Public Comments on TCI
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The latest Transportation Climate Initiative (TCI) modeling information[1] presented September 16, 2020, has several significant problems highlighted below. TCI, at its core, is an attempt to raise gasoline and diesel fuel prices through taxation to force people to drive less. The tax revenue will be primarily used to subsidize expensive electric vehicles, to build bicycle and walking trails and to expand public transportation as alternatives to private vehicles. The underlying goal is to reduce carbon dioxide emissions (CO_2). To sell this idea the major proponent, the Georgetown Climate Center, has exaggerated the expected results, and the benefits, while camouflaging the costs.

The most aggressive tier of taxation has a goal to reduce emissions from motor vehicles by 6%. It would raise gasoline prices in 2022 by 19.6 cents/gallon rising steadily to 32 cents in 2032 for an average price increase of almost 26 cents over the ten year period, raising over $73 billion in revenue in twelve states. TCI will likely follow the decade old model program known as the Regional Greenhouse Gas Initiative (RGGI) that placed a similar tax on electric generation.

Ultimately, the Governors of each state hold the power to determine participation in the program. However, a non-governmental, multi-state agency with no public oversite will determine how to spend the money with limited legislative oversight. Maryland, as one participant in a twelve state program, may have little say in these decisions.

Some key highlights of this analysis are:

- People drive out of necessity and higher fuel prices result in a very small reduction in driving. The planned tax will likely only reduce driving one-half percent by 2032. Electric vehicles are $16,000 to $20,000 more expensive than conventional vehicles, and reduce emissions by a very small amount as they require much more energy to produce, and generating and moving electricity to charge them also results in significant emissions. Battery cost are falling very slowly. An analysis for the Georgetown Climate Center based on RGGI experiences shows TCI will yield only half the emissions reduction as projected by TCI documents. RGGI investments in emission reduction was accomplished at 10 to 25 times less cost per ton than the TCI program projects. In reality the 6% reduction scenario may lead to as little as a 1% reduction in emissions. Even the projected 6% program reduction will impact national fuel use by only 0.06%.
- The program claims to consider environmental justice for the poor. In reality everyone, including the poor, will pay about $254 more for gasoline a year, or $2,540 over the ten year period. A few wealthy people will receive large subsidies to

buy over-priced electric vehicles that will avoid conventional fuel tax, have subsidized electric rates and charging stations, and will have use of high occupancy rush hour travel lanes.

- The US is moving very quickly to replace diesel fueled buses with similarly priced natural gas powered busses that reduce emissions by 37% and lower operating and maintenance cost. TCI wants to replace the newer busses with electric powered busses that cost twice as much, have a history of running out of charge during the day, and are recharged primarily by the same natural gas used less efficiently as electric generation fuel, and are subject to transmission and DC conversion losses.
- TCI proponents also want to use the tax revenue to build bike lanes primarily used for recreation, and to remove roadway bottlenecks that could just as easily be improved with existing conventional gasoline taxes without a tax increase.
- Proponents suggest the tax will be offset by growth in the economy, and health co-benefits of reduced air pollution. TCI modeling itself expects economic growth of an insignificant 0.05%, and even that amount does not take full account of the negative impacts of the tax increase. We have national air quality standards set at levels to ensure safe health conditions. Most of the TCI region is in compliance with the standards, or will be shortly. The health benefits used in TCI modeling are greatly exaggerated. Modeling also suggests the tax may be higher than currently projected to meet the goals.
- There are numerous concerns about how the program will work in practice. Gasoline and diesel fuel owners at regional storage facilities will be responsible for buying and submitting emission allowances purchased in auctions managed by a non-governmental agency. The fuel may be shipped from a non-TCI state, or be in a TCI state shipping fuel to a non-TCI state, but will still have to participate in reporting, and in buying allowances. Tanker truck owners who only deliver the fuel might also have to buy allowances, and file reports in certain situations. The compliance process is very complex, and will not be overseen by any state taxing authority.
- The tax will decrease revenue from conventional gas taxes, and will increase state and municipal spending, as public services such as snow plowing, collecting trash, and transporting school children will be burdened with significantly higher fuel costs.
- With the real potential of a national tax that would replace this regional plan, and the need to recover from the economic impacts of the COVID pandemic this is just not the right time to be considering the TCI program.

Carbon dioxide savings of the TCI program overstated

The scenario targeting a 25% savings in emissions from the 12 state region finds emissions will be reduced 15 million metric tons by 2032 compared to no TCI. However, in the appendix a study by ICF International indicates only 11.8 million tons will be saved and that is partially offset by increased emission of 3.7 million tons from increased electric generation to

power an increased number of electric vehicles. So, the actual emissions savings will only be half as much as claimed, or 3%.

