

This is an edited transcript of a chat that occurred on Tuesday, May 26, 2009.

Guest chatter was CSIRO's Peta Ashworth.

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Peta Ashworth> Hello everyone I am on line now

Peta Ashworth> Not sure how you want this to run. Do I need to tell you anything about what I do or is it more try to answer questions? Let me know? I am happy with either

Stephanie Whitehead> Hi, I would probably like to hear a bit about you, I am very new to this area and my knowledge quite limited

Peta Ashworth> Okay briefly I work as a social scientist based at the Division of Exploration and Mining. I have been researching public perceptions to climate change and energy technologies for the past five or six years. Particularly interested in how information shapes and changes public attitudes of the range of low emission energy technologies, in particular CCS. Okay will hold off after this.

Deb Szekely> Peta, in what form does the support from Federal Govt come with respect to research into Post combustion carbon capture?

Peta Ashworth> Well I probably cannot tell you the detail but CSIRO Energy Transformed Flagship has funding to develop PCC and one of the sponsors was through the Federal Low Emission Technology Development Fund. There has also been a new announcement of 2 Billion dollars however, we are not sure which projects or technologies will be awarded this

Peta Ashworth> I can probably get the exact figures of Federal Government funding off line - there is a mix, if you think about CSIRO being funded through Commonwealth and then individual grants etc as I referred to. I think what we have seen is that through our research there is a better understanding of the need for a portfolio approach. All Australians would like to see solar technology and other renewables but at present not able to supply base load power competitively or reliably so therefore need a mixed investment into a range of options to mitigate climate change

Deb Szekely> That makes sense as there is not just one solution

Stephanie Whitehead> Peta, have you noticed a difference in attitudes between generations?

Peta Ashworth> As to attitudes it is quite different between generations. Particularly the 18 - 25 versus the rest of the population in that they are less prepared to wait to transition to a lower emission energy supply. They want it now. However, in relation to overall attitudes if they do not have strongly formed opinions then they are likely to perhaps be uncertain first and then as they hear more about the technology and its potential become more positive to CCS

Meaghan> Peta, I feel that the kids now days have a much greater perception of the problems associated with climate change given they are at the fore front in a way- however do you think that this is rolling over into action on their part?

Peta Ashworth> As to the action part we have a long way to go. I think we have about 30% of our community who are actively engaged in mitigation behaviours and they are the ones that help to influence the others. Although many are concerned it is difficult to get them to make the greater changes



required. I.e. we know that turning on airconditioners, using driers are large users of energy or for that matter driving our cars but often it is hard to break the convenience of it all

- Peta Ashworth> Many children, through schools programs are becoming aware and this is an essential start. Linking behaviours to the results of the climate change problem however, it is what happens when they become teenagers, wage earners we need to make sure those sustainable values hold true for later life. I have seen some great initiatives in schools already as well
- Katrina Bailey> So the key is to make the changes seem attractive to our students, such as encouraging them to organise a walk to school group, or even reminding each other to turn of electrical items when they are not needed.
- Patricia Gallagher> I feel that students on the whole tend to be aware - my own children's school has water tanks, and is just having solar panels installed as well.
- Meaghan> I agree, especially with kids these days wanting everything now, and being brought up with the convenience of everything changing their attitudes will be the hard thing
- Mary Conaghan> I know my students are most concerned that things are not happening rapidly enough and fear that we will reach a critical threshold whereby current world populations can no longer be sustained.
- Kaz VanHees> we are a technologically driven society and our children are being raised to rely on technology and modern conveniences, it is going to be a difficult cycle to break
- Peta Ashworth> I agree with all of the comments about encouraging students. Anything you can do to raise awareness will help. Also I am a big believer in students educating up to their families at home and should not be underestimated. So the sooner we start the greater impact we can have
- Katrina Holewa> Yes, I think one thing we have to make our students aware of as teachers is that it has taken more than a hundred years to build up the levels of Greenhouse gases in our atmosphere and our solutions for this problem will take time, as much as we would like to stop contributing to this problem straight away
- Peta Ashworth> The point about time is a really critical one Katrina. Something that is very hard for even adults to grasp. Even if we are successful at mitigating climate change and stopping rising levels of CO2 to a certain level we are still uncertain of what effects we will continue to see for the next lot of decades to come so it is a real challenge but I think reinforces the urgency of the problem
- Katrina Bailey> Peta, how safe is the storage of the captured carbon, or is it going to pose its own problem in a number of years?
- Mary Conaghan> I have the same question as Katrina.. too often things that are deemed 'saviours' now are problems down the track
- Katrina Bailey> They are confident, but no one can say that it is 100% safe though as it has not be tried before.
- Peta Ashworth> The 100% safe is an interesting one. I don't think anyone would say anything is 100% safe and why it gets down to risk perception communication etc. What level of risk is acceptable to society. In this case we can only rely on the experts and the scientists to ensure the test and demos that they do are carefully monitored.



