

Managing France's energy transition while safeguarding economic competitiveness: be productive!

France has begun a national debate about “energy transition”, as it seeks to reduce its dependence on nuclear power, reduce consumption of energy and fossil fuels and de-carbonise its economy. The combination of these goals will require higher costs of energy and carbon for the French economy. This has led to fears that the energy transition could pose a threat to the competitiveness of French companies competing in international markets and to the continued growth of the French economy. This Brief tries to put these concerns into context, by presenting key facts necessary for understanding the issues. It concludes that a transition to significantly higher electricity and energy prices would be manageable for the French economy as a whole, if it is done gradually and predictably. However, a small group of sectors – representing around 5% of GDP – would face significant pressure on margins and may require industry-specific transitional measures.

Background

One transition, many ambitions

The French “Energy Transition” refers to the new French government’s inter-related objectives of a) reducing the country’s dependence on nuclear power to 50% of electricity production b) reducing consumption of energy, particularly fossil fuels, and c) progressing towards the de-carbonisation of the economy. As of March, a formal national debate has begun that will obtain feedback and inputs from representatives of inter alia the public, industry, NGOs, and experts. It is scheduled to deliver its conclusions and recommendations in July in support of a legislative package to be prepared by the Government that will be presented to the Parliament in autumn 2013.

The issues raised by this debate are wide-ranging. They relate to future electricity prices, industrial competitiveness, technological and infrastructure challenges, how best to tackle energy poverty, etc. They also involve trade-offs. Will the nuclear phase-out make it more expensive to achieve ambitious de-carbonisation goals? To what extent does less use of fossil fuels and more renewable energy increase electricity prices for consumers and industry? This brief focuses on just one of these issues: the relationship between the energy transition and French economic “competitiveness”.

What is “competitiveness”?

A Nobel-prize-winning trade economist once famously described competitiveness as “a dangerous obsession” of policy-makers (Krugman, 1993). Indeed, competitiveness in an economic sense is an often misunderstood concept. Strictly speaking economic competitiveness is at its most precise when used in a microeconomic sense to refer to a firm’s ability to maintain or enlarge its share of a specific market relative to other firms who

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are trying to do the same – Apple versus Samsung, for example. Sometimes the meaning is stretched slightly by macroeconomists to refer to a country’s capacity to gain or maintain a share of the international “market” for tradable goods. For example, “the low value of the Renmimbi makes Chinese exports more competitive compared to equivalent US goods”.

However “competitiveness” is sometimes also applied to economies as a whole to mean something completely different. Sometimes the term is sometimes used to refer to the attractiveness of a country as a destination for foreign investment: “Ireland’s low corporate tax rates make it a competitive destination for multinational companies to invest”. It is also sometimes used as another way of saying a country’s “productivity” (i.e. how efficiently inputs are turned into outputs). It is therefore important to be precise about what “competitiveness” means in any given context in order to evaluate the true costs and benefits of the energy transition for French competitiveness.

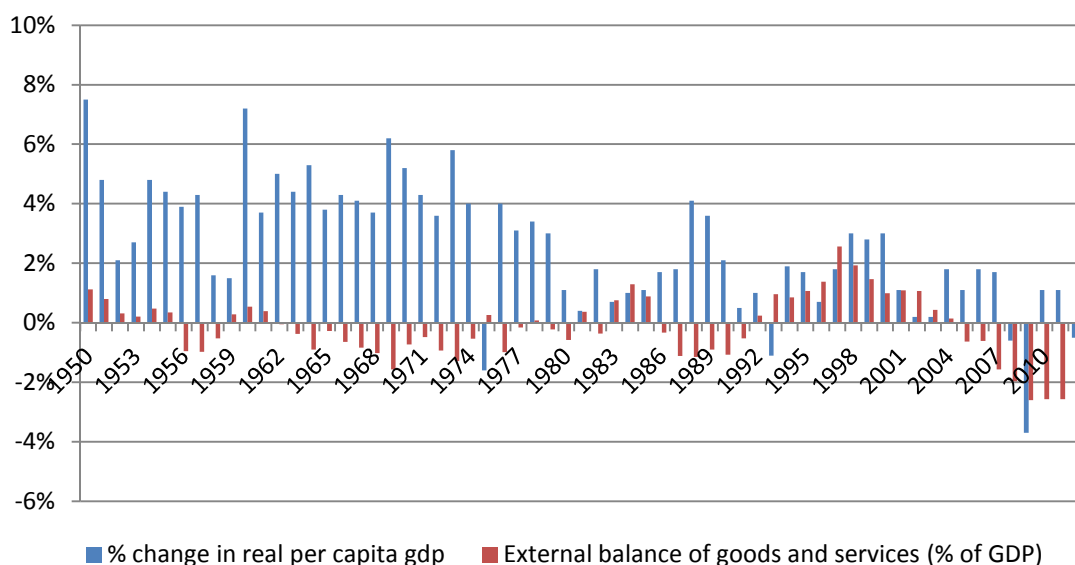
Competitiveness and energy in the French economy: key facts and figures

