Topic: **Residential Buildings**

Issue Summary

Energy used in houses and apartments is often produced from greenhouse gases. For example, in lots of electricity, used for lighting and appliances, is created from burning natural gas (although some is also from green sources). Both water and space heating are often from natural gas in residential buildings, as are many cooking appliances such as stoves and barbeques.

1) **Read the Issue Summary and discuss what you find.**
2) **Consider the following questions:**
   a) **Where in Kingston might you find this factor?**
   b) **What types of this factor might exist in Kingston?**
   c) **What types of this factor are best for the climate?**

3) **On the back of this card, create a summary of your factor, including:**
   a) Title
   b) Diagram or illustration
   c) Is this factor a source, a sink, or both?
   d) Choose a colour that we can use to designate this factor on our maps (make sure other groups don't have the same colour).

Topic: **Commercial Buildings**

Issue Summary

Energy used in shops, offices, and restaurants is often produced from greenhouse gases. For example, in Kington much of our electricity, used for lighting and appliances, is created from burning natural gas (although some is also from green sources). Both water and space heating are often from natural gas in commercial buildings, as are many commercial appliances such as ovens, washers, and computers.

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Topic: **Industrial Manufacturing**

Issue Summary

The manufacturing of many things produces greenhouse gases. Sometimes, this is simply because fossil fuels are burned to make energy to power machinery, but often greenhouse gases are made in the production process itself. For example, carbon dioxide is made when limestone is converted to lime in the manufacturing of cement. And carbon dioxide is produced in the manufacturing of ammonia, which is used in cleaning products, fertilizers, and pesticides.

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Topic: **Landfills and Sewage**

Issue Summary

Most landfills are not well aerated, which means that bacteria often convert organic waste — such as food scraps or paper products — into the greenhouse gas methane. This also happens in sewage facilities, where excrement decomposes into methane and nitrous oxide.

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Topic: **Agriculture**

Issue Summary

The amount of carbon that crops produce and take up depends on a lot of factors. Of course, crop plants take up carbon dioxide to grow, and some then sequester (i.e. store) this carbon in the soil. However, often soil is degraded when crops are grown, and this soil carbon is re-released into the atmosphere. Fertilisers also produce green-house gases when used on soil. And sometimes, crop waste (for example, dry corn stalks) are burned, releasing carbon dioxide into the air.

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Topic: **Roads and Road Transport**

Issue Summary

Road transportation, including cars, buses, motorcycles, and trucks, burn fossil fuels in the form of gasoline and diesel, creating carbon dioxide. About 60% of road transportation world-wide is used for passengers, and 40% for freight (i.e. the transport of goods).

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Topic: **Wetlands**

Issue Summary

Wetland plants use carbon dioxide to grow. When wetland plants die and sink down into the mud and water, they decompose very slowly, releasing relatively little carbon back into the atmosphere. This plant matter builds up, storing carbon for a relatively long time.

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Topic: **Lakes**

Issue Summary

Lakes store a lot of carbon, mostly because algae use carbon dioxide to grow, and when they die, sink down to the bottom of the lake, where they are stored in sediment. However, they also produce a lot of carbon — fresh-water is often very high in carbon from decomposing matter, and respiration of bacteria and zooplankton.

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Topic: **Forests**

Issue Summary

Forest plants use carbon dioxide to grow. When forests grow, that carbon dioxide is converted to plant matter. However, if these plants die, some of that carbon dioxide is re-released into the atmosphere, especially since plants decompose relatively quickly in forests. However, some plant matter takes a lot of time to decompose — for example, leaf litter and fallen trees. And some carbon dioxide is stored in the soil long term, by fungi.

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Topic: **Lawns**

Issue Summary

Turf-grass takes up carbon to grow. However, the species of grass used on lawns generally have short roots, so much of this carbon is removed when a lawn is mowed, and quickly decomposes and returns to the atmosphere. Not only this, but fossil fuels are often burned in order to mow lawns, and fertilizers release greenhouse gases when applied to soils.

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