



Carbon Costing for CAP164

Suggested approach from Carbon Costing Subgroup to WG1



Agenda

- Basic Principles
- Stages of the process

- Next steps



Principles

- Be as realistic as possible, but try to keep simple
- Forecast nature of key variables means that this is not a prediction
- Would be an assessment of probable outcomes against given scenarios
- Focuses on CAP164, but may want to carry out for other amendments
- Focuses on carbon, not constraints, but need to be mindful of constraint analysis



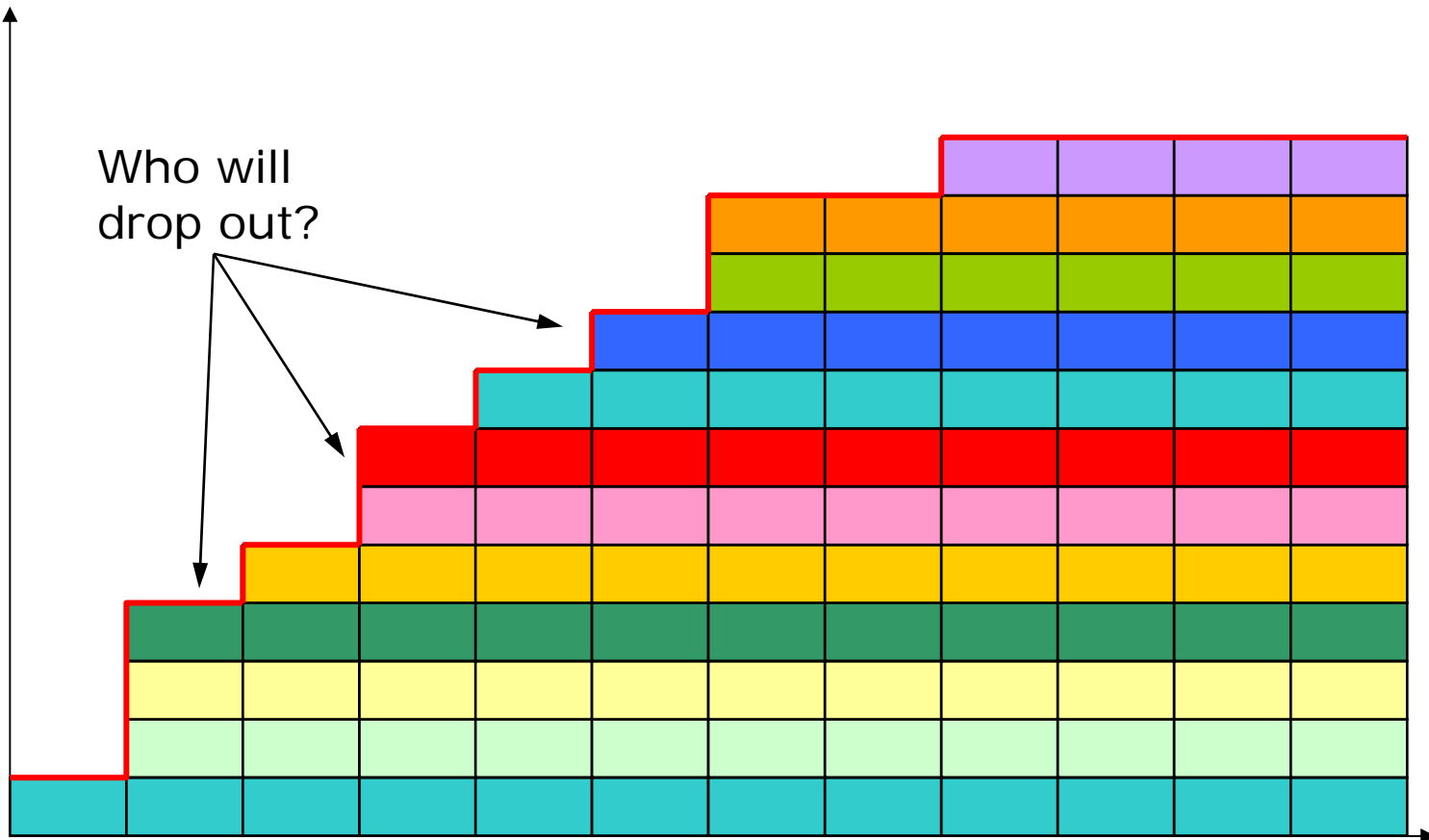
Stages of process

1. Establish baseline
2. How would profile be altered by CAP164?
3. Conventional generation displacement
4. Impacts on CO₂ emissions
(Stages 3 and 4 could be brought together)
5. Price CO₂ savings and costs

