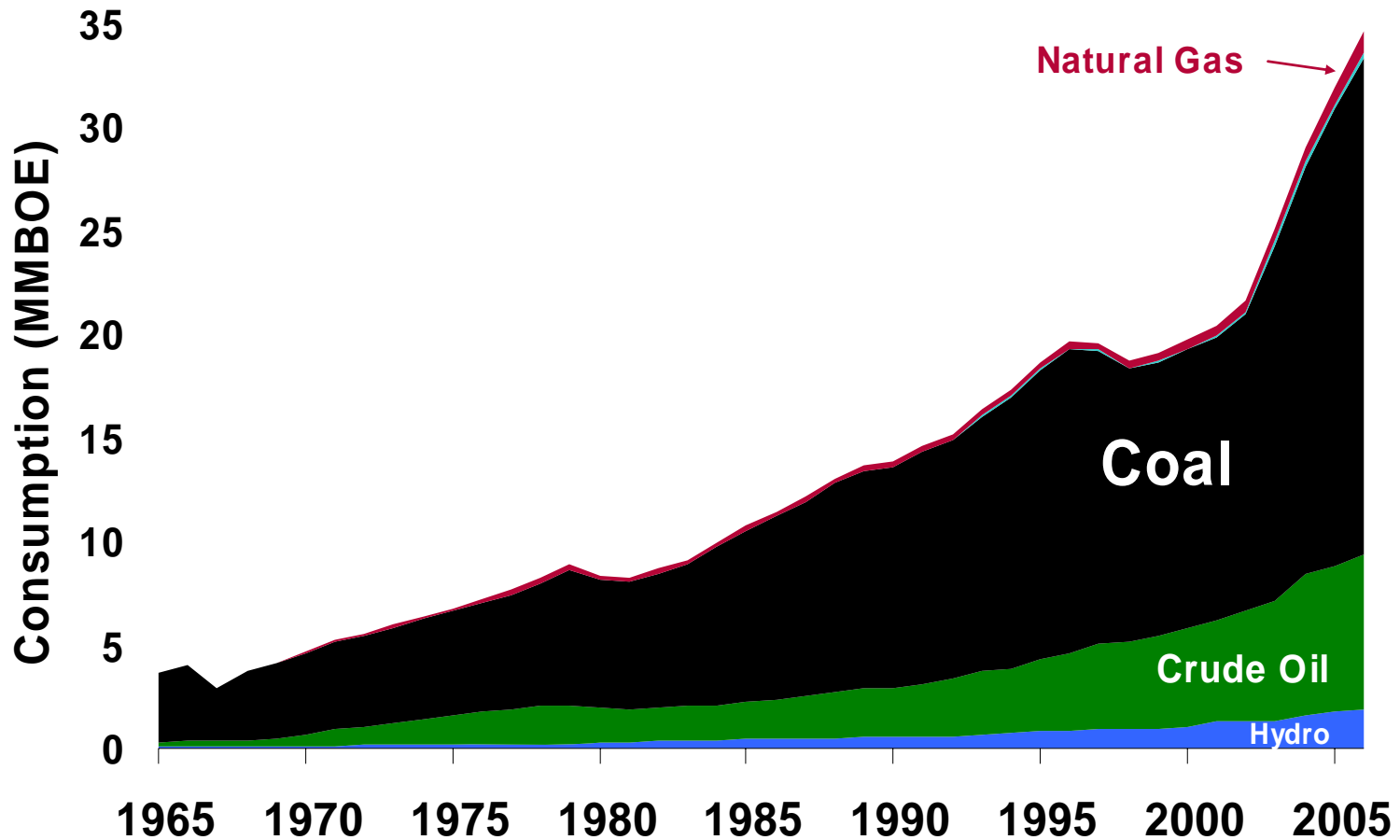
## 1965 to 2005 Energy Consumption by Fuel



