

Sociétés ET TRANSITIONS

Economie et environnement # 5



ECONOMIE ET ENVIRONNEMENT #5

RYM ALOUI

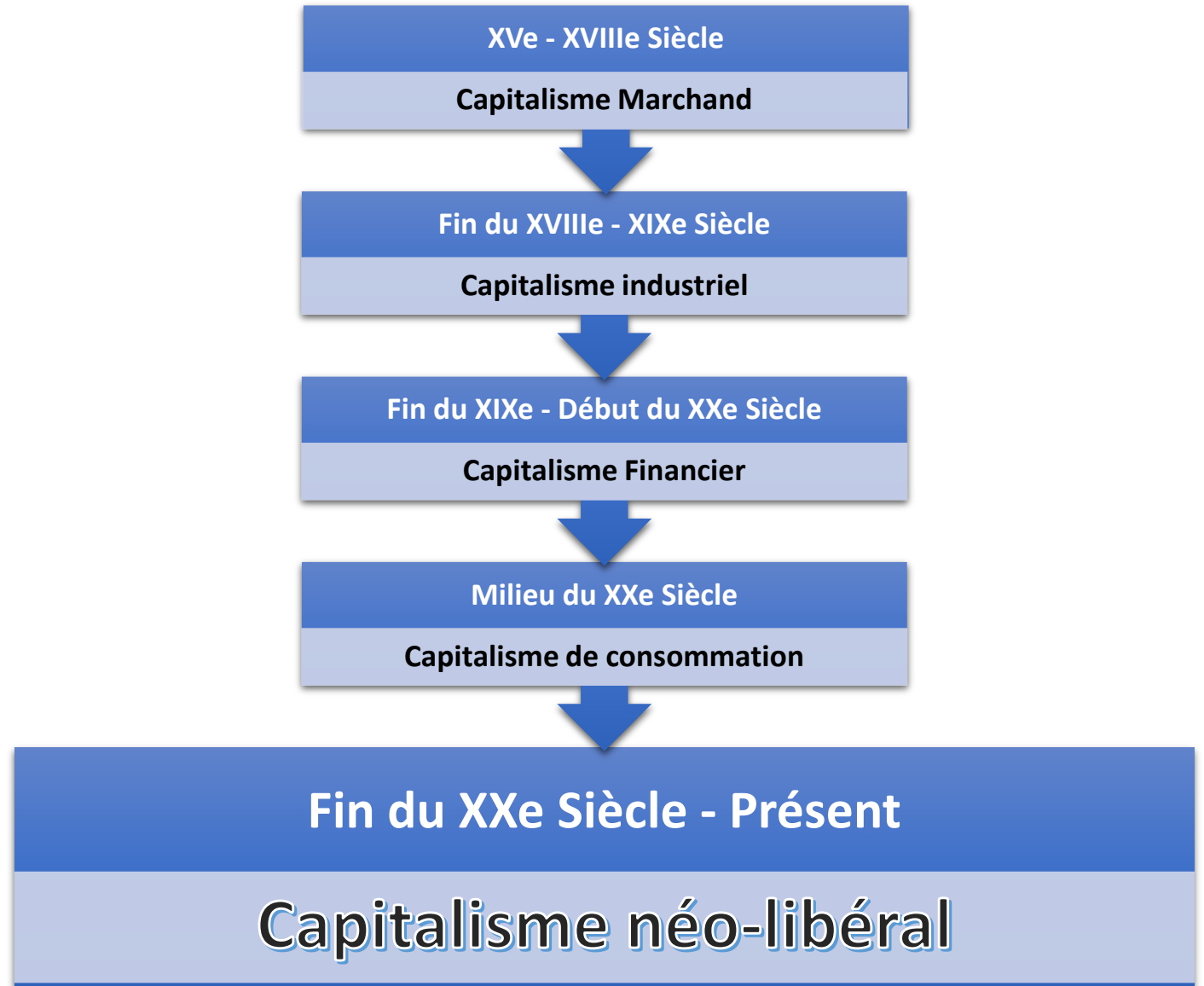
MAITRESSE DE CONFERENCES

UFR SEG et GATE-LSE



UFR de sciences
économiques
et de gestion

