The Role of Hydrocarbons in the European Energy Transition: Policies and Financing in the Wake of Coronavirus

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2020 – the year of COVID-19 and net zero targets

In early 2020, the European Union (EU) proposed that 'Union-wide emissions and removals of greenhouse gases regulated in Union law shall be balanced at the latest by 2050, thus reducing emissions to net zero by that date'. At the end of the year EU ministers agreed a 2030 greenhouse gas (GHG) reduction target of 'at least 55%' below 1990 levels (compared with the previous target of 40%). In Autumn 2020, carbon neutrality commitments were announced by governments in major Asian importing countries – Japan (2050), South Korea (2050) and China (2060) – as well as the incoming US Biden Administration (2050 with net zero electricity to be achieved by 2035). While this was happening at the government level, major international oil and gas companies (IOCs) also committed to achieving net zero emissions by 2050. Although 2020 will be remembered more generally as the year of COVID-19, energy and climate researchers will remember it as 'the year of net zero'.

Net zero targets require a substantial reduction in greenhouse gas (GHG) emissions from the energy sector, particularly for the European Union and individual EU and non-EU countries (such as the UK) which have committed to climate neutrality and accelerated 2030 reductions. But in relation to hydrocarbons, they raise four very important questions.

What do these targets mean for the development of zero-carbon technologies?

Commitment to net zero targets will require an intensification of political and corporate decision making around emissions from the production and trade (imports and exports) in all fossil fuels - oil, natural gas and coal. Many scenarios have been published by the EU, the IEA, national governments and IOCs show the possibilities of moving to a different mix of energy sources and zero carbon technologies. The most important technologies are:

- various types of zero carbon renewables dominated by (onshore and offshore) wind and solar and bioenergy,
- batteries of various types to cater for the intermittency of renewables and for transportation,
- fossil fuel decarbonisation technologies for the production of hydrogen (and potentially also ammonia) with carbon capture utilisation and storage (CCUS),

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- identification and reduction of methane emissions from fossil fuel production and also carbon dioxide from flaring,
- a new generation of nuclear reactors,
- low and zero carbon transportation fuels particularly for aviation and heavy transport,
- efficiency technologies for buildings and industry.

Different countries will focus on different sets of these technologies depending on their particular energy situation and aspirations, but it is clear that the availability of investment will not be sufficient for all technologies to be treated equally. The COVID 19 pandemic has limited the financial capacity of governments to support the transition compared with what it would otherwise have been. These two developments lead us to the second question.

How much investment will be needed to meet 2030 and net zero targets and who is going to provide it?

More aggressive reduction targets for 2030 will require urgent action and increased expenditure. In July 2020, the EU agreed a multilateral financial framework (MFF) budget of €1.1 trillion plus a Next Generation EU (NGEU) fund of €750bn for the period 2021-27. An overall climate target of 30% will apply to the total expenditure of MFF and NGEU which would mean that €555bn will be spent on climate-related sectors over this period. This would provide funding of €80bn/year spread across energy, agriculture, rural affairs and biodiversity. While this is an impressive amount of investment it will be spread across these four sectors of 27 EU member states. This suggests that the majority of investment, which in the larger economies will probably require double digit billions of Euros per year, to meet GHG reduction targets will have to come from national governments and the business sector. A report published at the end of 2020 by the UK Climate Change Committee found that in order to meet government targets, investments of £50bn (€55bn) per year would be needed in the period 2030-50 (although in net terms it claimed the costs would be very low due to reduced cost of fossil fuels and avoided climate damage).

At present, the only low and zero carbon supply technologies which are commercially viable on a large scale are wind and solar power, all other technologies require significant financial support from governments or regulators. Experience of wind and solar power suggests that with large scale development, and improvements in design, costs of other technologies will fall substantially. However, the urgency introduced by more stringent targets for emissions reduction in 2030, means that waiting 10 years for large scale technology development is not a realistic option. Governments are looking to industry to provide guidance on which are the most promising technologies. But private investors are looking to governments to provide a ‘long term roadmap’ for each technology, specifically the amount of funding which will be available. There is no consensus on which technologies – from the list above – are the most suitable in which countries and how they can be made commercially attractive to investors.

What does this mean for the future of hydrocarbons?

It is clear that, certainly in a European but also in a global context, hydrocarbon usage must fall substantially if climate change targets are to be met. In Europe (and much of the rest of the world outside Asia) the impact on coal has already been much more dramatic than for oil and natural gas. Many European governments have set targets for a complete phase-out of coal, which has become more realistic by dramatic fall in the share of coal-fired generation due to switching to renewables.

