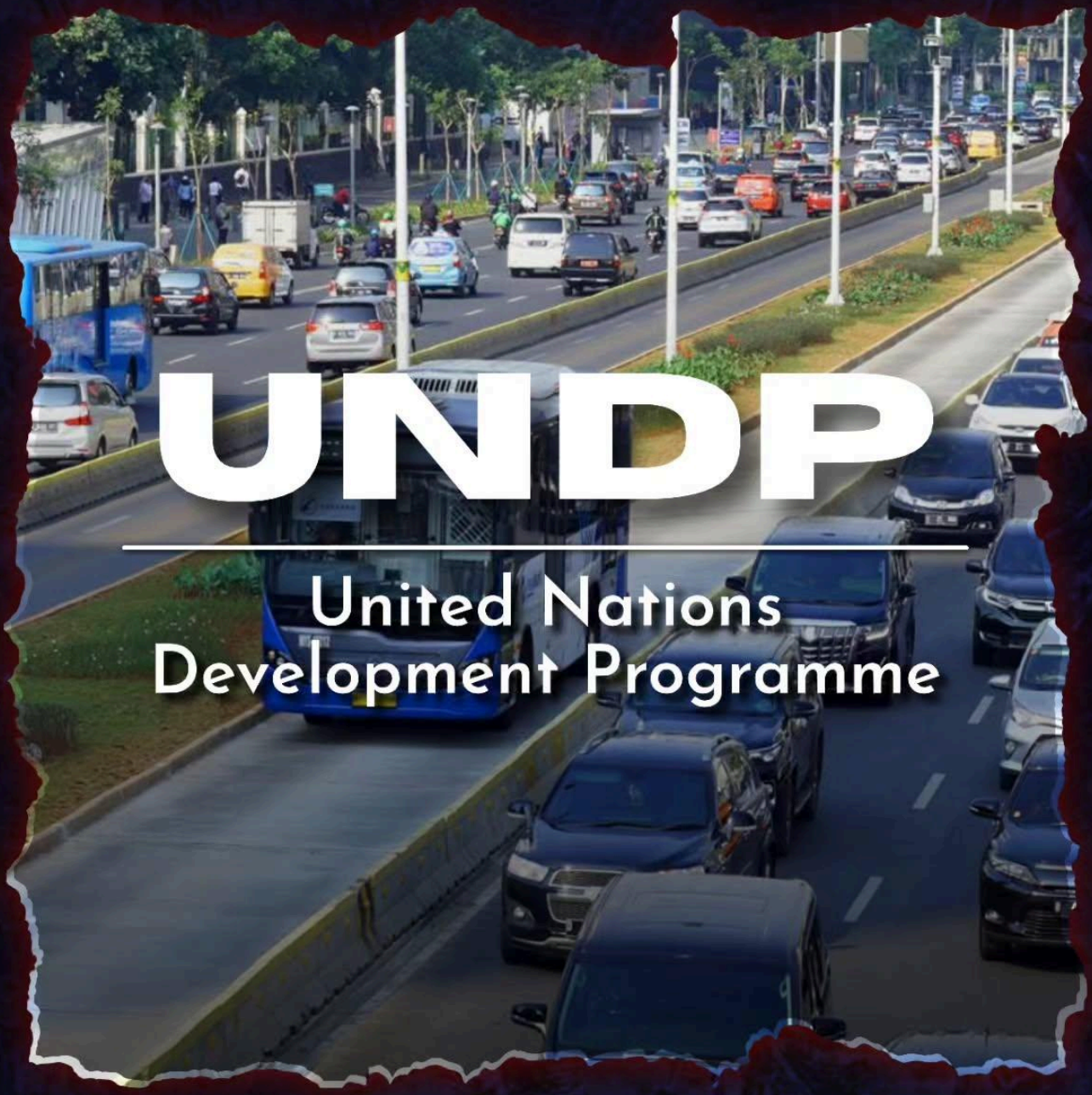
DKMUN'25



UNDP

United Nations Development Programme

Table of Contents

Letter from the Secretariat

Dear Delegates,

It is our honor to welcome you to DKMUN 2025. This conference will be a platform where you can challenge your ideas, develop your diplomatic skills, and collaborate with peers from diverse backgrounds.

Over the three days, you will not only debate pressing international issues but also gain valuable experiences that will serve you beyond the committee rooms. We expect you to speak with confidence, listen with respect, and approach every discussion with professionalism.

As the Secretariat, our greatest hope is that DKMUN 2025 will inspire you to grow as leaders and global citizens while creating friendships and memories that last long after the conference ends.

Sincerely,

Yağmur Hançer Secretary-General

Ali Baytören Deputy Secretary-General

Letter from the Under-Secretary-General

Most precious delegates,

Welcome to the United Nations Development Programme Committee of Denizli Koleji Model United Nations Conference 2025! I will be serving as your Under-Secretary-General during the conference.

I am quite excited for DKMUN'25, and although it is currently uncertain, there is a possibility that while you are reading this guide, we will have two identical committees with this agenda item, which makes me feel very happy to witness that the Denizli MUN scene and community is once again on the surge, and also thrilled to host the most amount of delegates I have ever had officially as an Under-Secretary-General in Denizli. For this, I would like to thank every delegate who has applied to attend DKMUN for their high interest and ambition!

In this committee, which I intend to be very beginner-friendly, we will discuss a single agenda item, "Encouraging More Sustainable and Clean Transportation". This agenda item is rather gigantic; it encompasses a vast array of concepts on its own. Thus, we will mention some specific aspects of this agenda item in this guide, to keep this guide readable and the agenda item discussable thoroughly in a three-day conference.

As a staple of my guides, the "Questions that delegates may address" section at the end is specifically included to assist delegates in their self-studies and to come up with solutions regarding the agenda item. While lengthy in number, please do not feel frightened by them; participants are free to address whichever questions they wish to address.

I cannot wait to meet you all at the conference! If you have questions regarding the committee, agenda item, or the study guide, please do not hesitate to contact me through my Instagram account, @yigiterendurmaz.

Best regards,

Yiğit Eren Durmaz

Introduction to the United Nations Development Programme

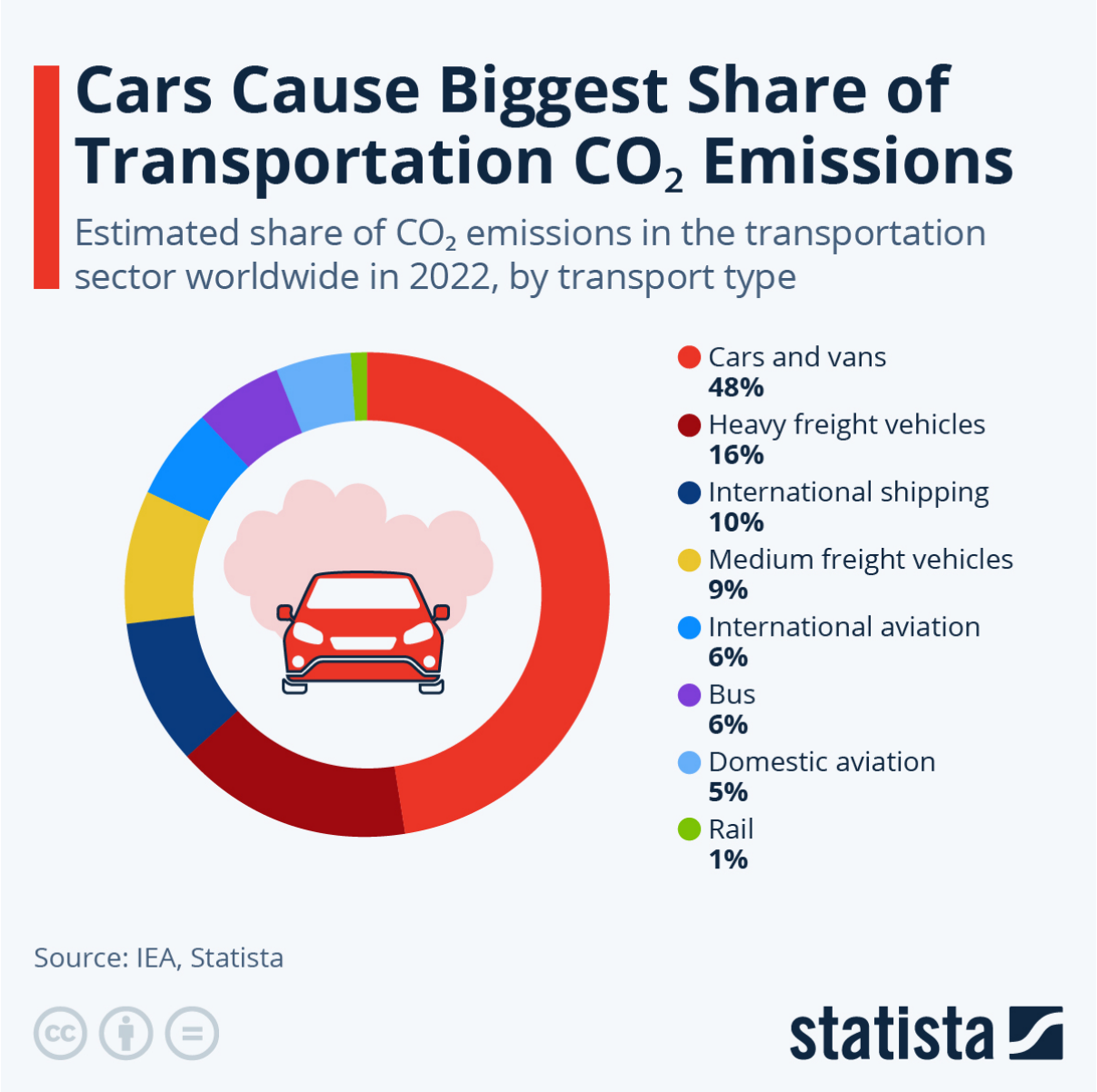
The United Nations Development Programme (UNDP) was established in 1965 through the merger of the United Nations Expanded Programme of Technical Assistance (1949) and the United Nations Special Fund (1958) to assist countries in eliminating poverty and achieving sustainable human development, an approach to economic growth that emphasizes improving the quality of life for all citizens while conserving the environment and natural resources for future generations. It is led by an administrator who oversees a 36-member Executive Board representing both developing and developed countries. It's headquartered in New York City.