Fact #1: Economic prosperity does not equal the trade balance

A common mistake made when talking about economic competitiveness is to assume that countries are in constant head-to-head economic competition with each other for wealth creation because trade is a zero-sum game with winners and losers. While this may be true for businesses, who if they are not competitive risk going out of business, it is generally a poor fit for economies as a whole.

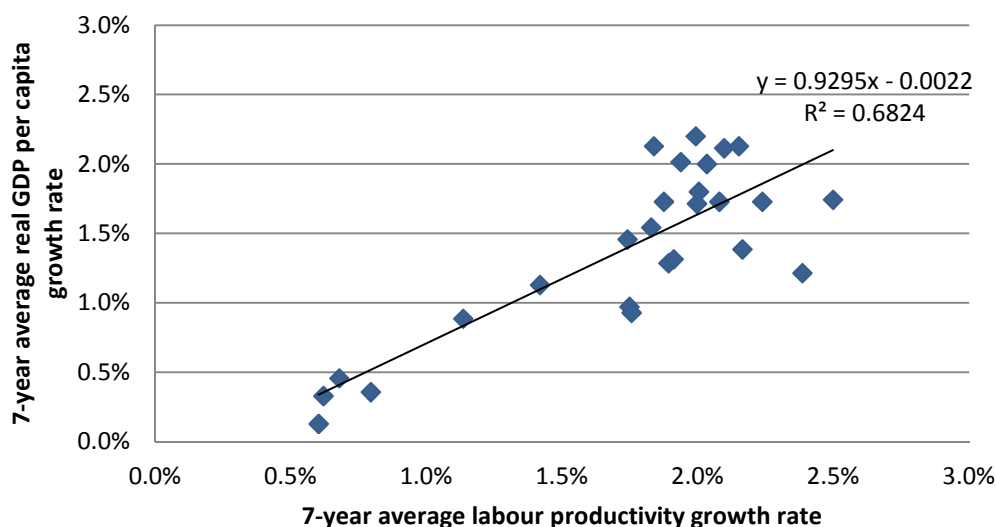
First of all, trade is not a zero-sum game. Economists since David Ricardo (1817) have understood that by allowing countries with different comparative advantages to specialize in producing different goods, trade can actually increase the wealth of both trading partners simultaneously. Secondly, while some countries, like China or Germany, are famous for having economic growth driven by a large export sector, many countries have shown impressive growth over long periods without this. For example, since 1950 France has fluctuated between small external deficits and surpluses, while GDP has consistently grown, virtually irrespective of the trade balance (cf. Figure 1). This has been achieved largely by having steadily increasing productivity growth in the domestic economy over time (cf. Figure 2).

Figure 1. Real French per capita GDP growth and external balance of goods and services (1950-2012)



Source: Eurostat, Authors

Figure 2. Real French per capita GDP growth vs. Labour productivity growth (previous 7-year rolling averages, 1987 to 2012)



Source: Eurostat, Authors

It is true that globalization has increased the importance of exports and imports as a share of the economy in France and there is some evidence that increased trade and offshoring affect different kinds of workers in different ways (cf. Ebenstein et al., 2009). However, productivity improvements have nevertheless remained the single most important long-term driver of per capita GDP growth, even during the past two decades of rapid globalisation and increased trade flows.

Therefore the competitiveness of French firms competing in global markets, while very relevant to workers and capital owners in those specific sectors, is nevertheless *not* the holy grail of French macroeconomic success that it is sometimes assumed to be.

