21st Century Energy Infrastructure:

Federal Financing Options to Support Buildout of Carbon Dioxide Pipelines

Prepared by the State CO_2-EOR Deployment Work Group

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1. FEDERAL FINANCING OPTIONS FOR PRIVATELY OWNED LARGE-CAPACITY CO_2 TRUNK PIPELINES

OPTION	HOW IT WORKS	SIZE OF BENEFIT TO PRIVATE ACTORS	ADVANTAGES	DISADVANTAGES	COST TO THE FEDERAL GOVERNMENT
Apply President Trump's tax credit proposal (as described by Navarro and Ross) to the equity financed-portion of the whole pipeline.	82% tax credit on equity (or 13.7% of total capital cost if debt to equity ratio is 5 to 1).	~19-33% reduction in needed tariffs from shippers (shipping cost per ton of CO_2). Benefit could be much lower (~10-15% for investors without "tax appetite" but able to transfer credit). Note: The riskier the project, the more equity needed as % of total financing, hence the bigger the impact of this option.	Could be part of a class of eligible projects. This is valuable regardless of tax rates (a dollar of credit is worth a dollar reduction in tax bill due).	Requires legislation. New idea. Usefulness depends on tax status of investor, unless credit is assignable. Only parties with enough taxable income to use the credit can receive its full value.	10-29% of capital cost of project. Assumes 40% equity as % of total capitalization.

Note: See "21st Century Energy Infrastructure: Policy Recommendations for Development of American CO_2 Pipeline Networks," February 2017 for an explanation of the rationale for federal financing of increased capacity for up to five priority CO_2 trunk pipelines, available at: http://www.betterenergy.org/American_CO2_Pipeline_Infrastructure.

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Private Activity Bonds (PABs) for the debt-financed portion of the whole pipeline.	Tax-exempt bonds are issued by a local or state government "conduit" (no risk to taxpayers) **on behalf of** a privately-owned company to pay for pipeline capex. Note: It is important for new authorization of such bonds not to require "State Volume Cap Allocation" since for certain types of PABs, states have a total annual issuance cap derived by the IRS based on state population. If a "Volume Cap" was needed, other valuable bond programs would have to be reduced to make room for the pipelines.	~4% reduction in needed tariffs from shippers (shipping cost per ton of CO_2) for full taxpayer pipeline, but up to ~10% for pipeline not currently paying federal tax. Note: The riskier the project, the harder it is to access conventional taxable debt markets. If the project is higher risk, or if the project/pipeline company is not a cash taxpayer, PABs could be much more valuable than indicated above. Some PABs are subject to individual and corporate AMT, and others are not. We assumed these projects were subject to AMT. If these PABs were not subject to AMT, the interest rate would be lower and the benefit would be bigger.	CO_2 pipelines could be part of a class of eligible projects. Expansion of an existing mechanism that is extremely robust and gives access to a market with ~$4 trillion of outstanding securities and ~$200-400 billion of annual issuance. Depends entirely on private market credit decisions. Lower interest rate → smaller total debt payments → ability to safely use more debt with same income stream → less equity needed → more efficient financial structure because equity 3-5x more expensive than debt.	Requires legislation. Typically cannot combine a tax-exempt bond with any "federal guarantee" as defined in the tax code. Use of tax-exempt debt requires straight-line depreciation on assets instead of standard Modified Accelerated Cost Recovery System (MACRS) depreciation. Investment tax credit (ITC) disallowed pro-rata to extent of % of tax-exempt debt in capital structure. Note: The last two points not an issue if project/pipeline company not a cash taxpayer.	~1% of capital cost of project. Calculations include requirement to switch to straight line depreciation and reduced interest deductions, both of which nearly cancel out fiscal scoring cost of PABs.

