



WEC, Abu Dhabi

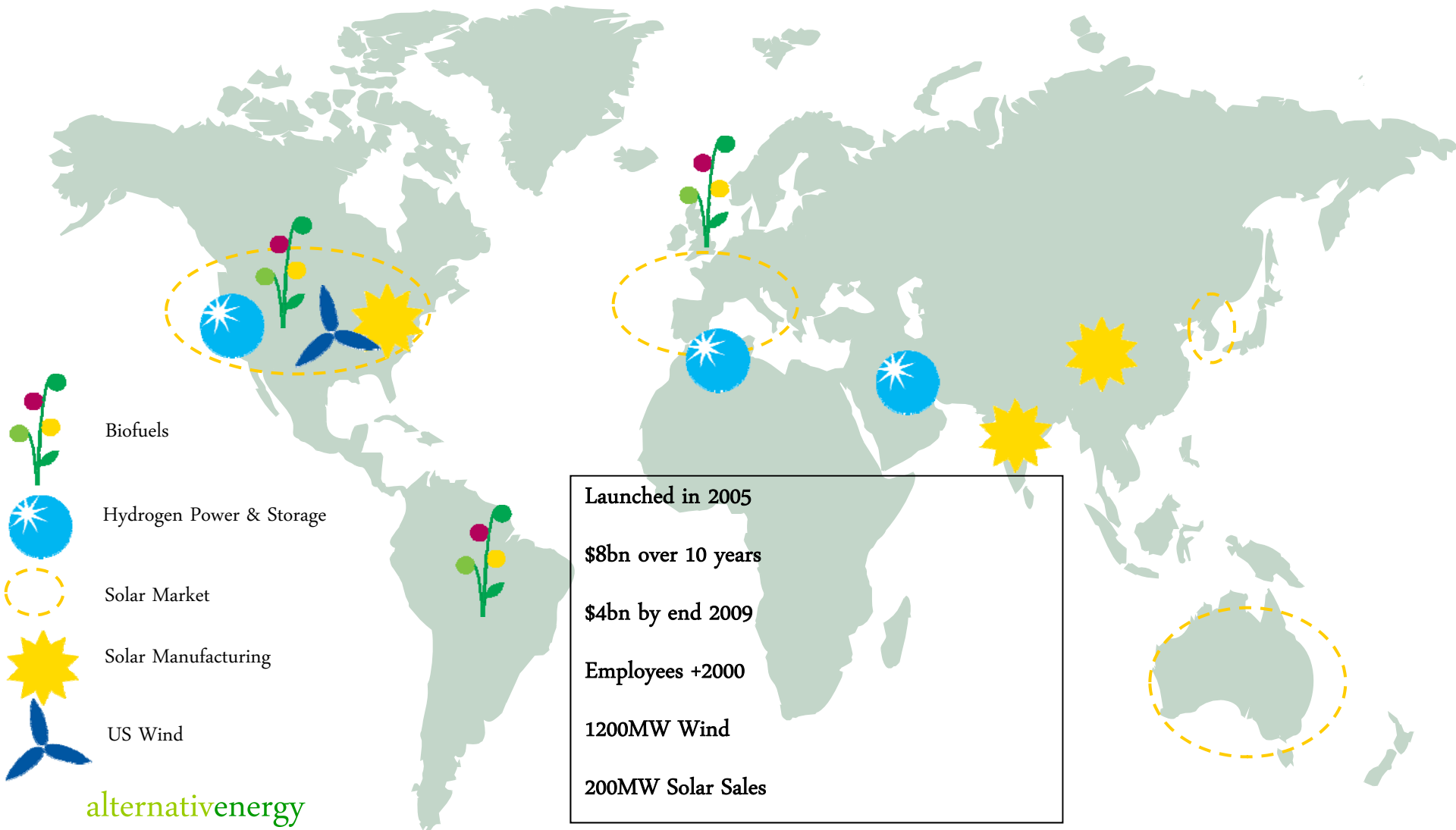
BP & CCS: From Algeria to California

Gardiner Hill, Senior CCS Advisor, BP

21st January 2010

alternativenergy

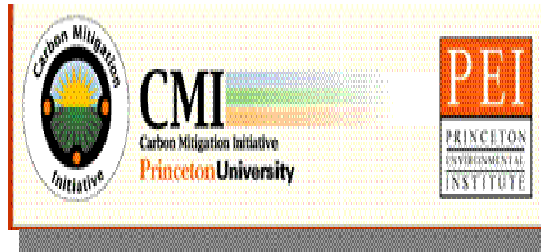
BP's Alternative Energy launched with commitment to invest \$8bn over 10 years



