



# **IEAGHG International CCS Summer School Series**

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**COP-18, Doha, Qatar**

# IEA Greenhouse Gas R&D Programme



- A collaborative international research programme founded in 1991
- Aim: To provide information on the role that technology can play in reducing greenhouse gas emissions from use of fossil fuels.
- Focus is on Carbon Dioxide Capture and Storage (CCS)
- Producing information that is:
  - Objective, trustworthy, independent
  - Policy relevant but NOT policy prescriptive
  - Reviewed by external Expert Reviewers
- Activities: Studies and reports (>250); International Research Networks: **Risk, Monitoring, Modelling, Wells, Environmental Assessment, Oxy, Capture, Social Research, Solid Looping**,; GHGT conferences; IJGGC; facilitating R&D and demonstrations eg Weyburn; Summer School; peer reviews.





# Objectives



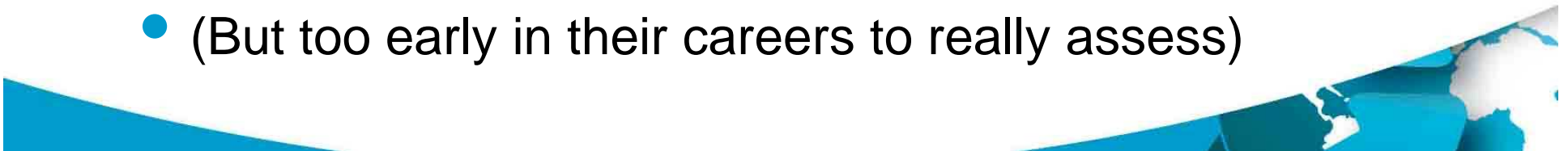
- To improve CCS-knowledgeable human resource
  - To educate young researchers in all CCS areas
    - Broadens knowledge base
    - Wider context
  - To inspire young researchers to make career of CCS
  - To create CCS-awareness
  - To create global network of peers
- Travel and accommodation fully-funded



# Rationale



- Shortage of education and training in CCS
- Growing need for expertise
- Anticipated future employment levels
- Level of student applications
- Host offers
- Impact – surveyed in late 2010:
  - 73/110 respondents still in CCS
  - > 12 moved into in CCS careers
  - (But too early in their careers to really assess)



# Curriculum



## Technical

- CO2 Capture
- CO2 Transport
- CO2 Storage
  - Storage mechanisms
  - Leakage pathways
  - Monitoring
  - Modelling
- CO2 Utilisation
- Safety
- Environmental Impact/Assessments

- Risk Assessment
- Capture from Industrial sources

## Non-Technical

- Economics and Finance
- Legal and Regulatory
- Policy
- Public Engagement
- NGO perspectives





# Group work



- Team work on specific topic or question
- Objective: Provide comprehensive approach to assessment and evaluation of the question or issue posed to your group
  - No 'right' or 'wrong' answer
  - Teams are **multidisciplinary, multinational, multicultural**
  - Will require research, collaboration, integration of collective skills, sharing of knowledge
    - Listening
    - Compromise
    - Consensus



# Working groups



- **G1:** Can CCS be applied to small and medium CO<sub>2</sub> sources and sinks?
- **G2:** Can societal acceptance of CCS be addressed?
- **G3:** Can China set up a series of regionally integrated CO<sub>2</sub> capture, transport and storage networks?
- **G4:** Can CCS be made part of a commercially viable integrated, sustainable and secure energy system?
- **G5:** Is CCS a viable option for developing countries?
- **G6:** Should CCS be mandatory in the developed world?





# IEAGHG International CCS Summer Schools



- 2007 - Germany, FzJ, Kloster Seeon
- 2008 - Canada, University Regina, Vancouver Island
- 2009 – Australia, CO2CRC, Lorne
- 2010 – Norway, NTNU-SINTEF, Svalbard
- 2011 – USA, ISGS, Champaign
- 2012 – China, Tsinghua University, Beijing
- 2013
- 2014

