



# **Hedging Against Climate Change An Energy Industry Perspective**

**Alaska Forum on the Environment**

**Charles A. Christopher  
BP Americas**

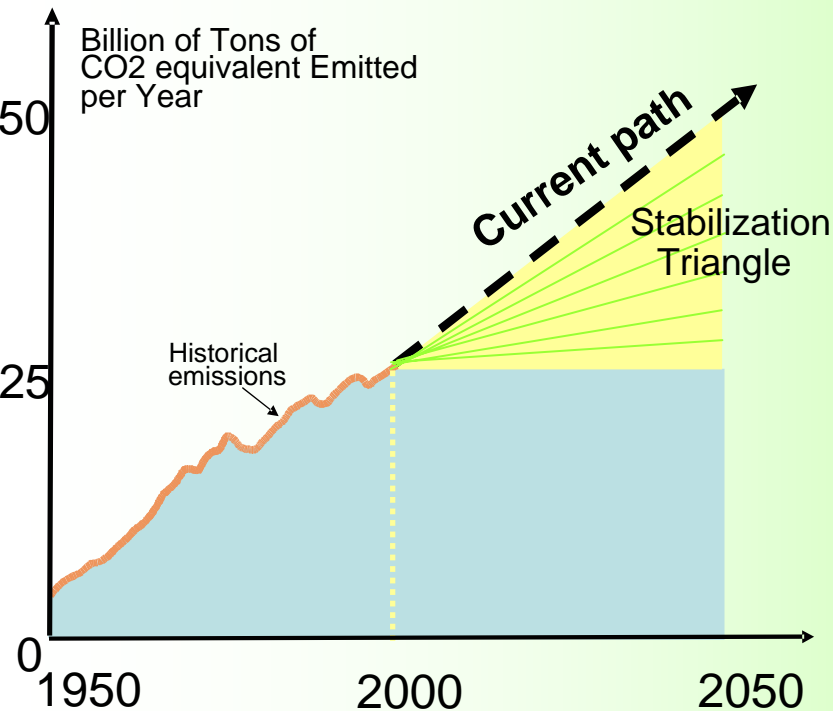
**February 8, 2006**



# The Climate Challenge

## BP Accepts the Science

### But how should we move forward?



## Stabilization Wedges

- Global emissions could double over next 50 years
- Challenge of stabilizing atmospheric levels of greenhouse gases
- Actions to reduce CO<sub>2</sub> emissions
- Examples:
  - doubling auto fuel efficiency
  - gas replacing coal
- Technologies are known



# BP's Goals

- **Leading energy producer and supplier**
- **Minimize damage to the environment**
- **Helping lead on global transition to lower carbon energy**



# The Bridges to a Sustainable Future

## Fossil Fuel Based



- Emissions Reductions
- Energy Efficiency
- Alternative Energy

## Renewables Based





# BP's Internal Emissions Commitment

- 1998 - Targeted 10% reduction from 1990 levels
- 2002 - 10% target reached through energy efficiency and flaring reduction
- Committed to net emissions at reduced levels to 2012
- **Climate Change Leadership**



# CO<sub>2</sub> Capture & Storage

In Salah - 1.1 mT/annum

CCS is an emerging technology suited to large stationary point sources of CO<sub>2</sub> from power generation, industry and H<sub>2</sub> production.

## CO<sub>2</sub> Capture

- ✓ Post-Combustion
- Pre-Combustion
- Oxyfuels
- \$60-100+/Tonne CO<sub>2</sub>

## High Purity Sources

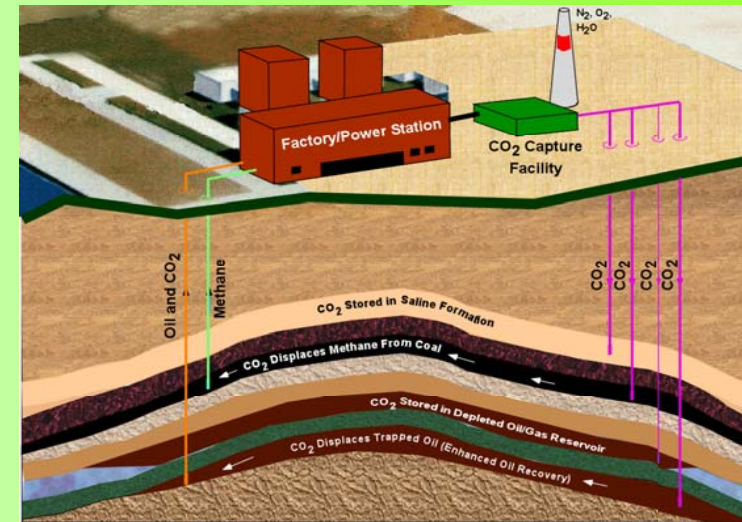
- Already separated
- Hi Concentration
- ✓ Amines, Membranes, H<sub>2</sub>
- \$2-10/t CO<sub>2</sub>