Source: BP Statistical Review 2007, ARC Financial Research

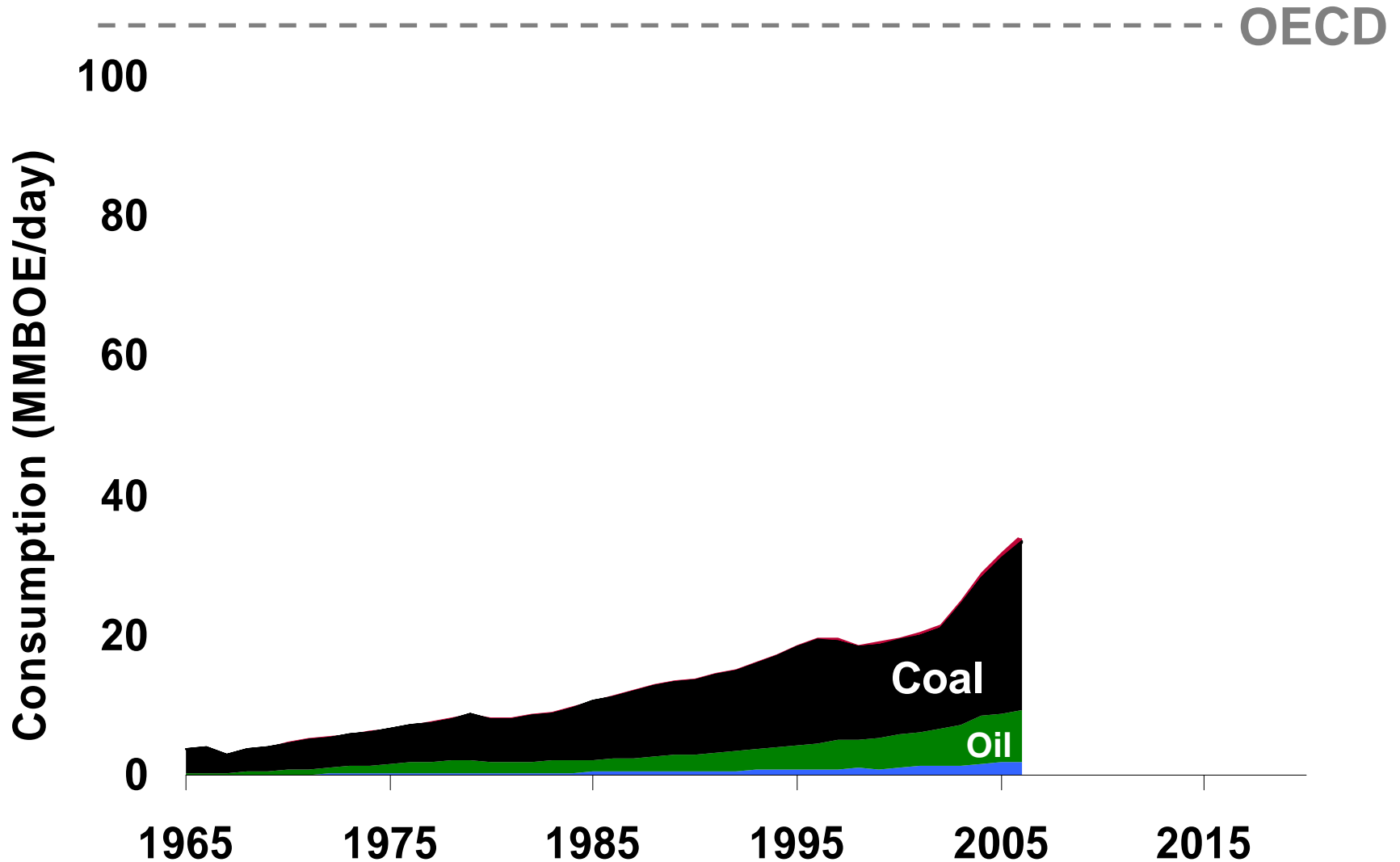
# China Energy Mix

## 1965 to 2006 Energy Consumption by Fuel



# China's Energy Mix

## 