

From the suburbs of London to global conflagration: a brief history of emissions

By [Aurélien Saussay](#)

A [new interactive map](#) of global CO2 emissions from 1750 to 2010 is helpful in understanding the historical responsibilities of the world's different regions for the climate crisis.

The 21st Conference of Parties (COP 21) ended on 12 December 2015 with a historic agreement. As 195 countries come to an accord on the need to limit global warming to 2 degrees by the end of the century, it is a good time to review the history of CO2 emissions since the beginning of the Industrial Revolution. Right to the end of the negotiations, the question of the historical responsibility of the different countries has remained one of the main obstacles blocking the path to a global climate agreement. The recently industrialized emerging countries and the developing countries that are just beginning their economic take-off rightly refuse to provide efforts comparable to those of the developed countries.

This feeling is confirmed by a [new interactive map](#) retracing 260 years of CO2 emissions from fossil fuel combustion and cement production on the surface of the planet[1]. This map can be used interactively to explore the emissions of each country and their distribution in space over the last two centuries, both in their entirety and per capita. It can also be used to follow trends in global emissions and the gradual consumption of the total carbon budget for holding global warming to below 2 degrees.



By combining historical data on emissions per country issued by the [CDIAC](#) (from 1750-2010) with decadal data on population density produced by the European [HYDE](#) project (also 1750-2010), it is possible to estimate the distribution of emissions over space and time around the planet's surface – on a grid with a resolution of 5' of arc (5' being equal to 1/12th of a degree, i.e. about 10 km by 10 km at the equator).

This interactive map shows the contribution of each of the world's regions since the mid-18th century – while at the same time offering a gripping account of the gradual spread of the industrial revolution over the last two centuries.

These data illustrate several key points that help to understand the debate about differentiated historical responsibilities:

- Up to the mid-20th century, only Europe and the United States (and to a lesser extent Japan) contributed significantly to global emissions.
- It was only in the last 30 years that, led by China, the rest of the world “turned on”.
- Driven by rapid economic growth in the emerging countries, emissions have taken off in the last fifteen years.
- When weighted by distribution of the world population, emissions are highly concentrated spatially. This conclusion

is bolstered when using even finer data, notably the location of power stations and the most energy-consuming manufacturing plants (cement, aluminium, and paper, for example).

This brief history of CO₂ emissions across the globe reminds us of the West's special responsibility in the fight against global warming. The precocity of the Industrial Revolution in the West allowed the economy to take-off much earlier than in the rest of the world, but it also led to the emission of a disproportionate share of the total emissions budget that we are entitled to if we are not to exceed the target of two degrees of warming.

This differentiated historical responsibility, which was recognized by the Paris Agreement, requires Western countries to make a special effort in the fight against global warming. This responsibility must thus be reflected in a greater effort in terms of financial and technological transfers so as to ensure that the emergence of the developing countries minimizes the use of fossil fuels, without hindering their economic take-off.

[\[1\]](#) These emissions do not include emissions from changes in land use (LUCLUF) or fertilizer use. Unfortunately, it is very difficult to reconstruct these emissions for the period under consideration.

TOFLIT18: for a better understanding of the French economy

By Loïc Charles and [Guillaume Daudin](#)*

Recurrent questions on our economies are, to quote a few: Which factors and actors are key for economic development? What private and public behaviors are particularly growth-enhancing? How important are institutions and policies in shaping trade, in promoting innovations and then growth?...There are different ways of enhancing our knowledge to answer these questions. The first way consists in laboratory experiments where a small-scale environment is created in order to understand “how the different pieces of the system work and interact” This is particularly appropriate for learning on social preferences and dealing with welfare issues. But, as soon as questions related to growth – such those mentioned above – are concerned, laboratory experiments do not appear very suitable. One other way of enhancing our knowledge consists in analyzing what happens today in our country and, possibly, to carry out international comparisons in order to disentangle between what is “good” and what is “bad” for the economy. Once one is engaged in that direction, why stop at comparison across space? Analyzing what happened several decades or centuries ago and to learn from these past experiences for the current period can also be very fruitful.

The project “Transformations of the French Economy through the Lens of International Trade, 1716-1821” ([TOFLIT18](#)) follows this direction. The 4-year project, granted funding by [ANR](#), was launched on the 1st January 2014.

In few words, the project aims at analyzing the French economy during the period that laid the economic ground for the entry

of France and Europe in the modern industrial era. Its main tools are the retranscription, the use and the diffusion of French international trade statistics.

The French administrative trade statistics are the most comprehensive and coherent source of quantitative information available for the French economy at that time. These data were produced locally and aggregated at the national level by the Bureau de la Balance du Commerce from 1716 on ([Charles and Daudin ,2011](#)). Despite several administrative reshufflings, the techniques of gathering and presenting the statistics on French foreign trade went almost unchanged up to the 1820s: they provided the total value, and sometimes the unit values, of merchandise and partner-specific trade flows; we have already photographed an almost complete series of yearly statistics. These documents are unique as they provide quantitative information on several geographical levels. As such, they can be used to study the economic effects of international trade on the French economy as a whole, on the economy of a single region, of a port town as well as on the economic behaviors of individual agents, e.g. a merchant or a community of merchants from a single town/region. They can also be used to get a more accurate understanding of the interplay that existed between these different geographical levels.

The volume and dispersion of primary sources makes the process of collecting and putting them into a usable form both time-consuming and costly. Our [team](#) includes therefore social scientists with consolidated experience in the construction and management of large databases (notably [MARPROF](#), [NAVIGOCORPUS](#), [RICardo](#) and [SoundToll Registers Online](#)). They will bring their expertise to cross-test our dataset with other types of information on trade (shipping and merchants accounts). The collaboration of researchers who are currently working on similar set of foreign trade statistics for important economic partners of France at that period— Great-

Britain and the Austrian Netherlands – will allow both crosschecking and building comparative studies.

The result database will include the bilateral value (with 20-30 different partners) of trade flows at the national level from 1716 to 1821, a merchandise (600-1000 different goods) and partner breakdown from at least 1750 onward, unit values and quantities from 1771 to 1792 and regional trade data. The project will transfer this database in the public domain and make it easily useable by the research community. The collected data can partly substitute for the lack of domestic macroeconomic series.

We will use the data to improve our knowledge of the French economy and our understanding of the economic mechanisms at work, both at the national and regional level. Two main avenues of research will be privileged. First, we will investigate the evolution of French specialization, both across French regions and in comparison to other countries. How was it linked to the contrasted economic development of France and Britain? What does it tell us on the determinants of international trade? Second, we will study the effects of policy choices on the French economy: France went through several wars and politic upheavals. It also went through stark changes in its commercial policies: from mercantilism to mitigated free trade in the 1760s with its colonial empire, to a number of free-trade treaties in the 1780s, followed by the closing up of the economy under the Empire. What were the effects of these policy choices?

All these questions resonate particularly to our contemporary ears. More importantly, the answer to these questions can provide a renewed glance on the functioning of the (French) economy, both then and now.

For more details, please contact [Guillaume Daudin](#)

—

**Guillaume Daudin est chercheur associé à l'OFCE.*