France: Balancing the G20’s Global Impact

Barney Foran¹,²
Manfred Lenzen²
Daniel Moran²,³
Ali Alsamawi²
Arne Geschke²
Keiichiro Kanemoto⁴

1. Institute of Land Water and Society, Charles Sturt University, Albury, Australia
2. ISA, School of Physics, University of Sydney, Australia
3. Norwegian University of Science and Technology, Trondheim, Norway
4. Institute of Decision Science for a Sustainable Society, Kyushu University, Fukuoka, Japan
Consumption emissions are rising: The consumption accounting used in this study shows that France’s greenhouse emissions grew from 1990 due to imports from global value chains. Thus consumption emissions are now 65% above the territorial or domestic account used in global agreements. One half of France’s emissions are imported (China, Germany, Russia, USA, India), and more than two thirds of animal species impacts, scarce water use and material use are imported. The European food and resource constraints that sparked colonial eras exist physically today with high external dependence and outsourcing of impacts.

Food reliant on external countries: The largest threat to animal species is biological harvesting (grazing, forestry) with agriculture, pollution and climate change also important. Threat numbers are dominated by imports from Madagascar, Russia and China. Imports of construction material (China, Algeria, Spain) are the largest part of material usage followed by biomass imports (India, Brazil, China) and fossil fuels (Russia, Algeria, Saudi Arabia). Crop imports dominate both the scarce water and land footprint indicators. Vegetables and fruit (Morocco and Spain), processed foods and spices (India) and rice and cotton textiles (Pakistan) dominate the scarce water account. Cotton, sugar cane and rice imports come from seasonally water stressed river basins in mostly poor countries.

High GDP and environmental impact: On a per capita consumption basis, France’s environmental impacts rank highly for land footprint and scarce water use and mid-level for emissions (helped by nuclear electricity), animal species impact and material usage. Economic productivity is 50% greater than the G20 average while the jobs requirement, at two thirds of a worker per capita, ranks seventh. The lower than average Gini coefficient shows good equity outcomes for government policies and an improvement on Gini values of 0.34 in 1984. Outside of official statistics however, the parallel or ‘petit business’ economy thrives in the housing estates and rural regions where the mainstream economy is less buoyant. The informal economy is one tenth of total. In absolute terms, environmental impacts are mid ranking (8-13) possibly reflecting France’s expertise in tourism, food and high value engineering giving a lower physical intensity per unit of output.

Part of France’s unemployment problem results from 49% of the workforce (21 million: see pie diagram) externally located in other countries which have lower wages, comparative production advantages (tropical commodities) or higher skills. Balancing the need for low consumer prices with unemployment, social unrest and growing government debt will require radical alterations in how this mature economy is structured, grows and develops.

Sparse domestic oil and gas reserves: France’s population of 66 million will grow to 73 m by 2050 and on to 80 m by 2100 while the median age grows from today’s 41 years to over 43 in 2050. A working age population of 40 million is maintained throughout this period in spite of ageing. These projections are based on birth rates at near replacement (higher than most European neighbours) and a net migration rate of 500,000 annually (currently around 300,000). Employment prospects, particularly for youth, cause social unrest currently, so these population drivers may alter.

Overall and youth unemployment are 10.4% and 22% respectively. French governments maintain social equity through laws, tax policies and social spending, driving government debt expansion to three quarters of GDP. With 79 million tourists annually, France is the world’s most visited country.

Historically, France’s low stocks of oil, gas and coal have given a high dependence on imports and led to investment in nuclear electricity. Untapped shale gas could supply nine years of current consumption. France has 58 nuclear reactors with one currently under construction. Total electricity capacity is 119,100 MW with half nuclear, fossil and hydro one fifth each. Nuclear generates three quarters of requirements and some of Europe’s lowest electricity prices. Capacity of wind (8,254 MW) and solar (4,300 MW) is growing, but hydro (25,400 MW) is stable.
Job re-shoring is slow and difficult: Production realities dictate that external jobs in Tanzania (fish, cocoa, tobacco, gems), Madagascar (crustaceans, vanilla, essential oils) and Indonesia (rubber, tin, palm oil, coffee) cannot be drawn back to mainland France. However, countries such as China (electronics, textiles, metals) and India (textiles, footwear, cars, electronics) now have industries once typically European that have lost advantage due to high wages, restrictive work practices and outmoded production chains. Industries are slowly returning to France seeking the ‘Origine Garantie France’ label to attract domestic consumer’s loyalty and assure worker equity standards. These include car, sports good, toy and optical manufacturers experiencing quality issues in external countries. Wage and work concessions by domestic workers underpin this re-shoring trend. However, globalisation trends are difficult to resist when mergers and economic concentration take jobs from regions where there are few alternative industries. Moderating these forces by shortening the working week for example, saw firms shed higher cost labour with little overall advantage for this policy change.