The UNDP is the UN's global development network, advocating for change and connecting countries to knowledge, experience, and resources to help people live better lives.

According to the UN, UNDP’s work is concentrated on three main focus areas: Sustainable development, democratic governance and peacebuilding, and climate and disaster resilience.

Introduction to the Agenda Item

As mentioned earlier in my letter, we have a single agenda item, “Encouraging More Sustainable and Clean Transportation”. In this guide, we will specifically mention three aspects of this agenda, but delegates are free to come up with other ideas as long as it is connected to the agenda item. These three aspects will include public transportation, alternatives to internal combustion engine vehicles, and alternatives to some transportation methods in general. Notice that the first one is nearly entirely focused on transporting people only, while the others may be used for both transporting people and other things, such as goods. Please also notice that these three dimensions are interconnected and tangled, as one dimension may affect another. We will talk about these dimensions in two sections.



Additionally, we will look at some sustainable development goals.

Once again, please remember that these dimensions and actions we will mention in the guide are not exhaustive, this agenda item encompasses a vast amount of challenges, problems and concepts, therefore, there is not a single solution to a specific problem, and there are more situations we may need to cover that will not be mentioned in this guide to keep it readable and concise.

Without further ado, let us start with alternatives to internal combustion engine (ICE) vehicles. Why do we start with this one? Because it is more interconnected to the other two dimensions than the other two are with each other, it is mentioned chronologically earlier in this guide.

Alternatives to Internal Combustion Engine Vehicles

First of all, you may be wondering, what are internal combustion engines? Let us talk about this first.

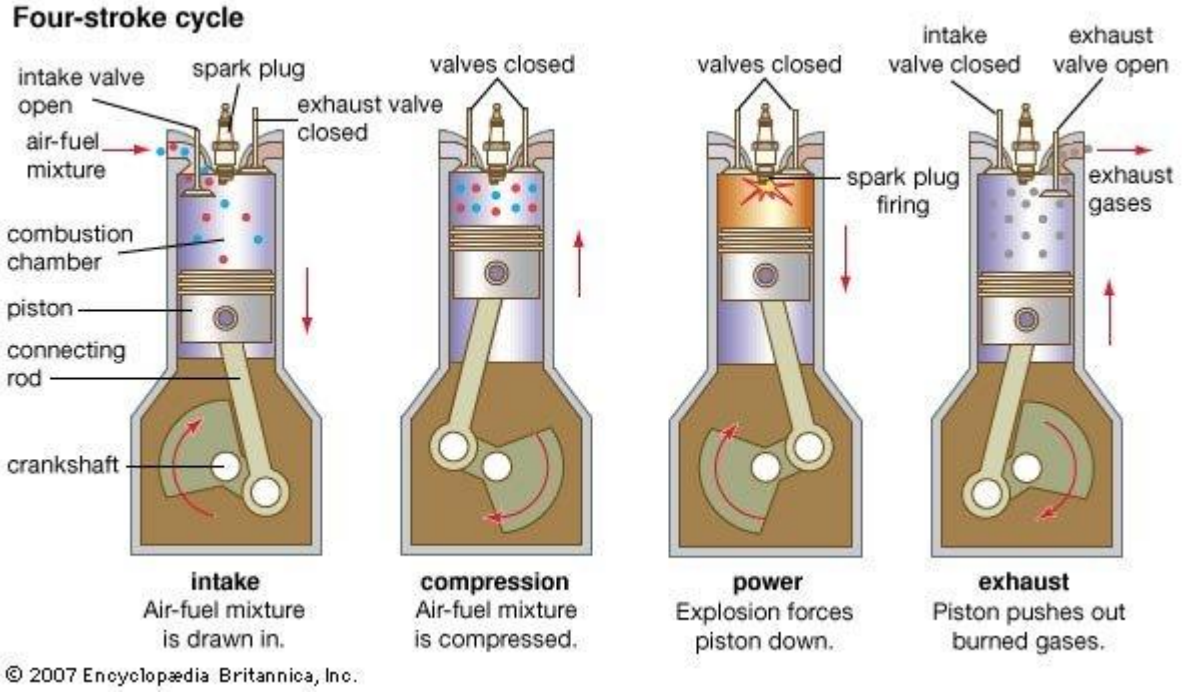
Internal Combustion Engines

Combustion, commonly known as burning, is the fundamental chemical process that releases energy from a fuel-air mixture. An internal combustion engine (ICE) ignites and burns the fuel within the engine. The engine then uses some of the energy produced by the combustion to do work, well, in our case, mostly to move the vehicle. The engine has a stationary cylinder and a moving piston. The expanding combustion gases push the piston, which turns the crankshaft. Finally, using a set of gears in the engine, this motion propels the vehicle's wheels.

There are two common types of internal combustion engines in the present: spark ignition **gasoline** engines and compression ignition **diesel** engines. The majority of these are four-stroke cycle engines, which means that four piston strokes are required to complete one cycle. The cycle consists of four distinct processes: intake, compression, combustion and power stroke, and exhaust.

Spark ignition gasoline engines and compression ignition diesel engines operate differently in terms of fuel supply and ignition. In a spark ignition engine, fuel is mixed with air before being injected into the cylinder during the intake process. The

piston compresses the fuel-air mixture, and the spark ignites it, resulting in combustion. The expansion of the combustion gases propels the piston during the power stroke. In a diesel engine, only air is injected into the engine and compressed. Diesel engines then spray fuel into hot compressed air at a controlled rate, causing it to ignite.



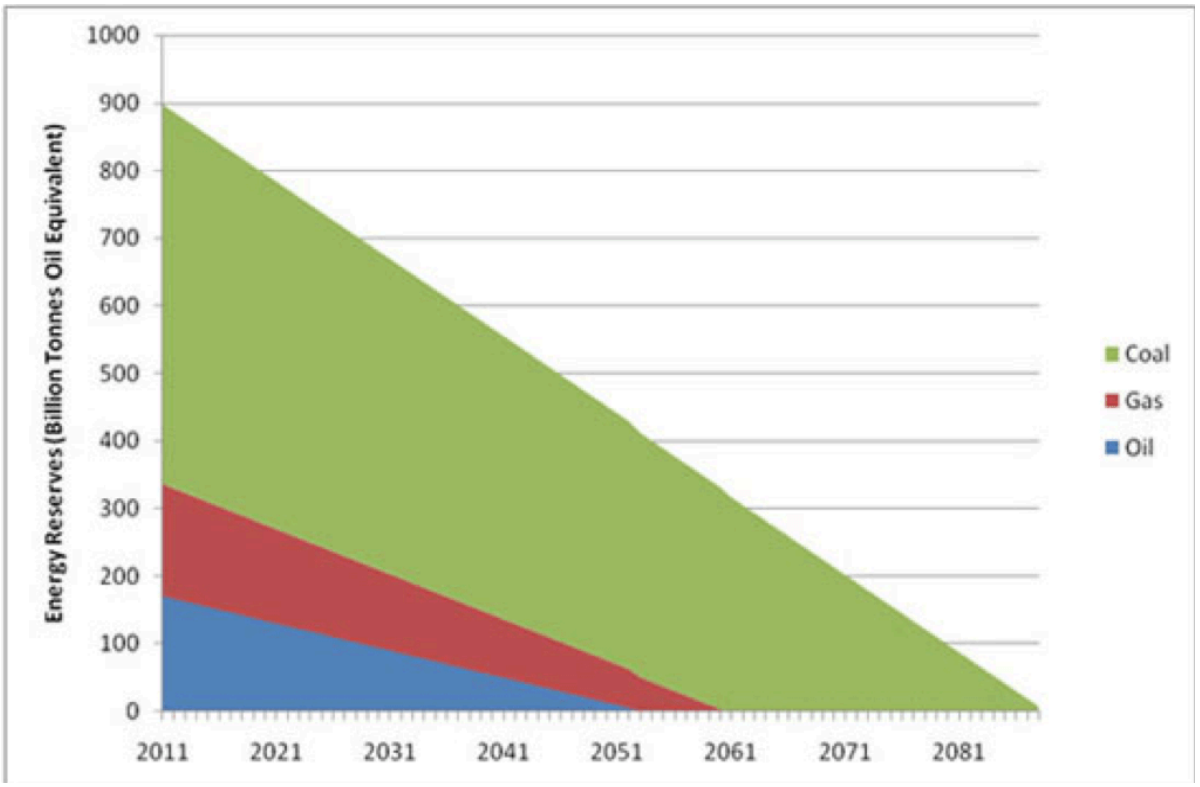
An image showcasing how four-stroke cycle engines work.