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Federal loans via U.S. Department of Transportation: 1. Expansion of DOT's TIFIA program to include CO_2 pipelines; or 2. Create a broader infrastructure loan program that is modeled on TIFIA. TIFIA loans are valuable because they are "subordinated" or junior to the borrower's main debt financing. Hence, the principal can be paid back last in time, as well as last in terms of interest in a particular year. Loan is for up to 49% of total capital cost, normally 33%.	TIFIA provides direct loans, loan guarantees, and standby lines of credit to qualified surface transportation infrastructure projects of state and local transportation agencies approved by DOT. The projects must have a dedicated source of revenue with which to repay the federal government to be eligible.	~14% reduction in needed tariffs (shipping cost per ton of CO_2). **Note: The riskier the project, the harder it is to access conventional taxable debt markets. If the project is high risk, the government loan could be much more valuable than indicated above.**	Well-tested program. Expansion of an existing mechanism. Pipelines could be in included in a broader class of eligible projects. Lower-cost debt allows more efficient capital structure (see PAB discussion). DOT loans fit with existing DOT PHMSA safety regulation of CO_2 pipelines. A Brookings paper recommends expanding TIFIA to include seaports, airports, and other economically valuable infrastructure. TIFIA has been limited to surface transportation because its funding historically came from the gas-tax-supported highway trust fund (HTF), but this rationale should no longer apply since the HTF is increasingly supported by general revenues.	Requires legislation. Decision to extend credit creates NEPA requirements, even if no other federal "nexus" exists, but this may not be important if siting/routing involves federal BLM, Corps of Engineers, etc. Usefulness is limited because TIFIA debt "ascends" to equal status with other debt after a default. Requires investment-grade ratings, which may be difficult to obtain. DOT indicates program size has been small in recent years ($275 million per year).	0%-10% to ~40% of total project capital cost. Project assumed to take at least 4 years to permit and construct. Assumed 75% debt as % of total capital. Option 1: If project scored under 1 or 2-year horizon of appropriations bills, no proceeds would be disbursed during the scoring window → 0%. Or, if already authorized and appropriated loan program is used → 0%. Option 2: If analyzed in 5-year window, as §1705 loans were as part of EPAct 2005, and treated as a loan guarantee → 10%.[1] Option 3: If analyzed under a 10-year window, would be ~40%, calculated as loan proceeds less principal and interest receipts on loan during years 5-10 of scoring period.

[1] In EPAct 2005, CBO created score of ~11.2% by multiplying 80% debt x assumed 20% "credit subsidy" x 30% of loans occurring inside 5-year window, or 11.2% of program loan amount to be authorized under EPAct. See https://www.cbo.gov/sites/default/files/109th-congress-2005-2006/costestimate/s101.pdf. Our score is lower because we are using 75% debt cap. CBO is ambiguous as to whether their "80%" figure is 80% of total capital as debt, or 80% of total debt "guaranteed."

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DOE Loan Programs Office (LPO) loan for the entire debt portion of the pipeline's financing structure. Loan is for 75% of total capital cost.	Pipeline owner needs to apply to DOE for loan under an existing program. LPO would need to recognize long-distance CO_2 pipeline corridors as an "innovative" technology under the DOE LPO's funding available for Advanced Fossil Energy Projects.	~21% reduction in needed tariffs (shipping cost per ton of CO_2). Note: The riskier the project, the harder it is to access conventional taxable debt markets. If the project is high-risk, the government loan could be much more valuable than indicated above.	Does not require new legislation. There has never been a long-distance CO_2 pipeline constructed in the U.S. expressly to carry man-made CO_2 to oilfields that exceeds 200 miles, or one built with increased capacity to facilitate and accelerate future deployment of carbon capture and EOR projects.	Up to LPO whether these pipelines are "innovative" based on LPO criteria. Decision to extend credit creates NEPA requirements, even if no other federal "nexus" exists, but this may not be important if siting/routing involves federal BLM, Corps of Engineers, etc.	0% to 10% to ~40% of total capital cost of project. 0% using existing funds. 10% using EPAct 2005 CBO method. 40% if looked at as a direct loan with proceeds all spent during fiscal scoring window (after an offset for loan receipts from borrower inside the window).

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Accelerated depreciation for the whole pipeline.	Faster depreciation → bigger deductions early in project → smaller federally taxable income → lower tax payments → more cash to pay dividends to stockholders early in the project → smaller revenue needs to earn same returns. Currently, existing pipelines use 15-year MACRS depreciation, while a carbon capture facility is treated as chemical manufacturing and uses 5-year MACRS.	~16% reduction in needed tariffs (shipping cost per ton of CO_2) for an owner with tax appetite. ~8% or less for a non-taxpayer, assuming a transfer mechanism such as a lease is arranged. Note: Such accelerated depreciation, especially combined with large interest deductions on pipeline debt and possible ITCs, are likely to mean the pipeline is "losing money" in early years from the point of view of figuring tax payments—thus this "16% reduction" could be of little value if the pipeline's partners or owners were not large U.S. cash taxpayers before investing.	Consistent with the tax treatment of carbon capture facilities (5-year MACRS) or renewable energy (also 5-year MACRS). CO_2 pipelines could be included in a broader class of eligible projects. Expansion of an existing mechanism.	Requires legislation. Has very little value if the partners in the pipeline are not taxpayers, so a private or public pension fund investing in pipeline gets no benefit. Similarly, if the pipeline is owned by a Master Limited Partnership, any excess deductions have no value to individuals who own MLP interests.	~ 20% of total capital cost of project. Estimate derived by comparing depreciation schedules for 15-year vs. 5-year MACRS during a 10-year fiscal scoring window. Assuming 4 years of permitting/construction followed by first six operating years of project, multiplied by tax rate; effectively comparing all six years of the 5-year schedule to the first six years of the 15-year schedule.

