

# Capacity Building for the Deployment of CO<sub>2</sub> Capture and Storage (CCS)

UNFCCC Meetings  
Bonn, Germany  
May 20, 2006  
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# Presentation Overview

- Asia Pacific Economic Cooperation (APEC)
- Carbon Dioxide Capture and Geological Storage Potential of the APEC Region
  - Project Proponents
  - Phase I
  - Phase II
  - Phase III
- Sources of Information

# What is the Asia-Pacific Economic Cooperation (APEC)?

- Forum for facilitating economic growth, cooperation, trade and investment in the Asia-Pacific region
- Purpose and goals are to further enhance economic growth and prosperity for the region and to strengthen the Asia-Pacific community

## APEC Member Economies

Australia

Brunei

Canada

Chile

China

Indonesia

Korea

Japan

Malaysia

Mexico

New Zealand

Peru

New Guinea

Russia

Philippines

Singapore

Taiwan

Thailand

United States

Viet Nam



## Project Overview

- APEC Energy Working Group (EWG) established a three-phased project to explore the potential for geological CO<sub>2</sub> capture and storage technologies in APEC regions.
- Initiative designed to help non-industrialized member economies successfully identify, evaluate and develop prime CO<sub>2</sub> capture and geological storage projects in their countries.

# APEC Project Expert Committee

- Ms. Jette Findsen, SAIC, USA
- Mr. John Gale, IEA Greenhouse Gas R&D Program, UK
- Mr. Michiaki Harada, Center for Coal Utilization, JAPAN
- Mr. Bill Reynen, NRCan, CANADA
- Mr. Andy Rigg, CO2CRC, AUSTRALIA
- Dr. Xu Shisen, TPRI, CHINA
- Ms. Melissa Chan, U.S. Department of Energy, USA
- Mr. Ohsumi Takashi, Research Institute of Innovative Technology for the Earth, JAPAN
- Dr. Kelly Thambimuthu, formerly NRCan and IEA Greenhouse Gas R&D Program, Canada (now in Australia)
- Dr. Malcolm Wilson, Department of Energy &

# Project Proponents

The Delphi Group  
(Canada)

The Alberta Research Council  
(ARC)

Innovative Carbon Technologies  
Pty Ltd (ICTPL)

The Cooperative Research  
Centre for Greenhouse Gas  
Technologies (CO2CRC)



# Phase I: Assessment of Geological Storage Potential

- Project Timeline: July 2004 – October 2004
- Results:
  1. Inventory and assessment of potential geological sites for storing CO<sub>2</sub> in the APEC economies
    - Overview of CO<sub>2</sub> emissions
    - Type of storage option available (i.e. deep saline formation, depleted hydrocarbon field, deep coal seams, etc.)

# Phase I: Assessment of Geological Storage Potential

2. Geographical Information System (GIS) project:
  - Project area political/province boundaries
  - Point source emission data by node
  - Major geological provinces
  - Major petroleum basins (productive and non-productive)
  - Sedimentary basins with high, low and no “prospectivity” for CO<sub>2</sub> storage
  - Coal distribution and coal type (e.g. lignite, bituminous) in East and SE Asia