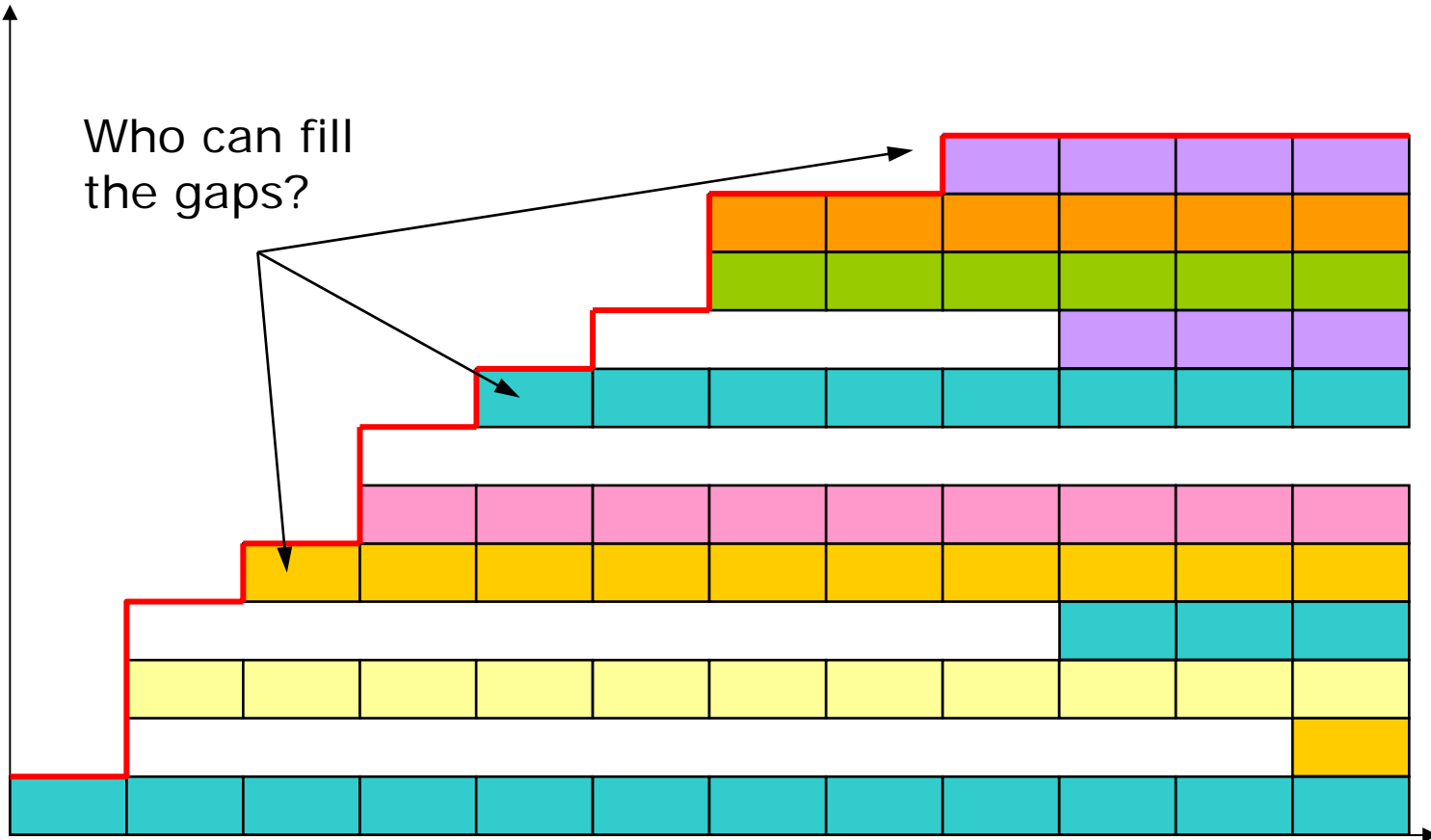
Stage 1 – Establish Baseline

- What would connect if CAP164 were not implemented?
- Contracted background forms basis but who will commission?
- Average drop out rate across GB or zonal rates (eg as planning success may differ by area)?