BP has been making a significant contribution to CCS for more than a decade



Research



Industry/ Academic Initiatives

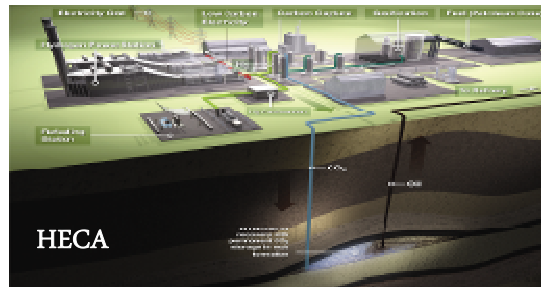


- Source-sink matching
 - CO2CRC, EUGeocapacity, Coach, US Regional partnerships
- Public policy support
 - CSLF, EU-ZEP, CDM
- Assurance framework
 - CO2CRC, CSLF, IMCO2, WRI
- 3rd Party Demonstrations
 - Sleipner, Weyburn, CO2Remove, Otway Basin

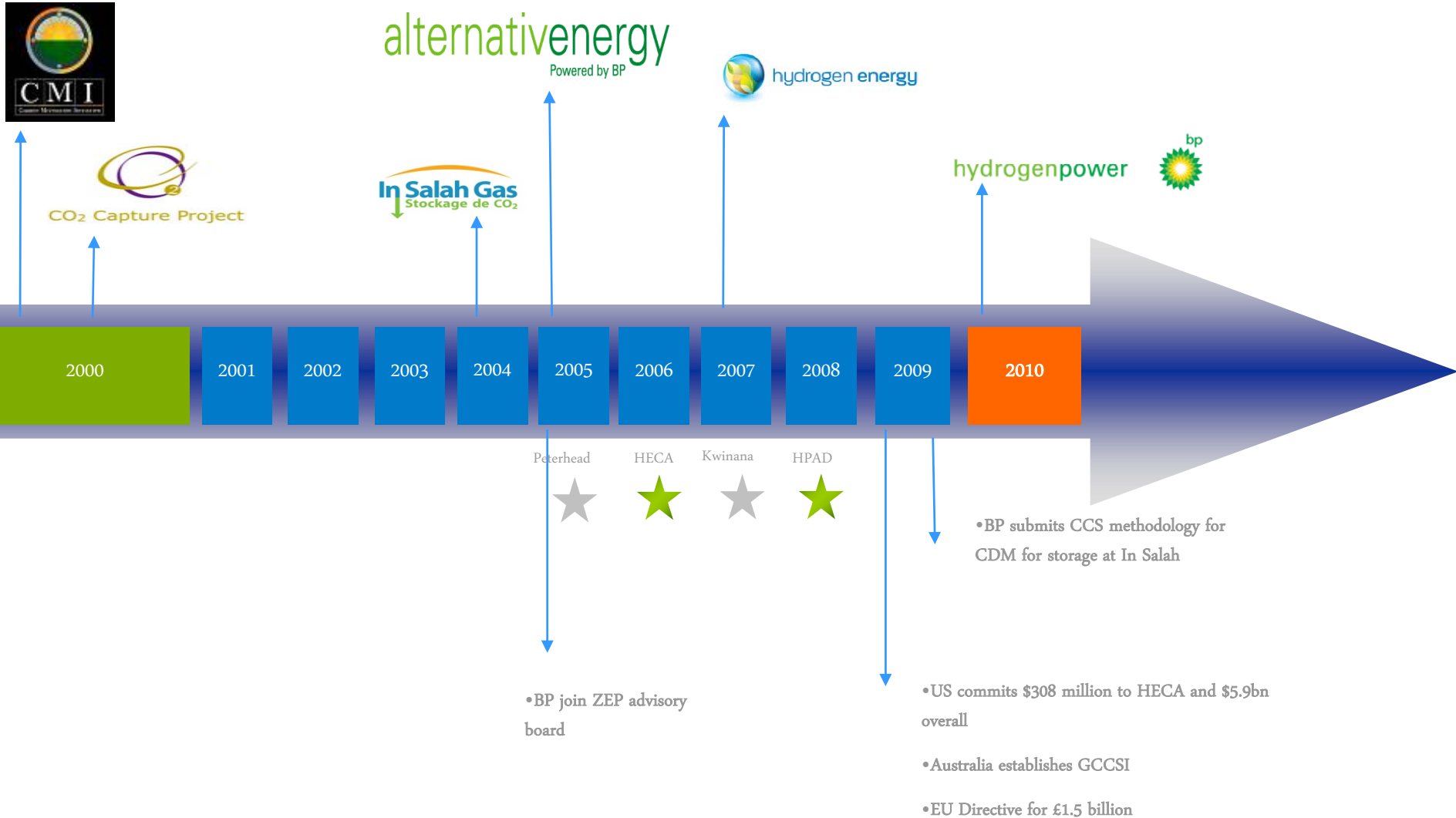
Technical Demonstrations



Industrial Scale Projects



The journey has been a pioneering one, but it cannot be done alone





Integrating Scientific Understanding with Technological & Policy Expertise



CARBON MITIGATION INITIATIVE



Stabilization Wedges Game

Discover different strategies of using today's technologies to take the world off the path toward dramatic climate change.



The Personal Carbon Footprint

CMI's "One Billion High Emitters" research makes Time Magazine's 50 Best Inventions of 2009.



Eighth Year Report 2009

CMI's eighth year was marked by BP's decision to commit to funding through 2015.

Science Group

Collects data from the oceans, the atmosphere, ice cores, and the land biosphere to study how natural sources and sinks of carbon have varied in recent and ancient times, and how they will respond to future climatic change.

Storage Group

Studies potential risks of injecting CO₂ underground for permanent storage. Models of subsurface carbon dioxide behavior and laboratory studies of well cement degradation are helping the group evaluate that risk.

Capture Group