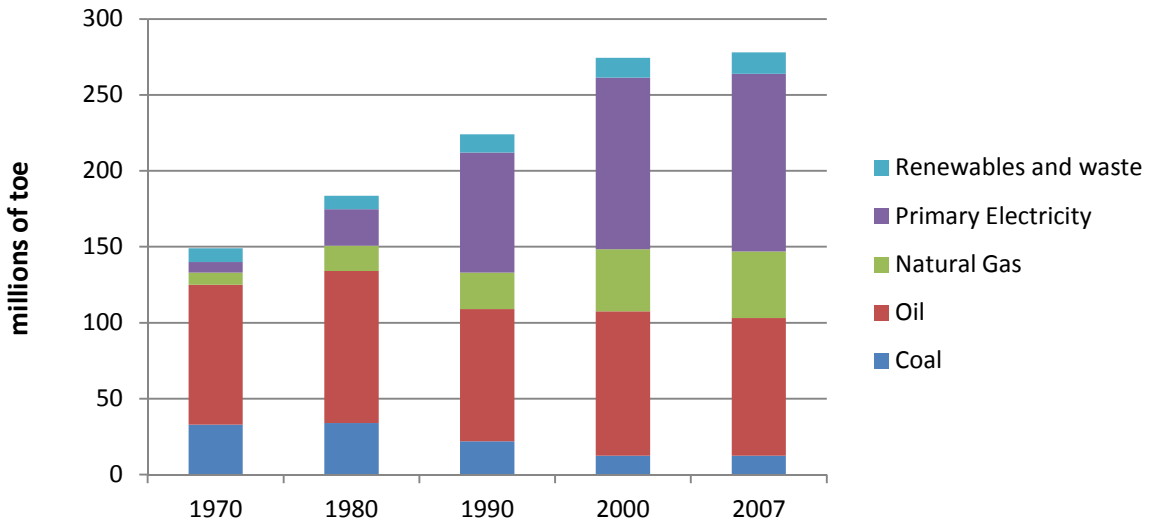
Fact #2: Sudden and large energy price shocks can be costly.

If productivity is more important for long-run economic growth for France than competing aggressively in international markets, what are the potential impacts of the energy transition on French *productivity*? There are several different channels through which the energy transition could theoretically increase or decrease French productivity growth. But the most obvious and arguably the most significant channel would be through increases in energy input costs into activities throughout the economy. A key question is thus: to what extent does the French economy depend upon cheap energy and electricity prices for its productivity and how vulnerable is it to price increases?

One way to approach this question is to look at what happened in the past. For example, in the 70s and 80s, energy prices in France were strongly linked to world oil prices. Consequently, when the world oil shocks of 1973 and 1979 occurred, they massively increased energy costs throughout the entire French economy. For France, as elsewhere in the OECD, this led to higher production costs, reduced productivity and lower or negative growth in the short run (cf Figure 4). The most influential empirical estimates of rises in oil prices of large OECD countries since the 1970s find that a 10% increase in prices has historically been associated with a negative effect on GDP of around -0.4 to -0.9 % in the following year or two (Hoffman, 2012)¹, with the effect reducing over time as economies adjust to higher prices.

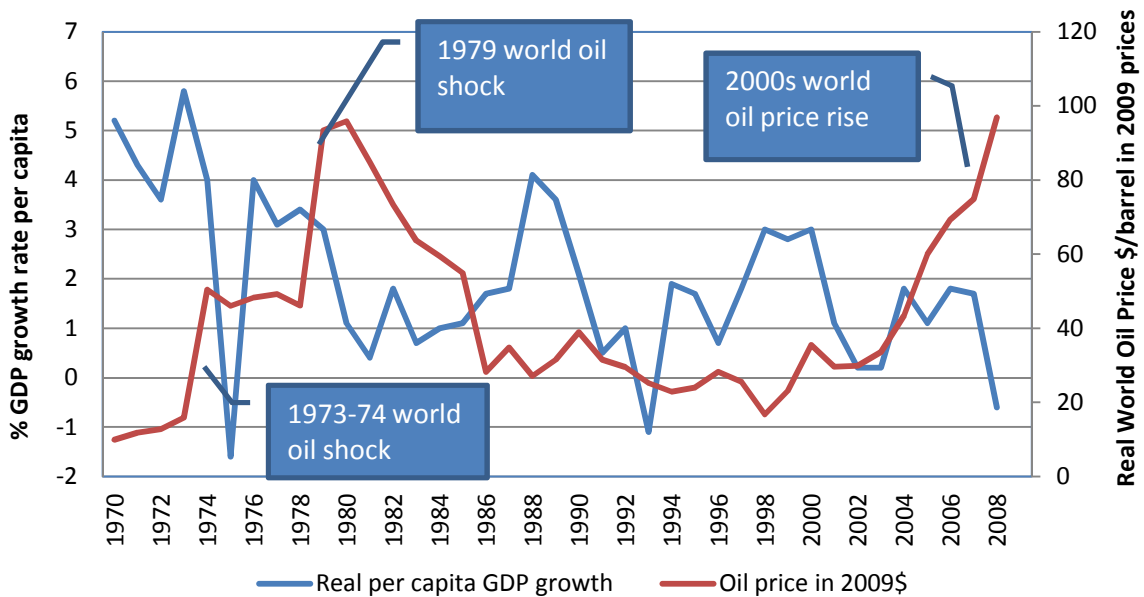
¹ Other factors such as macro-economic policy responses and previous experience of similar prices have been shown to reduce or exacerbate this effect (Hamilton, 2003; Bernanke et al, 1997).