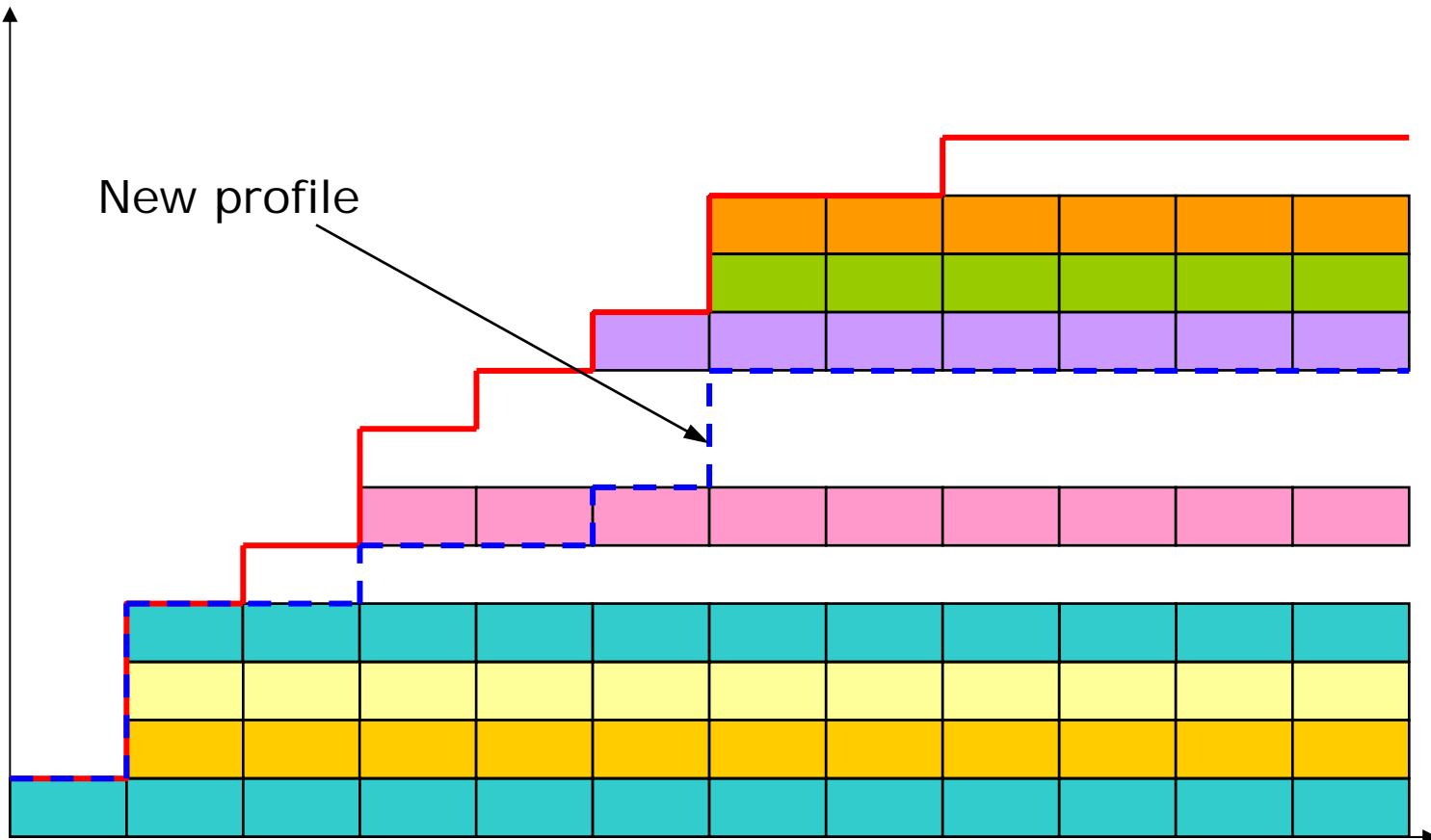
Establish baseline



Establish baseline



Establish baseline





Establishing Baseline

- Suggestion is to estimate drop out by zone taking into account local planning issues
- Need to make assumption of effect of CAP150
- What existing plant will close – so we can estimate fuel mix of conventional plant displaced
- Should we use a number of scenarios rather than one baseline (eg to reflect possible transmission delays)?

