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CAPITAL PARTNERS

In order to achieve a net-zero energy transition, we need to abolish carbon taxes and energy subsidies

Carbon taxes and energy subsidies – carbon pricing (carbon tax, emissions trading systems (ETS)) and subsidies (Contracts for Difference (CfDs) in the UK) – have been key to supporting the development of renewable energy (RE) and power systems in the developed world, but now risk exacerbating the threat of intermittency and slowing progress towards net-zero transition across our energy systems.

We are advocating for the abolishment of carbon tax regimes and renewable energy subsidies, in favour of policy settings that address a more fundamental shift in energy demand.

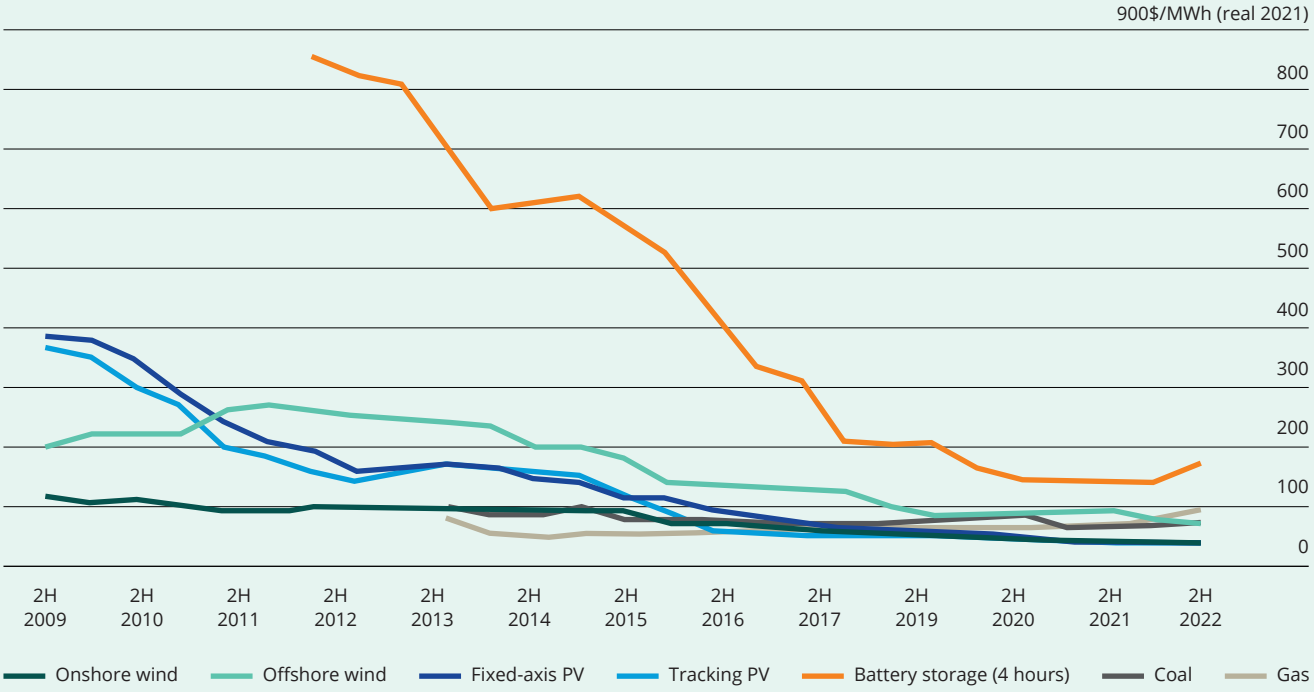
The current combination of policy mechanisms – a mix of subsidies, incentive schemes and carbon taxes – at the vanguard of developed economies' efforts to drive the net zero transition across energy systems is, inadvertently, exacerbating exposure to the risks, and cost implications, of intermittency.

In 2020-2021, governments in G20 countries committed at least $424.59 billion to support clean energy, equivalent to $92.6 per capita, according to the energypolicytracker[1].

To date, subsidies and incentive schemes have been critical to increasing capital flows into the development of the renewable power industry across developed economies. In fact, subsidy mechanisms have proven so successful that the levelised cost of renewable power generation has reached all-time lows, and is now closely comparable with coal fired power generation.