Kaz VanHees> My students studied CC and geosequestration last year, and the 100% safe issue came up as did the nuclear energy debate and it was good to see that they did not believe that 100% safe should be the overriding issue, obviously safety is a concern but the need to act responsibly and reduce emissions was more important to them. (Year 11/12 Geography class)

The students I had last year were more in favour of CCS than nuclear.

Peta Ashworth> Interesting to see discussions around CCS and nuclear - these are two that often come up in the international field as well. It seems to be if people are familiar with the technology then they are more supportive of it. I.e. if you look at France and nuclear or Sweden for that matter. It is an interesting part of my research, how much does familiarity influence acceptance

Mary Conaghan> My experience is that students tend to be very anti-nuclear.

Peta Ashworth> We find in our research that if you pitch CCS and nuclear almost everyone show a preference for CCS over nuclear

Katrina Bailey> How will the captured carbon be monitored?

Peta Ashworth> Monitoring CO2 is not that difficult a process and there are several projects underway already. I am sure you would have looked at the CO2CRC website but if not I commend that to you as they are injecting and monitoring all the time. Also the Sleipner project in Norway, Weyburn in Canada and BP's project in In Salah in Algeria. Worth googling all of these if you have not already. They do a range of things but often it is drilling down to test where the CO2 is based on the wells. To measure carbon content and how it might change. As well as atmospheric monitoring. One of the things we have been talking about is that there is a lot of naturally occurring CO2 which varies in levels all the time based on time of day, season so a lot of baseline data needs to be collected before to make sure you know if there is any difference.

Peta Ashworth> I was also thinking about the 100% safe. The most important thing or one of the most important is site selection for the storage and this is what many of our geologists are working on around the world right now. So choose the right site and safety of storage becomes much less of an issue

Cassie Hall> Peta, I meant the storage of the captured carbon. How long can we keep using the method we are of storing it under ground?

Peta Ashworth> They are hopeful that the storage mechanism will be long term. I guess they are using the actual method for enhanced oil recovery at present. That is when oil levels get lower they use CO2 to push it out more. However the biggest unknown is how big are the storage sites, what capacity do we have. The technology people suggest we have plenty of space but there is a lot of investigation going on around this now.

Stephanie Whitehead> How do you think Australia compares to the rest of the world?

Peta Ashworth> Australia in comparison to the rest of the world in CCS is seen as a world leader. We were one of the first to develop our regulations, and have led many international efforts that have brought technology developers and policy makers together to unify the world on this. No doubt you would have seen that the Group of 8 leaders is now advocating for the early deployment of this technology. 20 demos by 2020 in an effort to see if it really can deliver the goods.

Peta Ashworth> Also at the climate congress in Copenhagen in March which was much more than just energy Australia had one of the largest representations of delegates which shows the respect and level of our science across all of these areas



- Peta Ashworth> I guess the balance with the portfolio is where governments are intervening in some ways. I think there is a pretty good idea around the world of where each of the technologies are at, not to take away from the opportunity for a breakthrough but this is why certain technologies are allocated more funds than others. The market also has an important role to play in this and hence why they arguments and discussions around CPRS
- Deb Szekely> There would be alot of Govt departments looking at this issue for example the GBRMPA are actively seeking solutions for the impacts to the reef - is there one central body pulling all the research and efforts together so everyone knows what the other is working on and any progress made - ie is there a coordinating committee for want of a better description
- Peta Ashworth> The point about the coordinating committee is an interesting one. I have for sometime been advocating that we need a much better way to integrate science into society and that CSIRO could play a greater role in that. I guess to answer your question there is a lot of collaboration across institutions, both industry, research and government so that the left hand does know what the right hand is doing but there is always room for improvement.
- Meaghan> Are other countries looking into the CCS and wanting to employ similar techniques?
- Peta Ashworth> Countries around the world are looking at CCS. At present it is mainly developed countries, although saying that China has a PCC plant it is trialling in conjunction with CSIRO etc. I guess the feeling is that if developed worlds can find a way to clean up coal fired power stations then it will be helpful for the large countries such as China and India. My main reason for working in this field is that we know electricity increases basic human rights i.e. live longer, access to clean water, better education levels and so if these technologies can be developed to help other countries then that is a positive contribution as well as making the world more sustainable.
- Patricia Gallagher> In terms of other countries, what is happening in China - are they including CCS in their building of power stations?
- Peta Ashworth> I think I have answered the China one. They are actually doing a lot and many people suggest that in some ways China has done more for climate change through their one child policy than a lot of countries however that has a big ethical question around it so we wont go there. Sorry I just did. China are interested as they recognise they need to clean up their energy and as far as I know are investing across the portfolio, CCS, nuclear, solar etc.
- Patricia Gallagher> Where would we find information on the PCC plant in China as this was a criticism by my students last year when we were looking at this topic?
- katrina-lee jones> <http://www.sciencedaily.com/releases/2008/07/080731135924.htm> will help with PCC in China
- Kaz VanHees> Whilst educating students in school is obviously a great place to start, what other education programs are in place or being put into place to educate the wider public?
- Peta Ashworth> Kaz - education of the wider community is happening in all sorts of ways. We have a process called Energymark which I can happily point you to the website afterwards, through QRC where you can learn more. There obviously needs to be greater emphasis but I believe we have to start somewhere. Watch this space for the CSIRO energy saving handbook which has everything the householder needs to know about how to save energy. We also run some community workshops on energy technologies as part of our research and industry have sponsored us to run some in certain areas around energy efficiency. I am hoping to run one on Energy Technologies with politicians soon as I believe if they learn more, and they are interested, that will help spread the word among communities as well. Local governments are also playing a big role and ramping up the access to