## Transport

- ✓ Pipelines
- Ships
- \$ Depends distance

## Geological Storage

- ✓ Enhanced Oil Recovery
- ✓ Saline Aquifer Formations
- ✓ Depleted Oil/Gas Reservoirs
- Enhanced Coal Bed Methane
- \$1-10/t CO<sub>2</sub>





# Efficiency gains and the “Wedges”

Princeton University and BP identified  
approaches for carbon reductions

- Internal combustion engine efficiency
- Demand side reductions
- Buildings energy efficiency
- Industrial process efficiency
- Efficient baseload coal plant
- Gas for coal power
- Carbon capture & storage for power
- Carbon capture & storage for transport
- Nuclear
- Wind
- PV solar
- Biomass for transport & power
- Hydrogen from gas
- Zero emission hydrogen
- Forestation
- Tillage



# Energy Efficiency - Identify key enablers

- Energy management
- Project management
- Coaching Skills
- Energy procurement
- Energy & Carbon demand forecasting



- Culture/ values
- Targets/ Measures
- Delivery model
- Accountabilities
- Cross group functions



- Corporate mngt info systems
- Business mngt info systems
- Operator M&T systems
- Collaboration tools
- Specialist tools & technologies

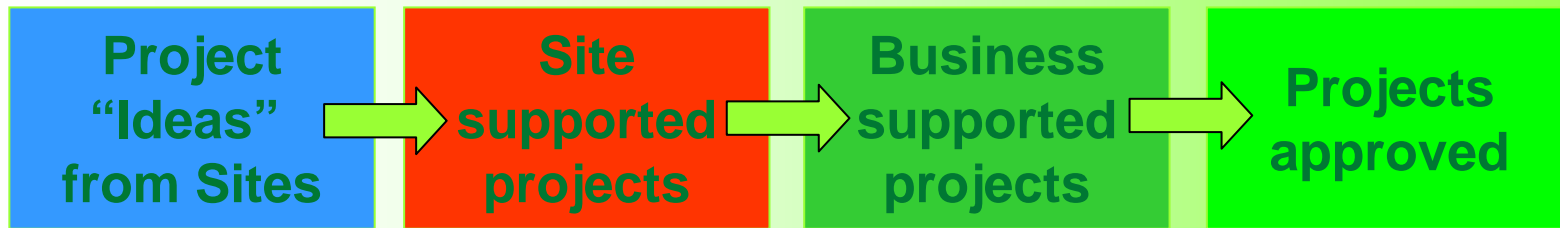
- Capital allocation
- Risk weighted criteria
- Hurdle rates
- Spend tracking



**BP identified four key enablers**



# BP process to drive energy efficiency



- Web based tool open to BP employees
- 400 project ideas currently under development - \$350mm investments
- Shares ideas and successes on-line
- Aggregates investment and benefits

**Energy and GHG Projects Database**  
Energy Efficiency and Flaring & Venting Investment Tracking

Home | Add New Project | My Projects | Reports | All Projects | Charting | My Administration | Site Admin