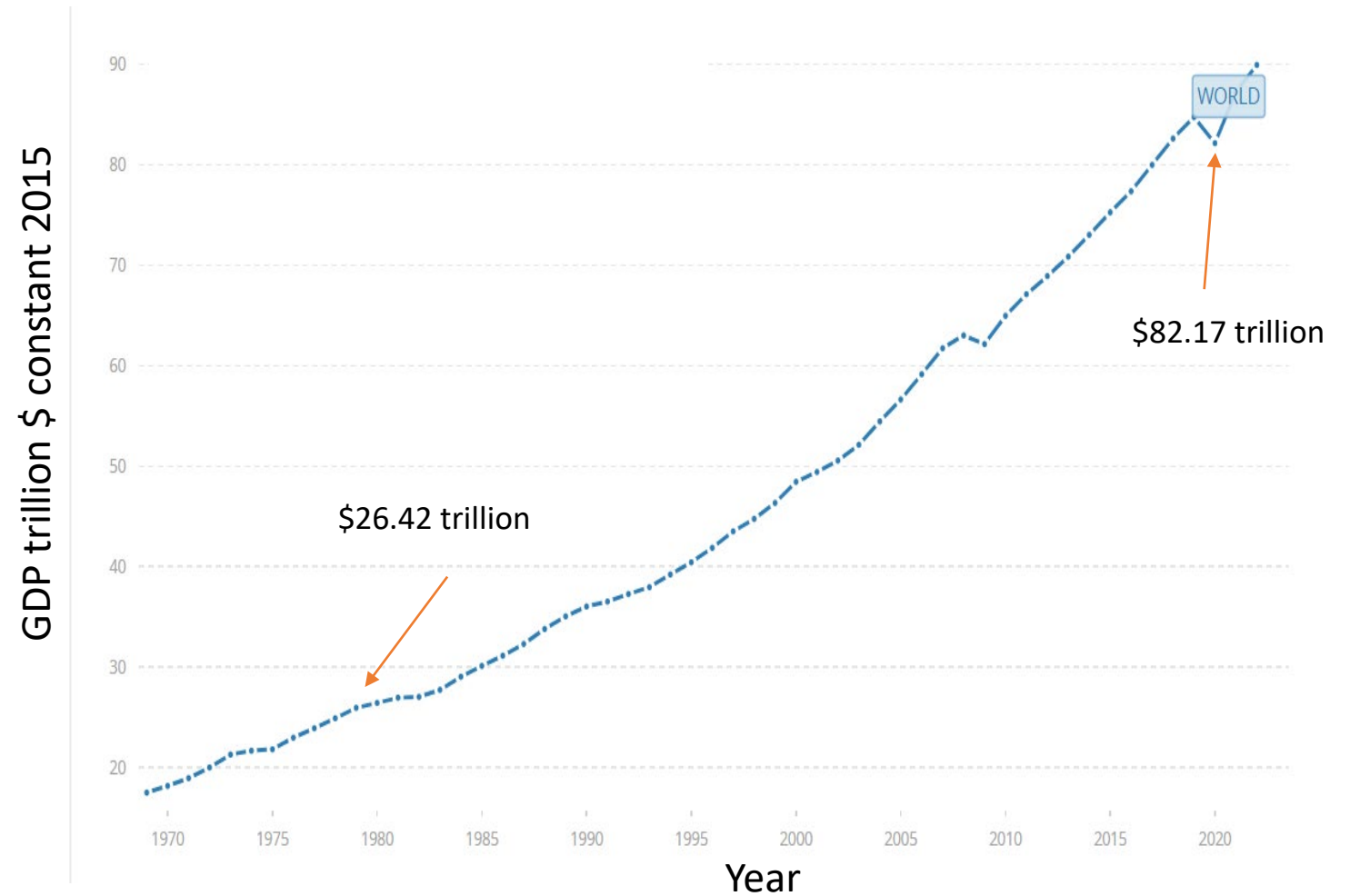




Croissance économique

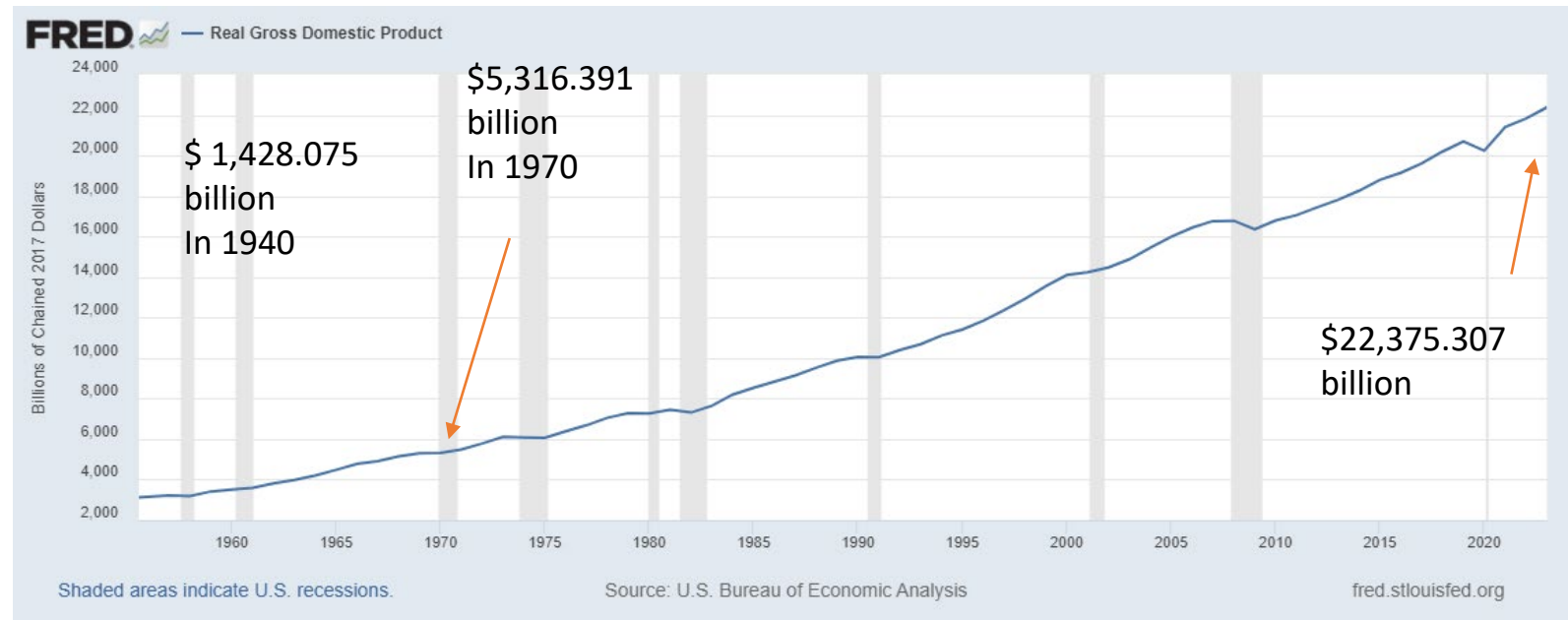
- Croissance économique substantielle
- Globalisation
- Innovation technologique
- Rôle limité de l'Etat et réduction de la réglementation
- Augmentation des inégalités