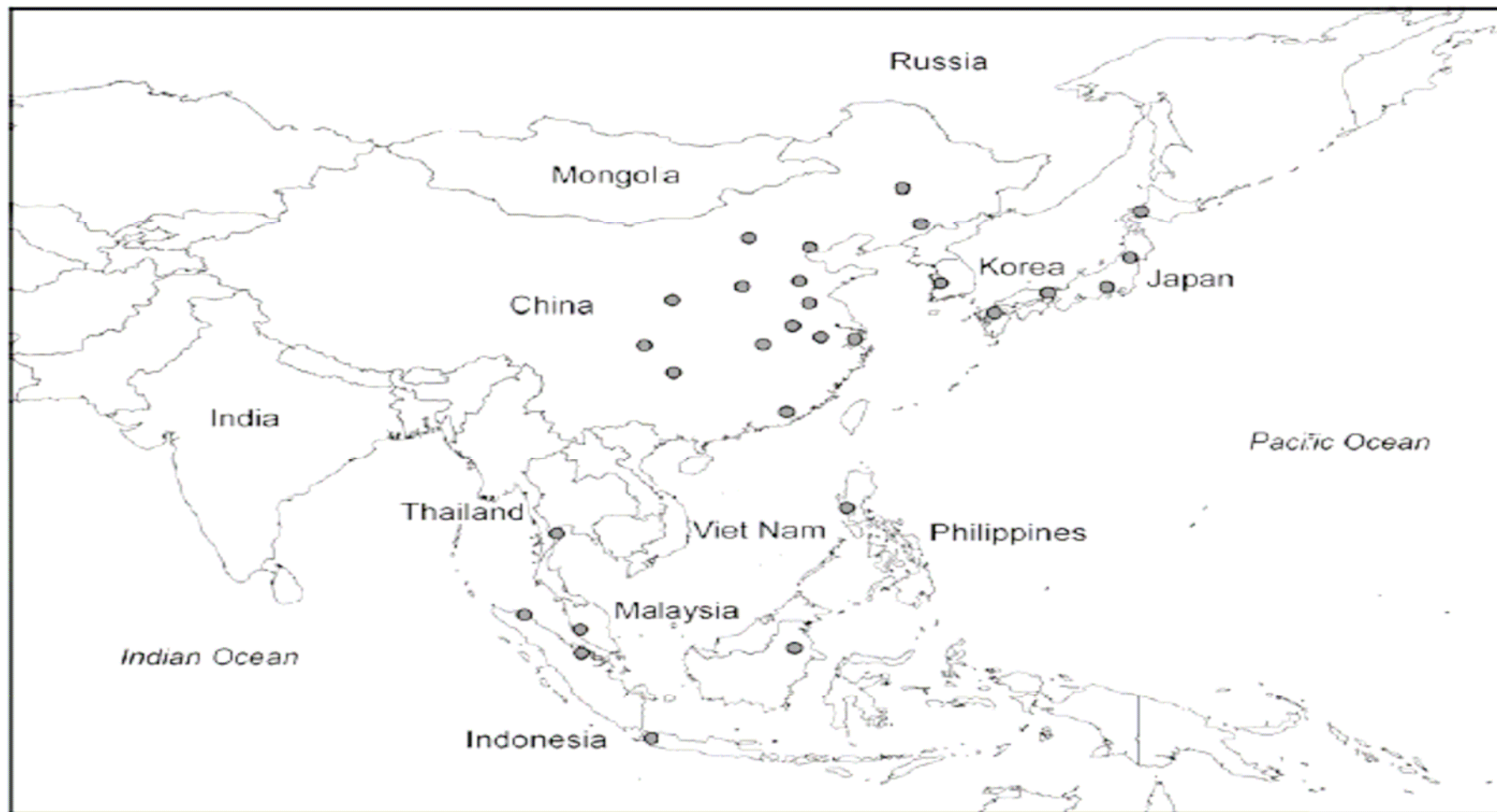
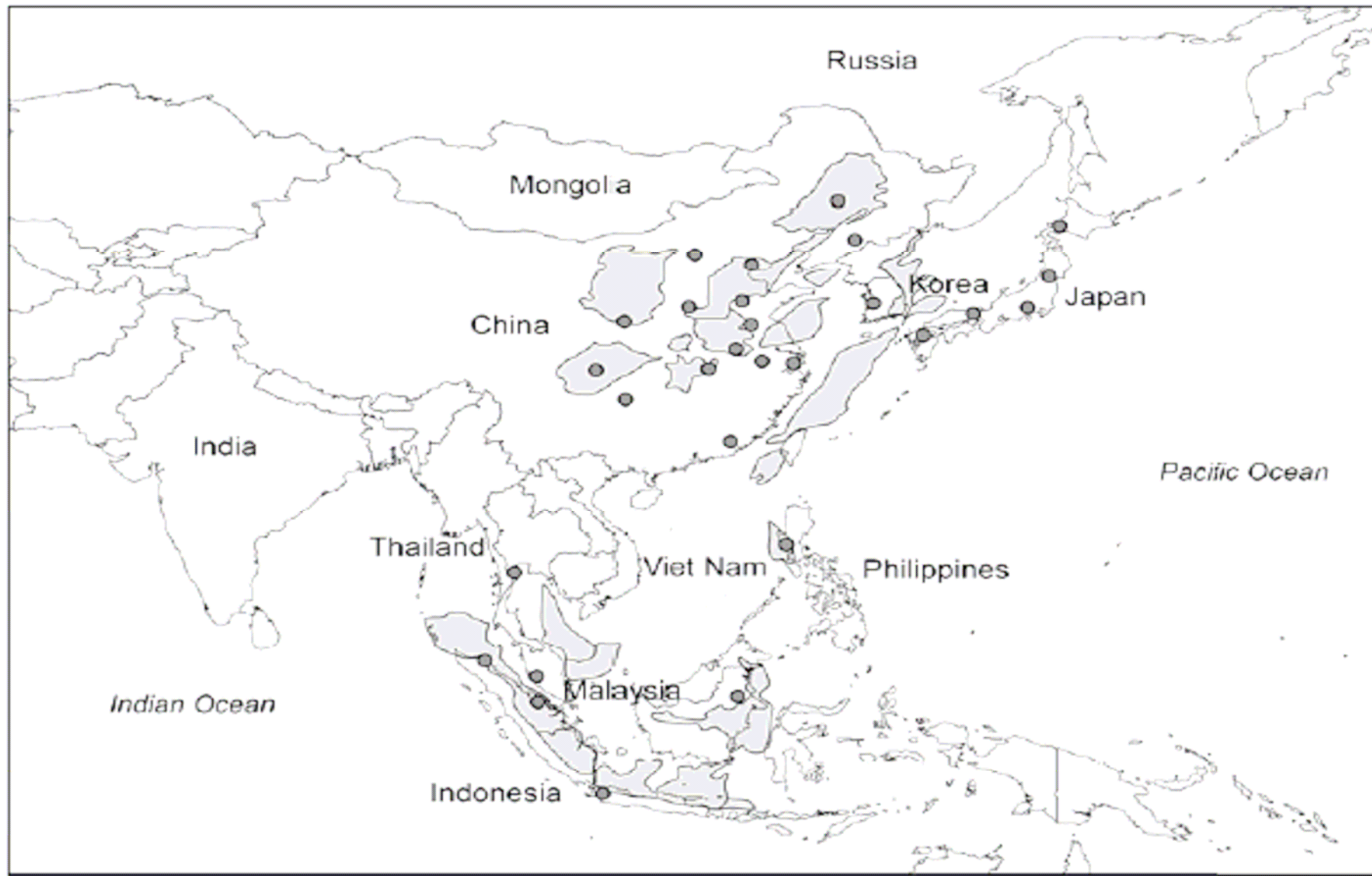