Figure 3. French energy consumption by source (1970-2007)



Source: Authors, based on data from Lahlou (2010)

Figure 4. French per capita GDP growth and world oil prices 1970-2008



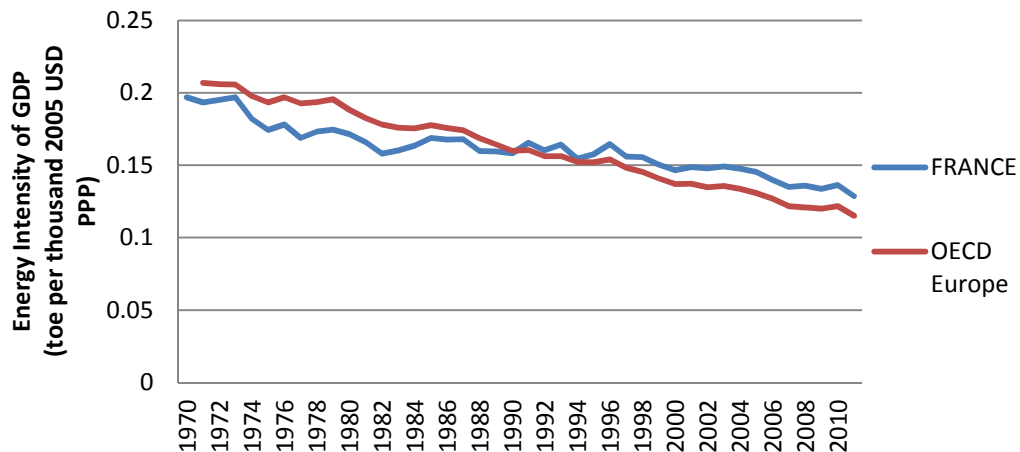
Source: Eurostat, www.ChartsBin.com (Illinois Crude oil price), viewed 23rd April, 2013, Authors

Fact#3: Cheap energy is less important to French productivity than it once was...

But is the same still likely to be true today? The evidence suggests that the French economy is now less vulnerable to energy price rises than it once was. France has significantly reduced its energy intensity of GDP – by approximately one third – compared to the period of the oil shocks of the early and late 1970s, when energy prices of ~250% (1973-74) and ~100% (1978-79) caused recessions (Figure 5). The share of total energy costs in final consumption expenditure has fallen from 11.4% to 5.7% between 1972 and 2008 (Figure 6), while the share of energy input costs in production has fallen from 10.1 to 6.5%. This development reflects changes in the composition of the French economy over the past 30 years, from greater production and consumption of manufactures, which tend to be more

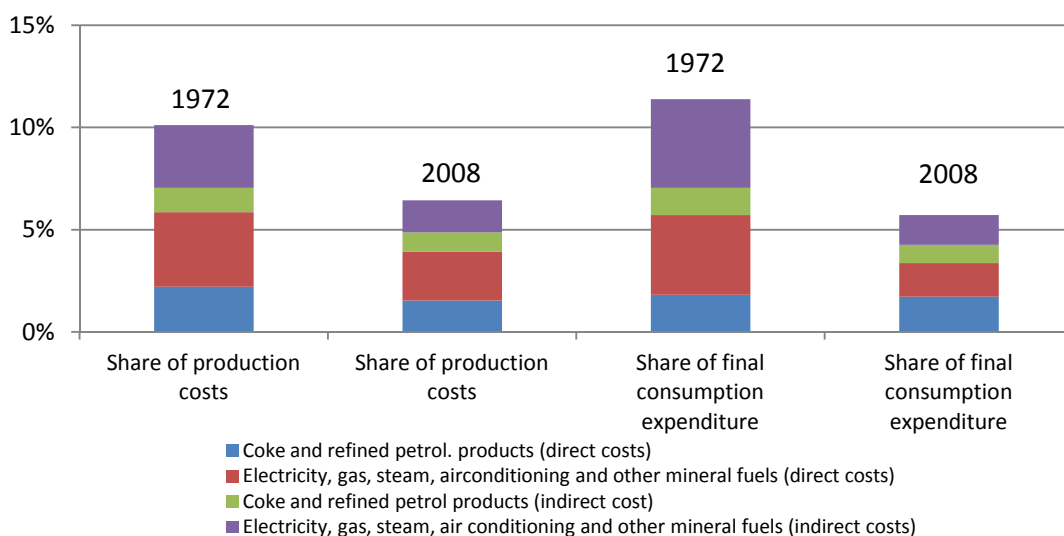
energy-intensive, to services² and higher value added products, as well as improving energy efficiency (ODYSSEE-MURE Database, 2013). There is therefore a strong case for arguing that the French economy is now less vulnerable to higher energy prices than it was when it was hit by the oil shocks of the 1970s.