Evolution du PIB dans le monde

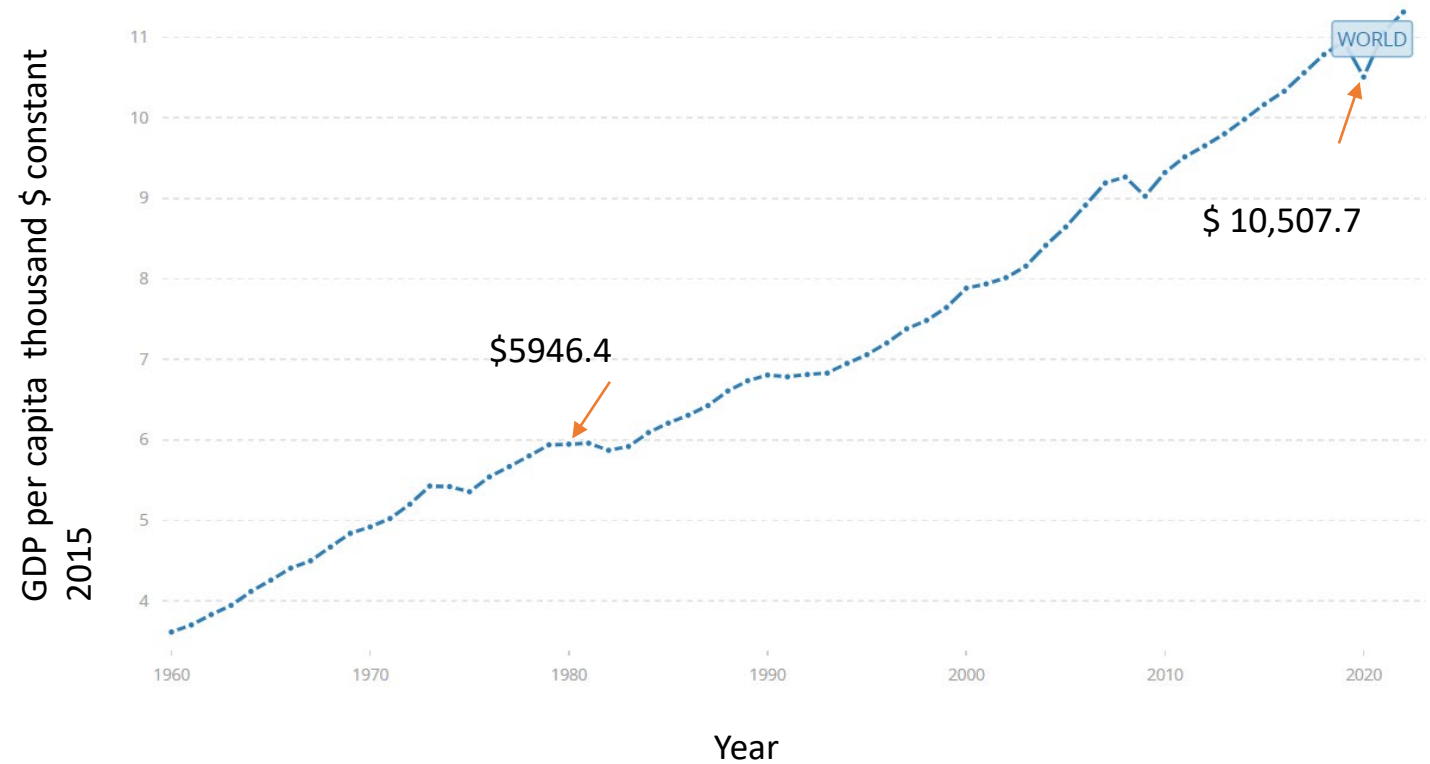


Source: Banque mondiale

Evolution du PIB aux USA



Evolution du PIB par tête dans le monde

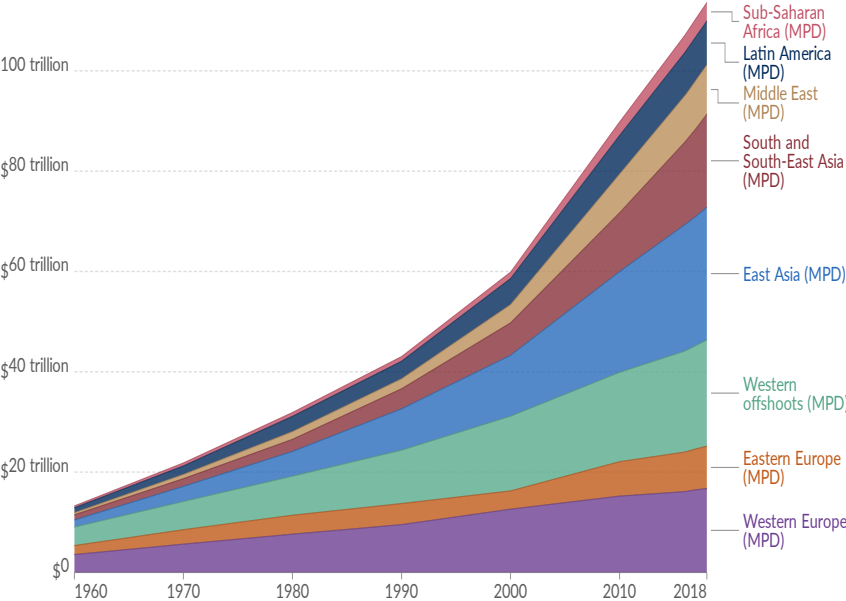


Source: Banque mondiale

Evolution des inégalités

Gross domestic product (GDP) by world region

This data is adjusted for inflation and differences in the cost of living between countries.



Data source: Maddison Project Database 2020 (Bolt and van Zanden, 2020)

Note: This data is expressed in international-\$¹ at 2011 prices.

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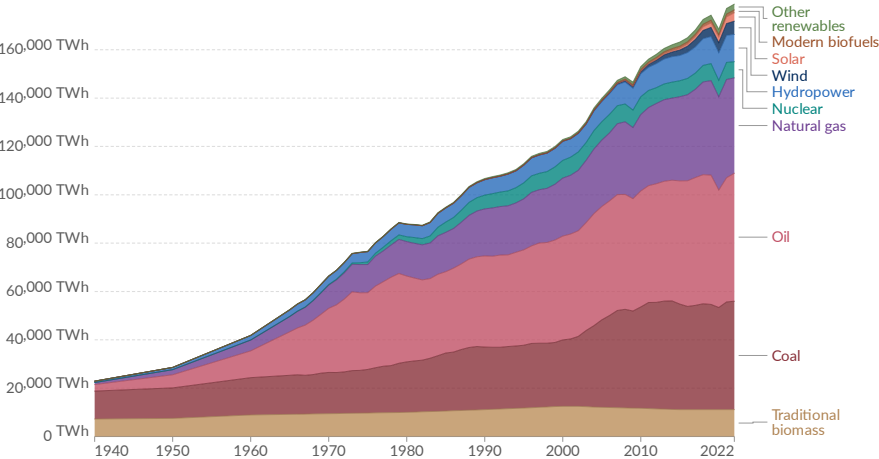
1. International dollars: International dollars are a hypothetical currency that is used to make meaningful comparisons of monetary indicators of living standards. Figures expressed in international dollars are adjusted for inflation within countries over time, and for differences in the cost of living between countries. The goal of such adjustments is to provide a unit whose purchasing power is held fixed over time and across countries, such that one international dollar can buy the same quantity and quality of goods and services no matter where or when it is spent. Read more in our article: What are Purchasing Power Parity adjustments and why do we need them?

Régions	PIB en Milliard \$US	
	1970	2018
Afrique Subsaharienne	570,87	3 700
Amérique Latine	1 730	8 730
Moyen-Orient	830,04	9 840
Asie du Sud et du Sud-Est	1 540	18 560
Asie de l'Est	3 000	26 430
Pays d'immigration européenne (Western Offshoots)	5 620	21 220
Europe de l'Est	2 870	8 400
Europe de l'Ouest	5 640	16 740
Total	21 810	113 630

Utilisation massive de combustibles fossiles dans le monde

Global primary energy consumption by source

Primary energy¹ is based on the substitution method² and measured in terawatt-hours³.



Data source: Energy Institute - Statistical Review of World Energy (2023); Smil (2017)

Note: In the absence of more recent data, traditional biomass is assumed constant since 2015.