Of even more concern, TCI is counting on higher prices to discourage driving, but travel necessity makes fuel use very inelastic. A study by the U.S. Energy Information Agency[2] found motor fuel prices would need to increase 25 to 50 percent to reduce driving by 1 percent, or a $3.72/gallon price increase to get a 6 percent reduction compared to the current plan of a maximum $.32 increase. This suggests the planned $36/ton auction price will only reduce emissions about 0.5%, not 6%.

Allowances price forecast may be understated

In the 25% reduction scenario the projected allowance price per metric ton in 2032 is $36. However, on page 53 covering the range of potential prices the cost may be 28% higher at $46/ton. Over the forecast period of 2022 to 2032, auction revenue could total $95 billion instead of $73 billion. Combining the higher auction revenue with the lower emission savings means each ton of emission savings from the spending of the TCI revenue could cost $2,162/ton instead of $887. In comparison the RGGI program only spent $79/ton through 2018 per ton emission savings investments[3]. The US EIA study on price elasticity mentioned above suggest a 6% emissions reduction may require an allowance price of $418/ton.

Assumption RGGI is a successful program are wrong

TCI is modeled after the Regional Greenhouse Gas Initiative (RGGI) with a claim that the RGGI program is successful. A comparison of RGGI states to non-RGGI states[4] with similar energy policies requiring additions of wind and solar power, and deregulated wholesale power over the period 2007 to 2015 showed:

- Essentially no difference in CO_2 emission reductions after adjusting for lost goods production (12% drop in RGGI states compared to 20% increase in non-RGGI states), and lost in-state power generation in RGGI states (power imports increased from 8% to 17%).
- GDP growth of 17% in Non-RGGI states compared to 7% for RGGI states
- Non-RGGI states had a larger increase in energy intensity (11.5% v. 9.6%), and in-state renewable energy (6% v. 3%)

The potential economic benefits of TCI are overstated

- TCI reports the 12 state GDP is $5.3 trillion, and the TCI program may add $0.7 to $3 billion, or an insignificant .01% to .05%. As shown above GDP is more likely to fall then rise. Re-directing $7 to $9 billion a year in TCI auction revenues from productive market driven use to inefficient subsidies for over-priced products will almost certainly hurt GDP.
- TCI also estimates CO_2 reduction has a benefit, but is using an exaggerated Social Cost of Carbon that compares domestic costs to global benefits. The most recent estimates from the US EPA[5] use US Office of Management & Budget guidelines to only compare

domestic costs to domestic benefits and to use a 3% and 7% discount rate to calculate a Net Present Value of $2 to $8/ton value of reduced emissions in 2030. Using that estimate with a range of CO_2 savings of 8 to 15 million tons in 2032 yields a savings range of $16 million to $120 million compared to the TCI estimate of $249 to $892 million.

- TCI also calculates public health benefits from the co-benefits of air pollution reductions, and fewer motor vehicle injuries from fewer miles driven. However, the ICF study suggests the miles driven estimates are too large, and the air pollution benefit estimates have several flaws. The air pollution reduction estimate is overstated by two to six times just like the CO_2 reduction estimate. Further the estimates use out-of-date values. The US EPA now states[5], with high probability, health benefits should only be considered for exposure above the National Ambient Air Quality Standard (NAAQS). The TCI estimates assume health impacts from any exposure over zero.
- 85% of the TCI claimed health co-benefits come from the mortality cost of exposure to fine particles[6]. In the past the EPA used any exposure above zero as the threshold, but now considers that a low probability. In the entire 12 state region there is one air quality monitoring station out of 9 in Allegheny County, PA that is over the NAAQS by 9%. There is an implementation plan to bring that station into standard. Likewise there are 10 million people out of 70 million in the 12 state region that experience marginally higher levels of ground level ozone than the NAAQS[7]. Most likely the ozone standard will be met as non-TCI improvements reduce available ozone precursors.
- It is unlikely there will be any health savings from the marginal reductions expected from the TCI.
- The planned tax will average $.258 per gallon between 2022 and 2032. The average family may pay an extra $254 a year[8] for gasoline. The total annual cost could average $7,317 million[9] and non-tax states won't have this penalty, and will gain a competitive advantage.
- With a 12 state average of almost 11% of families living below the poverty level[10], and many of them living in rural areas with longer trips and no public transportation, this extra cost will hit the poor hardest. Only the rich have been able to afford electric vehicles.
- TCI will also increase state and municipal spending, as public services such as snow plowing, collecting trash, and transporting school children will be burdened with significantly higher fuel costs.
- As fuel use declines conventional fuel tax revenue will fall limiting funds for highway construction and repair. Electric vehicles don't contribute to highway trust funds.

