Counterflow

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45Q: Money for Nothing

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Binge watching the earlier Star Trek series (highly recommended), there is this enigmatic, fantastically powerful entity, Q. Now it seems that the Manchin-Schumer package is going to create an enigmatic, fantastically powerful Q for the Internal Revenue Code.

Up until now this section 45Q has been a limited source of tax credits for carbon capture projects. BTW, 87% of the tax credit claims didn't comply with IRS requirements.[1] As for direct grant subsidies for carbon capture, GAO recently reported that DOE spent $684 million in taxpayer money for six carbon capture coal projects of which *zero* are operating.[2]

Under Manchin-Schumer the 45Q spigot will be opened wide with taxpayers on the hook for carbon capture at power plants and elsewhere at a cost of $85/ton, and for direct carbon capture at a cost of $180/ton.[3]

Why would taxpayers want to:

- pay twice the cost for one type of carbon capture versus another?[4]
- pay a multiple of the tax credit cost of emission reductions from wind and solar generation of about $32/ton?[5]
- pay many multiples the cost of carbon offset credits that range from $7-$22/ton?[6]
- pay an even bigger multiple of the cost of emission reductions from LED lighting of $5/ton?[7]

Money — both public and private — is inherently limited for any and all purposes. Not

| *International Energy Agency*

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spending efficiently inherently undermines the task at hand.[8]

The 45Q Cost Is Likely to Be Ginormous, Contrary to Congressional Claims

The Joint Committee on Taxation and the Congressional Research Service claim that new 45Q is going to cost U.S. taxpayers an average of $323 million per year over the next 10 years.[9]

That seems fanciful.

45Q supporters say they want to stop the massive shift from coal to natural gas and renewables,[10] the shift that is responsible for enormous reductions in carbon emissions.[11]

These supporters presumably know what they need, and they lobbied for the $85/ton level. And won. The Carbon Capture Coalition says: "The bill includes all of the Carbon Capture Coalition's top legislative priorities for the 117th Congress."[12]

This Coalition goes on to say that the bill could deliver 210-250 million tons of annual emission reductions.[13] So at $85/ton that would be about $20 billion per year.

Princeton's ZERO Lab projects this level of annual emission reductions is reached in 2031, increasing rapidly to 450 million tons by 2035,[14] when the annual cost would be about $40 billion per year.

So let's call it about $30 billion per year, and contrast that with the Joint Committee on Taxation/CRS claim of $323 million per year. Congress is understating taxpayers' cost of new 45Q by a factor of about 100. A mere bagatelle.

One More Thing

There's another problem with the credit to the extent it succeeds in heading off coal retirements that would otherwise occur. That's because coal plants *with* carbon capture still emit about as much carbon as new gas plants *without* carbon capture.[15] So in those instances taxpayers would be paying an enormous subsidy for nothing.

Of course new (and existing) gas plants could install carbon capture. But the incentive is relatively small because (ironically) there's so much less carbon to capture. New gas plants also will have to confront the prospect of low energy prices when so much other generation — wind, solar and now coal — will have low if not negative marginal costs.

My head hurts.

P.S. This discussion of 45Q isn't intended to imply that the bill overall isn't better than nothing, especially since the alternative might be nothing for a long time. But taxpayers deserve better when it comes to provisions like this one. ■

[1] https://www.menendez.senate.gov/imo/media/doc/TIGTA%20IRC%2045Q%20Response%20Letter%20FINAL%2004-15-2020.pdf.

[2] https://www.gao.gov/assets/gao-22-105111.pdf, Table 1 on page 7. This table shows the Petra Nova project as operating, but as reported by GAO it was suspended in May 2020 and has not resumed operations. So DOE funding is 0 for 6. The GAO report reveals shocking mismanagement of taxpayer dollars by DOE.

[3] https://carboncapturecoalition.org/inflation-reduction-act-of-2022-makes-monumental-enhancements-to-the-foundational-45q-tax-credit/

[4] The Carbon Capture Coalition advocated these levels based on the relative costs of the two carbon capture technologies, https://carboncapturecoalition.org/wp-content/uploads/2021/09/Proposed-AJP-and-Infrastructure-Investments-1.pdf. This doesn't make sense: Why pay twice as much to subsidize one technology just because it costs twice as much?

[5] https://www.catf.us/wp-content/uploads/2017/12/CATF_FactSheet_Cost_of_CO2_Avoided.pdf, adjusting the $48.76/ton value, based on a PTC of $23/MWh, for the current/future PTC of $15/MWh.

[6] https://www.projectfinance.law/publications/2022/february/carbon-offsets-as-a-potential-source-of-revenue/

[7] The average light bulb in the U.S. is on 1.6 hours per day averaging 47.7 watts, which is 27.86 kwh/year. https://www1.eere.energy.gov/buildings/publications/pdfs/ssl/2012_residential-lighting-study.pdf. LED bulbs use 84% less electricity, cost about $2.50 each, and last 25,000 hours or more, for a lifetime of 42.8 years at 1.6 hours/day. Incandescent bulbs over a collective lifetime of 42.8 years would use a total of 1,192 kwh, which reduced by 84% is a savings of 1,001 kwh, which is 1 MWh. Reduced electric use reduces carbon emissions at 0.47 tons/MWh, https://www.catf.us/wp-content/uploads/2017/12/CATF_FactSheet_Cost_of_CO2_Avoided.pdf, so reducing emissions by 1 MWh at a cost of $2.50/bulb costs $5.30/ton.

[8] One example I've discussed before is offshore v. onshore wind where the former takes 11 times the subsidy for a given MWh of generation, which means we can get on average 11 times more onshore wind from a given dollar of subsidy. https://energy-counsel.com/docs/Offshore-Wind-Edifice-Complex.pdf. Ditto rooftop v. grid solar.

[9] Joint Committee on Taxation, https://www.finance.senate.gov/imo/media/doc/7.29.22%20Estimate%20of%20Manchin%20Schumer%20agreement.pdf, Title I, Subtitle D, Part 1, line 4, the total for years 2022-2031 divided by 10; adopted by the Congressional Research Service, https://crsreports.congress.gov/product/pdf/R/R47202, Table 5.

[10] https://www.eenews.net/articles/big-payout-more-co2-greens-split-over-dems-ccs-plan/, quoting the head of the Wyoming Mining Association: "From the industry standpoint, we see it as necessary to keep coal viable going forward."

[11] Gas plants displacing coal plants are responsible for 90% of the carbon emission reductions in PJM. https://www.energy-counsel.com/docs/NRDC-Prescribes-More-Carbon-Emissions.pdf. Also, https://www.energy-counsel.com/docs/we-see-through-a-glass-darkly.pdf.

[12] https://carboncapturecoalition.org/inflation-reduction-act-of-2022-makes-monumental-enhancements-to-the-foundational-45q-tax-credit/

[13] Id.

[14] https://repeatproject.org/docs/REPEAT_IRA_Prelminary_Report_2022-08-04.pdf, slide 13.

[15] A study of Wyoming coal plants says that coal plant emissions after carbon capture would be 0.29 kg/kwh, https://pubs.acs.org/doi/pdf/10.1021/acs.est.1c08837, page 9876, which converts to 650 lbs/MWh. EPA data on new gas plants shows average carbon emissions of 777 lbs/MWh, https://www.epa.gov/system/files/documents/2022-01/egrid2020_data.xlsx, PLNT2016 tab, column PLCO2RTA, for sample plants Riviera Beach, Colorado Bend II and Cape Canaveral.