Assesses technologies for capturing CO₂ emissions from fossil fuels used in electricity, hydrogen, and synfuels production. Other research areas include studies of alternative fuel combustion, renewable energy, and energy storage.

Integration Group

Synthesizes research discoveries and explores the policy implications of carbon mitigation strategies. It also works to communicate issues of carbon and climate to industry, government, NGO's and the general public.

News

[Looking Ahead From Copenhagen: How Challenging is the Chinese Carbon Intensity Target?](#)

[A Once-Dark Polaroid Factory Goes Green](#)

[Listen Now!](#)

[more news >>](#)

Events

[CMI 9th Annual Meeting](#)

February 9-10, 2010,
Princeton University
Member login required.

Join Our Mailing List

Name:

E-mail:



Phase 3

CO₂ Capture Project



Cooperating for a Better Environment

The world will have to reduce **GreenHouse Gas** emissions before it stops using fossil fuels.

CO₂ capture and geological storage removes the carbon from fossil fuels and can provide a significant cost-effective GreenHouse Gas reduction option for the world.

The **CO₂ Capture Project** is an international initiative funded by eight of the world's leading energy companies and three governments.

Project Goals

- Conduct research, development and pilot testing to reduce the cost of CO₂ capture from large, fixed sources.
- Demonstrate that the geological storage of CO₂ is secure and can represent a viable GreenHouse Gas mitigation technique.
- Establish an extended network for CO₂ storage demonstrations to share learning.