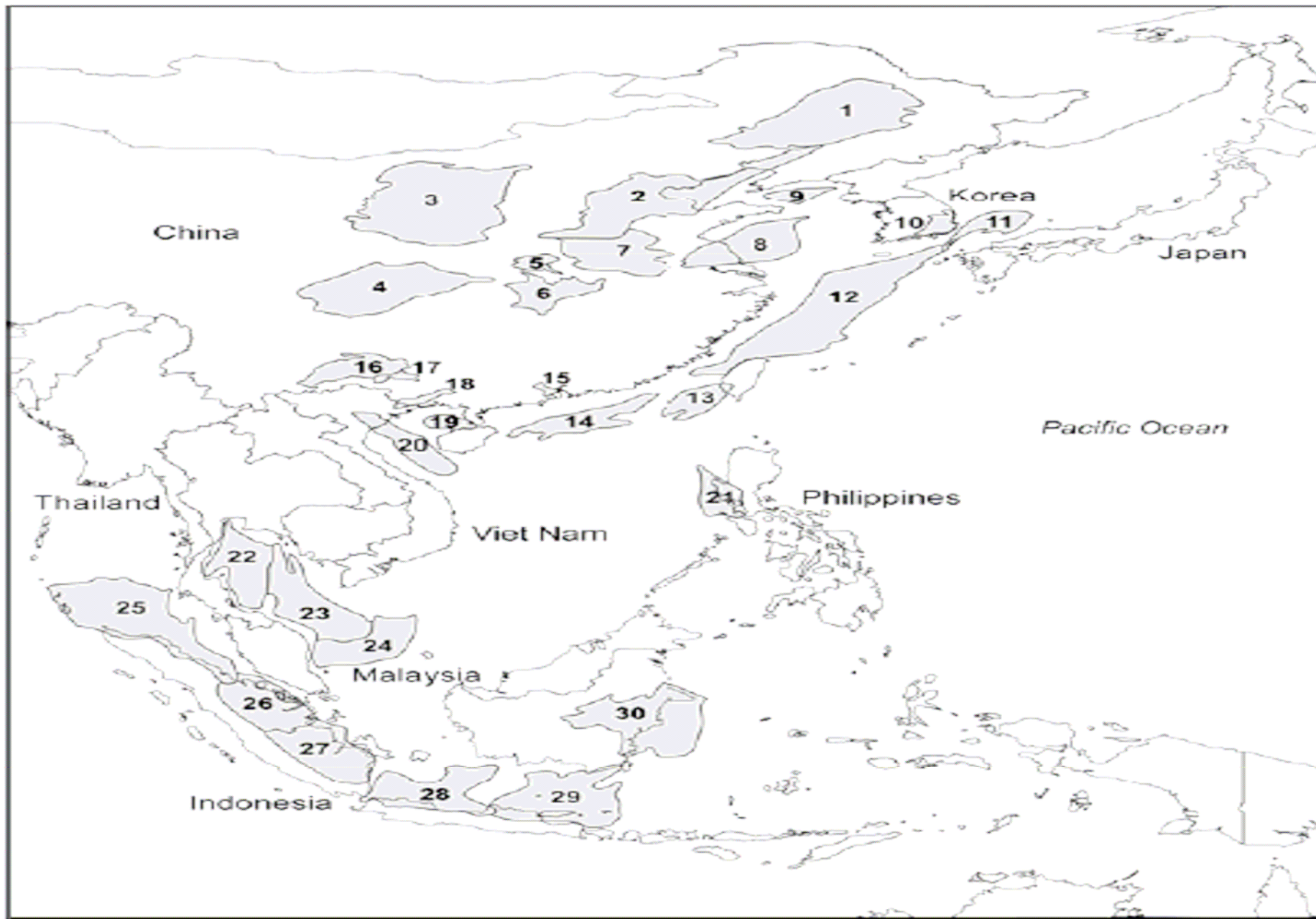