Practical implementation concerns alone bring the concept of TCI into question

Jeff Wennberg, a key designer of the RGGI program stated in the Rutland Vermont Herald[11], the TCI needs three elements to work; the participants in the program must make the key decisions affecting emissions, there should be few participants, and the participants should be sophisticated players with significant technical and financial resources. There are relatively

few electric generators in each state, with highly trained engineers to improve efficiency, and even to switch to lower emitting fuels. Electric generators tend to be well financed. In contrast, hundreds of fuel wholesalers simply deliver what is asked with no control over fuel choice, or the efficiency of the vehicles using the product. 72 million consumers will make the decisions on fuel efficiency, with little information, and financial resources only partially motivated by an invisible tax. TCI meets none of the key requirements to support a successful cap and trade program.

TCI is not a good use of resources considering recent events

- There is a robust debate on a national tax on emissions that may supplant state initiatives.
- The current economic impact of the COVID pandemic limits support for any new tax. Polls in VA and VT found only 34% and 38% support for TCI when the cost is known[12].
- Regional interest in TCI is falling; Governor Sununu has announced NH will not participate, Governor Scott in VT opposes carbon dioxide taxes, Governor Mills of ME opposes a tax that would be passed on at the pump, and VA, and NJ have had recent conventional gas tax increases squeezing out TCI taxes.
- The average TCI estimate for motor fuel reduction is 3.5%, or about 91 million gallons/143 billion gallons used in the US, or an insignificant .06%
- Commitments to the multi-state Climate Alliance calls for a CO_2 emission reduction of 26% to 28% by 2025 from 2005 levels. Emission inventory trends from the US EIA, and RGGI, Inc. indicate emissions in Delaware had already fallen by 32% by 2019, and 35% in Maryland[13]. TCI is not needed to meet the Climate Alliance goals.
- Increasing national vehicle efficiency standards is a proven alternative to reduce fuel use. TCI assumes policies already in place will have five times the impact on emissions reductions. The TCI is simply not needed.

Planned tax revenue spending plans are likely to be ineffective

- TCI will spend 81% of revenue subsidizing the purchase of electric vehicles. TCI assumes big electric vehicle purchase subsidies are needed. Last year Tesla reduced electric vehicle (EV) prices up to $5,000 [14] to compensate for $7,500 in lost federal subsidies. The TCI assumption large subsidies are still needed to maintain current sales volumes is overstated.
- TCI contemplates spending 54%, or about $40 billion of revenue subsidizing the purchase of about 10 million light duty, all electric cars and trucks, or about $4,000 per vehicle. Currently, electric vehicles are adding $16 to $20 thousand to the purchase price of a new vehicle. Generously assuming EV price premiums are cut in half the proposed subsidy may only cover half the premium cost of EVs maintaining the same ratio as 2018. It seems unlikely the proposed subsidies will stimulate EV sales increases as forecasted. The planned subsidy also means EV buyers will have to pay half the premium cost of an EV leading to only the more affluent being able buy EVs leaving out the poor.