1965 to 2006 Energy Consumption by Fuel

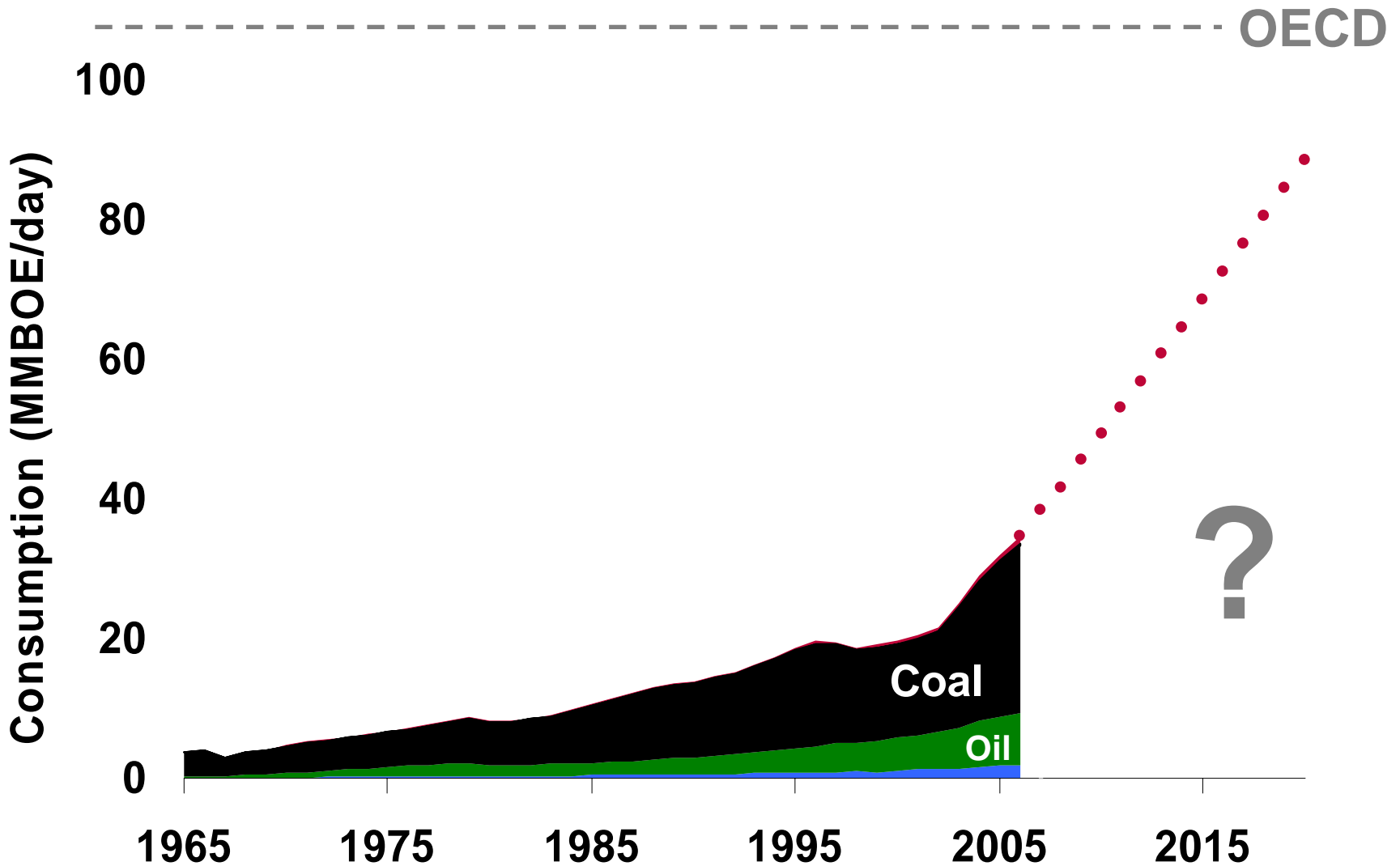


Source: BP Statistical Review 2006, ARC Financial Research

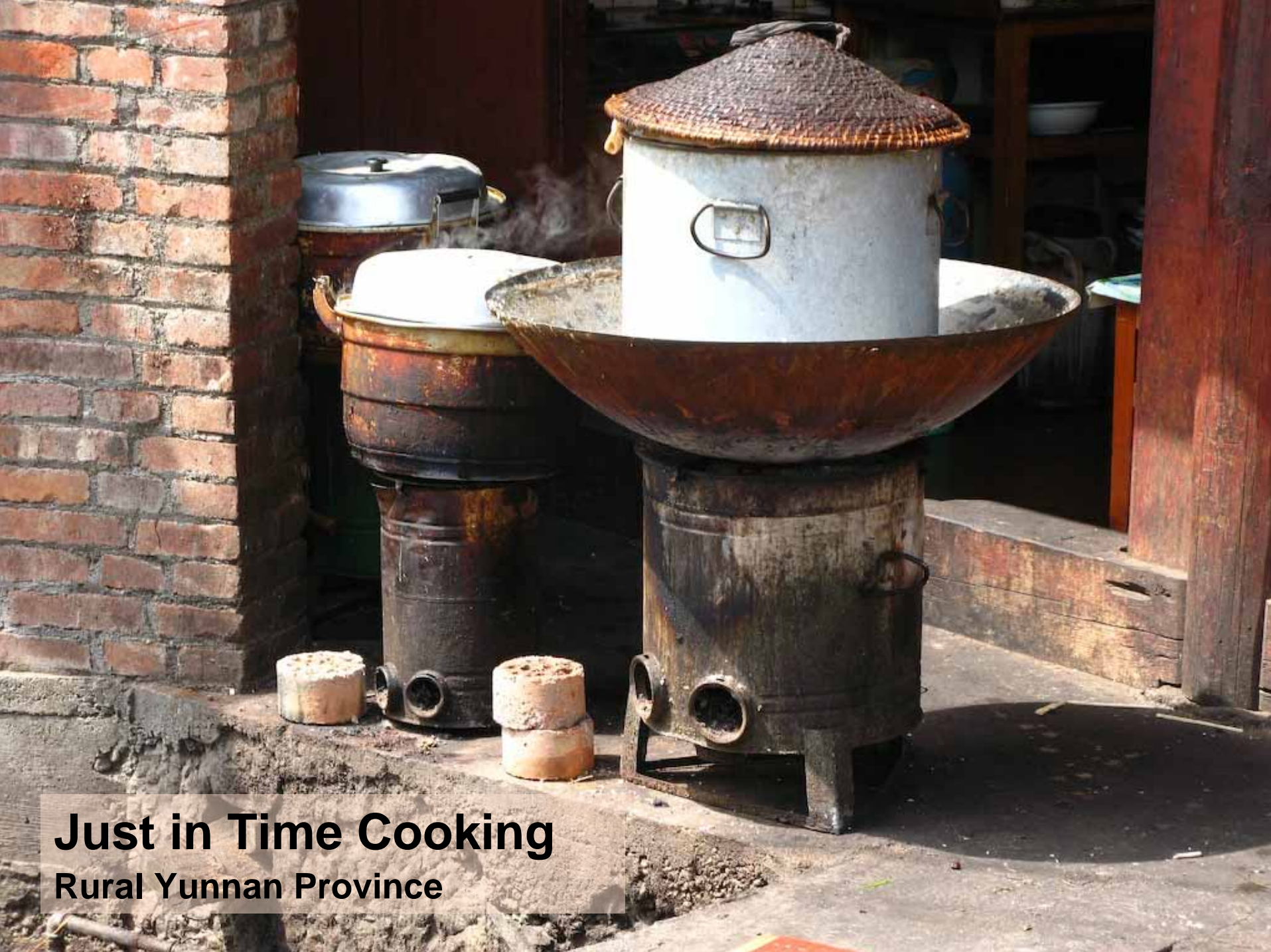