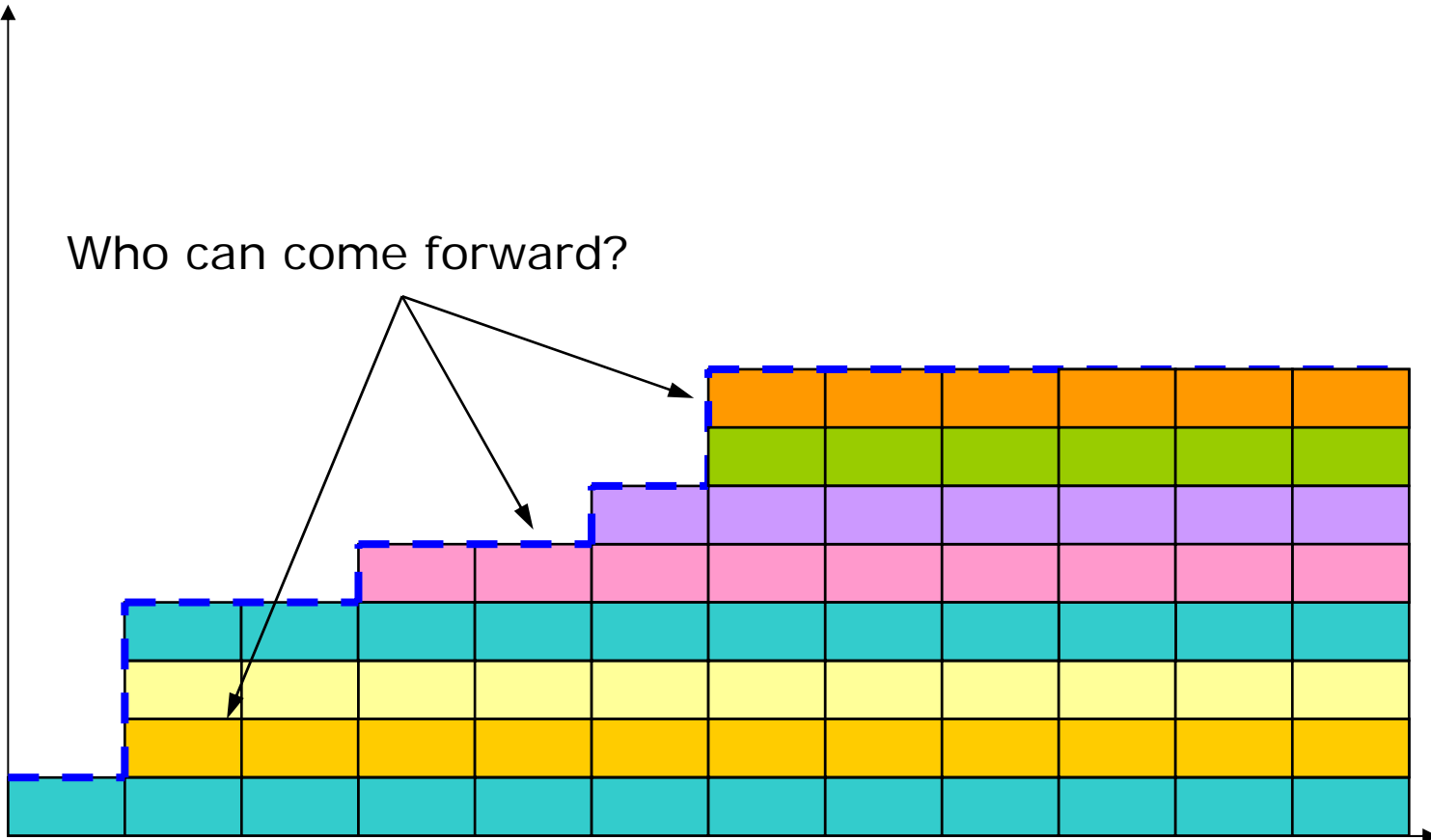


Stage 2 – How would profile change?

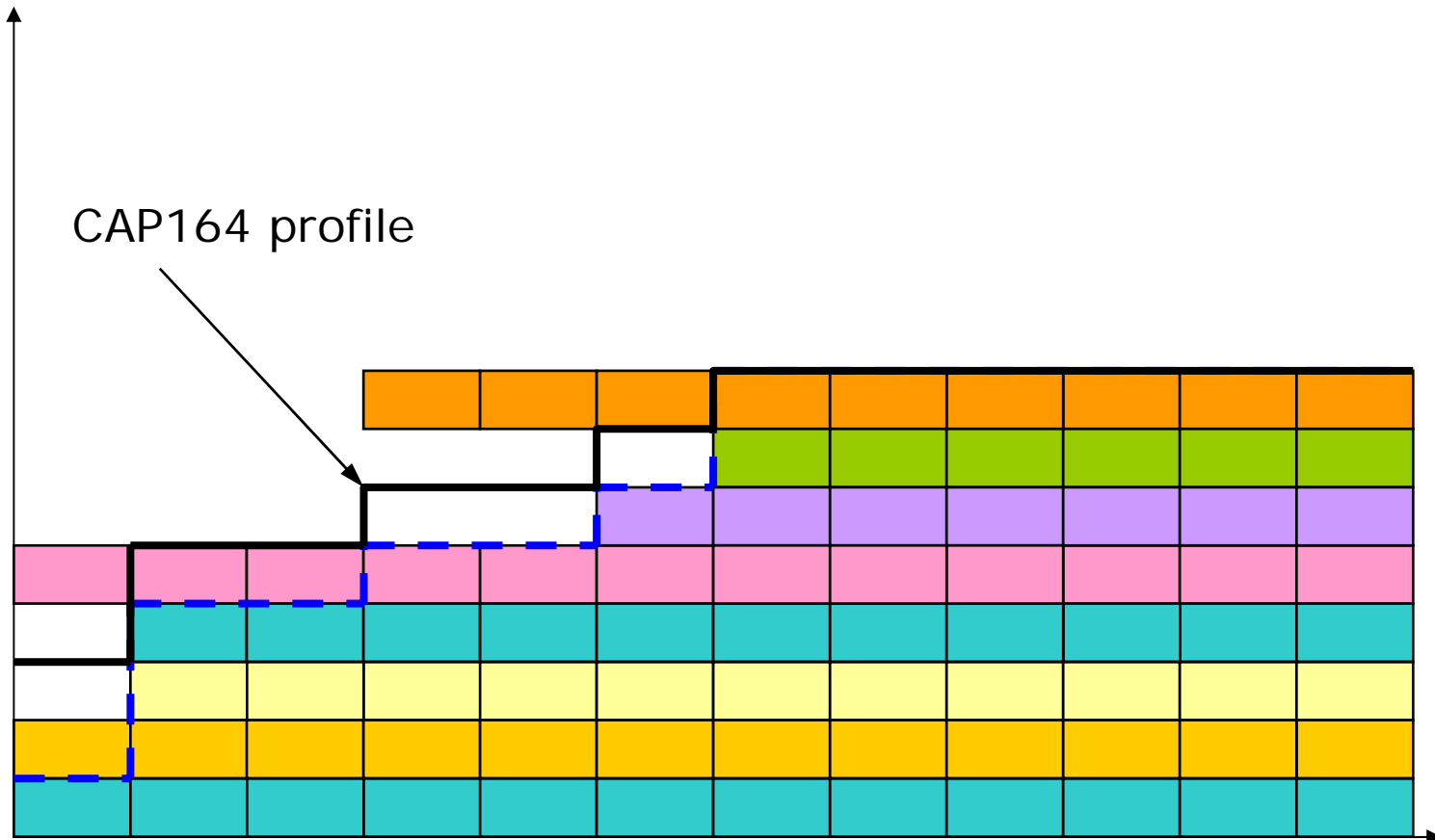
- What projects in background are awaiting MITS reinforcement and could benefit from CAP164?
- How many of these could advance local works?
- What proportion could bring forward their generation projects? (eg status of planning/turbine availability)