OurWorldInData.org/energy | CC BY

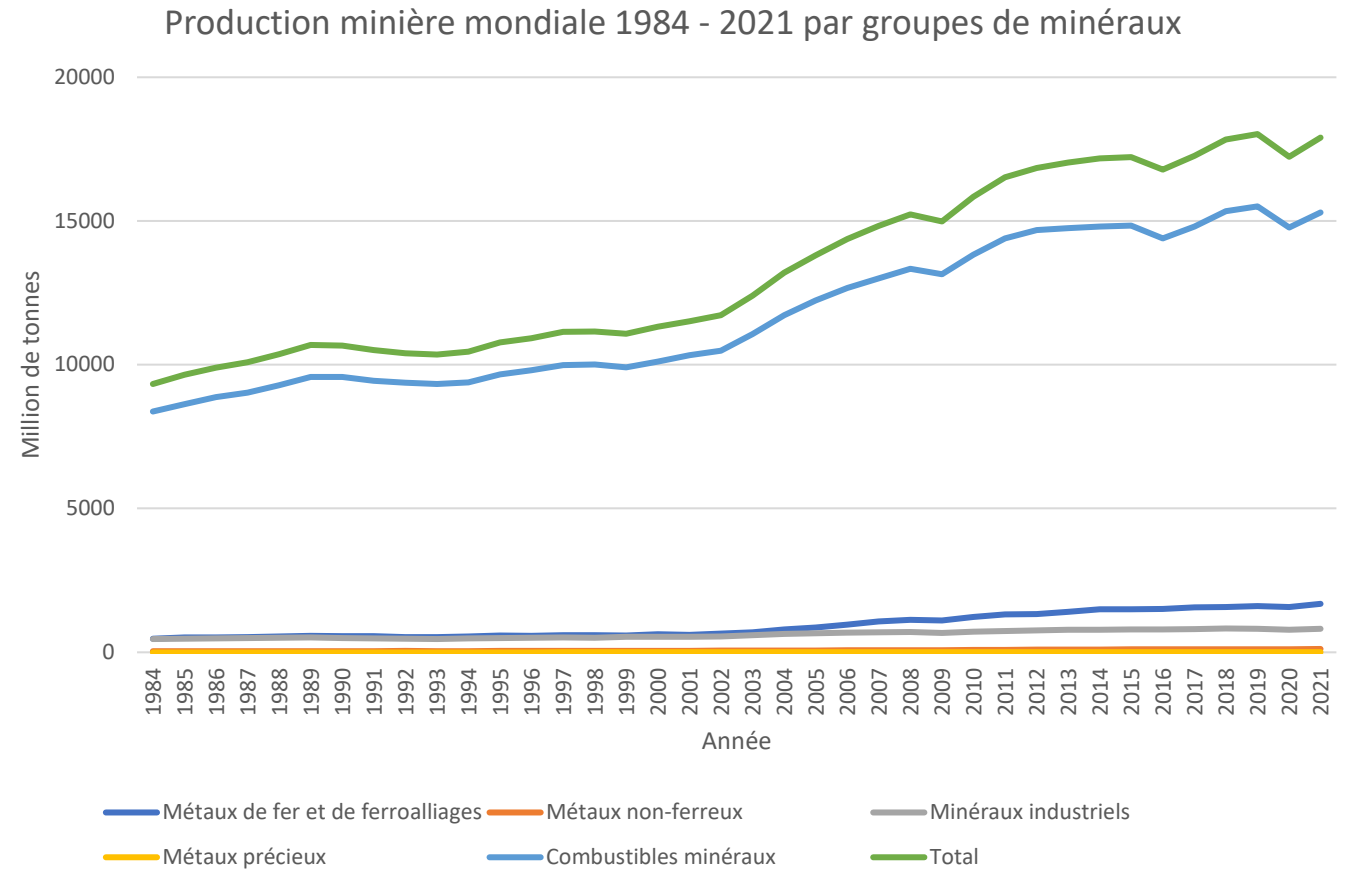
1. Primary energy: Primary energy is the energy available as resources – such as the fuels burnt in power plants – before it has been transformed. This relates to the coal before it has been burned, the uranium, or the barrels of oil. Primary energy includes energy that the end user needs, in the form of electricity, transport and heating, plus inefficiencies and energy that is lost when raw resources are transformed into a usable form. You can read more on the different ways of measuring energy in our article.

2. Substitution method: The 'substitution method' is used by researchers to correct primary energy consumption for efficiency losses experienced by fossil fuels. It tries to adjust non-fossil energy sources to the inputs that would be needed if it was generated from fossil fuels. It assumes that wind and solar electricity is as inefficient as coal or gas. To do this, energy generation from non-fossil sources are divided by a standard 'thermal efficiency factor' – typically around 0.4. Nuclear power is also adjusted despite it also experiencing thermal losses in a power plant. Since it's reported in terms of electricity output, we need to do this adjustment to calculate its equivalent input value. You can read more about this adjustment in our article.

3. Watt-hour: A watt-hour is the energy delivered by one watt of power for one hour. Since one watt is equivalent to one Joule per second, a watt-hour is equivalent to 3600 Joules of energy. Metric prefixes are used for multiples of the unit, usually: - kilowatt-hours (kWh), or a thousand watt-hours. - Megawatt-hours (MWh), or a million watt-hours. - Gigawatt-hours (GWh), or a billion watt-hours. - Terawatt-hours (TWh), or a trillion watt-hours.

