

ENERGY SECTOR INTEGRATION, REGULATORY INTEGRATION?

How technological change
might lead to a different
approach to regulation

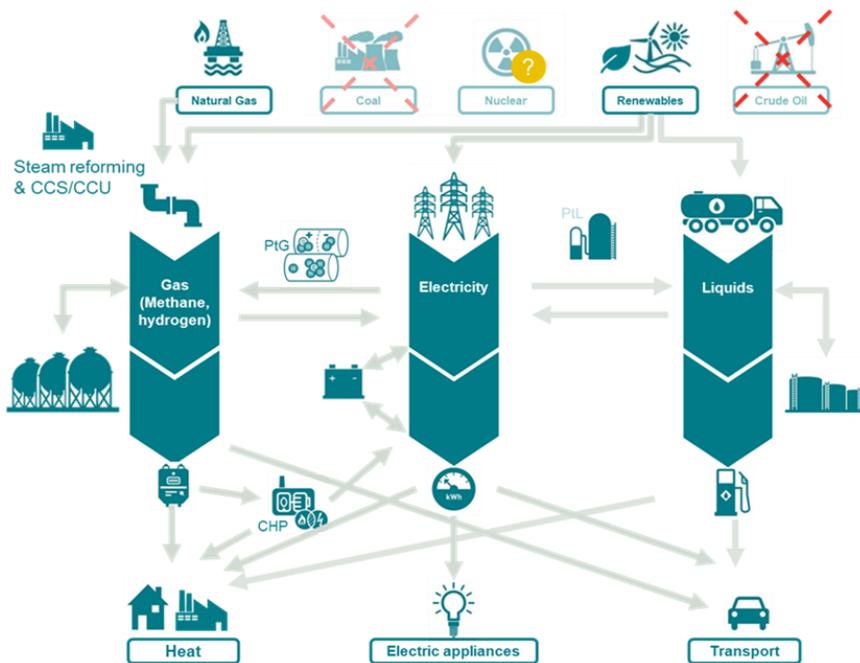
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HOW TECHNOLOGICAL CHANGE MIGHT LEAD TO A DIFFERENT APPROACH TO REGULATION

This process, which is often called sector coupling or sector integration, is illustrated below.

FIGURE 1 SECTOR COUPLING



Source: Frontier Economics

This process also results in a wider variety of fuels and technologies being made available to meet standard energy uses. The most significant example might be road transport. Traditionally fuelled mainly by diesel and gasoline, transport is now witnessing the advent of electric vehicles and the development of alternative clean combustion fuels such as e-gasoline and e-diesel, produced from electricity.

EXEC SUMMARY

The decarbonisation of the European economy is increasing existing links between different sectors and fuels. For example, in the past gas was used to generate electricity in power plants. But with renewables such as green hydrogen and e-fuels growing in importance, the relationship is becoming bidirectional, with electricity serving as an input for those fuels.

REGULATION NEEDS TO KEEP UP

As with any big change in technology, that has effects on the market, the issue of regulation quickly arises. This convergence of fuels makes it more clear that what matters is not electricity, gas or liquids but emission-free fuels. And regulation is needed to achieve society's decarbonisation goals at least cost but, to that end, it is important that the rules and standards are technology neutral. If they are not, there is a danger that the transition away from carbon will be inefficient. Two principal sets of risks stand out:

- Decarbonisation will proceed faster in sectors where the cost is higher; and
- Within a given sector, the process will be driven by technologies which are not efficient and competition between companies providing similar services will be distorted.

Achieving technology neutrality is not an easy task. It is also difficult politically, as changes to the status quo create winners and losers. Our colleagues Vikram Balachandar, Dan Roberts and Claire Thornhill have outlined important lessons from the past to make progress in this direction (see [here](#)).

Furthermore, sector coupling calls into question the current fuel-specific approach to regulation. For example, the European Union has an Electricity Directive and a Gas Directive. But take electricity storage using renewable gases: which of the two directives does this come under? Or if several fuels are going to compete to provide carbon-free mobility, shouldn't they have a common regulatory framework that ensures fair competition?

TELECOMS POINTS THE WAY

This market-based, as opposed to sector-based, approach to regulation already applies, to some extent, in the telecommunications industry. In 2018 the European Commission approved the European Electronic Communications Code, which defines a set of rules for all types of electronic communications, independent of the underlying technology.

The Commission has also drawn up a list of relevant markets subject to ex-ante regulation, which it updates on a regular basis. When defining these markets, substitution across different technologies (e.g. copper, fibre, mobile, etc.) is one of the key elements that officials take into account.

Using telecoms as the template, the critical issue in the case of sector coupling is to determine what the relevant markets are by means of competition analysis. This would entail examining what alternatives are available to customers, the ease of switching between those alternatives and whether new suppliers are likely to enter the market.

Such an approach would help in the quest with for technology neutrality. If we look at the heating and road transport sectors, for example, a host of factors stand in the way of neutrality. Differences in taxation levels and structures, variability in costs included in the regulated tariffs paid by customers, different support mechanisms for renewable technologies and varying costs of carbon all muddy the waters when calculating which green fuel source is most efficient.

RADICAL THOUGHTS

Taken to the extreme, a market-based approach to regulation could lead to radical changes. If several fuels are competing to serve a particular end market, would regulations still be needed to ensure effective competition within each fuel sector? Unbundling rules aimed at ensuring fair competition among electricity providers spring to mind in this context.

Or imagine how the provision of electricity to light our homes and power our appliances might evolve. Self-consumption, where consumers themselves produce the electricity they use, could become possible and affordable. Energy communities of producers and consumers could become a competitive reality. In these circumstances, would it be necessary to regulate third-party access to the electricity network?

Once again, the telecommunications sector illustrates one way of approaching such issues. As mentioned above, instead of considering mobile and fixed communications in isolation, telecoms markets are often analysed by taking into consideration all fixed technologies (copper, fibre and cable) in conjunction with mobile technologies. As a consequence of including mobile broadband technologies as part of the relevant market under review, some countries have gone on to deregulate fixed broadband services.

NEW MINDSET, PLEASE

Technology has not evolved as rapidly in the energy sector as it has in telecoms, so it might sound somewhat extreme to be even discussing such eventualities. But change is coming. Politicians are latching onto growing public demands for an acceleration of the transition to a zero-carbon future. The European Green deal to make the EU climate neutral by 2050, China's pledge to achieve net zero emissions by 2060 and US President-elect Joe Biden's promise to re-join the Paris agreement on climate change all bode well for progress at next November's climate conference in Glasgow.

Seen in this light, it is certainly not premature to consider how energy regulation can change with the times to promote the swift, smooth phasing out of fossil fuels. Given how technical progress is deepening the integration of energy end-use and supply sectors with one another, a persuasive case can be made for a shift in regulatory mindset from one based on specific fuels to one based on the markets that an ever-rich range of fuels are serving.

AUTHORS

FERNANDO BARRERA

Director

PABLO GONZALEZ

Manager

WANT TO KNOW MORE?

WWW.FRONTIER-ECONOMICS.COM

HELLO@FRONTIER-ECONOMICS.COM

+44 (0) 207 031 7000