Figure 5. The improving energy-intensity of developed economies



Data: IEA Online Data Services

Figure 6. Direct and indirect energy costs as a share of inputs into production in the French economy.

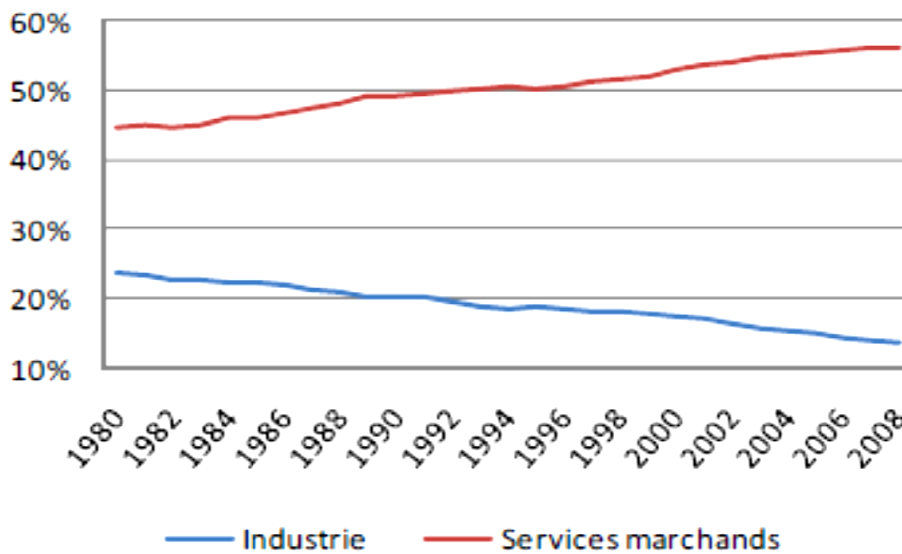


Data: Eurostat, INSEE, Authors’ calculations

Direct costs refer to direct energy inputs into production or consumptions. *Indirect costs* refer to embedded energy costs within intermediate or final products used for production or consumption (e.g. the oil content of plastics).

² It is true that the manufacturing output figures are reduced also by the outsourcing of complementary services to manufacturing activities which were previously provided “in-house”. But this cannot explain more than about 1/3 of the total decline in importance of manufacturing and the rise of the importance of services (cf. DG Trésor, 2010) .

Figure 7. The growth of services in France



Source: DG Trésor (2010)

Note: Does not account for outsourcing of manufacturing services. However, DG Trésor (2010) estimates this factor as unlikely to explain more than 1/3 of the observed decline in manufacturing.