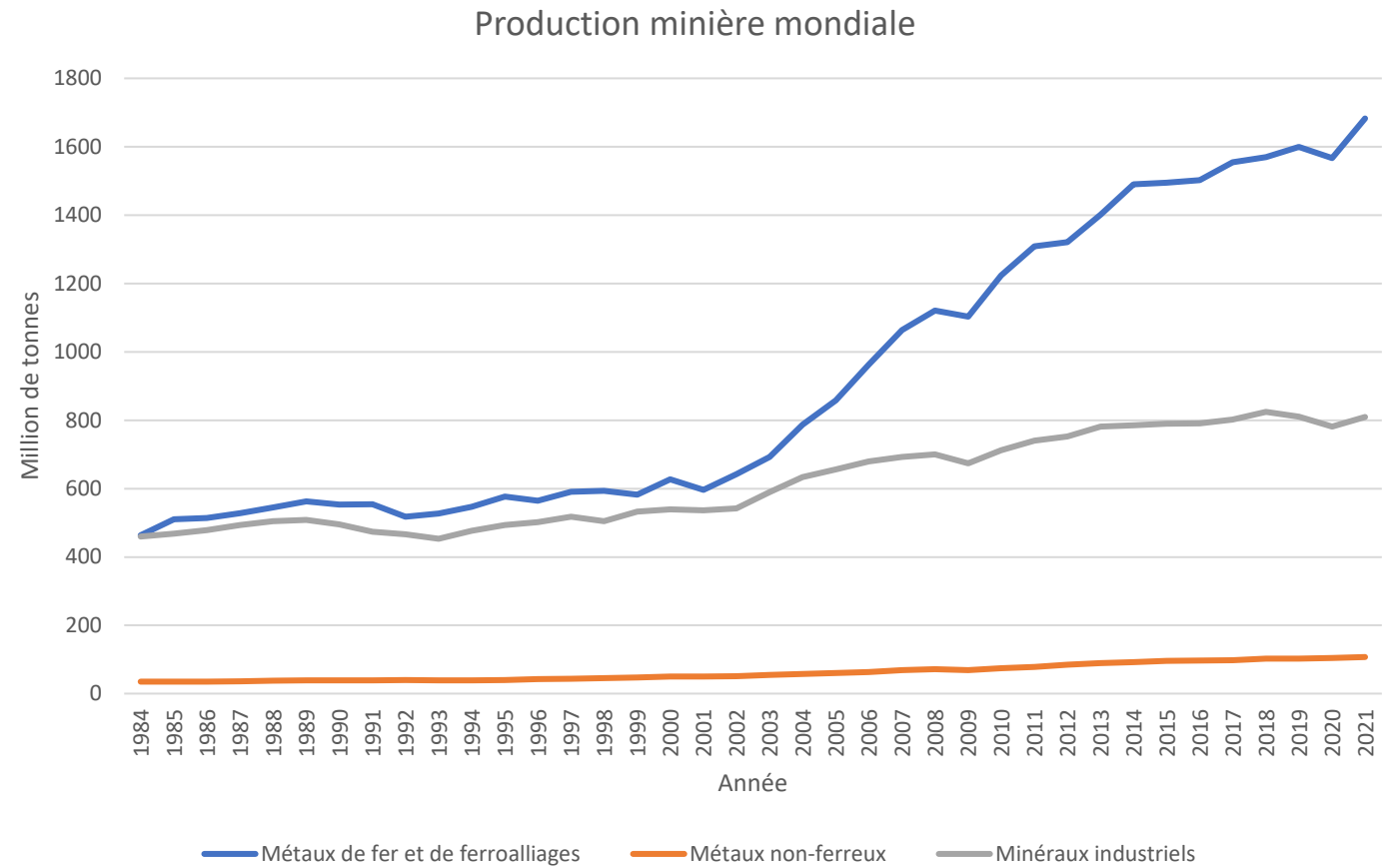
Source d'énergie	Térawatt heures	
	1970	2022
Biomasse traditionnel	9444	11 111
Charbon	17059	44 854
Pétrole	26520	52 970
Gaz naturel	9615	39 413
hydroélectricité	3473	11 300
Nucléaire	224	6 702
Biofuel moderne	14	1 199
Autres renouvelables	80	2 414
Solaire photovoltaïque	-	3 448
Eolienne	-	5 488
Total	66429	178 899

