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Overview

The UK Government is faced with critical choices in its energy strategy. Sanctions on Russia's energy exports are putting immediate pressure on UK living costs and necessitating scrutiny of longer-term energy security. While the Government's immediate priority is to provide help for the people of Ukraine and deter Putin's invasion, its policy response to rising energy prices could have irreversible consequences for our energy and climate future.

This short, non-peer reviewed 'rapid analysis' aims to provide stakeholders with relevant quantitative data in a timely manner, and to contribute reliable statistics to inform public debate. It uses published data and makes high-level assumptions (further detailed below) to explore three scenarios:

- A forward-look at the 'avoided spend' on meeting oil and gas demand from 2022 to 2030 if the UK were to meet its Balanced Net Zero pathway in the Climate Change Committee's (CCC) Sixth Carbon Budget.
- A backward-look at the value of what the UK could have avoided spending on Russian oil and gas if it had not imported oil and gas from Russia post the 2014 Crimea crisis.
- A scenario based on reduced demand for heating – 'turning down thermostats by 1 degree'.

Results

Since the 2014 invasion of Crimea, the UK has spent more than ~$30 bn (~£22bn) importing hydrocarbons from Russia.

Looking ahead, our analysis shows that the UK could avoid spending ~$90 bn (~£70bn) on meeting its oil and gas demand (based on future projections of oil and gas prices) if it were to match the CCC's "Balanced Net Zero" pathway between 2022-2030 – eliminating the need for Russian oil and gas imports as early as 2023 and 2024, respectively.

The UK could eliminate its need for Russian gas supply if all domestic households were to turn their thermostats down by 1 degree.

1. Forward look

Summary Statement: There is a high opportunity cost to delaying the transition to net zero. Our 'rapid analysis' using estimates from the Climate Change Committee's (2020) Sixth Carbon Budget and other assumptions, suggests that if the UK were to match its "Balanced Net Zero pathway" between 2022-30, it could avoid spending a cumulative amount of ~$90 bn (~£70bn) on meeting its demand for crude oil (estimated at ~65% of this number) and natural gas (estimated at ~35%) between 2022-30.

This would be driven by significant reductions (~30%) in both UK oil and gas demand, as projected by the CCC's Balanced Net Zero pathway between 2022-30.

While a demand reduction might under normal market conditions result in the most expensive imports at the margin being reduced first, if a strategic decision were to be taken, this pathway could effectively eliminate the need for Russian gas imports in 2023 and Russian oil imports by 2024, freeing up financial resources which could be redirected elsewhere.

Method, data sources and assumptions

Using data from the Climate Change Committee's (2020) Sixth Carbon Budget, we estimated the difference (delta) in projected petroleum and natural gas demand between 2022-2030, and converted these into a cumulative value (GBP), using future annual price projections for crude oil and natural gas (BEIS, 2020). These price

projections are the latest BEIS projections yet do not factor in the market volatility and recent energy price spikes observed in 2021/2022.

We used approximate conversion factors from BP Statistical Review of World Energy (2021) and the US-EIA (n.d.) in our calculations. Estimates may vary accordingly.

We used exchange rates of 0.76 GBP:USD from XE on March 18th 2022.

Our estimates do not account for inflation.

2. Backward look

Summary Statement: Since the 2014 Crimea crisis, we estimate that the UK has paid Russia ~$30bn (~£22bn) for imports of hydrocarbons.

This equates to the cost of ~8,000 T-14 Russian tanks, each worth ~$4mn (~£3mn).

Method, data sources and assumptions

Using data from the World Bank's World Integrated Trade Solutions database (WITS, 2020) on hydrocarbon (crude oil and natural gas) trade between the US and the UK, we estimated total expenditure by the UK on hydrocarbon imports between 2014-2020.

We used the estimated cost of a T-14 tank ($4mn)[1] (as reported in Howard (2018)).

Our estimates do not account for inflation, and we do not take into account the potential net impact on the market i.e. whether reduced imports from Russia to the UK would have been offset by an increase in imports from elsewhere, or the impact on Russia's hydrocarbon revenues (that is, whether a reduction in UK hydrocarbon imports from Russia was offset by increases from other importing economies).

We used exchange rates of 0.76 GBP:USD from XE on March 18th 2022.

[1] Quote by Deputy Prime Minister Yury Borisov in Howard (2018).

3. ‘Turn-down’ by 1 degree

Summary Statement: The UK could eliminate its need for Russian gas supply if all domestic households were to turn their thermostats down by 1 degree. This is because national gas demand would decrease by 21TWh (as estimated by Dr Simon Evans of Carbon Brief), which is ~2.5% of national gas demand; whilst Russia's average share of supply has been 2.3% over the last 5 years.

It is crucial to note that any reduction in demand made in this way should carefully consider the different needs of communities and vulnerable individuals across the UK. Although demand reduction of this kind could have an impact on exposure to Russian gas supply, it would not be appropriate or expected for all households to make such a change.

Method, data sources and assumptions

We used an estimate published by Dr Simon Evans of Carbon Brief, which states that turning down thermostats by 1 degree would lead to 21 Terawatt hours (21TWh) of savings – representing ~2.5% of UK gas demand of ~810TWh in 2021 (BEIS, 2021a). Dr Simon Evan’s analysis assumed that demand would be reduced by 7.5%, based on a data point from the International Energy Agency.

We converted this volume figure into a GBP value using UK-domestic gas price data from BEIS (2021b). We then compared this against HM Government’s estimate of the share of UK’s gas supply from Russia: 2.3% on average in the last 5 years[2].

We used approximate conversion factors from BP Statistical Review of World Energy (2021). Estimates may vary accordingly.

We used exchange rates of 0.76 GBP:USD from XE on March 18th, 2022.

Our estimates do not account for inflation.

[2] Based on data shared by BEIS at https://www.linkedin.com/posts/beisgovuk_the-uk-is-in-no-way-dependent-on-russian-activity-6907249012341403648-HUq3?utm_source=linkedin_share&utm_medium=member_desktop_web

Tables

Table 1.0 Sixth Carbon Budget demand projections for oil and gas for Balanced Net Zero pathway and baseline, 2022-30 (Committee for Climate Change, 2020)

1.0										
		Unit	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gas	BNZ pathway	TWh	873	849	835	808	764	726	697	674	631
	Baseline	TWh	973	978	991	956	961	907	916	911	942
	Delta	**TWh**	**100**	**129**	**156**	**147**	**197**	**181**	**219**	**238**	**311**
Oil	BNZ pathway	TWh	762	755	728	692	661	628	595	558	521
	Baseline	TWh	824	839	851	849	846	842	839	836	849
	Delta	**TWh**	**63**	**84**	**123**	**157**	**185**	**214**	**244**	**278**	**327**

Table 2.0 Gas and oil price projections 2022-30 (BEIS, 2020)

2.0		
	Gas	Oil
Unit	p/therm	$/bbl
2022	50	61
2023	51	64
2024	52	66
2025	53	68
2026	54	70
2027	56	72
2028	57	75
2029	58	77
2030	59	79

Table 3.0 Value of hydrocarbon imports from Russia to UK, 2014-2019 (WITS, 2020)

3.0	
	$bn
2014	8
2015	5
2016	3
2017	4
2018	7
2019	6

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