In short, if we are using a vehicle that uses a type of petrol like diesel or gasoline, that vehicle has an internal combustion engine. ICEs are used in some other applications as well, for instance, to generate electricity or propel rockets, but we will mainly talk about their usage in transportation in this committee.

If you are curious, you may check out the following website to find out more about how such an engine works with interactive content, descriptions and animations: https://ciechanow.ski/internal-combustion-engine/

Though, why do we need to replace ICEs? Before mentioning anything else, we will run out of fossil fuels (which include petroleum, natural gas, and coal) eventually, and if we do not switch to the alternatives before this happens, life as we know it today will come to a complete stop. There are several predictions on when we will run out of of fossil fuels, for instance, some research suggest that this will happen

around 2050, while some also predict we will instead reach “peak oil” by 2050, which means when the Earth will see a period of maximum oil production, and then the production will start to decrease irreversibly, as oil sources start to deplete.



A graph showing predictions of when some fossil fuels will be depleted.

Either way, even if we find new reserves or use less, we will at some point run out of fossil fuels, as they are not renewable. Even from this perspective, a switch to the alternatives is very necessary.

Other than that, our biggest motivator as individuals may as well be the fact that ICEs produce greenhouse gas (GHG) and particle emissions that disrupt nature’s lifecycles and systems and harm all organisms. Different ICE models, improved fuel refinement, emissions reduction technologies, and other innovations have helped to reduce ICE pollution; however, fossil fuels are fossil fuels, and burning them will inevitably release greenhouse gases like carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O). GHGs contribute to climate change and global warming by absorbing energy and trapping it in the Earth's atmosphere.

ICEs also produce hazardous gases, which are toxic gases that can cause severe physiological effects when inhaled, such as carbon monoxide (CO) and nitrogen oxides (NOx).

Also emitted by ICEs, particulate matter, also known as "particle pollution," is the term for small, airborne solid or liquid particles, such as dust and soot. Large volumes of PM are released by ICEs (and diesel engines in particular), which present serious health and environmental hazards (such as ground-level ozone) and cancer.

Alternatives

Okay, now we should have some idea of why we should consider replacing ICEs in vehicles with alternatives. Now, let us elaborate on the alternatives themselves. Before proceeding any further, though, it is also worthwhile to consider some alternatives which are not completely clean or green, such as biomass-based fuels, as they often release less harmful materials, and their usage may make the switch smoother and easier.

Why use different alternatives, though? Other than environmental and supply-related concerns, using renewable, clean and green energy types, and less reliance on petrol benefits many nations, especially developing nations. Even nations which are exporting petrol demonstrate a willingness to switch to alternatives, as being less reliant on petrol themselves means they could sell more petrol to other countries. Anyway, these alternatives may help developing nations open new job opportunities for their citizens, embrace more sustainable and environmentally friendly practices, and create economic advantages for their citizens and institutions.

Now, alternatives usually consist of different fuel types and engines that are made to work with them; therefore, we will actually be mostly looking at the fuels themselves rather than the engines designed for them, because it could get too technical for the committee if we get too deep into the engines themselves.

Other Fossil Fuels

In this section, we will mention two alternatives mainly: natural gas and liquified petroleum gas (LPG). But why? These alternatives are not clean or renewable, but

using them during the transition period may prove to be beneficial, as there are already vehicles and engines that are common today which use them, they may release less harmful substances, and we have more time until they deplete (especially in the case of natural gas).

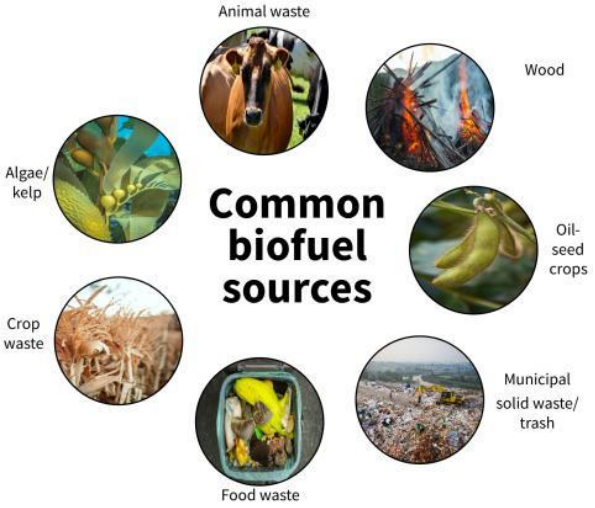
- **Natural gas** powers around 23 million vehicles around the world today, and is used either compressed or liquified in cars. Dedicated (only natural gas), bi-fuel (may use either natural gas or gasoline) and dual-fuel (run on natural gas but use diesel fuel for ignition assistance, mostly used in heavy-duty cars) are the most prominent types of natural gas vehicles.
    - According to the Argonne National Laboratory's Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) model, light-duty vehicles powered by conventional natural gas can provide small to moderate GHG emissions reductions while also reducing life cycle greenhouse gas emissions by 15%. Furthermore, because CNG fuel systems are completely sealed, the vehicles have no evaporative emissions.
    - Natural gas vehicles (NGVs) have similar power, acceleration, and cruising speeds to gasoline and diesel vehicles. NGVs have a shorter driving range than comparable gasoline and diesel vehicles because natural gas stores less overall energy in the same-sized tank. Extra natural gas storage tanks or the use of LNG can help larger vehicles achieve longer ranges. In heavy-duty vehicles, dual-fuel, compression-ignited engines are slightly more fuel efficient than spark-ignited, dedicated natural gas engines. However, a dual-fuel engine complicates the fuel-storage system by necessitating the storage of both types of fuel as well as the integration of diesel aftertreatment components.

- **Liquified petroleum gas (LPG),** also known as propane, is a clean-burning alternative fuel that's been used for decades to power light-, medium-, and heavy-duty LPG vehicles. It is kept under pressure in a tank as a colorless and odorless liquid. When the pressure is released, the liquid propane vaporizes and transforms into a gas that is used in combustion. Ethyl mercaptan, an odorant, is used to detect leaks.