Filter & Export

Filter Options

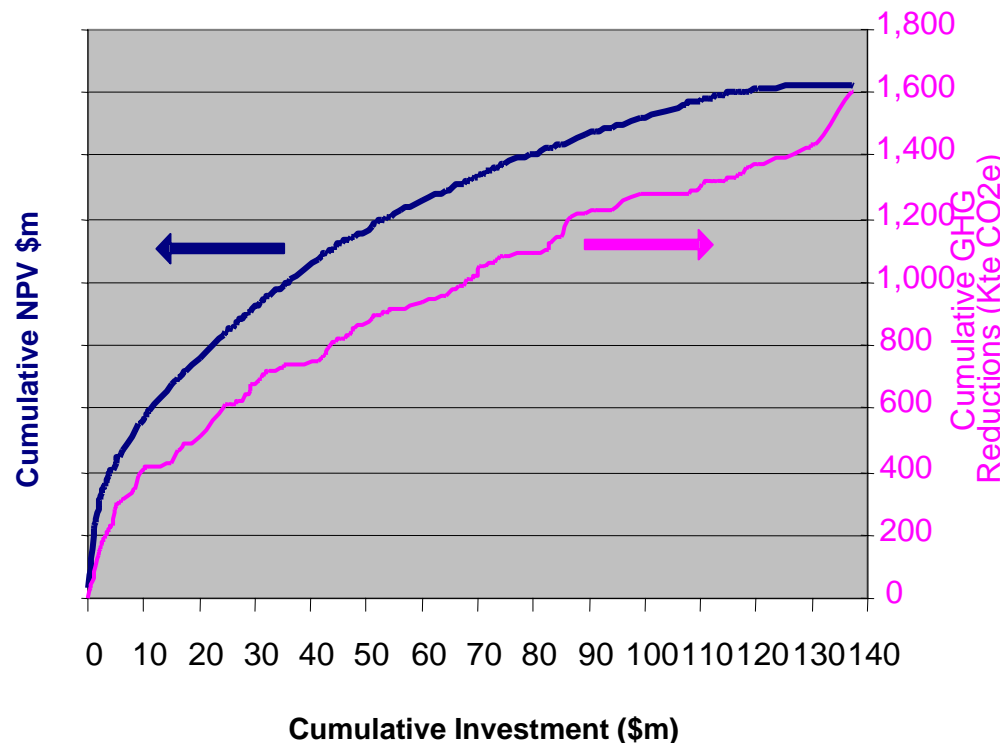
Project Name	SPU	Owner	Earliest Start Year	Plan Total Capex/Revin [\$Million]	Plan Total NPV [\$Million]	Plan Total GHG Reduction [KT CO <sub>2</sub> e]	Simple Capital Efficiency	Status
Expand All								
Aromatics & Acetyls								
49 projects				87.44	192.40	324.18	2.20	
Lubricants & Services								
1 project				0.20	0.00	0.00	0.00	
Refining								
169 projects				129.85	313.83	1,466.28	2.42	
<b>OVERALL TOTAL</b> 219 record(s) found				217.49	506.23	1,790.46	2.33	

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# Results so far: Very good for business

2004 & 2005 Energy & GHG Programme  
(Stacked by Capital Efficiency highest to lowest)



- Around 200 energy projects underway
- Projects prioritised by commercial attractiveness – GHG follows
- Portfolio IRR around 40-50%
- Group level numbers are becoming visible



# Alternative Energy: Our Aim

- World's leading low-carbon power business
- \$8bn investment plan over next 10 years
- Annual operating profit of up to \$1 billion within next decade
- Cut projected GHG emissions by 24 million tonnes a year by 2015



# Growing solar power



## Currently

World's third largest solar manufacturing and marketing company - make around 100MW of solar panels each year

## Our commitment

Doubling capacity by 2006 - new joint venture in China and new partnership in California; plan to increase solar sales 3x in 3 years



# Growing wind power



## Currently

Two wind farms in Netherlands, featuring some of Europe's largest wind turbines; large trader of wind power and renewable credits

## Our commitment

Planning new large-scale wind farms in US and Europe; plan to grow BP's wind business from 30MW to 450MW in 2008

Leverage BP land bank as source of competitive advantage; market growing at more than 12% per annum



# Growing gas power



## Currently

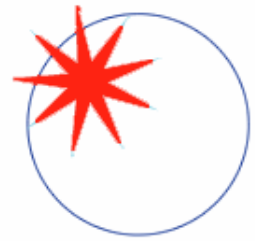
Participate in 13GW of gas-fired power plants in US, Vietnam, South Korea and Spain

## Our commitment

Develop another 200MW of gas-fired power capacity by 2008 and be leading trader in clean power and CO<sub>2</sub> credits



# Growing hydrogen power



## Currently

World's first hydrogen power plant with Carbon Capture and Sequestration in Scotland (DF1)

## Our commitment

Plan to build larger scale hydrogen power plant in the US and demonstrate technology works at scale



# Concluding Remarks

- Risks are real
- Precautionary measures to significantly reduce emissions now
- No single solution capable of dealing with problem



# Concluding Remarks (cont)

- Realistic transition can be made
- BP intends to be a very real force in driving that transition