CO₂ Capture Project

Phase 3

CO₂ Capture Project

Phase 3



www.co2captureproject.org

Zero Emissions Fossil Fuel Power Capability by 2020

ZEP's Proposal

First industrial scale step was CO₂ storage project at In Salah, Algeria

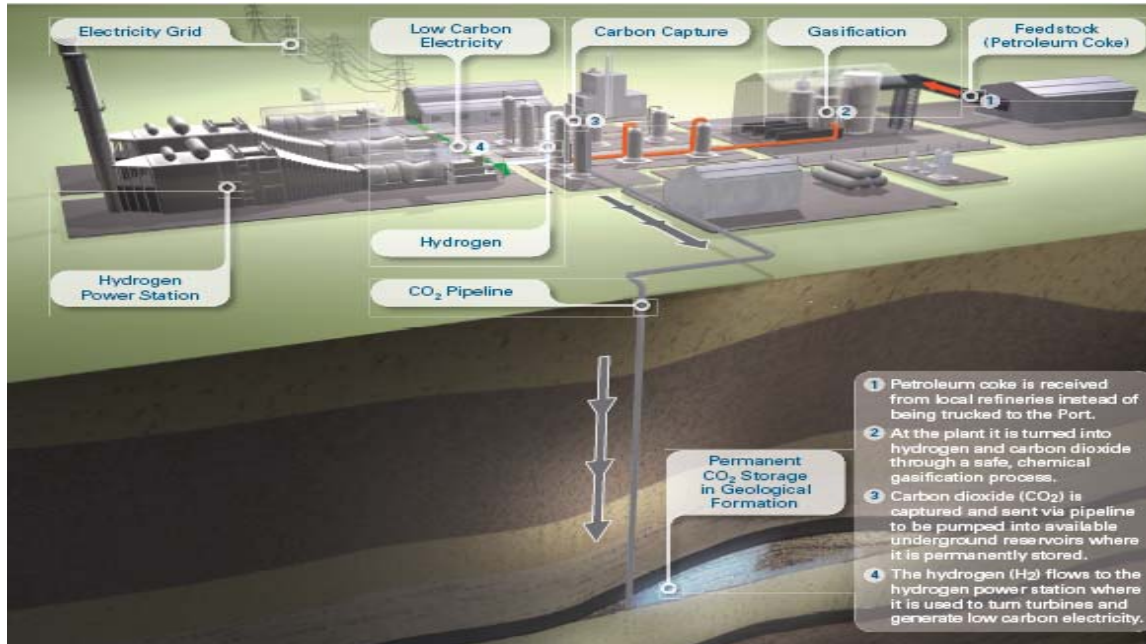


Project Facts

- Started storage in August 2004
- 1mmtpa CO₂ stored (17mm tonnes total)
- \$100mm incremental cost for storage no commercial benefit
- Test-bed for CO₂ monitoring technologies \$30mm research project
- Partners: Sonatrach and Statoil. Support from US DOE and EU Commission RTD



Followed by Hydrogen Energy, California in 2006



Project

- JV BP and Rio Tinto
- Uses gasification technology to convert solid fuels into hydrogen for low carbon power generation with carbon capture and storage.
- Project Sanction Milestone 2011 & potential start-up in 2014

Climate Change Milestones

- 250 MW of hydrogen-generated electricity - enough to power 150,000 California homes
- Capture **2 million tpa** of CO₂ for enhanced oil recovery (EOR) and long term storage in Kern County, California
- Lowest CO₂ emissions in the world for an IGCC plant due to 90% capture

Hydrogen Power, Abu Dhabi project was launched in 2007 with Masdar



Project

- JV MASDAR and BP
- Expected to be the world's first power plant powered by hydrogen derived from natural gas
- Delivered CO₂ could replace natural gas for Enhanced Oil Recovery
- Project Sanction Milestone 2010 & commissioning in 2013

