**Where will facilitators need these answers?**

The below information will assist you in answering more specific questions following the Video (gathering component #5). You will be equipped to check that your participants understood these key ideas as you move them through the Reflection (gathering component #6).

**What are feedback loops?**

Feedback loops are when the consequences of global warming lead to more warming, which lead to more of those consequences happening, which leads to more warming, etc.

In other words, when we warm the planet a little, feedback loops amplify our warming and make it bigger. They turn up the volume on the warming caused by humans.

Some examples:

- **Ice:** White ice reflects heat back into space. If it melts, it becomes dark and so it absorbs heat instead and less heat is reflected into space, which makes the planet even hotter, meaning even less heat is reflected, so more ice melts, etc

- **Forests:** If there's a bushfire, when the plants burn, they release $CO_2$, this contributes further to global warming, meaning more hot days, increasing the risk of more bushfires, which give off more $CO_2$, etc.

- **Permafrost:** In Siberia and other areas near the Arctic Circle there is soil that is frozen all year round - permafrost. Trapped inside that soil is old decayed plant and animal matter, as it decays, it turns into methane which is trapped in the permafrost.

  If we were to heat the Earth to the point where places with permafrost are above 0°C, it would melt, and release that methane into the atmosphere - that methane would trap more heat, causing more places to heat, which means more permafrost would melt, releasing more methane, etc.

The Earth's natural systems are full of feedback loops, and they usually operate in harmony with each other to keep the Earth in balance. But if we push the systems too far out of balance, we can reach a **tipping point** where one or more of these feedback loops starts to dominate and force the climate to change in ways that are undesirable and unpredictable.

**What are tipping points?**

A tipping point is when feedback loops are pushed out of control

eg When a bushfire burns, it releases $CO_2$, which contributes to global warming, which increases the chance that another bushfire will burn, which will release $CO_2$ etc. But the effect of that $CO_2$ is still smaller than human emissions.
That's bad, but if we stop emissions we still have a chance to reverse that trend and return to a stable climate.

If, however, we made it so hot that the whole Amazon rainforest dried out and burned, that could release enough $CO_2$ to heat the Earth so much that the permafrost also all melts, and the ice also melts and so even if we stopped our emissions, global warming continues and we don't know at what point it would stop.

In effect, if we cross a tipping point, the "off switch" is taken out of our hands.

**What is the importance of 1.5°C and 2°C?**

These are proposed "limits to warming" - an amount of warming we should avoid reaching.

2 degrees is a target that was set by politicians (not scientists) during one of the early UNFCCC conferences. It was thought to be a politically achievable target, but was not based on scientific projections.

● Scientists increasingly fear that we will hit tipping points before 2°C degrees

● More and more are advocating for 1.5°C

● However, the projections are probabilities, not certainties. The only thing we know for certain is that there is no guaranteed safe amount of global warming - so we should be working to stop warming as fast as we can.

**What are the practical implications of this? (What do we have to do as a society?)**

● We have to stop emissions as soon as possible

● That means we can't be opening new mines (there is already 5 times as much coal, oil and gas discovered as would be needed to take us beyond 2°C)

● This means everything has to change: Energy production, our grid, our buildings, our food chain, transport, *everything* in order to support a new approach to energy, food and waste.

● That's not possible by just recycling and making personal change, it's not even possible with small incremental changes

● We need our government to act

**Why isn't our government acting?**

Either:
● they don't want to and so don't, or
● they do want to but can't, because they don't think they have support

So either way, we have to tell them we want them to act