# China Go-Forward Energy Demand?

## 1965 to 2020



Source: BP Statistical Review 2006, ARC Financial Research



**Just in Time Cooking**  
Rural Yunnan Province



**Inside a Coal Stove**  
Lijiang Market

# Stove Coal Delivery

Old Lijiang, China







**Stoking the Stove**  
Yunnan Province



**Gas Grill**  
Beijing, China



# Shell GAS

分銷商

217

煤氣牌 煤氣爐 專門店



港利行

古今閣  
業主立案法團

Life After Coal  
Hong Kong



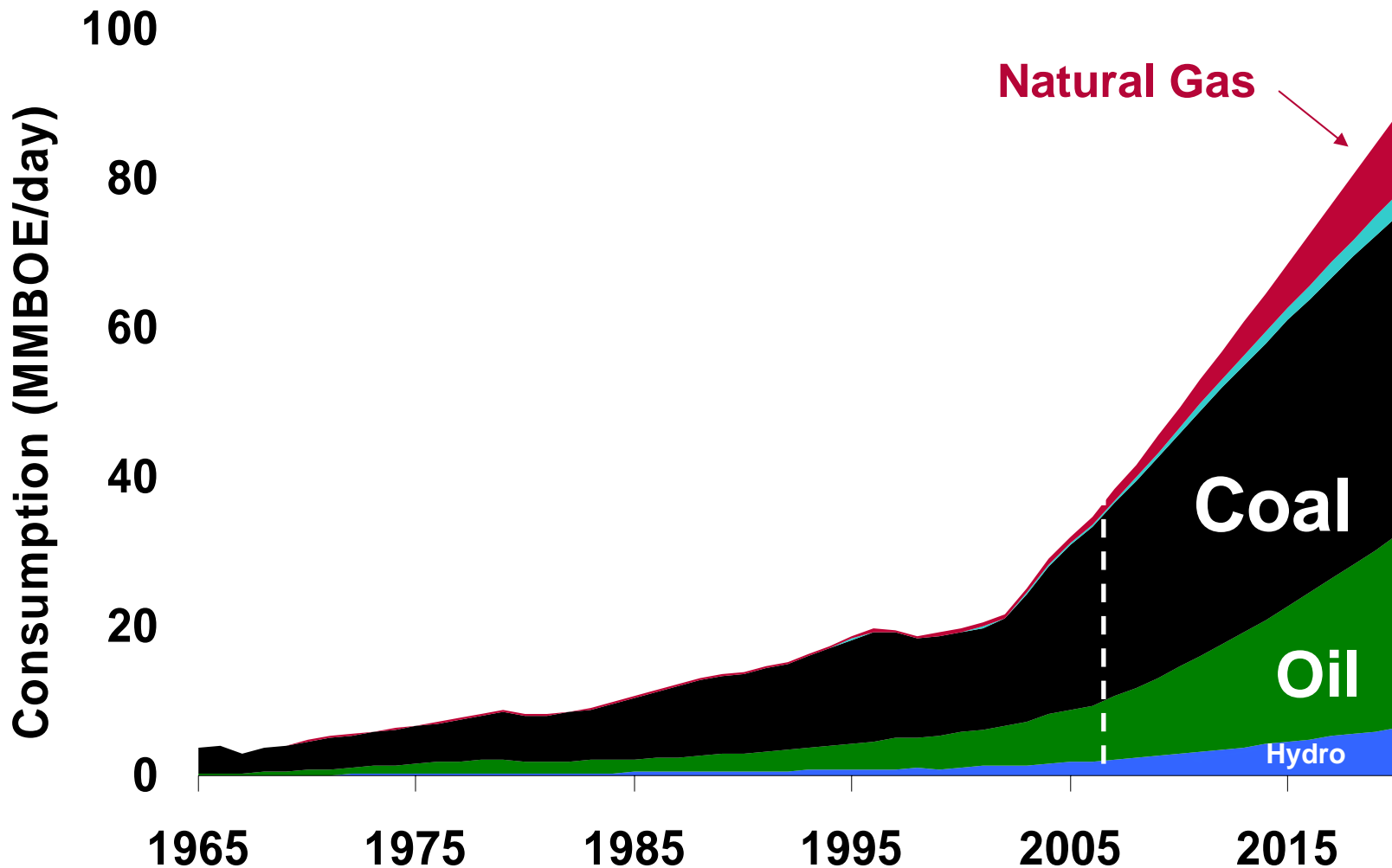


山水豆腐花

**Propane Supply Chain**  
Lantau Island

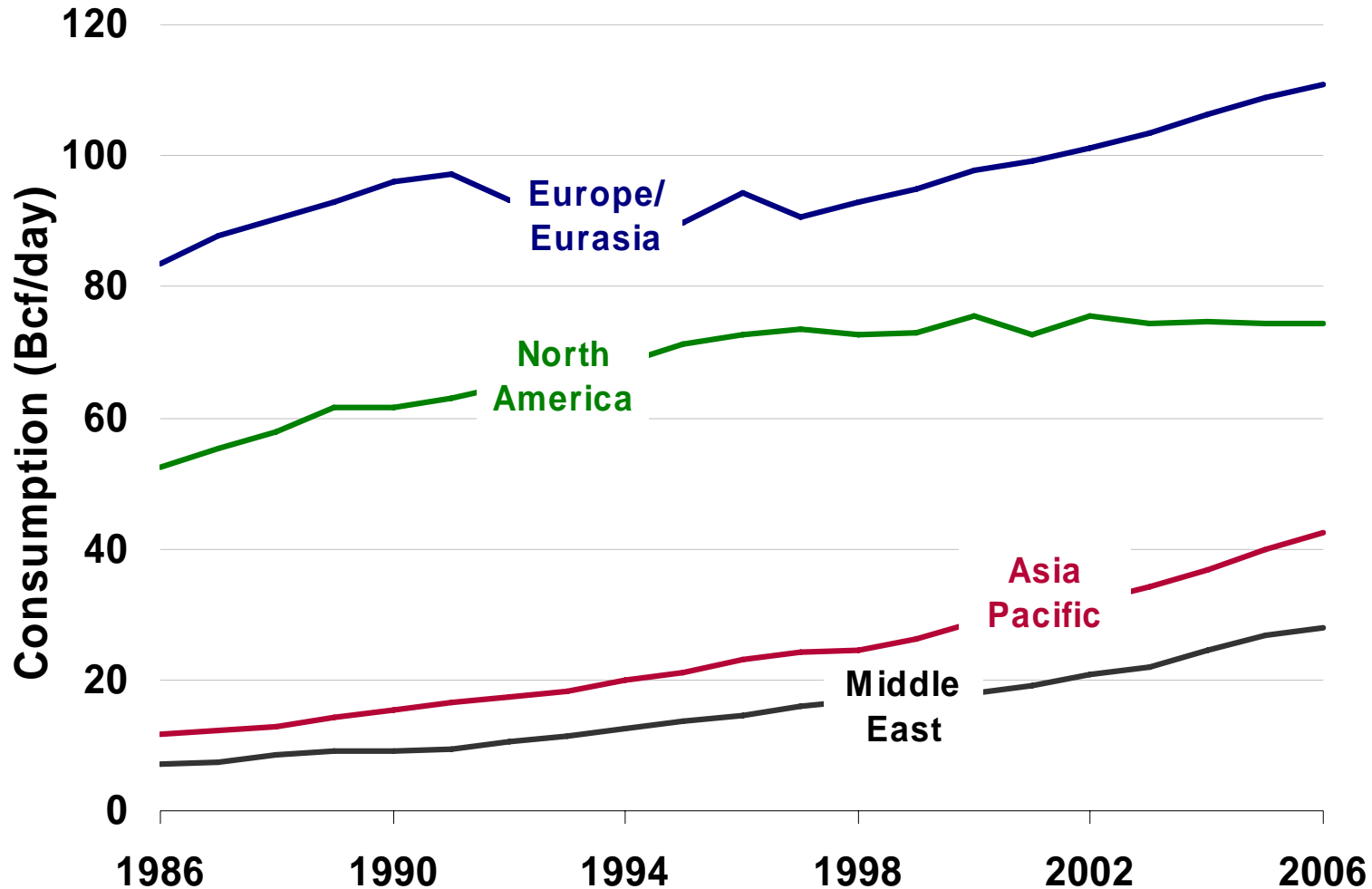
# China's Go-Forward Energy Mix?