How would profile change?

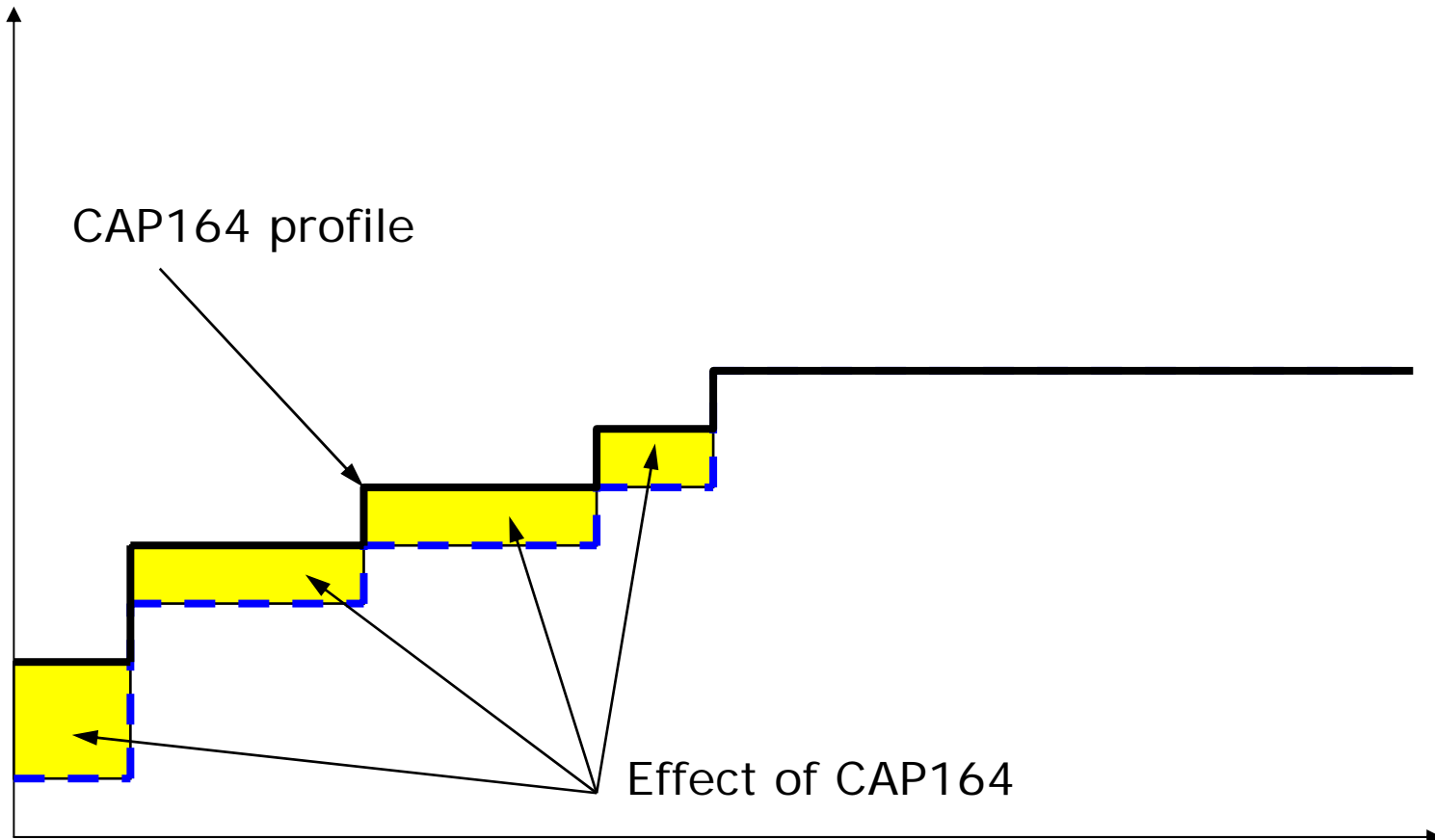
Who can come forward?