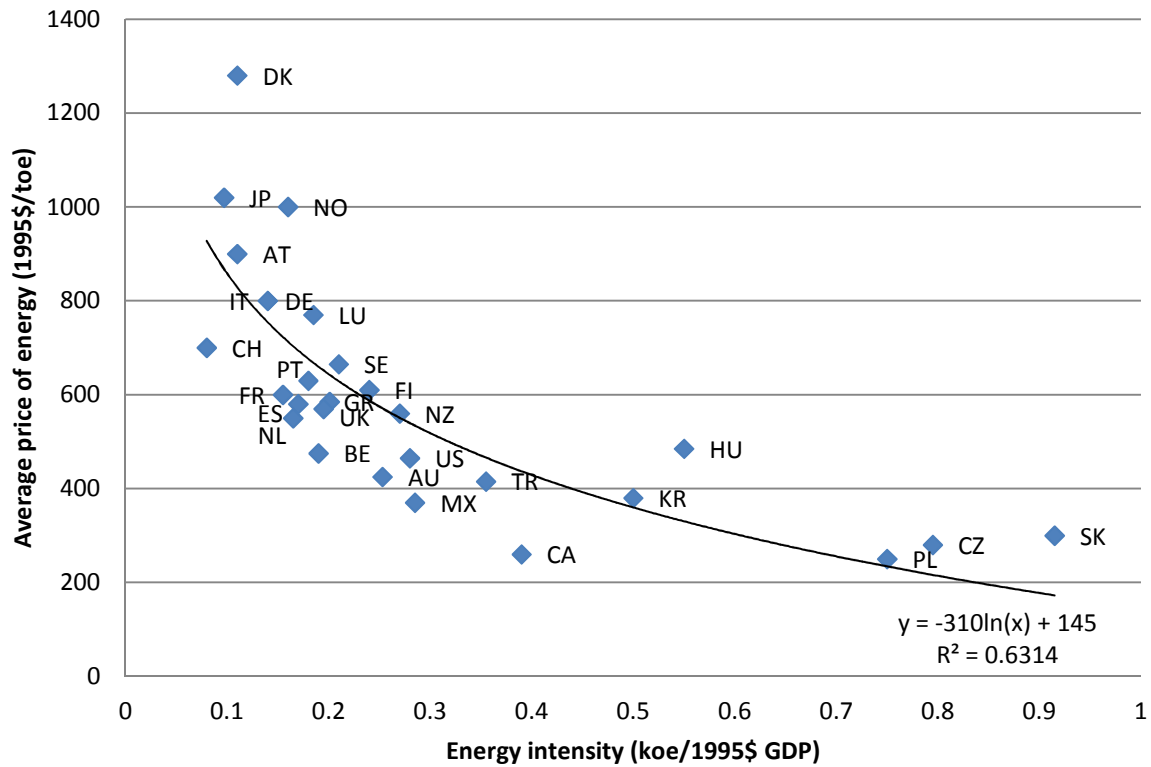
Fact #4: Gradual energy price rises are more manageable than sudden shocks

While energy costs are now a less important share of economic expenditure than they were during the 1970s energy-price shocks, they still represent a significant share of costs for both business (6.5%) and consumers (5.7%). There is therefore good reason to believe that similarly large and sudden energy price rises to the 1970s would have negative, although smaller effects on productivity, purchasing power and GDP in the short-term. However, the time horizon over which such energy prices occur matters a great deal. There are in fact good reasons to believe that if French energy prices were to rise by similarly large amounts, but over a longer time horizon than the sudden, unexpected shocks of the 1970s, then the effects on economic productivity, purchasing power and growth would be much smaller.

In the longer term, economic actors have greater flexibility to adapt their investment and consumption choices to changed relative prices of different goods and thus to reduce energy consumption; and prices have time to adjust to reflect higher anticipated energy costs and thus help to restore full employment and the associated level of productivity. Figure 8 gives an example of one of the ways in which developed economies can adjust to higher energy costs. It shows the strong negative relationship between average energy prices and energy use per unit of GDP. It can be seen that economies with higher energy prices tend to become more energy efficient at producing their GDP.

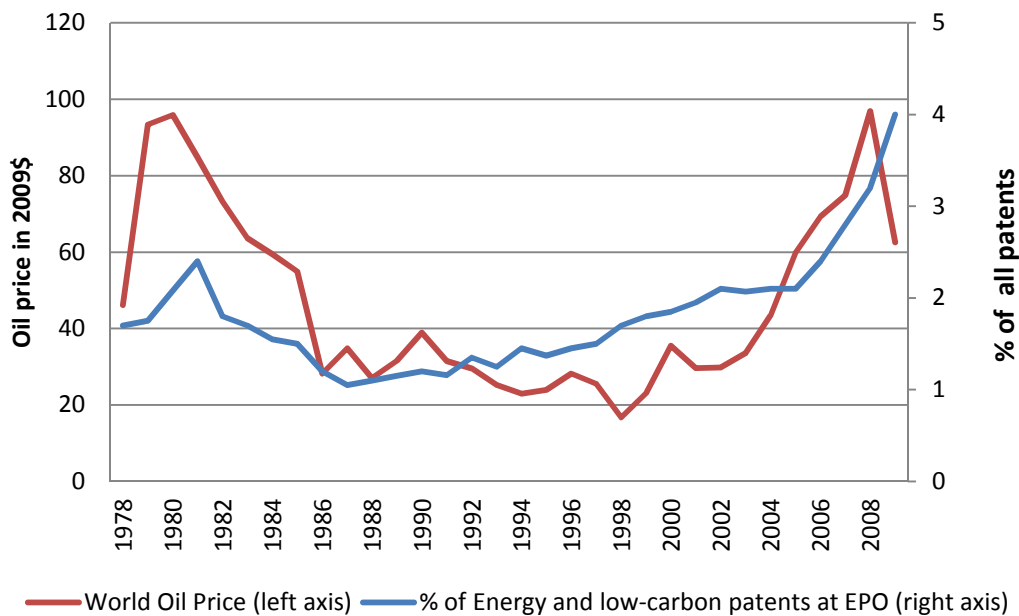
This evidence is also consistent with evidence of the link between energy prices and innovation in energy efficiency. Figure 9 shows how energy efficiency and “low-carbon” innovation – measured by the share of total patents registered at the European Patent Office in this category – has responded to two periods of peaking oil and fossil fuel prices in 1979-1981 and 2004-2009. As the Figure shows, innovation tends to follow price rises with a time-lag, suggesting another reason why gradual and predictable price rises may be easier to adapt to than sudden and unexpected shocks.