The impact of the COVID-19 pandemic on oil demand has also been significant due to the decline in travel of all types. Natural gas demand both in Europe and globally has not been impacted to the same extent as coal and oil, but significant initiatives and investments in hydrogen – which could replace natural gas in industrial and residential heating sectors – are under way. There is a debate about whether the first decades of hydrogen development will need to be principally from reformed natural gas with carbon capture and storage (CCUS) so-called 'blue' hydrogen. Or whether hydrogen from renewable energy – so-called 'green' hydrogen – can be developed sufficiently rapidly and at a sufficiently low cost. CCUS is not yet being developed on a large enough scale – partly because in many countries it is not environmentally acceptable – to give confidence that sufficient blue hydrogen will be available. Electrolysers to produce green hydrogen will be scaled up from the current 10-megawatt capacity to gigawatt scale but this is likely to take at least a decade.

Can oil and gas companies create a business model to play a major role in the transition?

Many IOCs have already declaring net zero corporate targets for 2050 which means they will need to substantially change their business models. The IOC business model has been to spend significant sums of money finding large accumulations of oil and gas. They then seek exclusivity from governments to develop these reserves over periods of 20 or more years, underpinned by legally guaranteed property rights in return for tax and royalty payments. Having developed the reserves, they sell them at market prices internationally, and market or regulated prices domestically. The traditional business benchmark for IOCs has been a 12-15% post-tax real rate of return. This is the level of return that has led investors to commit funds to these companies and the sector in general. A differentiating factor for oil and gas companies is the scale of their traditional business which meant that few could challenge their position. Many large companies can organise and finance projects requiring investments of several billion dollars. But IOCs launch projects requiring investments of tens of billions of dollars outside the countries in which they are located.

The business model problem for oil and gas companies is two-fold: most low and zero carbon energy projects are on a much smaller scale, and the returns on these projects are relatively low (in comparison to traditional IOC expectations) and mostly require the support of governments. In fact,

it is debatable whether low and zero carbon energy can be described as ‘a business’ in terms of providing attractive returns to investors. And it is uncertain whether profitability will be based on selling wind turbines, solar panels and electrolysers, or selling the units of electricity or hydrogen that they will generate. Whatever the answer, low and zero-carbon energy is not compatible with traditional oil and gas business models either in terms of project scale or return on investment. The much smaller scale of projects means that many companies can compete successfully and raises questions as to whether oil and gas companies can create a significant comparative advantage in the low carbon energy sector.

Conclusion: does climate change mean that energy has become ‘a business for governments’?

If governments are going to meet COP21 (let alone net zero) targets by 2050 then fossil fuels have to be decarbonised or phased out. Government intervention and support has already, and will increasingly, be required to achieve this outcome. For countries where energy sectors remain dominated by state-owned and controlled companies this is not a major change. For the electricity sector it is already the current situation the IEA tells us that in OECD countries government policy already determines 75-90% of decisions. The European Union has its own carbon trading regime (EUETS) and some governments have introduced additional national carbon levies and taxes. Carbon pricing and taxation will be a key government policy to achieve targets, with modelling showing the need for prices in Europe to rise from around €30/ton in 2020 to around €100/ton by 2030 and double that figure by 2040. Governments will control carbon prices and taxes either directly or through the allocation of allowances.

Governments will need to play a large part in the selection of technologies to achieve carbon reduction targets. During the liberalisation era of the 1980s and 1990s, the view in many European countries was that governments should not ‘pick winners’ in terms of energy technologies, they should allow market forces to determine which technologies were the most competitive and hence most successful. However, the lead times for large scale introduction of these technologies, and the changes in infrastructure these require, mean there is no time to allow markets to make those decisions. For example, to introduce hydrogen on a large scale, or build massive offshore wind parks or new nuclear power stations, with all of the gas and electricity network changes those decisions would require, will require a decade (and possibly longer) to achieve. The urgency of the 2030 targets means that governments need to take decisions very quickly about which technologies they wish to support.

In Europe, the required speed of the energy transition requires hydrocarbons to be removed from energy balances starting with coal and oil; natural gas (principally for heating) will probably remain for a longer period of time. National governments will play the major role in determining the speed and direction of the transition, and companies – particularly hydrocarbon companies – will need to react and adapt as best they can. A final thought is that it is not clear whether the trends

described in this article should be thought of as Europe-specific – arising from the adoption of more ambitious 2030 targets – or whether they will also be relevant for other countries and regions.

Writer's Profile

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