

Appendix 1: Post-Charrette Correspondence

(A) Post-Charrette Correspondence from Travis Bradford:

From: Travis Bradford <tbradford@prometheus.org>
Subject: Re: Useful discussion
Date: October 12, 2016 at 9:47:52 AM EDT
To: Rod Richardson <rrr.grf@gmail.com>

Rod –

Trying to get this to you quickly, so apologies for any errors or omissions.

Optimizing Clean Tax Cuts –

In thinking about the most effective way to use tax reduction to target clean energy (or resource) deployment, it seems definitional that the goal is to encourage the most capital investment in targeted technologies. Doing so is most likely done at one of three levels of taxation around clean investment – 1) at the corporate level of firms deploying these assets, 2) at the project level for firms developing these projects, or 3) for investors who provide the financial capital for these capital intensive projects. The most direct mechanism for achieving the desired outcome is the third. Corporate tax abatement is too diffuse and is likely to achieve perverse outcomes of investment strategies by firms, depending on exactly how the tax cut is structured. Project level tax abatement is not effective because of the low level of project level taxes paid for these types of assets until the heavy depreciation burden and interest expense have been burned through at the project level. Incentivizing capital providers through strategies similar to municipal bond tax abatement for interest and dividend income from approved investments will direct capital specifically to those assets and will be instantly realizable by the investors.

Plus, many design options exist – partial tax abatement, tax abatement based on the realization of the project performance, double abatement in the form of carbon capture and sequestration, declining abatement potential over time to incentivize accelerated investment. It is super flexible. Also, it probably just simply corrects for existing distortions in the tax code through MLPs where certain conventional energy assets have pass-through status and only one level of taxation. This levels the playing field somewhat for clean assets.

A hidden advantage of targeting investors –

Here is the cool part of this - a significant amount of the tax abatement that occurs will go to driving down the imputed interest rates of interest that these projects and their assets bear – again similar to municipal bonds that have much lower cost of capital than equivalently risky private-sector borrowers. Given that the set of technologies that are being financed are largely capital-based, with very little fuel or O&M costs in their total cost structure, this has a major impact on reducing the cost of delivering the output from the asset – somewhere between 15 and 30%, depending on specific circumstances. A clean energy solution would see its leveled cost of electricity fall by this amount.

I have included a related chart from my forthcoming textbook on this to see the effect. Simply, reducing project WACC by a modest amount, the levelized cost of delivering the output of that asset falls. This means that the investors are not only getting tax abatement, but they are creating the conditions that drive down the cost of clean solutions directly. This WACC reduction will take a technology that may be a 25% too expensive and make it cost effective, or one that is already cost-effective would become 25% cheaper than other solutions. Cheaper solutions have the effect of creating substantially larger potential markets for these technologies opening up many more options for cost effective deployment – simply, clean tax cuts at the investor level increase the supply of clean solution investment opportunities and the demand for them simultaneously.

Original WACC	Rate Reduction			
	3.5%	3.0%	3.5%	2.0%
9.0%	-26.8%	-23.2%	-19.5%	-15.7%
8.0%	-28.0%	-24.3%	-20.4%	-16.5%
7.0%	-29.3%	-25.4%	-21.4%	-17.3%
6.0%	-30.6%	-26.6%	-22.4%	-18.2%

Assumptions: Amortized capital costs only; No O&M or fuel costs; 25 year lifetime.

Hope that helps. I am sorry, but the agriculture point seems to have escaped me. Perhaps Paul could refresh my thinking of the context of the conversation, or we save that one for the sequel.

Best wishes and many thanks.

TB

TRAVIS BRADFORD

Faculty, Columbia University

Director, Energy and Environment Concentration, SIPA

[420 W. 118th Street](#) (at Amsterdam), #804

President, Prometheus Institute

[520 W. 112th St., #16A](#)

[New York, NY 10025](#)