[1] https://www.energypolicytracker.org/region/g20/

Global levelised cost of electricity benchmarks, 2H 2022



Source: BloombergNEF

Note: The global benchmark is a country-weighted average using the latest annual capacity additional. The storage LCOE reflects a utility-scale battery storage system with four-hour duration running at a daily cycle and includes charging costs.

However, a lack of capital is no longer the primary challenge to energy transition and the continued development of renewable power generation in the developed world; the renewable energy (RE) market today is a highly saturated market, characterised by decreasing returns for investors.

Instead, the real issue today is that the increasing share of renewable power generation in the UK and US has left our energy systems perilously exposed to the risk of intermittency, and the extrinsic geopolitical factors impacting the provision and availability of natural gas (key to countering intermittency, particularly as electrification accelerates).

As a result, the path to net zero remains highly vulnerable to the availability of – and geopolitics surrounding – natural gas, delivering negative impacts to consumers through price shocks. Here's why.

SUPPLY SIDE FOCUS

Through carbon pricing measures and subsidies, governments have focused on the 'supply side' of the complex supply demand dynamics across the energy system.

Putting a price on carbon through some form of taxation has been the primary mechanism adopted to bring down emissions and raise funds to offset some of the external costs of CO2 emissions, e.g. physical damage to property or social and healthcare costs arising from flooding or wildfires. The underlying logic of pricing carbon is to charge the source of the pollution (emissions) that creates external costs, but also to encourage the adoption of non-polluting alternatives.

Two main forms of carbon pricing are prevalent: carbon taxes and ETS schemes. Carbon taxes set a defined price on carbon through a tax rate on emissions or on the carbon content of fossil fuels. ETS are mainly cap-and-trade systems, where the total amount of emissions is capped and companies with low emissions can sell their extra allowances to those that have higher emissions. Under ETS, the carbon price is variable and depends on supply and demand factors. The main difference between the two systems is that in ETS the emission reduction target is pre-set, whereas with carbon tax, the price is set but the emissions reduction target is not.

Carbon pricing costs have risen and are expected to remain high, with implications ranging from higher inflation, as companies first attempt to pass through these costs to their customers, to company closures and/or whole sectors closing capacity, with subsequent rise in unemployment. The lack of global coordination on carbon pricing means that companies subject to carbon taxation are at a disadvantage against global competitors which are not under any such tax.

By penalising pollutive energy sources through carbon pricing and taxes and rewarding the development of low carbon energy generation through subsidies, governments have undoubtedly helped to reduce the supply of pollutive energy sources and increased renewable energy sources and production.

However, this shift has also led to an overall reduction in the energy supply because RE generators cannot consistently produce sufficient electricity due to intermittency.

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In parallel, the demand for energy has increased while supply has hit constraints, thereby increasing the supply/demand gap, which we believe risks pushing the goal of achieving a sustainable energy system even further away.

In the UK, the policy mix of incentives and taxes is based on two key components.

— First, a system of cap and trade, called the UK ETS operates to cover carbon emitters with an ever-decreasing circulation of allowances, thereby driving the price of these allowances up, by virtue of supply and demand.

— Second, the Central Power Station (CPS) scheme taxes users of fossil fuels in power generation.

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The net impact results in thermal power generators using fossil fuels being more heavily penalised economically, either by direct taxation, or through having to procure ETS allowances from the market to cover their emissions. By contrast, renewable power generators are insulated from both these costs and, through reliance on natural resources, i.e., naturally occurring sunlight and wind, rising commodity prices. This has been particularly acute after gas supplied by Russia has been removed from developed western markets.

By focusing predominantly on reforming the type of energy being produced through carbon taxes, western energy systems have become increasingly exposed to energy security risks, driving up the cost of energy to consumers, increasing the prevalence of intermittency issues and concentrating investments in renewables only (in order to benefit from the structural margins which carbon taxes provides to them).

Given that current renewable energy costs are so low, such incentives are no longer needed; the world is building more renewable energy capacity regardless of the availability of subsidies. Fossil fuel sources will only play a marginal role of providing stability to grids. During such transition, which is irreversible, carbon taxes will do nothing but cause pain to economies and end consumers, particularly through recent pricing volatility.

THE COSTS OF INTERMITTENCY

Renewable technologies generate power through naturally – and not consistently – occurring resources, making them an intermittent source of energy. Put simply, when the wind doesn't blow and the sun doesn't shine, the system operator needs to call on more conventional sources of power, including thermal power plants operating on coal and natural gas or nuclear power plants, to meet the shortfall, often at peak pricing.

