

Testimony submitted to the  
Joint Committee on Telecommunications, Utilities and Energy

Hearing on Carbon Price, Competitive Supply, and Consumer Protection

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Thank you for providing me with the opportunity to comment on legislative initiatives to promote carbon pricing in Massachusetts. I am a macroeconomist and econometrician. My current research is in the economics and policy of climate change and the energy transition. In 2013-2014, I was a Member of President Obama's Council of Economic Advisers, where my portfolio included macroeconomics and climate/energy policy.

Let me preface my remarks by underscoring how important it is that we take action to reduce emissions of greenhouse gases. The past year has seen a remarkable change in the public awareness of the need to decarbonize our energy system. This has been driven in part by a series of extreme events, including the horrific fires in California and Australia, and last year having the second-warmest temperatures on record. Closer to home, just last weekend we shattered temperature records, with two consecutive days in early January having highs over 70 degrees. While none of these events is directly caused by climate change, climate change makes all of them, and other such extreme events, more likely.

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Despite this increasing public awareness, our efforts to date have been wholly inadequate. Although US CO2 emissions fell by 2% last year, that was almost entirely a result of declining coal use for electricity, and transportation emissions remained flat despite improved fuel economy. US emissions remain where they were in 2016, and we are not on track to meet our Paris 2025 target of 26-28% reduction, relative to 2005. In fact we are less than half way there.

Decarbonizing the energy system requires a suite of economic policies. A key component of those policies is placing a price on carbon.

A carbon price works through three mechanisms.

First, the carbon price is passed on to consumers, raising the price of energy somewhat and reducing demand. This effect is small however. For example, a \$10/ton carbon price, operating through this channel alone, would reduce emissions from cars and trucks by only 1-3% over the long run.

Second, the carbon price encourages substitution. This effect is quite large in the power sector and even the low RGGI permit price provides a meaningful incentive to shift away from fossil fuels for generation. In the transportation sector, for this channel to be effective, there needs to be alternatives to using gasoline and diesel. In practice, this means expansion of public transportation options and, especially, affordable electric vehicles.

Third, to the extent that the carbon price generates revenues, some uses of those revenues can grease the wheels of substituting towards low-carbon fuels. In the transportation sector, a smart set of policies aimed at building out charging station infrastructure, such as could be supported by the Transportation and Climate Initiative, is one such example.

### **Evidence from Europe suggests that a carbon price does not dampen growth of GDP or jobs.**

A commonly raised concern about a carbon price is that it might have a negative effect on jobs and economic growth. Nearly all the studies of the effects of carbon pricing to date have used complicated simulation modeling to project how the economy might respond to a carbon price. A reasonable thing to ask is, well, what is the evidence if we look at entities that have actually implemented a carbon price? How have their economies and job markets fared?

To this end, Gib Metcalf and I recently undertook a study of the macroeconomic effects of carbon pricing in 31 European countries, using data from 1985 through 2018.<sup>2</sup> All of these countries are in the European Union Emissions Trading System, a cap-and-trade system that covers power plants and large manufacturing facilities. Some of them also adopted, at different times, a carbon tax, which typically apply mainly to the transportation sector and exempt facilities covered by the power sector cap and trade system. All but three of these economies

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<sup>2</sup> Metcalf, G. and J.H. Stock. 2020. "Measuring the Macroeconomic Impact of Carbon Taxes," forthcoming, *American Economic Review*.

are in the European Union and so are connected by trade with low barriers. The median population for these countries is 8 million, only slightly larger than Massachusetts. Thus, these European countries provide a plausible comparison for what might happen if Massachusetts were to adopt a carbon price, applied to the transportation sector as in the TCI, or to both the transportation and residential sector.

Theoretical models of carbon pricing suggest that there would be an initial slowdown in employment and output, which would then increase to a value at or slightly below the growth rate that would occur absent the carbon price.

To our surprise, this is not what we found. Rather, countries that adopted a carbon price actually saw an *increase* in GDP growth and employment growth. Concerning employment, after a brief increase, the growth rate fell back to the normal level, so that the carbon tax gave a temporary *positive* boost, then basically back to normal.

There are several possible explanations for this positive effect. In particular, some of the countries that adopted a carbon tax used those revenues to reduce very high personal or corporate income tax rates. Such changes would not be relevant to Massachusetts, at least under legislation that has been contemplated. Thus we are reluctant to push our finding that carbon taxes are good for the economy very hard. Rather, our main takeaway from this analysis is that there is no evidence for a negative effect of the carbon tax on either GDP growth or employment.