How would profile change?



How would profile change?





How would profile be altered?

- Recommend carry out analysis of who can bring forward on zonal basis (same as with setting baseline)
- Allows to assume local planning rates
- Allows to assess role of MITs investment? (ie CAP164 only benefits those who are being held up by wider reinforcements)

Stage 3 - Conventional generation displacement

- What amount brought forward is renewable or lower CO₂ conventional?
- What load factor will the plant operate at? For wind this could be calculated for a zone. What to assume for new conventional?

Stage 3 - Conventional generation displacement

- Displacement of marginal plant. What will this be? Use range between CCGT and Coal?
- Do this at NBP or by zone? If carbon costs or benefits affected by constrained running of renewable or conventional plant, maybe by zone?



Stage 4 – Impacts on CO2 emissions

- a) Conventional plant displacement
- b) Losses
- c) Transmission Infrastructure



Conventional plant displacement

- What are the CO₂ emissions of the conventional plant displaced?
- If using scenario approach for identifying marginal plant would use values associated with that plant.
- Any increased emissions from part loaded plant?
- Use same CO₂ values for both?

Losses

- National Grid can calculate losses if know assumptions of size and location of output (another reason to carry out zone based analysis?)
- What is the carbon cost of losses (same as marginal plant?)
- More fundamentally do people believe losses are relevant?



Transmission Infrastructure

- Local works will be brought forward (SPC changes by year)
- Will MITS works be affected? Won't this remain unchanged unless SQSS is changed?
- Therefore, is it worth assessing any impact on Transmission Infrastructure given that this may simply run to time value of SPC effects?