- The Chevrolet Bolt and the Honda Fit are both hatchbacks, and are basically compact vehicles. The Bolt uses a 60 KWh battery weighing 960 pounds, for a range between charges of 238 miles, similar to a base model Tesla Model 3. A cradle to grave comparison in carbon dioxide emissions between the Bolt and the Fit in the PJM regional electric transmission area shows the Bolt will save essentially zero emissions. The Bolt will use 27,778 KWh of electricity which emits 1.18 pounds/KWh (0.933 pounds/KWh PJM Systems Mix marked up 21.5% for transmission and charging efficiency losses), or 16.4 tons of CO_2 over its life. In addition, various reports estimate manufacturing of the EV will emit between 6 to 13 tons more than a mid-size internal combustion engine vehicle for total emissions of 22.4 to 29.4 tons. The Fit will use 2,778 gallons of gasoline which emits 18.9 pounds/gallon of E10 gasoline, or 26.2 tons of CO_2. The lifetime emissions savings of the Bolt may range between -3.2 and +3.8 tons, or an average of essentially zero savings. The assumption EVs will save emissions may be overestimated.
- TCI expects significant investment in electric buses will lower emissions. However, about 60% of buses had already switched to alternative fuels by 2017[15] to reduce emissions, and lower costs, and the trend will continue as using natural gas lowers fuel and maintenance cost, and the buses cost about the same as diesel busses. Natural gas generates 37% less CO_2 than diesel, or about 8 pounds per gallon equivalent. The gas is more efficiently burned directly in a bus instead of burning it in a power plant with transmission and DC conversion losses of over 20 percent. Fleets are unlikely to switch to electric buses that cost two times as much as a natural gas powered bus. Public transit ridership has fallen dramatically over COVID concerns, and may not recover with more people working remotely suggesting public transit will become less efficient on a passenger-mile basis.
- TCI assumes more electric vehicle charging stations are needed, however last year the Delaware Public Service Commission found the competitive charging market has delivered the needed stations, and declared they would not regulate the market[16]. Vermont made a similar decision. As more electric vehicles enter the fleet more charging stations will be built to meet demand. The current trend of 80% of charging being done at home at one-third the cost of using a public charging station should continue.
- TCI expects to spend 10% of the revenue to encourage more bike and pedestrian travel by building trails. It is unlikely a significant number of people are going to leave their cars for walking, or bicycling. Most trails are used for recreational purposes and do not reduce vehicle miles traveled.
- TCI also expects to spend 9% of revenue reducing traffic bottlenecks. That need can just as easily be met with conventional fuel taxes used in highway construction.

References:

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7) US EPA NON-ATTAINMENT AREAS FOR OZONE, HTTPS://WWW3.EPA.GOV/AIRQUALITY/GREENBOOK/JNCTY.HTML
8) Average miles driven per year in 12 states for 2019, 13,264 with 3,644,509 licensed drivers, https://www.mycarinsurance123.com/average-miles-driven-per-year/ , Number of households in 2019, 2,287,452 https://www.statista.com/statistics/242258/number-of-us-households-by-state/ , equals 2 drivers per household X 13,264 = 21,964 miles per household, average miles per gallon in 2019, 22.3, https://www.greencarcongress.com/2019/12/20191203-doetax.html , fuel use per household 21,964/22.3 = 985 gallons X $.258/gallon = $254 TCI tax/year/household
9) Total motor fuel use in 12 states in 2017 was 28.4 million gallons X $.258/gallon average TCI tax = $ 7,317 million/year, US Department of Energy, Motor Fuel Use by State 2017, Total US motor fuel use was 143 billion gallons, http://ipsr.ku.edu/ksdata/ksah/energy/18ener6a.pdf
10) Poverty Rate by State, 12 state average 10.8% with a range of 7.5% in NH and 14.4% in NY, https://worldpopulationreview.com/state-rankings/poverty-rate-by-state
11) Rutland Herald, TCI Criticism, Jeff Wennberg, 1/3/2020, https://www.rutlandherald.com/opinion/commentary/tci-criticism/article_b8f69d01-576f-5e0f-a1b9-0cee6a54a0f2.html
12) Thomas Jefferson Institute Virginia TCI poll, https://www.thomasjeffersoninst.org/files/3/VA1219TCIResults.pdf , Ethan Allen Institute Vermont TCI poll, https://www.ethanallen.org/poll_majority_of_vermonters_oppose_tci_tax_gwsa_lawsuits
13) For Delaware US EIA shows emissions fell to 12.3 million metric tons in 2017 from 16.7 million in 2005. RGGI, Inc. shows emissions from the electric industry dropped another 0.9 million tons by 2019, and fuel economy improved 2.4% for an additional 0.1 million tons resulting in estimated 2019 emissions of 11.3 million tons, a 32.3% reduction. For

Maryland US EIA shows emissions fell to 52 million metric tons in 2017 from 82.8 million in 2005. RGGI, Inc. shows emissions from the electric industry increased 2.3 million tons by 2019 from new power plants, but fuel economy improved 2.4% for an additional 0.7 million tons reduction resulting in estimated 2019 emissions of 53.5 million tons, a 35.4% reduction.

14) The popular Model 3 AWD with extended range dropped from $54,000 at the beginning of 2019 to $49,000 by March, https://insideevs.com/news/343373/teslas-confusing-price-changes-heres-a-chart-of-the-adjustments/
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16) Delaware Public Service Commission Docket 19-0377, "Jurisdiction over electric vehicle charging stations", Order 9516, file:///C:/Users/dtste/Downloads/Docket%20No.%2019-0377%20Order%20No.%209516.pdf