Day 2 notes

Global Primary Energy

- Primary energy: can be renewable and nonrenewable energies. Electricity form renewables and carbon capture storage are examples. Energy generated by raw fuels is another example.
- Energy vector: enables to carry energy across the economy to an end user who wants to buy them.
- 29% of global energy comes from coal,31% from oil and 21% from natural gas
- Primary energy —-> energy vector ——-> useful energy

Is there a carbon bubble?

- **Fossil fuel reserves** – total quantity of fossil fuels which have been located with reasonable confidence and recovered with existing technologies at current prices.
- Let's start by converting the primary energy in fossil fuels like coal and oil reserves into carbon dioxide.
- New York(366), London(266), and Moscow (266) account to 2/3 of Carbon dioxide reserves. That is approximately 1500 $GtCO_2$. Total carbon budget is 2900 $GtCO_2$. This number is associated with a probability higher than 66% of avoiding 2 degrees of temperature increase.
- We have already emitted about 2100 $GtCO_2$ which leaves us with an estimate of 775 gigaton.

There are two responses to an excessive monetization of carbon reserves:

- Leaving the fossil fuels underground once the carbon budget has been used up. Over the last few years, this has caused a divestment from fossil fuels, that is the action on selling stocks in fossil fuel sectors. This has mostly been focused on coal but ignored for oil and gas which obviously also have carbon.
- the other response is to continue accessing the carbon reserves but stopping a fraction of CO_2 entering the atmosphere through carbon capture storage technology. Once the carbon budget is used up, CCS allows the use of additional fossil fuels and access to the additional wealth they represent which would otherwise be left underground.