Stage 5 – Multiply CO2 effects by price of carbon

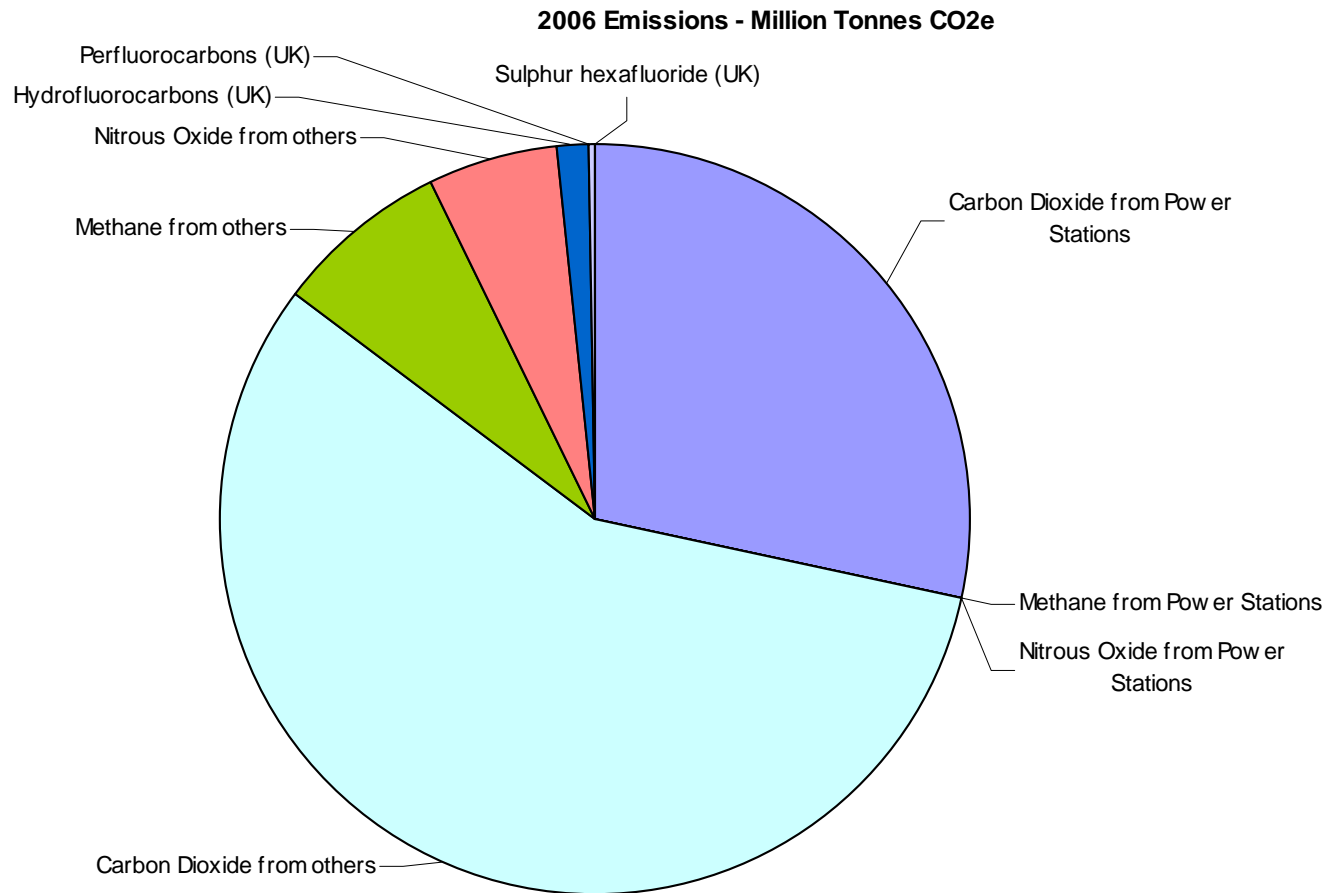
- Is the Shadow Price of Carbon the correct measure to use?
- Could use Social Cost of Carbon
- Recommendation is to use SPC as this more likely to be value Ofgem use. Is this the correct assumption?



Other issues

- What time period to carry the analysis over?
- Should we consider other emissions?

Consider other emissions?





Other issues

- What time period to carry the analysis over?
 - Later of when CO2 effects cease and completion of transmission infrastructure works
- Should we consider other emissions?
 - No



Possible approach

- Scenarios rather than one baseline
- Analysis carried out at zone level (can consider local planning, wind conditions, MITS and effect on constraints and losses)
- Use range of marginal plant between CCGT and coal for CO₂/MWh
- Ignore transmission investment
- Count losses as increased marginal output
- Use SPC



Next Steps

- Agree final approach/assumptions
- Start work on baseline
- Then, once amendment is finalised stage 2 can commence
- Who is going to do this?