Phase 1

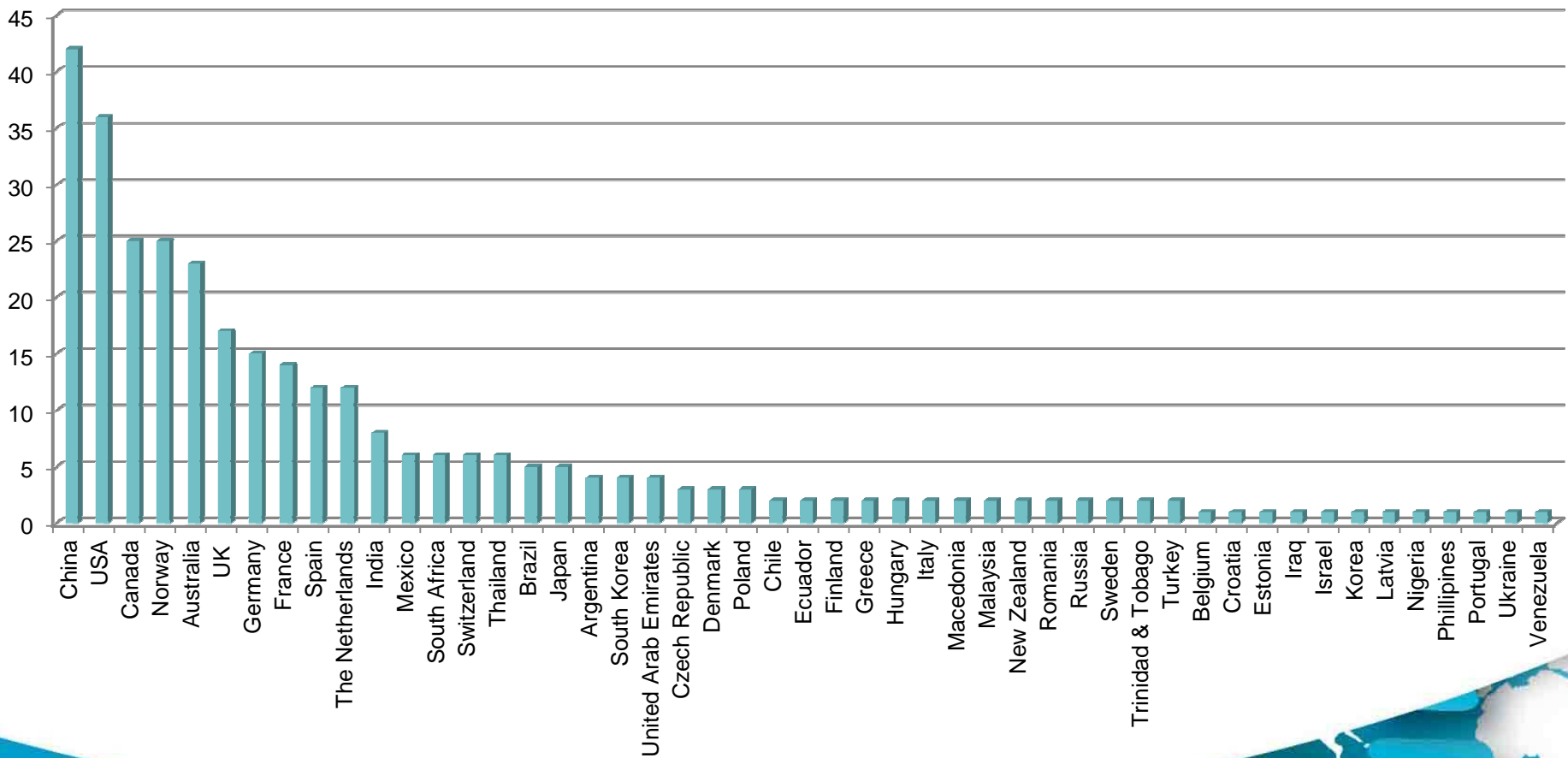
Phase 2



# Alumni



326 students from 49 countries  
28% from developing countries



# Svalbard 2010



- 4<sup>th</sup> International Interdisciplinary CCS Summer School in Longyearbyen, Svalbard August 2010
  - 221 applications received and 56 students were selected, from 32 countries: 48% from developing countries





# Field work



# International CCS Summer School 2011 Champaign, Illinois



- 5<sup>th</sup> International Interdisciplinary CCS Summer School in Champaign, Illinois July 2011
  - Hosted by STEP & MGSC
  - 53 students from 25 Countries: 21% from developing countries
  - 29 Experts and 2 student mentors





# International CCS Summer School 2012 Beijing, China



- 6<sup>th</sup> International Interdisciplinary CCS Summer School in Beijing, August 2012
  - Hosted by Tsinghua University
  - 47 students from 18 Countries and 22 nationalities: 51% developing countries
  - 19 Expert Mentors

# Agenda



- Usual topics on capture, transport, storage, health & safety, economics, regulations, public perception and technical writing.
- New this year:
  - Utilisation (GCCSI)
  - Bio-CCS (IEAGHG)
  - Environmental Impacts (Gassnova & Uni. Of Texas)
  - NGO Perspectives (NRDC)
  - **Panel discussions**
- Field trip:
  - Huaneng Group's pilot capture plant at the Gaobeidian power station





# Group Presentations



Best group: **‘How can China set up integrated CO2 capture, transport and storage networks?’**



Most outstanding students:  
**Niels Berghout**, Utrecht University, NL  
**Vivianne Romeiro**, University of Sao Paulo, Brazil



# Feedback



- ‘Keep up the great job!’ *Lisa Joss*
- ‘Excellent – a great & memorable time. Thanks IEAGHG 😊’ *Tom Demetriades*
- ‘I feel this Summer School was great, I learnt a lot, worked hard, but at the same time I feel so much rewarded!’ *Yue Liu*
- ‘Perfect of all parts! I love it!’ *Bo Yu*
- “I now have an idea how to speak to people about CCS to increase awareness in my country”
- “The most favourite thing for me it was opportunity to see how CCS works in reality”
- “It was a full program but I learned a lot and had a really nice time”
- To improve the Summer School for next year I would...”have more time to sleep”
- To improve the Summer School for next year I would...”I think that invite NGOs which does not support CCS in order to have a very interesting discussion”



# GHGT Mentored Student Programme



- GHGT conference series - largest on CCS
- GHGT-11, Kyoto, Nov 19-22<sup>nd</sup> 2012, 1300 attendees, 900 papers
- Mentored Student Programme to support and assist students from developing countries
- Guidance, mentoring, travel funding
- Global CCS Institute supported



# Future: 2013 Summer School



- **Hosts:** University of Nottingham, UK
- **Dates:** 21<sup>st</sup> – 26<sup>th</sup> July 2013
- Open for applications January 2013 on IEAGHG website







**Thank you**