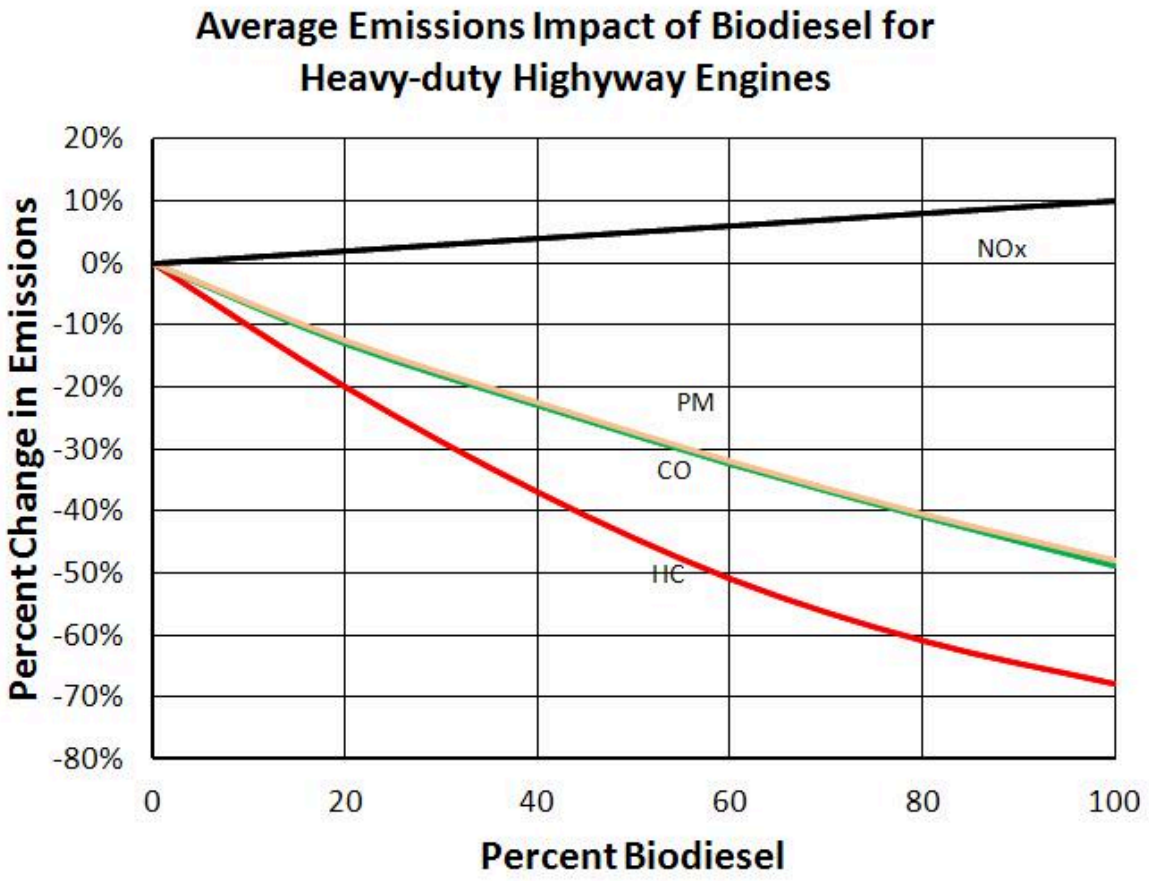
- LPG has a high octane rating, making it ideal for spark-ignited internal combustion engines. If spilled or released from a vehicle, it poses no risk to soil, surface water, or groundwater. LPG is formed as a byproduct of natural gas processing and crude oil refining. Its other primary applications include home and water heating, cooking and refrigeration, clothing drying, and powering farm and industrial equipment. The chemical industry also uses LPG as a raw material in the production of plastics and other compounds.
- Many LPG vehicles are in production and use today, and methods exist to convert vehicles to use LPG instead of gasoline.
- A bit similar to natural gas vehicles, there are two kinds of LPG vehicles: dedicated and bi-fuel. Dedicated LPG vehicles are designed to run exclusively on LPG. Bi-fuel vehicles have two separate fueling systems, allowing them to operate on either LPG or gasoline. Bi-fuel vehicles typically have a longer range than dedicated LPG or gasoline vehicles because they can use either fuel. Extra storage tanks can extend range, but tank size and weight affect payload capacity.
- LPG is typically less expensive per gallon than gasoline, and LPG vehicles have a similar driving range to conventionally fueled vehicles. LPG has a lower British thermal unit rating per gallon, which results in lower fuel economy, but its lower per-gallon cost can quickly offset this.
- LPG is a popular choice for high-mileage vehicles because it can reduce maintenance costs. LPG's high octane rating, combined with its low carbon and oil-contamination characteristics, has resulted in longer engine life than conventional gasoline engines. Cold-start issues can frequently be reduced as well. This is because the fuel mixture (propane and air) is completely gaseous when it enters the engine's combustion chamber, and LPG engines do not require an enriched fuel mixture during cold-weather starts like other liquid-fueled engines do.

Biofuel

Bioenergy is made from various organic materials, known as biomass, including wood, charcoal, animal waste, and other manures for the production of heat and power, as well as agricultural crops for the production of liquid biofuels. After producing electricity, the majority of biomass is used by poorer populations in rural areas of developing nations for cooking, lighting, and space heating.



Burning biomass produces greenhouse gas emissions, but at a lower level than burning fossil fuels such as coal, oil, or gas. For instance, below you will see a graph for heavy-duty car engines.



A graph showing the change of some emitted particles and substances with different blends of biodiesel.

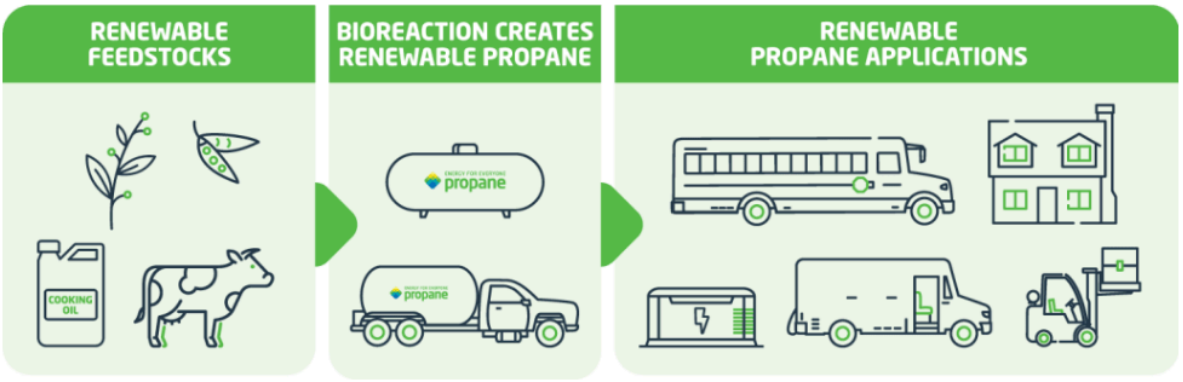
One notable use area of bioenergy, which is extremely relevant for our agenda item, is converting them to biofuels such as ethanol or biodiesel, so that they may be used prominently as a petrol/diesel alternative. Ethanol is made by fermenting biomass that is high in carbohydrates, such as sugarcane, wheat, or corn. Biofuels are not as efficient as gasoline, but they may be blended with gasoline for better efficiency, and they release small amounts of emissions. Most petrol/diesel engines today are reported to be compatible with blends of biofuel; however, some modifications are needed in most cases to be able to use pure biofuel without any gasoline blending. There are also some concerns regarding biofuel decreasing the lifespan of some engine components; however, there are different opinions on this matter. Either way, to sum up, engines which produce heat or energy from petrol or diesel could be used with biofuel with minor modifications, according to research.

Now, let us talk about the vehicles themselves a bit. Do not worry, we will not be contradicting ourselves, we will not dive too deep into the technicals:) Surprisingly, as written before, biodiesel and regular diesel vehicles are nearly the same. Although light, medium, and heavy-duty diesel vehicles are not alternative fuel vehicles, nearly all may run on **biodiesel** blends; if they cannot, they may with some minor modifications, or different blends. Aside from environmental benefits, there are several other advantages to using biofuel. For example, biodiesel increases the cetane number of the fuel and improves its lubricity, and a higher cetane number means the engine is easier to start and has less ignition delay. Diesel engines rely on the lubricity of the fuel to keep moving parts from wearing out prematurely. Improved lubricity reduces friction between moving parts, preventing additional wear. One of biodiesel's primary advantages is that it can improve fuel lubricity at blend levels as low as 1%.

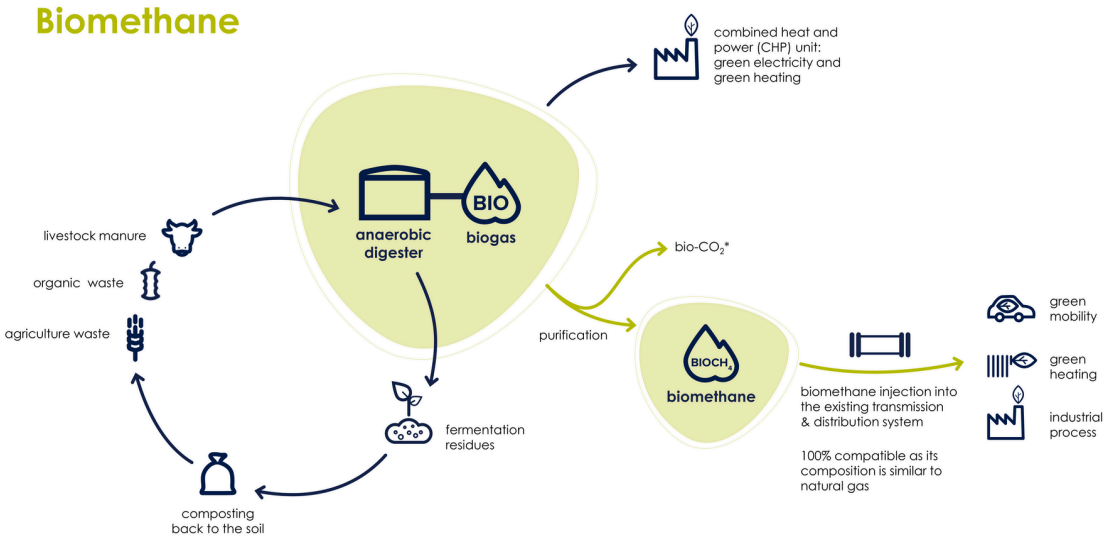
Another biofuel, **ethanol**, is also very often used. For instance, more than 98% of gasoline in the United States already contains ethanol to oxygenate the fuel (usually with a rate of 10% ethanol and 90% gasoline, called E10), which also reduces pollution. According to research, corn-based ethanol produced from dry mills reduces greenhouse gas (GHG) emissions by 40% on average, with reductions reaching beyond 88% if cellulosic feedstocks are used, depending on feedstock type, when compared to gasoline and diesel production and use.

