

## INTERVIEW

### LOW-CARBON TRANSITION AGENDA: AVOIDING SOCIAL QUICKSAND



**Patrick Artus**

Chief Economist and Executive  
Committee Member (Natixis)

**Patrick Artus** is a graduate of Ecole Polytechnique, of ENSAE and of IEP Paris. He is the Chief economist and member of the executive committee of NATIXIS. He began his career in 1975 in economic forecasting and modelling at the French Ministry of Finance. He worked at the Economics Department of the OECD (1980), at Banque de France (1985) and served as the Head of Research at ENSAE. Throughout his career, Patrick has been a visiting professor at a number of Universities including, Dauphine, ENSAE, Ecole Nationale des Ponts et Chaussées, HEC Lausanne, Ecole Polytechnique. He is now Professor of Economics at the Paris School of Economics. Patrick ARTUS is also a member of the Board at Total and Ipsos as an independent director. He has been a member of council of Economic Advisors to the French government.

**Q1. In a recent paper\*, you argued that market-based instruments such as carbon taxes are less effective in achieving emissions reduction compared to non-market measures owing to the relative price inelasticity of fossil energy consumption. What regulatory measures do you think are more relevant in Europe?**

It is true that the estimated elasticity of fossil energy consumption to its price is very low: -0.09; it means that an 11% increase in the price of fossil energy is required to reduce its consumption by 1%. Therefore, a price-based mechanism (like a CO2 tax) would be very inefficient to reduce sufficiently the use of fossil energy (remember that, to respect the Paris Agreement, a 4% a year reduction in CO2 emissions is required whereas CO2 emissions worldwide have increased by 1% in 2019).

The consequence is obviously that regulations will have to be the main instrument used to reduce CO2 emissions. The sectors involved will be primarily transportation, industry, and housing (rules for CO2 emissions for cars and trucks, construction regulations). The main issue is that regulating implies an inefficiency: every regulation corresponds to an implicit price of CO2 which differs from one regulation to the other, hence an inefficient allocation of the effort aiming at reducing CO2 emissions: an optimal framework would imply the same CO2 price implicit to all regulations.

\*Natixis Flash Economics (Dec. 12, 2019), Climate targets and fossil energy prices.

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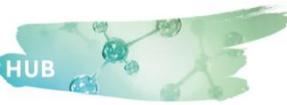
**Q2. Some sectors are already impacted by energy transition policies, for instance job losses in the car-industry as a result of the advent of electric vehicles and the dominance of Asia in battery manufacturing. Could this be of a significant magnitude ?**

The electric battery, even though it becomes more efficient and less costly, represents between 30 and 40% of the value of an electric car. Car making is a very competitive industry and it so likely that the batteries built in Asia, which will stay cheaper than those built in Europe, will keep a dominant market share, except for the luxury car segment. A rapid calculation shows that, if the EU loses a third of the value added of car making, 700 000 jobs might be lost. Of course, new jobs will be created, in the renovation of housing, in the installation and maintenance of renewable energy equipment, but they are very different jobs, in terms of skills and wage levels, and the adjustments to these new jobs might be very difficult and costly. Moreover, car making is concentrated in few territories, where the impact on labor market will be huge.

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**Q3. We have seen protests in Lebanon, Iran, Ecuador or Haiti caused by attempts to phase out fossil fuel subsidies or yellow vest movement in France. What measures are necessary to mitigate the negative consequences of the energy transition on workers and low-income households ?**

As it has been said above, a CO2 tax is necessary but can only provide a second-order solution to the problem of excessive CO2 emissions, the first-order solution being regulation. To mitigate the social effects of a CO2 tax, the most efficient solution is to redistribute explicitly the proceeds of the tax to the population, specially to the low-income people, but in a way which is completely decorrelated from their energy consumption. Subsidizing fossil energy consumption has obviously to be completely stopped.

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If the EU introduces a decent (40€ per ton going to 100€ per ton?) CO2 tax, necessarily a border carbon tax (tariff) has to be introduced. To be manageable, it has to be simple, based on the path of CO2 emissions of the countries, not on the analysis of the carbon content of every imported product.

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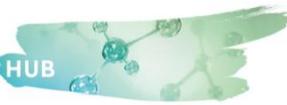
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**Q4. Apart from regulation, customers' habits and demands, especially from the youth, are expected to spark a more radical transition towards a low-carbon economy. What impact can we anticipate from youth-driven movements such as “flying shame” in Sweden (“flygskam,” in Swedish)?**

The opinions should be reminded that energy transition is a slow process, and that carbon neutrality has to be achieved in 2050, not in 2030. This implied a 4% a year decrease at first in World CO2 emissions, and, initially, substituting natural gas to coal to produce electricity, not stopping all forms of fossil energy consumption. I am worried that the pressure to go too fast would push to bad decisions: using technologies that would prove afterwards not to be the right ones (for instance lithium-ion batteries vs hydrogen), disrupting a number of industries (car making, airlines, tourism...) before they can adjust their technologies.

The same applies to the capital markets, if the demand for the debt and the equity of the “brown” companies diminishes rapidly, the market value of these companies will collapse, hence a financial crisis and the shrinking of their investments. The right thing to do is to keep the pace of the 2°C scenario, and to finance the transition of these companies.



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**Q5. Lastly, the International Energy Agency’s 2°C scenarios largely rely on the assumption of large scale deployment of carbon sinks (negative emissions), especially carbon capture technologies. Another bet from the IEA is made on reining in energy demand (energy efficiency gains). But economic growth has never really been decoupled from GHG emissions and at the same time, energy efficiency gains are often followed by an increase in total consumption (the so-called rebound effect). How do you assess the credibility of these assumptions?**

It is true that the 2°C scenario of the International Energy Agency is based on “heroic” assumptions concerning the elasticity of energy demand to GDP. It assumes that new energy saving techniques make it possible to have a stable world energy consumption, between 2020 and 2040, with a 3% potential GDP growth.

In the past the elasticity of energy consumption to GDP, at the world level, is 0.54: a 3% long term GDP growth would lead to a 1.6% a year increase in energy consumption.

If we keep the elasticity of the past, of course the necessary increase in the share of renewable energies becomes much larger.

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