Production minière dans le monde



Source : World-mining-data

Production minière dans le monde



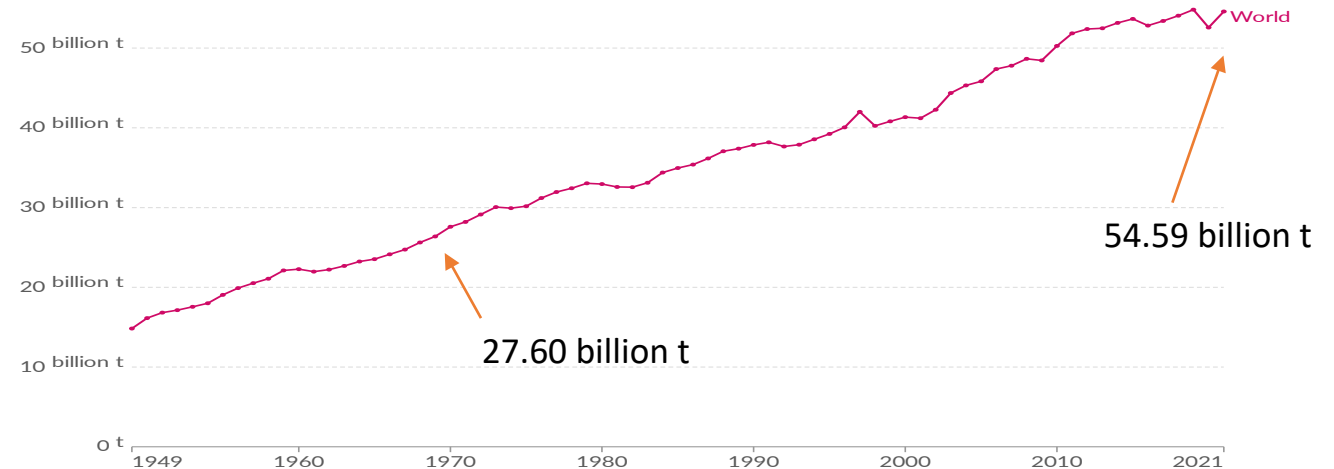
Source : World-mining-data

Emissions de GES dans le monde

Greenhouse gas emissions

Greenhouse gas emissions¹ include carbon dioxide, methane and nitrous oxide from all sources, including land-use change. They are measured in tonnes of carbon dioxide-equivalents² over a 100-year timescale.

Our World
in Data



Data source: Jones et al. (2023)

Note: Land-use change emissions can be negative.

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1. Greenhouse gas emissions: A greenhouse gas (GHG) is a gas that causes the atmosphere to warm by absorbing and emitting radiant energy. Greenhouse gases absorb radiation that is radiated by Earth, preventing this heat from escaping to space. Carbon dioxide (CO₂) is the most well-known greenhouse gas, but there are others including methane, nitrous oxide, and in fact, water vapor. Human-made emissions of greenhouse gases from fossil fuels, industry, and agriculture are the leading cause of global climate change. Greenhouse gas emissions measure the total amount of all greenhouse gases that are emitted. These are often quantified in carbon dioxide equivalents (CO₂eq) which take account of the amount of warming that each molecule of different gases creates.

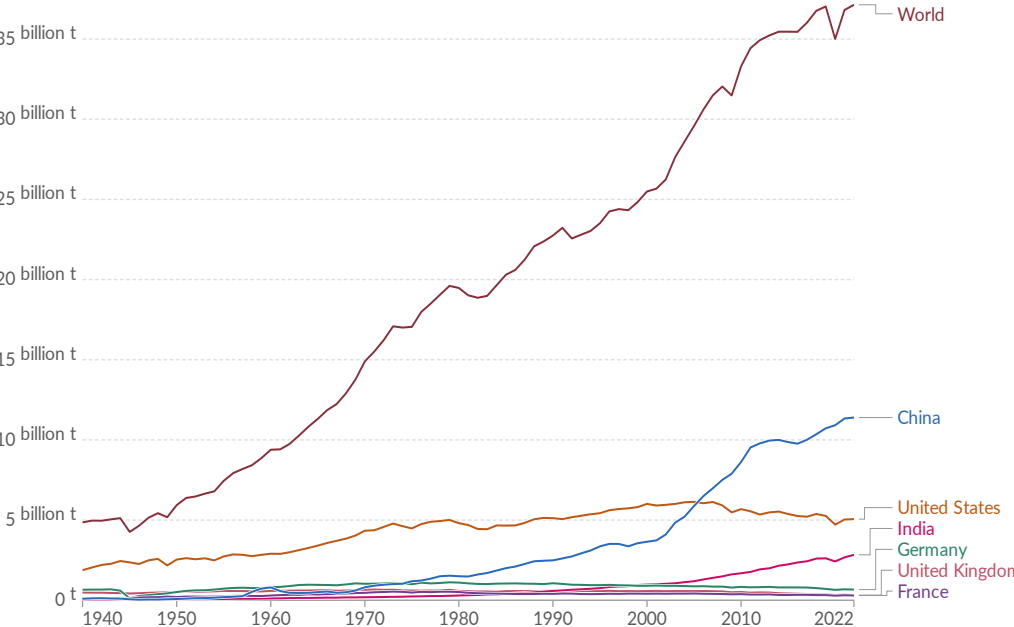
2. Carbon dioxide equivalents (CO₂eq): Carbon dioxide is the most important greenhouse gas, but not the only one. To capture all greenhouse gas emissions, researchers express them in "carbon dioxide equivalents" (CO₂eq). This takes all greenhouse gases into account, not just CO₂. To express all greenhouse gases in carbon dioxide equivalents (CO₂eq), each one is weighted by its global warming potential (GWP) value. GWP measures the amount of warming a gas creates compared to CO₂. CO₂ 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 CO₂. 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 CO₂eq over 100 years, we'd multiply each gas by its GWP over a 100-year timescale (GWP100). Total greenhouse gas emissions – measured in CO₂eq – are then calculated by summing each gas' CO₂eq value.

