

Round-up: Handling the green transition

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Charts editor



Good for the environment, bad for Russia

Climate change and the ageing population

EVs — the new smartphone?

Carbon taxes: which sectors are most at risk?

Good for the environment, bad for Russia (13 April 2022)

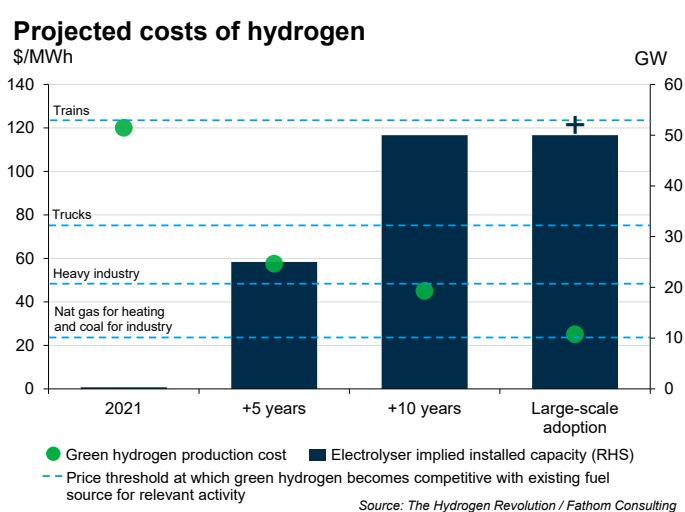
- The European Commission has pledged to reduce the amount of natural gas it buys from Russia, currently around 40% of Europe's supply
- There are several ways it could do so: by finding alternative suppliers, or burning more coal, or boosting the supply of renewable energy or by reducing demand – but each of these carries costs, financial or environmental, and none can replace Russian supply overnight
- One policy option that could be implemented relatively quickly, and could replace more than 10% of the gas coming from Russia while boosting the net zero transition, would be to introduce hydrogen into the European gas network, creating a natural gas/hydrogen blend¹
- Most hydrogen currently produced for commercial purposes is either grey² or blue,³ meaning the environmental benefits would be limited, at least in the short term
- But if this hydrogen was required to be green⁴ (say, within a three-year timeframe), the environmental benefits could be huge: it would ramp up demand for electrolysers (the machine needed to make green hydrogen), thus giving a significant boost to the hydrogen ecosystem and providing surety of demand to wary investors, while adding only limited extra cost to consumers⁵

1. Marco Alverà, the CEO of Italian energy infrastructure company Snam, believes that hydrogen blends of between 5 and 10% could work in Europe's existing gas network
2. Extracted from natural gas or coal via a process called steam reforming in which CO2 emissions are generated
3. Same process as grey hydrogen, but where the carbon emissions released are captured and stored
4. Hydrogen made by splitting water (H2O) into its constituent elements, hydrogen and oxygen, using renewable electricity
5. According to Alverà, the extra cost involved would be around €8 per person per year — similar to the cost that European drivers pay to have a mandatory share of biofuel added to their petrol





- According to Marco Alverà, the CEO of Snam, an Italian energy utility, such a policy alone would imply that the global installed capacity of electrolyzers (currently a mere 0.3 gigawatts) increases by around 35 gigawatts, making green hydrogen a competitive fuel source for trains, trucks and some industrial applications⁶
- The chart below projects how the cost of hydrogen might fall under some relatively conservative scenarios for electrolyser installation (in its 2050 net zero scenario, the International Energy Agency sees installed capacity of electrolyzers reaching 850 gigawatts by 2030)
- Forcing green hydrogen into the European gas network could accelerate this process and be a credible way to reduce reliance on Russian gas, while providing electrolyzers and the green hydrogen industry with the kickstart they need



Climate change and the ageing population (20 April 2022)

- The University of Notre Dame's climate change vulnerability scores suggest that richer countries tend to be less vulnerable and poorer countries more vulnerable to the effects of the changing global climate: in 2019, the least vulnerable country was found to be Norway and the most vulnerable country was found to be Niger⁷
- Meanwhile, the world has a growing problem with dependency: the proportion of the global population that is dependent on others, either because they are too young or too old to work, has risen and is set to rise further