We do not examine the experience of British Columbia, which implemented a revenue-neutral carbon tax in 2008. Research by others finds a similar result to ours, with some research finding a small boost in aggregate employment associated with the carbon tax, and other research finding no effect.<sup>3</sup>

Our estimates concern economy-wide effects, and it is important to keep in mind that a carbon price will affect different entities differently. For our major industries in Massachusetts, such as education and health care, a carbon price would reflect a very small component of total costs and would not be expected to have noticeable effects on employment. For a small number of Massachusetts industries, such as chemical manufacturing, non-electricity energy costs are a

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<sup>3</sup> Yamazaki, Akio. 2017. "Jobs and Climate Policy: Evidence from British Columbia's Revenue-Neutral Carbon Tax." *Journal of Environmental Economics and Management*, 83, 197-216; Bernard, Jean-Thomas, Maral Kichian, and Misbahul Islam. 2018. "Effects of B.C.'S Carbon Tax on GDP," USAEE, Research Paper Series No. 18-329; Murray, B. and N. Rivers. 2015. "British Columbia's Revenue-Neutral Carbon Tax: A Review of the Latest 'Grand Experiment' in Environmental Policy," *Energy Policy*, 86, 674-683; Olale, E. et. al. 2019. "The Effect of Carbon Tax on Farm Income: Evidence from a Canadian Province," *Environmental and Resource Economics*, 74, 605-623.

major consideration, as they are for rural residents, and it is appropriate to mitigate disproportionate impacts on energy-intensive sectors or regions of the Commonwealth.<sup>4</sup>

### **A carbon price should be stable and predictable**

There are various ways to implement carbon pricing. Rather than get into the details, I want to stress a guiding principle: that the resulting carbon price path should be predictable. A “no-surprise” carbon price path provides companies and individuals the ability to plan and invest.

In other research, I have studied the Renewable Fuel Standard (RFS), which has attributes of a cap-and-trade system applied to biofuels. Since 2013, allowance prices in that system, which are the credit price for blending a gallon of conventional renewable fuel into the fuel supply, have fluctuated from less than \$0.10 to more than \$1. These are large swings when compared with the price of a gallon of gasoline. The high level and especially the volatility of these prices has led to the program becoming politicized and subject to a great deal of industry pressure from both the petroleum and biofuels industries. To many, the RFS is seen as a failure that has locked in a small amount of first-generation biofuel while failing to make major market penetrations that would pave the way for low greenhouse gas second-generation fuels. My

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<sup>4</sup> The European evidence is consistent with projection is the 2014 Mass DOER study of potential carbon pricing in Massachusetts. (Marc Breslow, Sonia Hamel, Patrick Luckow, and Scott Nystrom, “Analysis of a Carbon Fee or Tax as a Mechanism to Reduce GHG Emissions in Massachusetts,” December 2014.) Although the numerical values in that study are out of date, and that study focuses on an economy-wide fee not a sectoral fee, the report’s findings remain relevant. The DOER study finds that a carbon fee will have a small effect on economic growth, in fact, this small effect would be positive for employment and (for small fees) for Gross State Product. The reason for this surprising result is that Massachusetts gets all its fossil fuels from other states. So spending less on fossil fuels means less fossil fuel imports – and less money shipped out of state for those fuels. Because the money from the fee is rebated, the consumer now has more to spend. Some of that extra spending will be on Massachusetts goods and services, such as restaurants and retail trade, which tend to be more labor-intensive than fossil fuel distribution. This is not a big effect, but there likely would be a small employment bump from the carbon fee. I find these study results for state economic activity plausible and applicable to the proposals under discussion today.

There are potential economic upsides of a climate fee that are difficult to quantify, and that are excluded from the conservative assumptions of the study, but which could be important. By being on the forefront of states tackling climate change, new green technology firms could be drawn to Massachusetts. Enormous investments in low-carbon technologies will be made globally over the coming decades, and a Massachusetts carbon fee could help the Commonwealth be on the ground floor. And by learning to operate in an environment with a price on carbon, Massachusetts businesses will be ahead of their national competitors when national policy does, eventually, place a price on greenhouse gas emissions.

analysis suggests that the uncertainty of the tradable permit price and associated programmatic uncertainty are essential design flaws that led to the failures of this program.

The lesson is that a stable carbon price is important for both economic and political reasons: economic, so that consumers and businesses can take count on when they make investments in energy technologies and major purchases like cars, and political, to avoid negative reactions when energy consumers are suddenly faced with unexpectedly high carbon prices.

### **Massachusetts can be a national leader in adopting a carbon price**

Because the US is a highly integrated economy, Federal action will be needed to make significant economy-wide progress towards the goal of decarbonization. But we need not and should not wait for Federal action, and the Commonwealth, ideally in conjunction with partner States, can take meaningful steps today on the path towards emissions reduction. Indeed, through aggressive offshore wind procurements, the recent extension of the MOR-EV program, and other measures, the legislature is doing so already.

But these important actions, for which the legislators here should be congratulated, are not enough. An important next step is leading the way among states to place a price on carbon outside the power sector.