information. Also Federal Government through DEWHA have many energy efficiency initiatives so it is worthwhile checking their website as well.

I also saw a fabulous video recently where India have developed a cottage industry for women who rent out solar lamps to provide light to families and therefore allowing kids to read etc = check out the TERI website for more details. Research institute in India

Meaghan> I like the idea of educating the politicians on it!

Meaghan> I think that we also have to work to rid the current mind set- I know my students before we started discussing CCT and CCS they all thought clean coal technology meant you washed the coal before you burn it, therefore I think there needs to be ALOT more public awareness about these technologies

Peta Ashworth> I would urge you as much as possible to move away from the term clean coal and focus on low emission coal. Clean coal is confusing and not surprising. Many people think you wash it and it will come out white or something. Check out the Cohen Brothers take on this for an amusing, satirical campaign against the clean coal idea. It was a heavy hitter in the US. I think low emission is a much more appropriate term as it is more accurate and less confusing.

Katrina Bailey> Would it be a good idea for the CSIRO energy saving handbook to be included in the Sunday Mail one week, just like how the shower timers were distributed a while back

Peta Ashworth> As for CSIRO energy saving handbook I have to leave that up to the comms people. All ideas are under development right now. PS you won't hear any more about the handbook for a couple of months. I can touch base with QRC when the time is approaching for its launch.

Katrina Bailey> That would be a fantastic resource not just only for households but also for the classroom

Peta Ashworth> The nuclear one is very interesting, especially when you also talk to engineers who are much more confident about the range of technologies

Mary Conaghan> My local government has run a number of breakfast meetings that have climate change, renewable energy, clean coal etc as their theme for local business owners etc. They have been quite popular. One selling point has been that they do demonstrate in the meetings how embracing the concepts will increase sustainability and profitability.

Peta Ashworth> The idea of energy efficiency saving money is quite accurate. People, organisations, etc do not have to do much to save money when they improve energy efficiency. Obviously there are degrees some things require a greater investment and so will take longer to get a return but many things around energy efficiency are low or no cost. Hence why it is so important to bring this into the discussion along with larger technology effects

Meaghan> finally, if you had to convince a room full of 14-18 year olds why CCS is the way to go- what key point would you discuss

Peta Ashworth> I guess it gets back to my underlying research. What is the role of information in shaping attitudes and that can be at the general public, right to most senior politicians but they need accurate, balanced objective information

THANKS

Cassie Hall> I would like to thank you Peta. The ideas and information you have given us has been great in extending our own knowledge, not just our students. Thanks again.



Katrina Holewa> Yes, Peta I have learned a lot today and have some new ideas for the classroom.

Kaz VanHees> Thanks are definately in order - you have been very informative! 🙌

Stephanie  
Whitehead> Thanks to Peta and everyone that contributed ideas!!

Peta Ashworth> Thanks to everyone for having me along. Hope it has been useful. Happy to discuss any ideas or thoughts as appropriate and to join you up with technology people as required. CSIRO Education are also a great resource. If there is a need for more of these online chats I am sure I can find a way to coordinate with other scientists as per the topic or something. We can perhaps discuss off line with moderators. Best wishes everyone. Thanks for having me

Patricia  
Gallagher> Thank you for your time and information - thanks also to Katrina for the website

Mary Conaghan> Three cheers Peta

Meaghan> thank you very much peta

katrina-lee  
jones> Dear All, Many thanks for your contributions today and EXCELLENT questions. A huge thank you to Peta for taking the time to participate in the chat and to our moderators form the The Learning Place Karen and Candice. We hope the information you have gained today will be of benefit to your teaching and the education of this important topic. Tracey will be in touch with you all on her return from Townsville. See you everyone. We do have some more chats lined up for the remainder of the year. tracey will keep you in the loop. Always happy for input and chatters from CSIRO. Thanks again Peta

