Study Guide for the Australian Collaboration Fact and Issue Sheet

BEYOND THE IPCC REPORTS: EMERGING FINDINGS

FOR REVIEW

1. The IPCC Reports

1a. Do you know what the following key terms mean? If not, look them up in a dictionary, encyclopaedia, or ask your teacher:

i) What does 'conservative' mean in the context of climate change estimates?

ii) What is a 'range of uncertainty'?

iii) What is 'risk management'?

1b. List three reasons why the IPCC reports tend to be conservative.

1c. Are increases in carbon dioxide emissions and sea levels still within the ranges predicted by the 2001 IPCC reports?

1d. What is the reason for the accelerating growth rate of emissions?

1e. Describe four positive feedback or amplifying effects that have been noticed in the past decade but that have not been included in IPCC models.

2. Sea-Level Rise

2a. Draw a quick scale or 'map' of the different predictions for sea-level rise, including the IPCC 2007 report, the new report in 2007 and James Hansen's predictions.

2b. How can we tell that positive feedback in the Artic region has already begun? That is, how do scientists observe these feedbacks in action and what has been observed?

2c. List four additional accelerating processes that are beginning to take effect.

3d. How quickly will the shoreline retreat on a long, straight, sandy beach?

3e. What effect will rising sea-levels have on coastal populations?

3. Emission Reduction Targets

3a. Why is the setting of emission reduction targets so subjective?

3b. How much warming is dangerous according to the 2007 IPCC report?

FOR DISCUSSION

1. Question for a "Think/Pair/Share" activity:

The Fact and Issue sheet suggests that sea-level rises of several metres are not out of the question. Do you live in a coastal area, or have you spent a holiday by the sea? Try to imagine what a one-metre sea-level rise would do to a coastal area you know. Remember what engineers predict about the receding of shorelines for each one meter of sea-level rise along a straight stretch of beach, Rocky coastlines will be affected differently.

i) Spend some time remembering the coastal area you have in mind. What would it look like with a one-metre sea-level rise? What would be lost? Buildings? Roads? Or perhaps a natural feature, such as a wetland? Or might cliff faces become dangerously eroded?

ii) Compare notes with a partner.

iii) Build up a class 'prediction' of how areas you live in or have visited may be affected.

2. Question for class debate:

If low-lying South Pacific islands disappear within this century due to rising sea levels, what is Australia's responsibility to the inhabitants of these islands? Bear in mind that Australia is one of the highest per-capita emitters, whereas south pacific islands are generally not high emitters.

3. Question for "Think/Pair/Share" activity:

In the Fact and Issue sheet, Barrie Pittock argues that the scientists working on the IPCC reports tend to focus on the most likely result, somewhere in the middle of the range of uncertainty. A 'risk management' approach, on the other hand, would require us to consider the risk of changes near the top of the range. Should we be focussing on the *most likely* result when developing policies on climate change, or should we act to protect ourselves from *potential but unmeasurable risks?* Consider, for example, other 'risk management' contexts, such as buying health or car insurance. Do we focus on the *most likely result* (it is most likely, for instance that we will not get hit by a car), or do we base our action on the *potential risk* of accident or ill health?

i) What do you think? Should we base our action on the most likely result or the potential risk? Work independently to list a few key points to support your position.

ii) Share your thoughts with a partner. Is their position different to yours?

iii) Get your class to make a chart showing the reasons for each position.

FOR RESEARCH

1. Do a project on Arctic sea ice. Spend some time at the sea ice education centre, located within the US National Snow and Ice Data Center's internet site: **http://nsidc.org/seaice/**

You can start with these questions: What is the cryosphere? What is sea ice? Why is it so important? How does sea ice influence the global climate? What is different about the sea ice in the Arctic and the Antarctic? What is 'sea ice extent' and why do scientists study it? Which animals live in polar regions? How do changing ice conditions affect these animals?

2. Research 'carbon capture.' What is carbon capture and storage? Is it a viable solution to climate change? What do opponents of carbon capture say? You can start your research here:

http://www.co2captureandstorage.info/whatisccs.htm

3. For advanced students:

Research the links between climate change and international security. Start by downloading the Lowy Institute Paper, *Heating up the planet: climate change and security*: **http://www.lowyinstitute.org/Publication.asp?pid=391**

Divide the class in half. Each half is to read one of these chapters:

Chapter 2: Food, water and disease.

Chapter 3: Natural disasters, energy security and environmental refugees.

Divide each half of the class into three groups. Get each group to select one topic from within the chapter they have read and prepare an oral presentation to the class. All six topics from the two chapters should therefore be covered, providing a good overview of security issues.