Figure 8. Economic adaptation: there is economic life with higher energy prices...



Source: Authors after Newberry (2003)

Figure 9. Incentivising the industries of the future? Energy-efficiency and low-carbon patents as a share of registered EPO patents versus energy prices



Source: IMF, Calel and Dechezlepretre (2012), Authors

Fact #5: The role of internationally-traded energy-intensive sectors in the French economy is relatively small, despite cheap electricity...

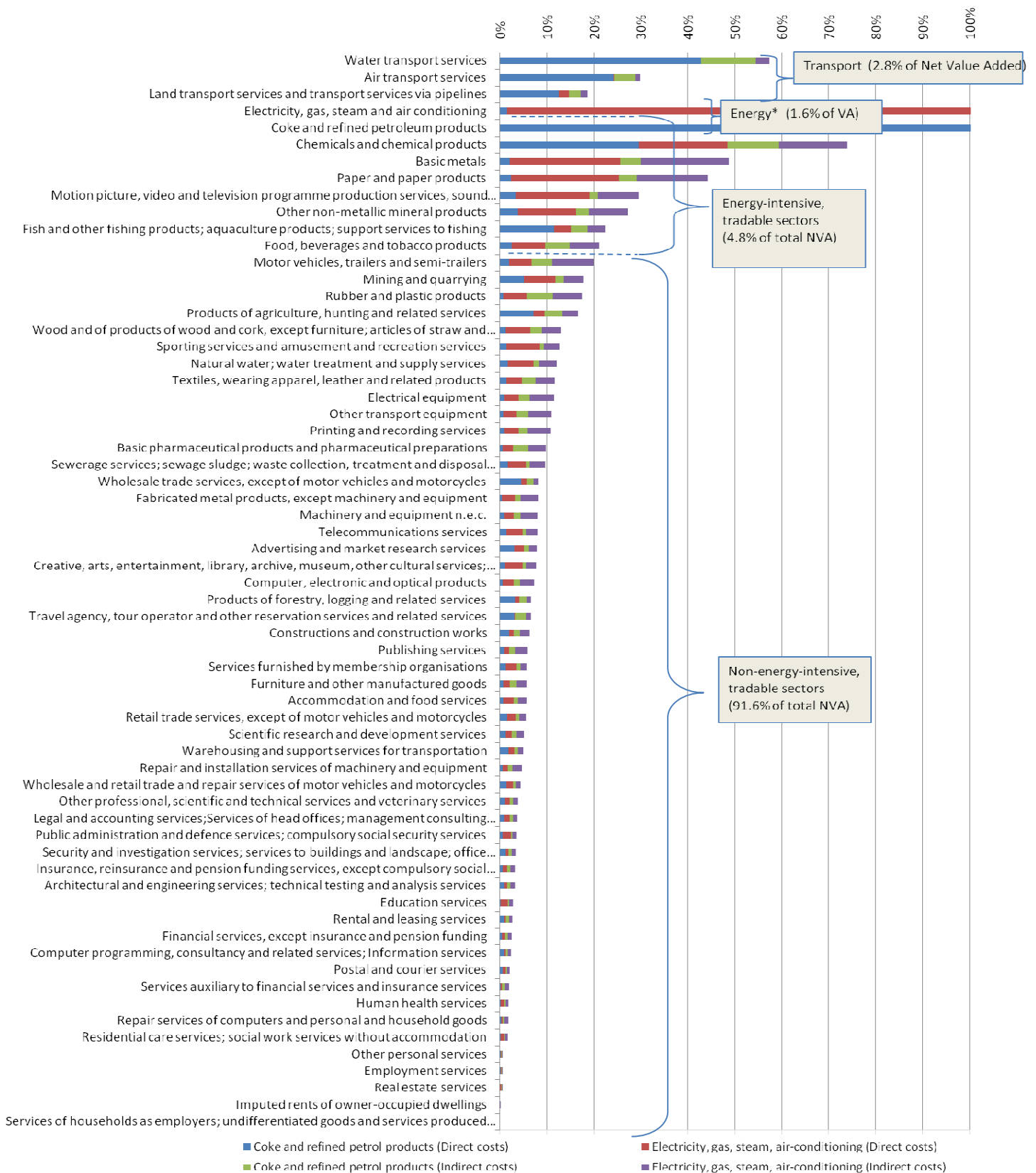
But while the risk to economy-wide French productivity and purchasing power of higher energy prices seems manageable, there are some individual sectors which would be affected more strongly than others – assuming France were to act alone in raising its energy and carbon prices. Figure 10 attempts to identify energy and electro-intensive sectors of the French economy. For each of 66 sectors NACE 2-digit sectoral classifications, it shows the estimated level of direct and indirect energy costs as a share of sector Gross Value Added (GVA) as well as their contribution to the GDP.