6. This assumes a 15% learning rate (i.e., the decline in price given a doubling in installed capacity) and that the cost of renewable electricity falls in line with mainstream expectations. Learning rates for solar panels and lithium-ion batteries used in EVs are estimated to be around 24% and 23% respectively. And learning rates for electrolyzers are estimated to be around 13-20%, according to Bloomberg and McKinsey. A projected learning rate of 15% is therefore a relatively conservative assumption.

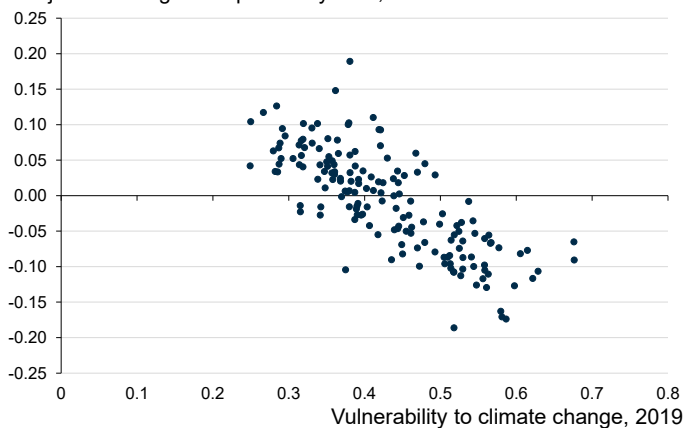
7. These scores assess vulnerability to climate change in various different ways, including direct exposure by virtue of geography, and the ability of each country to adapt.



- According to the UN, dependency ratios are set to rise the most in high-income countries, and less in middle-income countries; in low-income countries dependency ratios are not expected to rise at all⁸
- This creates a strong negative correlation between a country's vulnerability to climate change and the projected change in its dependency ratio, as our chart shows
- In coming decades, the consequences of unmitigated climate change are likely to lead to increased demand for migration out of poorer, more vulnerable countries into richer, less vulnerable countries
- Our analysis suggests that policymakers in richer countries, faced with a deteriorating demographic position and all that entails for economic growth and the public finances, could consider the economic benefit of accommodating at least some of that migration demand
- Equally, immigration-wary policymakers in wealthier countries might consider the value of doing more to prevent and mitigate the worst effects of climate change, if they want to reduce future demand for climate-related migration

Vulnerability to climate change and demographics

Projected change in dependency ratio, 2020-2030



Source: University of Notre Dame / United Nations / Fathom Consulting

EVs — the new smartphone? (27 April 2022)

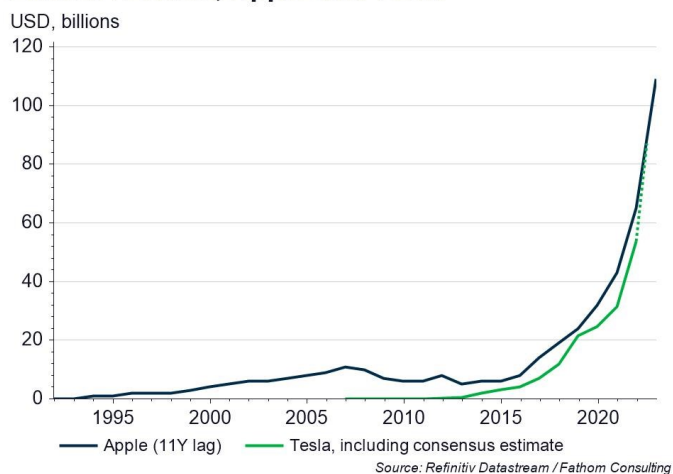
- Tesla revenues are expected to reach \$87bn this year, up from \$12bn in 2017 - a sharp rise that closely mirrors Apple's meteoric increase in revenue 11 years ago following the release of the iPhone

8. These projections are derived from the UN's 'medium variant', which assumes that major drivers of a country's population, such as its fertility rate, return to their historic averages. At present, some of the poorest countries have very high fertility rates, which can lead to high dependency ratios. In 2020, Niger's dependency ratio, which I have defined as the population aged up to 15 and the population aged 65 and over as a proportion of the population aged between 16 and 64, was the highest in the world at 1.09.