The supply-side focus of current policy settings makes the intermittency of renewable energy sources particularly costly for consumers, as shortfalls must be met by the very same producers being penalised by a web of carbon tax regimes. Increases in the cost of producing thermal power are being passed on to the market clearing price of power and ultimately, the price of retail power which consumers must bear.

Crucial to the energy transition – and expansion of renewable capacity – is the need for the 'firming' of the grid through periods of low renewable generation, where shortfalls still need to be met by thermal power production.

Natural gas, particularly when accompanied by carbon capture and storage technology provides firming properties which are essential to grids and will therefore play a key role in the transition to net zero, particularly as electrification intensifies in all parts of the global economy.

However, regional dependence on certain sources of natural gas supply, including from countries which proactively implement resource nationalism (i.e. Russia), has made the risk of supply cessation a reality, and driven price and volume volatility across energy and power markets.

ADDRESSING THE DEMAND SIDE

In this context, it is essential that national governments and grid operators focus on ensuring energy security through a combination of actions including promoting energy efficiency and demand side response schemes, diversifying sources of gas supply; promoting gas power generation combined with carbon capture schemes, and incentivising greater investment in short and long duration storage technologies.

A singular supply-side focus on disincentivising investment in conventional power in favour of renewable production is no longer an effective policy mix to support net zero transition.

Instead, policymakers and power generators must target a more comprehensive approach that seeks to fundamentally change the demand side of our energy system, including increased support for investment in demand side energy efficiency, longer duration storage technologies, carbon capture technologies and other schemes, in order to achieve 100% renewable power generation without intermittency issues.

Future policy mechanisms must address and respond to profound changes in final energy consumption – electricity's share of final energy consumed is forecast to rise from 20% in 2022 to account for around 50% under the Net Zero Emissions by 2050 Scenario (NZE); energy security and encourage a more fundamental shift in energy demand.

Electricity storage (to be discussed in a forthcoming Victory Hill White Paper), a multi-faceted demand-side policy response and dispatchable low emissions sources of power are essential to meet flexibility requirements in clean energy transitions, according to the IEA, particularly if the overall demand for electricity increases as expected. Our reliance on fossil fuels will remain for the interim transitional period, albeit we have a choice of selecting those more abundant and less hazardous for the environment, such as natural gas.

Demand-focused mechanisms should target:

Household demand

Enhanced measures targeting changes in behaviour of energy usages. Some measures have already been implemented, such as the Energy Company Obligation scheme in the UK. These can include promoting heat pumps, insulation and potentially hydrogen use on-site.

Distributed energy

Expansion of localised distribution methods, replacing larger power plants (PPs) located far away from the areas of electricity demand with an increased number of smaller, localized PPs closer in proximity to demand.

Circular Economy

The role of sequestering carbon emitted from gas-fired generators (which themselves provide firming to the grid), and potentially reusing this commodity as food grade CO2 or converting it into durable materials such as graphene (for anti corrosion paints, electronics et al).

Energy storage

To not only support the provision of batteries covering short periods, but also long duration storages (10 hours+) to cover overnight periods. The UK Government has started investing in Nuclear Power storages, and technologies such as the Pumped storage hydropower (PSH) have already been available for a long period of time, but the scarcity of these available sites remain a major roadblock, alongside the development of technologies to cover long-duration storage.

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CONCLUSION:

Carbon pricing's popularity is understandable, it's a relatively cheap policy for governments to enact and easy for companies to understand in its application.

But it's also important to note that carbon pricing does not guarantee a change in how polluters behave. Moreover, in some cases it can create the conditions for the status quo to continue. An example of this is the number of developed countries that reopened or considered reopening coal fire power stations to regulate power on the grid during the recent energy crisis.

In other words, this system will not affect meaningful change in situations where it is profitable or more cost effective to pay the carbon price rather than to adopt a cleaner energy technology.

Rather than focusing on affixing an artificial price on carbon, the UK and other developed market governments would do better to align themselves with market forces and address gaps in how we supply energy and how we reduce electricity demand.

They also need to be clear-eyed in how they create incentives that push for change in the system and be brave enough to abandon those policies when they are no longer fit for purpose.

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