Figure 10 shows that there are three types of industry that would be strongly affected by energy price rises: transport services, energy industry (electricity, gas, steam, air-conditioning, coke and refined petroleum products), and other energy-intensive industries (coke and refining, chemicals, basic metals, pulp and paper, “motion picture, video and sound”, other non-metallic minerals, fishing and aquaculture, food and beverages. Taken altogether these sectors represent 8.4% of total value added in the French economy.

Of the three groups of sectors, the sectors facing international competition are the “other energy-intensive sectors”, since the lion’s share of transport and energy services are not tradable and thus not offshorable³. These tradable energy intensive sectors represent approximately 4.8% of GDP (at basic prices), using the NACE two-digit level of sectoral disaggregation. Thus, on the surface of the evidence, sectors that one might expect to be exposed to potential competitiveness impacts from higher energy prices represent a relatively small part of the French economy. It is therefore difficult to argue that France’s economy depends, to any significant degree, upon low energy prices, since 95.2% of economic activities are either non-tradable or not highly energy-intensive. Instead, this result would seem to argue for sector-specific measures to ease the transition to a less energy- and carbon-intensive economy in this group of strongly impacted sectors.

³ In practice part of the transport sector could still be exposed to international competition since current technology for trucks can allow for a full tank to traverse the length of French territory from Switzerland to Spain on a single tank filled in Switzerland. This is one example of the potential benefits of a pan-European approach to fuel taxes. Similarly, intra-European cross-border electricity market interconnections mean that the electricity sector is not 100% insulated from foreign competition. However, competition is limited by the capacity of interconnectors, among others.

Figure 10. Which sectors are energy-intensive in France?
(Direct and indirect energy input costs - % of Sector Net Value Added in 2008)



Source: Authors, Eurostat Input-Output Tables (2008 data)

Note : Does not include costs of French energy extraction industries. *Direct costs* refer to direct energy inputs into production or consumptions. *Indirect costs* refer to embedded energy costs within intermediate or final products used for production or consumption (e.g. the oil content of plastics).

Conclusions

Evaluating the impact of France’s energy transition on its economic competitiveness depends critically on the definition of competitiveness. In general, the competitiveness of a country’s tradable goods sectors is not nearly as important for long-run economic growth as its productivity. This Brief has shown that higher energy prices that might follow the French energy transition need not have a significantly negative effect on French productivity. Just as the French economy rapidly shrugged off the sudden and unexpected oil price rises of ~250% in 1973-4 and overcame subsequent price increases of ~100% in 1979, the capacity of the economy to adjust and innovate, given sufficient time, suggests that it would also manage to maintain growth with significantly higher energy prices than today if it needed to. This seems all the more likely because, while energy costs remain significant to the French economy, they are roughly one-third less important as a share of production costs and 50% less important as a share of consumption expenditure than they were in the 1970s.

However, a small – but not insignificant – number of sectors competing in international markets and representing around 5% of the economy would be likely to face significant competitiveness effects from large energy cost increases. The share of the economy which these sectors represent suggests that the losses to these sectors should be weighed against the advantages sought by the energy transition more broadly. The fact that the sectors likely to be strongly affected represent a relatively small share of the economy would seem to argue for targeted, sector-specific measures to assist and ease the transition.

To find out more...

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