Annual revenue, Apple and Tesla



- We can be confident that electric vehicle (EV) adoption will continue to increase rapidly in the coming years, given both economic and regulatory tailwinds, although whether Tesla will be able to retain its dominant position remains to be seen
- The EV sector is an example of how the green transition will not only change the way we live, but also result in big financial winners
- Fathom's climate team has the tools to identify the winners and losers from this transition at both the company, sector and country level

Carbon taxes: which sectors are most at risk? (29 April 2022)

- With climate change regulation developing quickly and investors increasingly frowning upon high-emitting companies, we simulate the effect of a hypothetical carbon tax on different sectors of the S&P500
- The blue bars in the chart show the potential hit to earnings of the average (median) company in 24 sectors from a hypothetical new carbon tax of \$50 per tonne of CO₂e
- The green dots show the relative ability of different sectors to decarbonise using our proprietary decarbonisation pathways
- A clear trend can be seen: the more difficult it is for a sector to decarbonise, the more likely that company earnings will be negatively affected by a hypothetical new carbon tax
- There are a few notable exceptions: the utilities, energy and automobile manufacturing sectors have an easier pathway to net zero than many other sectors, but are more exposed to a tax on carbon

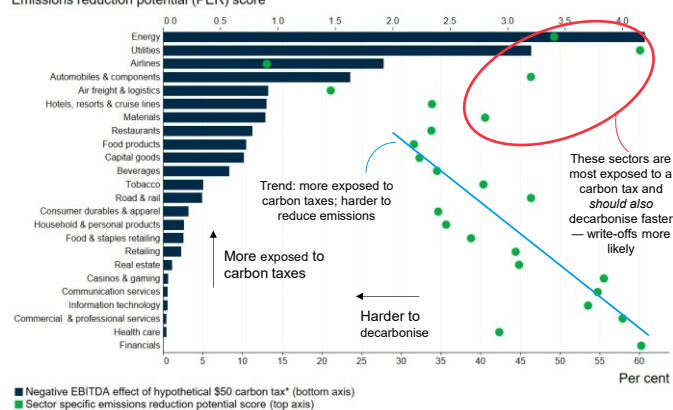
9. We assume that the full cost of the tax is borne by companies on their scope 1 emissions, while 50% of the tax is borne by each company on their scope 2 and 3 emissions. This simulates the effect over and above any carbon tax currently paid by each company. We simulate the effect of a carbon tax on each company listed on the S&P500 on their earnings before interest, tax, depreciation and amortisation (EBITDA) in each year between 2018 and 2020





- In other words, they are more at risk from climate regulation and have less excuse than others to be in this position for much longer – these companies risk getting punished by investors if they don't start reducing their emissions soon
- That might explain why some companies in these sectors are moving faster than existing tax policy or regulation¹⁰; those that fail to do this face significant financial risks as the transition to net zero progresses

Carbon tax effect and emission reduction potential
Emissions reduction potential (PER) score



*Assuming tax is fully absorbed by company on its scope 1 emissions and half absorbed on scope 2 and 3 emissions

Source: Refinitiv Eikon / Fathom Consulting

For more on how we assess sectors' relative ability to decarbonise, and on our suite of transition risk products, services, tools and data, contact Brian Davidson, Fathom's Head of Climate Economics.

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10. <https://www.cnbc.com/2021/01/28/general-motors-plans-to-exclusively-offer-electric-vehicles-by-2035.html>



Further reading:

[Allocating the world's carbon budget](#)

[Reflections from COP26 — winners and losers](#)

In case you missed it, here's last month's round-up:

China in a global context



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