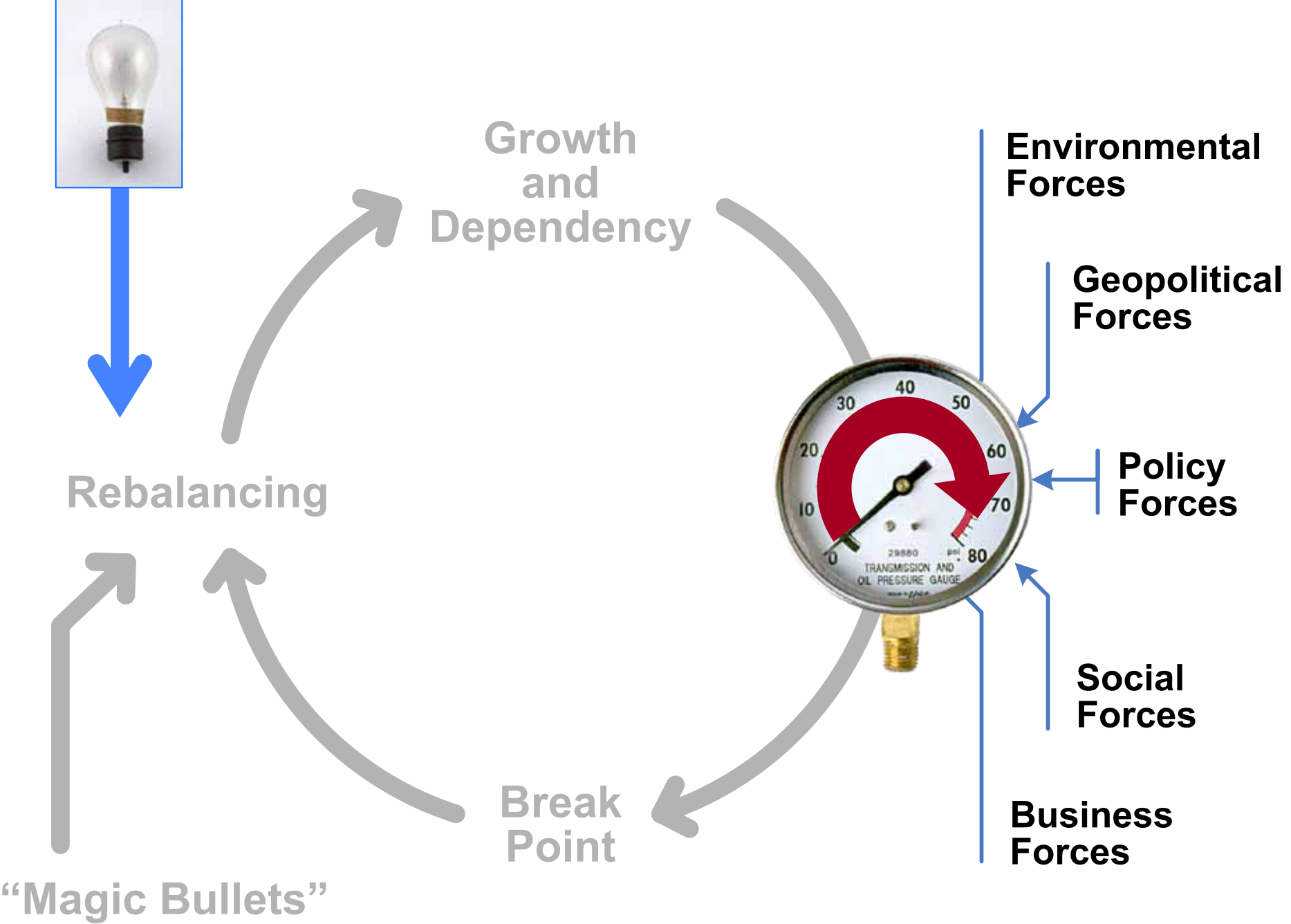
## 1965 to 2020 Energy Consumption by Fuel



Source: BP Statistical Review 2006, ARC Financial Research

# World Natural Gas Demand by Region 1986 to 2006





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# 2007 Houston World Oil Conference

Proceedings



*Energy Action for a Healthy Economy  
and a Clean Environment*

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