Figure 13.3: Asian APEC economies with significant CO<sub>2</sub> emissions and location of major CO<sub>2</sub>- nodes (modified from Bradshaw et. al., August 2004).





## Phase II: Capacity Building

Project Timeline: July 2004 – March 2004

Objectives:

- Enhanced capacity of APEC economies through the use of training materials and workshops
- Build awareness and capacity around the potential for the capture and geo-storage of CO<sub>2</sub>
- Contribute to sustainable development objectives

## Phase II: Capacity Building

The overall project produced the following materials:

- Training materials (13 modules, 2 case studies)
- A strategy for community outreach
- A workshop to disseminate the outcomes of the project, facilitate capacity building, and enhance technical understanding of carbon dioxide capture and geological storage technologies

# Capacity Building – Technical Materials

- CO2 capture and storage: An overview of the science and what it has to offer
- CO2 capture: Post-combustion flue gas separation
- CO2 capture: Pre-combustion (decarbonisation) and oxyfuel technologies
- CO2 compression and transportation to storage reservoir
- Storage options for CO2: Types of geological storage projects
- How to screen reservoirs for suitability of CO2 storage



# Capacity Building – Technical Materials

- Summary of key steps involved in developing and implementing a CO<sub>2</sub> capture and storage project
- Health, safety and environmental issues associated with CO<sub>2</sub> storage
- Performance assessment: Planning for and mitigating potential leakage and remediation issues
- Regulatory/legal aspects and public policy associated with CO<sub>2</sub> storage
- The Clean Development Mechanism
- Economic considerations of CO<sub>2</sub> storage
- Potential of CO<sub>2</sub> capture and storage in the APEC region

# Capacity Building – Other Materials

- **Community Education & Outreach Strategy**
- **Two Case Studies**
  - Saline Aquifer CO2 Storage Project (Statoil Sleipner in the Norwegian North Sea)
  - CO2 – EOR storage project (Weyburn, Saskatchewan)

## Phase III: Enhanced Capacity Building

Project Timeline: On-going

Objectives of Project:

- Enhance Existing Training Materials
- Design & deliver two workshops
  - Mexico
  - China
- Identify opportunities that CO<sub>2</sub> capture and geological storage represent for their economies.
- Increase ability to evaluate options and implement successful CCS initiatives.

## Phase III: Enhanced Capacity Building

More specifically, the project will:

- Build relationships to aid in technology transfer;
- Present options for advancing CCS projects & technologies;
- Facilitate capacity building through targeted training sessions
- Gain input from participating stakeholders to identify options as to how to progress the development of CCS as a viable technology

## Useful Links

**APEC Website** <http://www.apec.org>

**Internal Project Website (Phase II)** <http://www.delphi.ca/apec/>  
This site provides links for the APEC training package

### **Project Proponent Websites:**

Alberta Research Council <http://www.arc.ab.ca>

The Delphi Group <http://www.delphi.ca>

Innovative Carbon Technologies Pty Ltd (ICTPL)  
<http://www.ictpl.com.au>

## More Information:

### For More Information Contact:

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