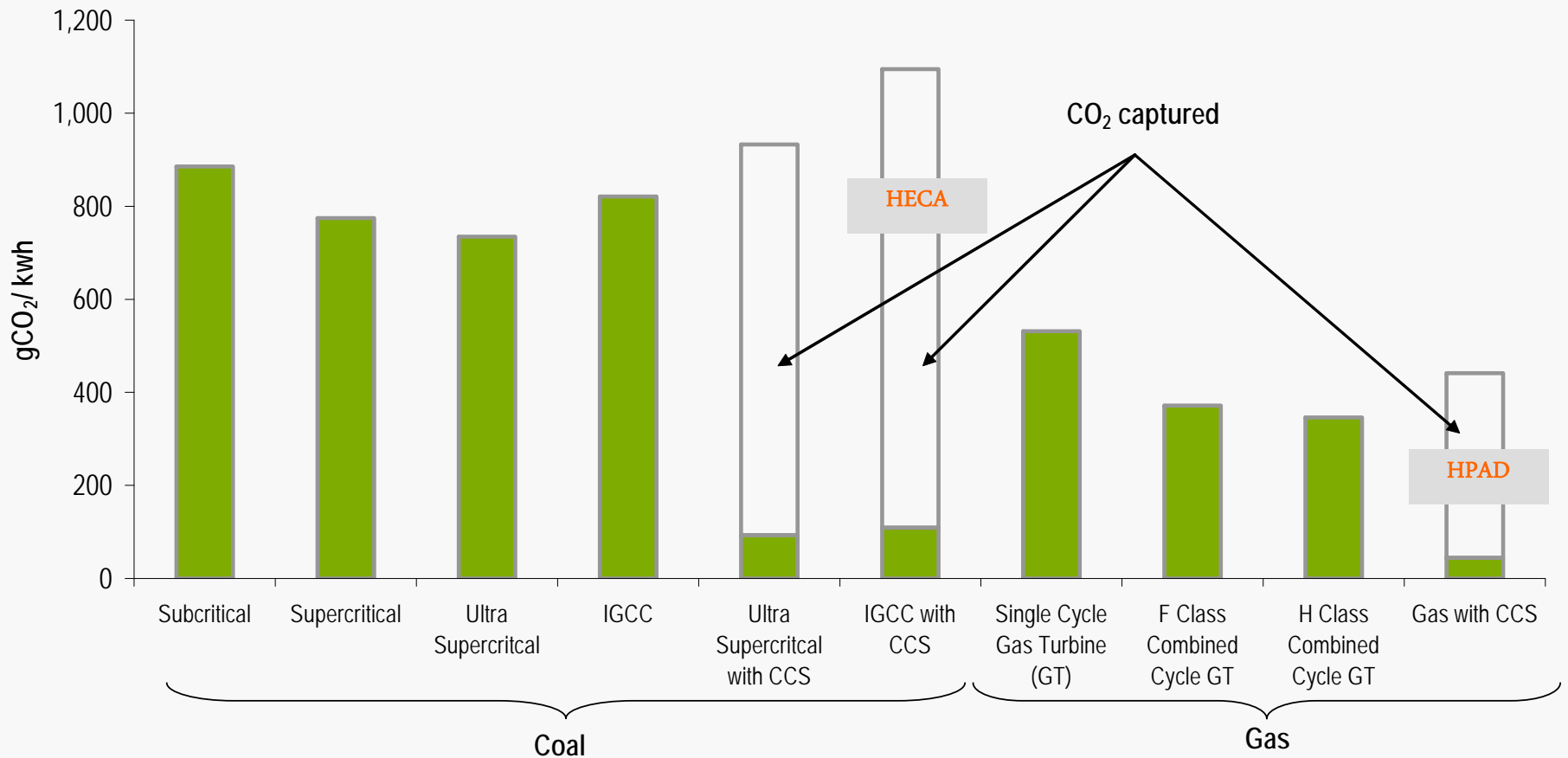
Climate Change Milestones

- 400 MW of low-carbon electricity = 5% of Abu Dhabi's capacity
- 1.7 mmtpa CO₂ captured = decarbonizing Abu Dhabi's transport sector
- CO₂ will be used for Enhanced Oil Recovery (EOR) and ultimately stored
- Secure geological storage of CO₂

Projects to prove generation of 90% CO₂ free electricity at an industrial scale



CO₂ Comparison for Reference Generating Plants



In conclusion



- BP continues on this important journey to deliver cost effective CCS and low-carbon power solutions at industrial scale to combat climate change
- All components of the CCS value chain have been proven at scale: the technology is here and ready to be deployed now
- BP continues to play an active role in helping enable CCS deployment
- BP technology programme focused on meeting BP business needs and delivering next generation technology; improve efficiency, reduce cost, secure CO₂ storage and advanced CO₂ EOR with storage
- In Salah will complete phase I at the end of 2010 and develop plans around the needs and substance of follow-on work for phase II
- CCP has successfully completed phase II and phase III of the project, which is focused on technology demonstrations and pilots, has been successfully launched
- BP will continue its commitment through its portfolio of activities, particularly the delivery of the critical HPAD and HECA projects