What are the processes and parameters that are critical to modelling requirements?

- Geological models essential, but choose the appropriate scale
- What should we care for all the scales? What information can we get from all the scales?
- How sensitive large scale plume with respect to different scales?
- How M, C, T effects will modify CO2 flow?
- Look at processes that can create risks (on my area) and focus on them – e.g. brine migration, wells' integrity, faults
- Look at processes having an effect on fluid migration (CO2, brine)
- Have a top-down approach, but how we can decide initially what are the more important processes? Start with experts' opinion (objective ranking needed), then simplified models
- Subsurface is highly uncertain, don't be overwhelmed by details
- Oil industry is used to live with high uncertainty, power companies no
- Reach a common agreement on criteria to decide what processes are important
- How to distinguish numerical artefacts from real physics?

What knowledge gaps still exist?

- Upscaling, will be different depending on processes (upscaling geochemistry, upscaling geomechanics..), upscaling across processes
- Communication gaps, (1) among scientists/disciplines, and (2) with regulators & policy makers - how do we communicate with regulators and decision makers, and (3) the public
- The best arguments are not enough, emotional factors too, need for a “front” man or woman
- Gaps between what is occurring in the lab and in the field. How do we get representative experimental data?
- Learn more from natural analogues
- Impurities- depending on type of power plants/industry and capture process
- Analogy with meteorological models and calibration
- Consistency in data (e.g. geochemical databases), lack of data for the relevant P,T, Salinity range
- Cement behaviour, thermodynamic/kinetic data
- Computational limits for coupling processes
- Hydrate formation (in case of leakage or highly depressed reservoir) and impact on pore space properties