One downside of ethanol is that its blends effectively have less energy in the same amount of fuel when used with most vehicles compatible with it. This is because these compatible vehicles are often designed with gasoline or diesel usage mainly in mind; therefore, they may not utilize ethanol as efficiently.

Renewable LPG or **renewable propane** is another alternative fuel derived from non-petroleum feedstocks such as natural fats, vegetable oils, and various greases. It is chemically identical to conventional LPG and can be used as a drop-in replacement fuel in all LPG systems.



The final variant we will talk about here is **biomethane**, also called renewable natural gas (RNG). It is a pipeline-grade vehicle fuel. It is created by purifying biogas, which is produced through anaerobic digestion of organic materials (such as landfill and livestock waste) or thermochemical processes such as gasification.



*Capturing biogas from landfills and livestock operations reduces emissions by preventing methane from entering the atmosphere. Methane is a 25-times more

potent greenhouse gas than CO2. Furthermore, producing biogas through anaerobic digestion reduces odors and produces nutrient-dense liquid fertilizer. Because RNG is chemically identical to fossil-derived conventional natural gas, it can use the existing natural gas distribution system, but must be compressed or liquefied before use in vehicles.

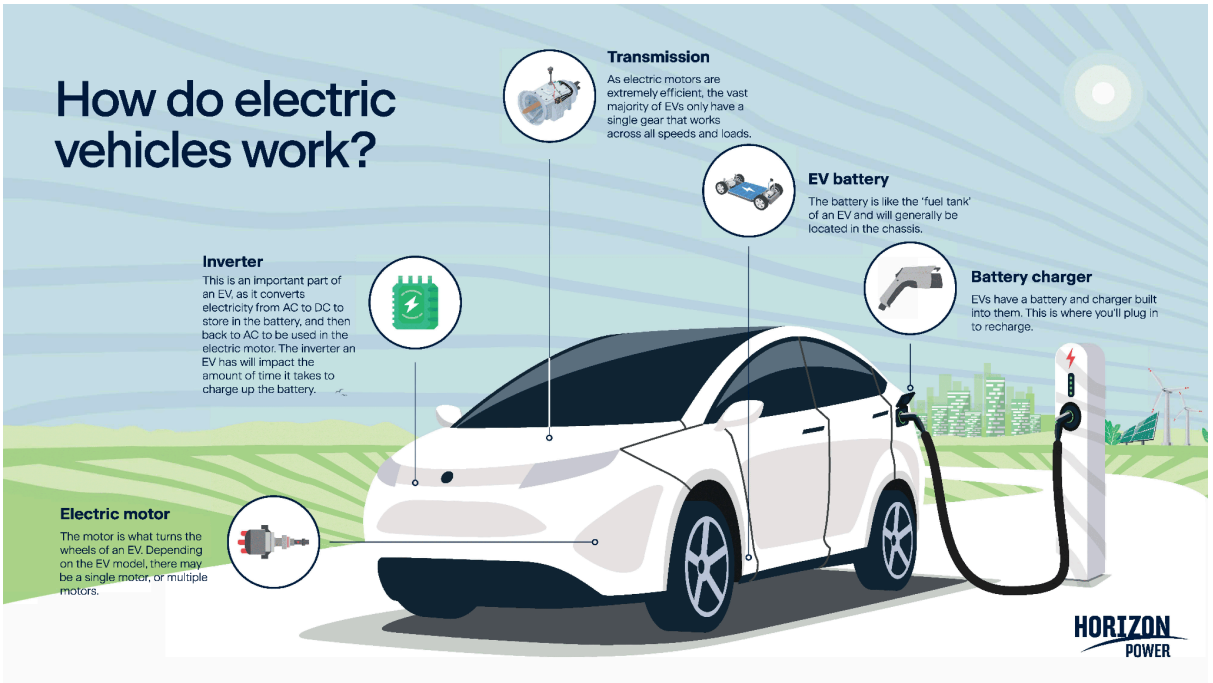
As a final remark, biofuel production in general often enables us to reuse waste and utilize it as energy sources in the form of biodiesel and ethanol, and also creates many new jobs, especially in rural locations.

A screenshot of a biofuel bus from the 2015 city simulation videogame, Cities: Skylines, which remains an inspiration for this committee and many others before it:)

Electric and Hybrid

As we are seeing them slowly break into the mainstream, cars that work only with electricity or hybrid, more flexible cars also exist, and are very applicable alternatives. Formally speaking, electric cars (EVs) can be powered by electricity, which includes all-electric vehicles, also known as battery-electric vehicles (BEVs), and plug-in hybrid electric vehicles (PHEVs). These vehicles may charge their batteries by drawing power straight from the grid or other off-board electrical sources. In contrast, hybrid electric vehicles (HEVs) run on liquid fuels such as

gasoline but utilize batteries to recover energy lost during braking. PHEVs can use off-board electricity to generate power, making them EVs, but they can also use liquid fuels and operate similarly to HEVs if necessary.

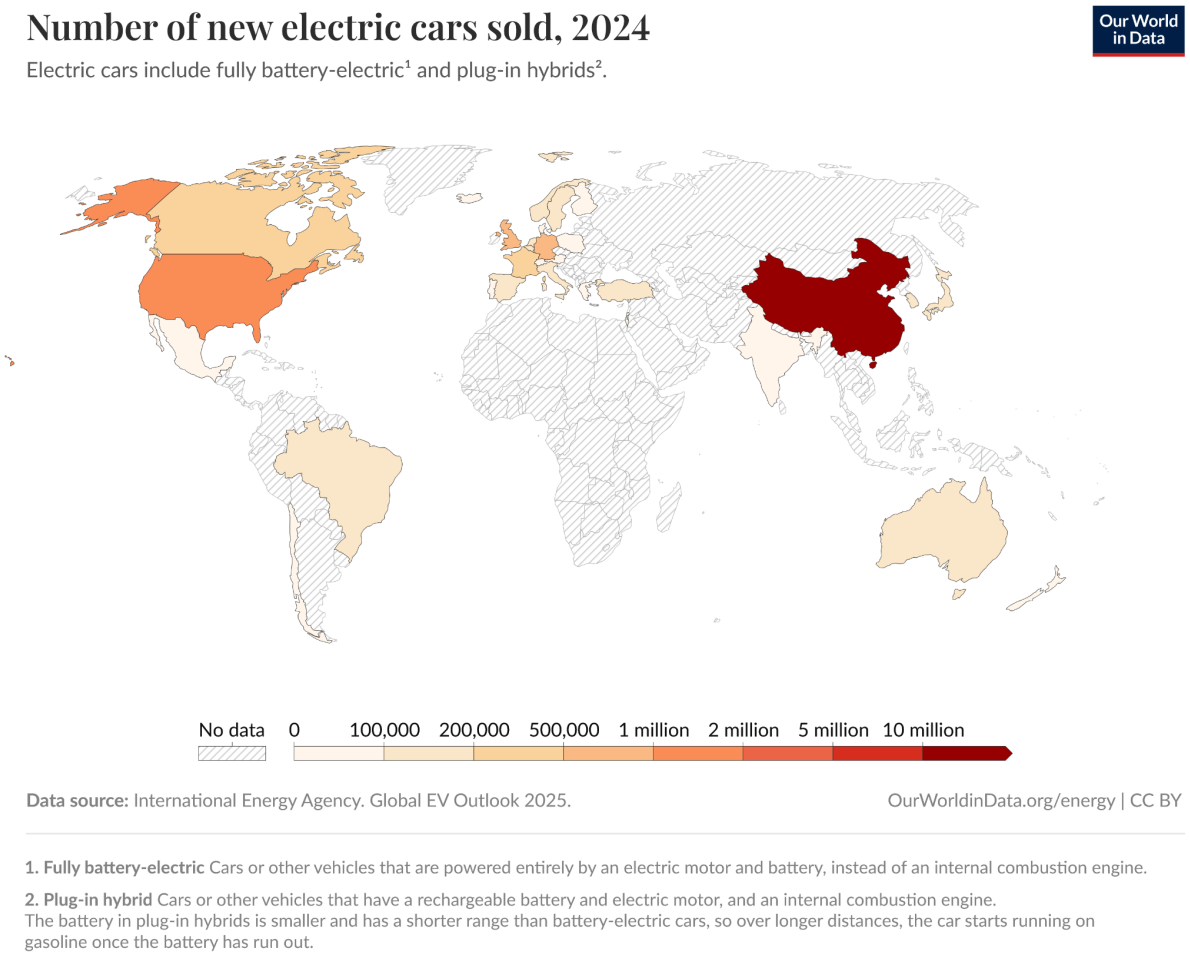


The electricity used by such vehicles can be produced from a variety of energy sources, including natural gas, coal, nuclear energy, wind energy, hydropower, and solar energy.