Emissions de CO2 dans le monde

Annual CO₂ emissions

Carbon dioxide (CO₂) emissions from fossil fuels and industry¹. Land-use change is not included.

Our World
in Data



Data source: Global Carbon Budget (2023)

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1. **Fossil emissions:** Fossil emissions measure the quantity of carbon dioxide (CO₂) emitted from the burning of fossil fuels, and directly from industrial processes such as cement and steel production. Fossil CO₂ includes emissions from coal, oil, gas, flaring, cement, steel, and other industrial processes. Fossil emissions do not include land use change, deforestation, soils, or vegetation.

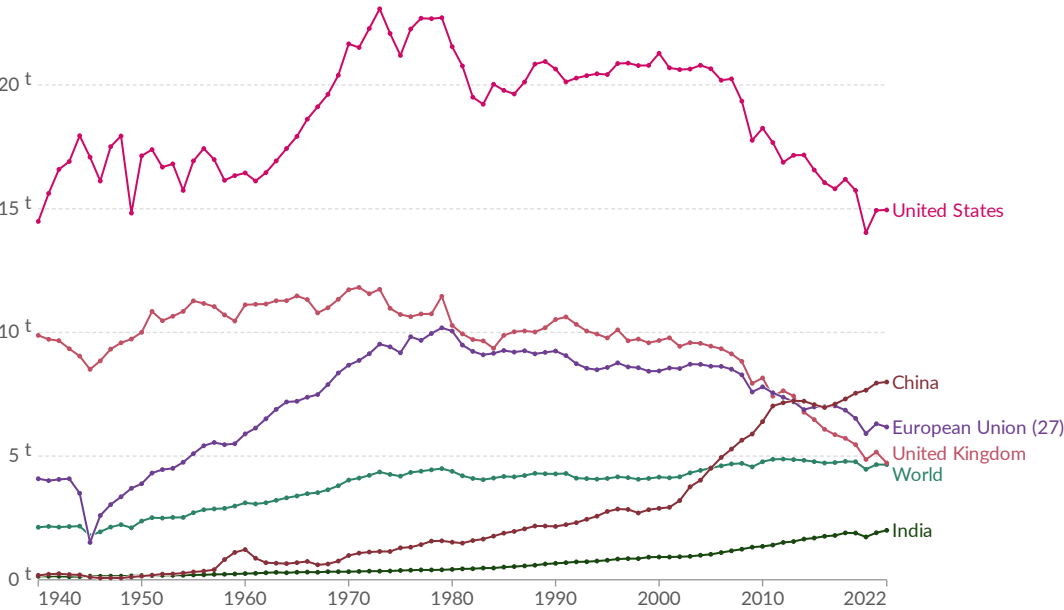
Pays	Million de tonnes	
	1970	2022
Le Royaume Uni	625,58	318,65
L'Allemagne	1 030	665,60
Les Etats-Unis	4 340	5 060
La France	460,42	297,53
La Chine	870,95	11 400
L'Inde	181,72	2 830
Le Monde	14 900	37 150

Emissions de CO2 par tête dans le monde

Per capita CO₂ emissions

Carbon dioxide (CO₂) emissions from fossil fuels and industry¹. Land-use change is not included.

Our World
in Data



Data source: Global Carbon Budget (2023); Population based on various sources (2023)
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1. Fossil emissions: Fossil emissions measure the quantity of carbon dioxide (CO₂) emitted from the burning of fossil fuels, and directly from industrial processes such as cement and steel production. Fossil CO₂ includes emissions from coal, oil, gas, flaring, cement, steel, and other industrial processes. Fossil emissions do not include land use change, deforestation, soils, or vegetation.

Pays	tonnes	
	1970	2022
Le Royaume Uni	11,7	4,7
Les Etats-Unis	21,7	14,9
L'union européenne (27)	8,7	6,2
La Chine	1	8
L'Inde	0,3	2
Le Monde	4	4,7

Conscience écologique

- Prise de conscience d'une ampleur sans précédent
- Littérature influente : "Limits to Growth" (Les limites à la croissance) - Club de Rome (1972)
- Mouvements environnementaux (Greenpeace, WWF, Friends of the earth,...)
- Alertes Scientifiques Majeures (Les rapports du GIEC, Protocole de Kyoto,...)

Conclusion

- Une croissance économique mondiale.
- Une augmentation des inégalités
- Une dégradation de l'environnement
- Une prise de conscience écologique accrue
- Cette prise de conscience sera-t-elle suffisante pour éliminer les effets négatifs sur l'environnement de notre modèle économique?