Climate change will constrain domestic and external suppliers: Water supplies in northern France will reduce and the Mediterranean zone, with more heat, population and development, will need to reallocate agricultural water to urban and industrial use. The high reliance on imports from external river basins will increase and possibly relocate as those commodities become more affected by climate change. For global equity reasons, French emissions policy will need to accept consumption accounting since imports are now one half of French emissions.

Most domestic emissions categories are stable or declining but energy supply and use (45%) and transport (25%) are large components that cannot easily be substituted or undergo a reduction step change. Electrification of some transport and home/industrial heating is possible but unlikely, given that employment and social issues will drive political agendas. Nuclear electricity and expanding wind and solar infrastructure give a low carbon foundation for the economy which most greenhouse policy makers would envy.

Biodiversity impacts increasing: France’s domestic list of threatened species has increased since the analysis used here, with the biodiversity hotspot in the Mediterranean region being of particular concern. Tropical countries such as Madagascar and Tanzania also carry the French biodiversity footprint through their exports, and will require that French consumers become part of the solution.

Out of sight and out of mind: The former spoils of colonial commerce now challenge France as it reaps the advantages of outsourced global value chains while its youth searches for new employment opportunities. Compared to most G20 countries, France’s individuality might bring a new approach to this quandary. Choosing a materially simpler life that still bears the French stamp, while some production chains are re-shored and old jobs recaptured, allows time for new designs for this mature economy to be crystallised.
Rationale for Indicators

Greenhouse Emissions (CO2-e): The emissions footprint for each person’s consumption leading to heat gain in the atmosphere and oceans and thus increasing climate disruption (due to accounting uncertainties, the indicator excludes land use, land use change and biomass burning). Measure: Tonnes of CO2 equivalents per capita excluding land use change, forestry and biomass burning. Year 2011, Source- Eora Global Database http://worldmrio.com/

Material Footprint (Material usage): The material use footprint. Increasing material use by developed and developing economies poses long term threats to sustainability at both ends. Limits to resource quality of virgin materials and a faster consumption lifecycle suggest issues for disposal and recycling. Measure: Total material flow in tonnes per capita. Year 2008, Source- Eora Global Database http://worldmrio.com/

Endangered Animal Species (Species threats): Land clearing and over-fishing are two of 15 or more drivers of accelerated rates of biodiversity endangerment. This species threat footprint traces endangered animal species from the IUCNs ‘Red List’ to complex trade networks of threatening production activities. Measure: number of endangered animal species (species threats) per one million of human population. Year 2000, Source- Eora Global Database http://worldmrio.com/

Scarce Water Use: The scarce water use footprint. Over- extraction increases threats to human water security and river biodiversity in 30 of the globe’s 47 most volumetric river basins. This scarce water is eventually consumed as clothes, food and beverages. Measure: litres of scarcity-weighted water use per capita. Year 2011, Source-Eora Global Database http://worldmrio.com/

Inequality (Gini coefficient): The footprint or production chain measure of the distribution of, or spread of wages within a country, across the population. A smaller rich elite and a large working poor gives a higher Gini coefficient while a more equal country has a lower value (e.g. South Africa 0.59, USA 0.38, Japan 0.29). Measure: Time series of Gini footprints computed as part of Eora employment studies. Data not yet available as part of Eora Database. Year 2011

Employment Footprint (Jobs): A social indicator measuring the domestic and outside workforce required to maintain domestic consumption and lifestyle. A cascade of lower paid workers delivers goods and services through complex production chains to more affluent consumers. Measure: Full time equivalent workers (domestically and out-of-country) per capita of domestic population. Year 2011 Source- Eora Global Database http://worldmrio.com/


Gross Domestic Product (GDP): A conventional and widely accepted economic measure of development and progress in each country. This is not a footprint or production chain measure. Measure: GDP per capita in deflated 2005 US dollars from United Nations data depository Year 2012 Source- GDP by Type of Expenditure at constant (2005) prices: http://data.un.org

Key References