Onboard batteries in EVs store energy for one or more electric motors. These batteries are charged with electricity from the grid and energy captured during braking, a process known as regenerative braking. Electric vehicles produce no exhaust gases, but there may be upstream emissions associated with electricity production.

Using electricity as a power source for transportation is currently usually less expensive than using gasoline, but EVs typically cost more to buy. However, energy savings and incentives can help to offset initial vehicle costs. Electricity for charging vehicles is particularly cost-effective if drivers can take advantage of off-peak residential rates and other utility incentives. The cost is determined by the price of electricity, which varies depending on region, generation type, time of use, and access point.

Another thing to consider about electric vehicles is their battery lifespans. Even though they are designed for extensive usage, they will eventually wear out. Findings on models used today indicate a lifespan between 8-15 years, at which point they should ideally be replaced.



Other Alternatives

In this section, we will discuss some worthwhile alternatives that are not just some type of fuel or engine. Rather, we will discuss cycling and other mobility options, and walkable cities.

Bicycling, also known as biking or cycling, is a method of transportation and a popular recreational physical activity. Benefits of cycling to health include decreased body fat, increased coordination and general mobility, stronger muscles, and better cardiovascular fitness. By reducing stress and releasing feel-good endorphins, cycling may benefit mental health, similar to other forms of physical activity.

Bicycling for transportation, such as commuting to work, has the advantages of incorporating exercise into daily life, lowering the costs associated with driving a car or taking public transportation, and reducing road congestion and air/noise pollution, as seen in cities. This is because, well, to put it as simply as we can, regular bicycles do not use any kind of fuel; they work with raw human power. As bicycles are often very affordable, they may be used by people with different financial capacities. Low initial cost and no fuel costs with little to no maintenance costs mean that riders also have more finances to spend elsewhere or save up.

An image of a seemingly random bicycle, which happens to be the Under-Secretary-General's trusty but rather heavy mountain bike:)

Some people are deterred by the risks associated with riding a bike, most prominently using them in a car-focused city infrastructure, which may lead to injuries related to crashes. This may be largely mitigated by planning and making bicycle tracks. A study in Montreal, Canada, found that cycle tracks had a 28% lower injury rate and attracted 2.5 times more bicyclists than parallel roads without bicycle facilities. Beyond cycle tracks, some countries, such as the Netherlands and Denmark, have implemented bicycle traffic signals, special precautions at intersections, and even express superhighways for cyclists who travel longer distances to work. Providing additional motorist training and traffic safety education in schools can help reduce accidents. Bike-specific signals, smooth surfaces with low resistance, parks, sidewalk cafes, art, and trees planted between the lanes and the street may all encourage more people to ride their bikes.

There are also E-bikes, which are electric bicycles with a small electric motor that operates when the rider pedals or turns a switch on the handlebars. Unlike a fully motorized scooter (speaking of which, they are also great alternatives, as they are electric, affordable, and usually usable in bicycle paths), riders must pedal an e-bike, though the effort is much lower than with a traditional bicycle. A significant advantage of an e-bike is the extra power provided when riding hills or if the biker becomes tired after a certain distance; this feature allows for a longer bike ride and a variety of terrain.

Now, let us talk about **walkable cities**.

An image showing the transformation of Amsterdam, The Netherlands, into a more walkable and pedestrian/bicycle-friendly city.

Walkable cities encourage residents to travel on foot. A walkable city allows you to work, eat, learn, shop, and relax all on foot. It requires a long-term vision and infrastructure that encourages citizens to forego the convenience of their automobiles. Walkability refers to the ease of safe walking in high-density urban areas with a large population. Allowing pedestrian-friendly spaces improves a city's liveability and promotes physical fitness for people who live there. Walkable cities are reported to have lower crime rates, considered to be a result of them encouraging

more social interaction. Walkability does not imply removing cars from a city, but rather reaching the perfect balance between pedestrians, bicyclists, public transportation, and private vehicles. The following are some examples of how the walkability of a city may be increased:

- Cities such as Edinburgh and Sheffield have seen a significant increase in walkability since dedicating walkway space for pedestrians on the edges of their roads. This includes the installation of well-lit, tree-lined walkways and safe pedestrian crossings. Walkways are clearly defined road spaces for walking only, as opposed to paved sidewalks that extend along the sides of the road. Safe walkways are at least 2.5 meters wide, continuous, and connect multiple points of interest and activity. It is critical to keep them accessible to everyone, including children, the elderly, and the disabled.
- According to surveys, many people prefer not to walk due to the high speed and traffic volume on the road for safety reasons. With the closure of roads that lead to schools and hospitals, a speed limit can be implemented. Encourage pedestrians and cyclists in high-traffic areas. Speed limits promote a safer and more comfortable environment. Traffic calming measures, narrower lanes, and other road design features can be used to control vehicle speeds. Public awareness of the importance of safe speeds helps speed management programs.
- Reducing the number of vehicles is only possible if more people take public transportation to destinations that are not within walking distance. Residents will only use public transportation if it is reasonably priced, accessible, and convenient. The effectiveness of walkable spaces in interacting with other active or sustainable modes of transportation has a significant impact on improving city walkability. The public transportation system should be well-integrated, connecting all major city neighbourhoods, and safe to use. The governments of member states should strategically place the stations to encourage people to walk to them.

PEDESTRIANS FIRST

A MIX OF INFRASTRUCTURE, ACTIVITY, AND PRIORITY

INFRASTRUCTURE

ENSURE A PHYSICAL SPACE AND DESIGN THAT PROMOTES WALKING

1. Sidewalks are sufficiently wide, in good condition, clean, unobstructed, and protected
2. Crosswalks are accessible for all pedestrians, safe to cross, and sufficiently wide
3. Signals give priority to pedestrians to cross first and limit wait time, while ensuring enough time for all to cross

ACTIVITY

BRING PEOPLE AND ACTIVITIES CLOSE ENOUGH TO WALK IN SAFE AND LIVELY ENVIRONMENTS

4. A mix of activities and services activate the street from morning to night, making it safer and more interesting to walk
5. Street vendors and sidewalk amenities such as seating, shade, lighting and garbage bins attract more users and animate the sidewalks
6. On-street parking that is well-managed and well-priced can calm traffic while creating a buffer between moving vehicles and the pedestrian realm

PRIORITY

GIVE PREFERENCE TO WALKING, CYCLING, AND TRANSIT OVER PRIVATE CARS

7. Transit, such as bike share, bus, BRT, and rail, are reachable by foot
8. Small street widths are easier to cross
9. Slower speeds for traffic, by both design and enforced speed limits, make safer and more enjoyable walking environments

Illustration | Pamela Hobbs

FOR MORE INFORMATION, CHECK OUT **PEDESTRIANS FIRST: TOOLS FOR A WALKABLE CITY** AT **WWW.ITDP.ORG/WALK**

Public Transportation

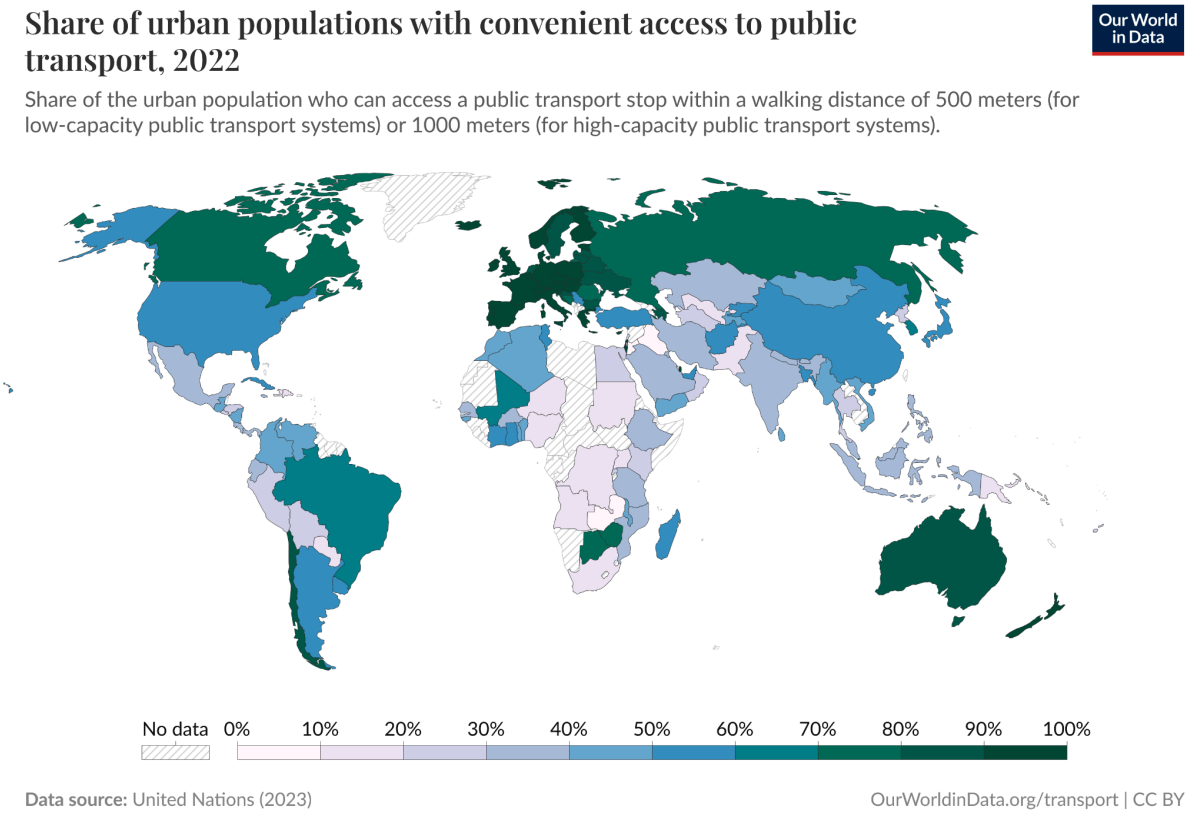
Now, let us talk about arguably the most important aspect of cleaner and more sustainable transportation: public transportation.