2. FEDERAL FINANCING OPTIONS FOR JOINT (50/50) PRIVATELY AND PUBLICLY OWNED LARGE-CAPACITY CO_2 TRUNK PIPELINES

OPTION ON PRIVATE PORTION & OPTION ON PUBLIC	HOW IT WORKS	SIZE OF BENEFIT (Blend Tables 1 & 3)	ADVANTAGES	DISADVANTAGES	COST TO THE FEDERAL GOVERNMENT
No benefit on private portion. Initially 50% federally owned and then transferred to private ownership.	Combination of private options of Table 1 and federal option of Table 3, in 50/50 combination. Federal government would need an agency authorized to either contract as a shipper (to take up slack in customer base) or to simply own a portion of the pipeline in an undivided interest format, selling increments to the private owner as needed.	21% reduction in needed tariffs from shippers.	See above.	Unprecedented for CO_2 pipelines.	0-10% of project capital cost, depending on scoring regime.

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82% ITC on equity on the private portion only. Initially 50% federally owned and then transferred to private ownership.	Same as above, but assuming undivided interest. Federal portion not eligible for ITC.	31-38%	See above.	Same as above.	14%-24% of project capital cost, depending on scoring regime.
Private Activity Bonds for the private portion. 50% federally owned or financed.	Same as above.	23%	Low-cost financing.	Same as above.	0.5%-10% of project capital cost, depending on scoring regime.
DOT's TIFIA loan for CO_2 pipelines for the private portion. 50% federally owned or financed.	Same as above.	27%	Low-cost financing.	Same as above.	0%-14% of project capital cost, depending on scoring regime of both loans and federal ownership.
DOE Loan Programs Office (LPO) loan for the private portion. 50% federally owned or financed.	Same as above.	32%	Same as above.	Current prohibition against "Federal Assistance" in LPO legislation. Need to explore how joint ownership would work.	0%-15% of project capital cost, depending on scoring regime of both loans and federal ownership.
Accelerated depreciation for the private portion.	Same as above.	29%	Same as above.	Assuming undivided interests, federal portion not depreciable.	10%-20% of project capital cost, depending on scoring regime of federal ownership.

3. 100% FEDERAL OWNERSHIP UNTIL PIPELINE FULLY SUBSCRIBED, WITH SUBSEQUENT PRIVATIZATION AT FAIR MARKET VALUE

OPTION	HOW IT WORKS	SIZE OF BENEFIT	ADVANTAGES	DISADVANTAGES	COST TO THE FEDERAL GOVERNMENT
Initial federal ownership of the whole pipeline, then privatized.	Needs some part of federal agency such as DOT or DOE to be authorized to construct and fund, plus authority to privatize, once fully contracted. Project would probably be financed with a loan from the U.S. Treasury, secured by repayments from a federal pipeline entity (similar to Bonneville Power Administration's transmission borrowing/repayment).	~43% reduction in tariff. 100% debt financed at Treasury borrowing rate.	Significant. Since there is no equity, and extremely cheap debt; even a small original shipper group can easily carry the entire pipeline via "ship or pay" long-term tariffs matching the life of the associated Treasury borrowing. When line is sufficiently subscribed, privatization can occur based on high valuations normally placed on completed, operating, highly-subscribed pipelines.	Requires legislation. Unprecedented for CO_2 pipelines, although there are similarities to Federal long-distance electric transmission projects.	0-20% of project capital cost. If scored under the appropriations practice of a 1 to 2-year horizon, the fiscal score would be zero because there would be no expenditures during permitting and construction. If scored under 10-year horizon, and assuming 65% of projects are privatized within 10 years and 35% not privatized, should score ~20%.