All forms of transportation that run consistently according to a set timetable are considered public transportation. It serves tens of millions of people daily worldwide and encompasses a wide range of transportation options, such as buses, trains, trams, ferries, and subways. Public transportation is often regarded as the heart of urban mobility since it offers a cost-effective, eco-friendly alternative to private vehicle use. Because public transportation methods move many people in the same vehicle or vehicle compartments (like train wagons), people are carried cheaply, much more efficiently, and in a more eco-friendly and sustainable manner, as the emissions of those travels would be several times bigger if every single person used their personal vehicles instead of public transport vehicles.

A completely random public transportation vehicle, which happens to be a bus.

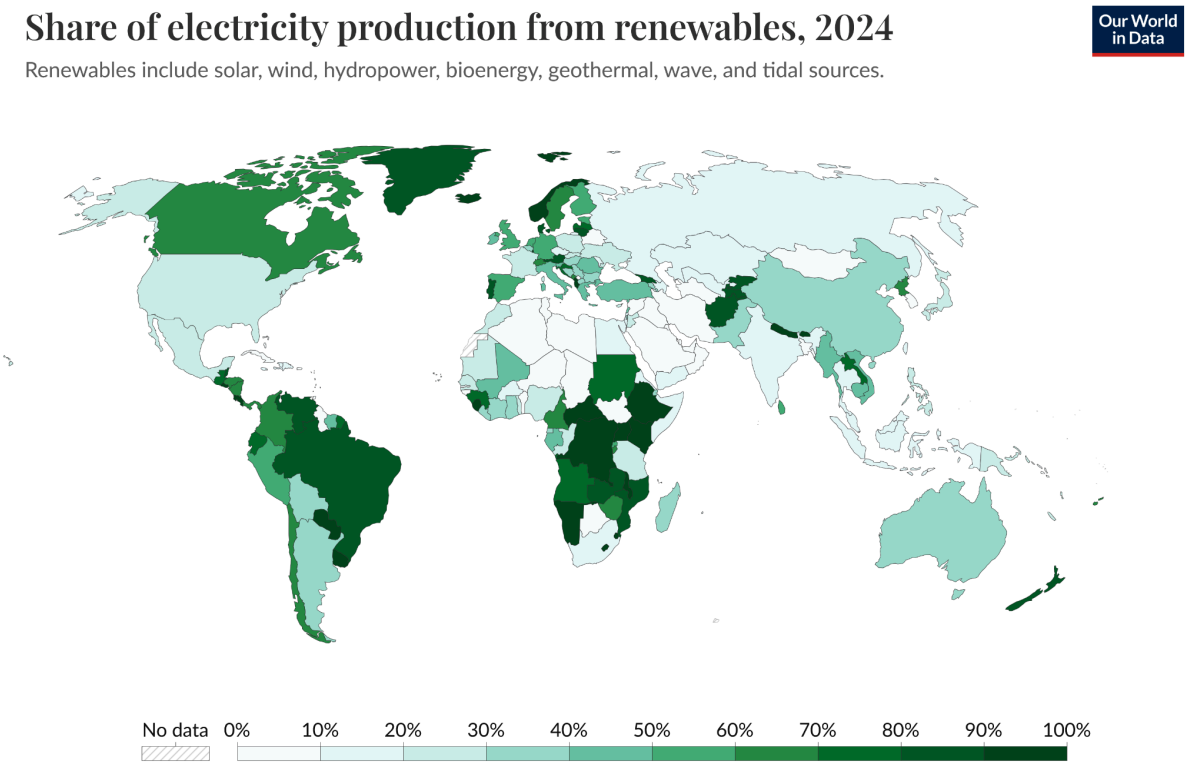
Thus, even if we just encourage public transportation vehicles that use fossil fuels, we would still have achieved more sustainable and clean transportation, which is the

ultimate goal of our agenda.



But why stay there? We could go a step forward and encourage more sustainable and clean alternatives to public transportation vehicles. Now, without having any more word salads (at least here), let us directly mention some examples regarding this.

- First of all, by utilizing electric or hybrid public transportation vehicles, we can use electricity from the grid to use little or no fossil fuels during vehicle use. This, however, has a very important thing to consider: how is the electricity in the grid generated? Well, if that electricity is generated from fossil fuels, we would be kind of deceiving ourselves. Our goal may be achieving cleaner transportation, but in that case, we will just be indirectly using fossil fuels, energy sources which are not clean, green, or sustainable. All of those investments and policy changes we will make will be pretty much pointless then, which is ironically what is happening around most parts of the world today.



- Utilizing hybrid and electric vehicles may require extensive vehicle and infrastructure investment as well. Think about buses - they may need to be charged every few hours, where will they be charged? (below, an electric bus)

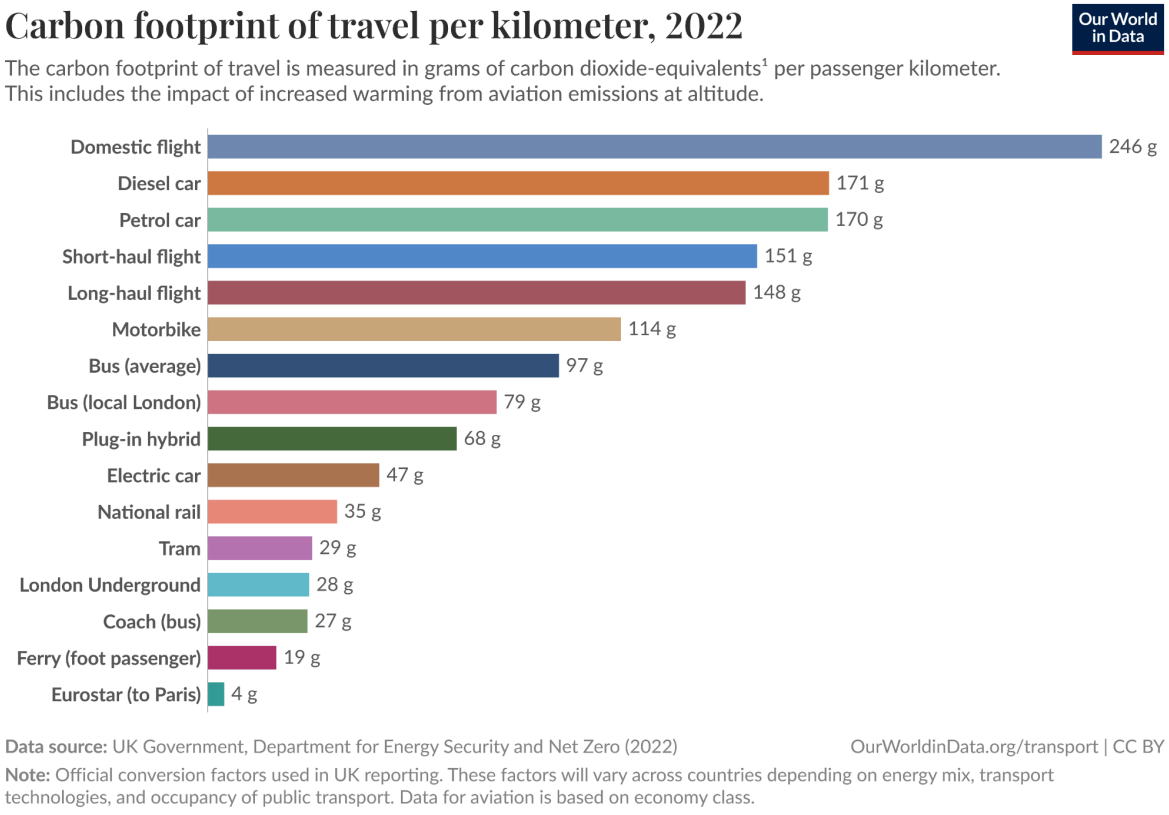
- We have extensively talked about biofuel and equivalent fossil fuel alternatives made with biofuel. Utilizing them could very well be either an alternative altogether or a stepping stone to even cleaner and more sustainable solutions.

- Think about solar panels. We may use them to generate electricity, which we could then use to power electric public transportation vehicles, like trams and trains. But why stop there? What if we further installed solar panels on such vehicles to power certain things like internal electrical components or USB chargers? Well, why stop there, while there is research suggesting that solar panels may be used to power entire buses as well?

- When people think about public transportation, they usually think only about buses. That is understandable, as they are versatile, cheaper and simpler to implement, and convenient. But why stop there, again? Trams, metro, trains, cable cars, monorail, and ferries may as well be used, and especially in the case of trains and their derivatives, may be much more sustainable for many developing nations. Not only that, if we further use the cleaner alternatives we have mentioned in this guide, they become even more sustainable, clean, and perhaps in some cases more convenient for both governments and people.

A completely arbitrary image of a cable car, which definitely does not include a totally random region that the USG has a special affinity for...

- Transportation does not only mean carrying people; carrying goods is also naturally included in transportation. While we are talking about public transportation here, which, well, is about carrying people, we can make an argument that commercial vans, freight trucks and other cars are not the only methods of transporting goods. Trains are often much more cost-effective to carry both goods and people, but they require special infrastructure (rails, not very surprising, right?). Still, we may reduce emissions and costs several times if we are somehow able to plan more strategically and invest in some other alternatives, and if we invest and plan a bit more to include renewable, clean and green fuel options, then we may fulfill the goals of our agenda, or rather, come closer to fulfilling them. Anyway, just consider that many options that are more sustainable for carrying people apply for goods in most cases as well, and goods are just as important as people for our agenda item.



1. **Carbon dioxide equivalents (CO_2eq)** Carbon dioxide is the most important greenhouse gas, but not the only one. To capture all greenhouse gas emissions, researchers express them in "carbon dioxide equivalents" (CO_2eq). This takes all greenhouse gases into account, not just CO_2.
To express all greenhouse gases in carbon dioxide equivalents (CO_2eq), each one is weighted by its global warming potential (GWP) value. GWP measures the amount of warming a gas creates compared to CO_2. CO_2 is given a GWP value of one. If a gas had a GWP of 10 then one kilogram of that gas would generate ten times the warming effect as one kilogram of CO_2.
Carbon dioxide equivalents are calculated for each gas by multiplying the mass of emissions of a specific greenhouse gas by its GWP factor.
This warming can be stated over different timescales. To calculate CO_2eq over 100 years, we'd multiply each gas by its GWP over a 100-year timescale (GWP100).
Total greenhouse gas emissions – measured in CO_2eq – are then calculated by summing each gas' CO_2eq value.

Sustainable Development Goals

The Sustainable Development Goals (SDGs), sometimes referred to as the Global Goals, consist of 17 interlinked targets that were embraced by member states of the United Nations in September 2015. Created to address various worldwide issues, including but not limited to poverty, inequality, environmental matters, peace, and prosperity, these goals are an evolution of the Millennium Development Goals (MDGs). The SDGs have the overarching objective of directing global endeavours to establish a fairer, more ethical, and sustainable planet by the year 2030. The 17 goals represent a shared global commitment to creating a better future for all. These goals address a wide range of interconnected challenges, which underlines the importance of collaborative efforts among nations, governments, organisations, and individuals.

The 17 Sustainable Development Goals.

This agenda encompasses numerous Sustainable Development Goals, most prominently Goals 7, 9, 11, 12 and 13. We can actually extend our arguments to include even more goals, but let us briefly mention each of these listed goals, and some of their targets, to at least have an idea of them and their relevance to our committee.

Goal 7: Affordable and Clean Energy

Ensure access to affordable, reliable, sustainable and modern energy for all. Relevant targets include:

- Target 7.1 (By 2030, ensure universal access to affordable, reliable and modern energy services),
- Target 7.0 (By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology),
- Target 7.b (By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support)

Goal 9: Industry, Innovation and Infrastructure

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. Relevant targets include:

- Target 9.4 (By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities),
- Target 9.a (Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States)

Goal 11: Sustainable Cities and Communities

Make cities and human settlements inclusive, safe, resilient and sustainable. Relevant targets include:

- Target 11.2 (By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons),
- Target 11.3 (By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries),
- Target 11.6 (By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management),

Goal 12: Responsible Consumption and Production

Ensure sustainable consumption and production patterns. Relevant targets include:

- Target 12.2 (By 2030, achieve the sustainable management and efficient use of natural resources),
- Target 12.5 (By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse),
- Target 12.8 (By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature),
- Target 12.a (Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production),
- Target 12.c (Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their

development in a manner that protects the poor and the affected communities)

Goal 13. Climate Action

Take urgent action to combat climate change and its impacts. Relevant targets include:

- Target 13.2 (Integrate climate change measures into national policies, strategies and planning),
- Target 13.3 (Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning),
- Target 13.a (Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible),
- Target 13.b (Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities)

Questions that delegates may address

These are the questions that the Under-Secretary-General of this committee advises delegates to address in the committee. You do not have to address all of them. You may address, research or think about only a few questions which interest you.

These may be used in researching the agenda item further before the conference, or they may be brought up as moderated caucus topics (for instance, you can propose a topic like “raising awareness on cleaner transportation” from the question “Awareness is also an important concept for this agenda. How can we ensure that the public is well-informed on clean transportation and its importance?”) to later devise a solution for it in the resolution paper (please remember that something needs to be addressed in a moderated caucus before it can be added to a resolution paper).

- As we are in an UNDP committee, should we solely focus on the development and investment sides of our agenda, or is this a bigger agenda that encompasses more topics and concepts, such as environmental and even humanitarian matters, which we should also pay attention to?
- What is an internal combustion engine (ICE)? Why should we consider alternatives to them?
- Are fossil fuels renewable? If not, when will we run out of them?
- What is meant by the term “peak oil”? How is it relevant to our committee?
- Does it make sense to use other, relatively cleaner fossil fuels as we transition into renewable alternatives? If yes, why, and how may we encourage their usage?
- Which fossil fuels may we use as transitional fuels as we switch to cleaner alternatives?
- Is biofuel a completely clean source of energy? If not, is it still a feasible alternative? If yes, how may we encourage their usage?

- Is it true that engines are not able to use biofuels, specifically ethanol and biodiesel, as efficiently as gasoline and diesel? If yes, why is that, and how may we solve it?
- What is renewable LPG (or renewable propane)? How is it produced? How is it different from regular LPG? How useful is it for our agenda item?
- What is biomethane? How is it produced? How is it different from regular natural gas? How useful is it for our agenda item?
- What are the different types of electric vehicles? More specifically, what is the difference between battery-electric vehicles, plug-in hybrid electric vehicles and hybrid electric vehicles?
- What are the advantages and disadvantages of electric vehicles today? How may we enhance the advances while mitigating the disadvantages?
- How may we encourage the usage of electric vehicles, potentially not limited only to cars?
- Electric vehicles use batteries, which have a lifespan. Does this pose a problem?
- While not mentioned in this guide, hydrogen is often considered a new, cutting-edge alternative fuel. How applicable or feasible is it? Could we use it in our solutions? Why did the Under-Secretary-General not include it in this guide, do you have any guesses?
- How could encouraging cycling help us in reaching our agenda item targets? How could we encourage it?
- What are the benefits of cycling?
- What is meant by the term “walkable cities”? What does it have to do with our agenda item?
- Why and how should we encourage implementing city plans and infrastructure that allow them to be more walkable?

- What is meant by the term public transportation? How is it relevant to our agenda item?
- Should we just encourage public transportation, or further encourage cleaner fuel alternatives in public transportation vehicles such as trains, ferries and buses?
- How can we make public transportation more convenient for people, as inconvenience often deters people from using public transportation?
- Is switching to hybrid and electric vehicles sufficient for our agenda item? Should we also pay attention to how the electricity they use is produced?
- How can we aid nations in laying down infrastructure for electric and other alternative fuels, especially for public transportation?
- Can we use solar panels to directly power vehicles, or at least some components of them? (some birds told me that the USG loves this idea)
- What are some rather rare forms of public transportation? In which cases may we use them? Why are they rare?
- How can we encourage train usage to carry goods, especially trains that use cleaner fuels?
- What are the Sustainable Development Goals, and which Goals are relevant to our agenda item?
- Awareness is also an important concept for this agenda. How can we ensure that the public is well-informed on clean transportation and its importance?
- Should we focus only on developed nations, or include developing and underdeveloped nations, specifically small island developing nations (SIDS) as well?

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