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# Policy Parity for CCS/CCUS

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## The Continued Case for CCS

The global energy industry is expected to more than double its service to our customers by 2050. This is due to:

- A projected population increase of over 2 billion people;<sup>i</sup>
- The need to meet the energy demands of 1.2 billion people who today are completely unserved. They have no access to commercial energy- no electricity- no liquid fuels;<sup>ii</sup>
- The need to meet the energy demands of 1.3 billion who are not adequately served with commercial energy.

Collectively this means we will need to serve another 3.4 billion people with electricity while maintaining supply to the existing 3.7 billion consumers. This needs to be done with production, distribution and utilization being safe, affordable, reliable and clean. Dramatically increased consumers demand will be met by a broad portfolio of resources and technologies including:

- Energy Efficiency and Demand Management
- Renewables: Hydro, Solar, Wind, Geothermal, Biomass and others
- Nuclear: particularly advanced generation technologies and small modular reactors and

- Fossil Fuels: Coal, Natural Gas, Petroleum and Derivative fuels

We will need to accomplish this while reducing greenhouse gas emissions, globally by 50%- and in OECD countries by 80%. Meaning- doubling our energy service to consumers while simultaneously decarbonizing the global energy sector. This cannot be done without Carbon Capture & Storage (CCS) and Carbon Capture, Utilization, & Storage (CCUS). It is important to implement actions needed now to establish and support CCS/CCUS projects in the near term. Over the last few years, some projects have continued to advance but others have faltered... in some case due to the withdrawal of government financial support. It is clear that we need to attract private capital to CCS/CCUS projects. Supportive government fiscal policies are essential to interest private sector investors. It is also clear that governments do not have the budgets to support deployment of these large, capital intensive demonstration projects.

## Defining Policy Parity for CCS/CCUS

The CCS community has acknowledged for years that we need additional utility scale demonstrations projects to acquire the learning needed to drive costs down and implement risk sharing arrangements with investors. This represents the urgent need to have fiscal policy parity for CCS and CCUS relative to other low carbon- no carbon technologies. Examples include:

### Accelerated Depreciation

Accelerated depreciation is the depreciation of fixed assets at a fast rate early in their useful lives. This reduces the amount of taxable income early in the life of an asset, so that tax liabilities are deferred. This incentive could be applied to certain equipment installed in energy generation facilities which reduce CO<sub>2</sub> emissions, thereby improving the business case for CCS/CCUS builds and retrofits.

### Carbon Valuation

Valuing carbon emissions is vital to ensure governments and economies take full account of climate change impacts in appraising and evaluating policies and projects. Valuation mechanisms seek to incorporate the “social cost of carbon” or the marginal global damage costs of carbon emissions via climate change impacts over the next century.<sup>iii</sup> Mechanisms of carbon valuation include: Fixed Carbon Pricing, Carbon Tax, Carbon Cap and Trade.

### Clean Development Mechanism or something similar

The Clean Development Mechanism (CDM), defined in Article 12 of the Kyoto Protocol, allows developing countries to implement emission-reduction projects. Emission-reduction projects earn saleable Certified Emission Reduction (CER) credits, which can be counted towards Kyoto targets. CDM was the first global, environmental investment and credit scheme which provided standardized emissions offset instrument through CERs. The mechanism benefits both developing countries, by stimulating sustainable growth, and industrialized countries, by permitting flexibility in meeting emission targets.<sup>iv</sup>

### Clean Energy Portfolio Standards

Portfolio standards mandate a percentage of energy sold comes from renewable sources. It is important to protect baseload sources to maintain a diverse generation portfolio that can meet environmental performance goals. State portfolio standards in five states- Utah, Michigan, Ohio, West Virginia, and

Massachusetts— allow electricity generated using CCS to be included in their electricity portfolio standards. However, electricity generated using CCS has not been applied to any of these states' portfolio standards.

### Contract for Differences

Governments should provide a contract for differences (CFD) structure for a limited number of projects. CFDs utilize a combination of incentives such as grants, loan guarantees, tax credits, and etc. to build a robust financial support scheme. The inherent success of a CFD structure lies in the strength of the underlying incentives. For example, the UK has successfully implemented a CFD structure to help low-carbon energy projects to penetrate the open market.<sup>v</sup> Currently projects such as onshore wind, solar PV, and landfill gas and sewage are considered; however future CFD allocation rounds are expected to include CCS in the UK.

### Feed-in-tariffs

FITs generally offer stable, long-term contracts (usually from 15-20 years) to energy facility owners and require the utility to interconnect the plant to the grid. FITs ensures revenue certainty and reduces risk thus lowering the loan interest rate (i.e. the cost of capital). The FIT model has been effective in the EU, especially in Germany, Austria, and Spain, for spurring the installation of solar power. One study states FITs are “useful for new technologies to encourage learning and cost reductions”, a crucial hurdle for the emergent commercial CCUS industry.<sup>vi</sup>

### Grants

Grants can be employed at every stage of the game from early R&D, equity for pilot projects, and incentives for large scale commercial projects. Within the US, the Department of Energy (DOE) should promote increased statutory authority to enable the use of both guarantees and grants on the same project with a cap on DOE's cost exposure to address the high capital costs of CCS projects. A large disparity still remains between the grant structures for renewables vs. CCS. DOE renewable grants are non-taxable when received by a partnership vs. DOE fossil grants are taxed as income nominally resulting in a loss of approximately one-third of the grant funds.

### Green Climate Fund

The Green Climate Fund (GCF) was established with a mission to advance the goal of keeping the temperature increase below 2°C by investing into low-emission and climate-resilient development. GCF was established by 194 governments to limit or reduce greenhouse gas emissions in developing countries, and to help adapt vulnerable societies to the unavoidable impacts of climate change. Eight projects were given support, for a total GCF investment of USD 168 million of its funds, marking the end of GCF's launch phase and starting the flow of climate finance through the Fund to developing countries.

### Investment Tax Credits

There is a high potential for CCUS to recreate the investment tax credit (ITC) successes of renewable energy industries. In the US, the Internal Revenue Code provides up to a 30% investment tax credit for qualified energy projects for commercial and utility investors. Since the implementation of the ITC in 2006, the cost to install solar has dropped by more than 73%.<sup>vii</sup> With the extension of the ITC, cumulatively installed solar energy is expected to grow from 27 gigawatts from the end of 2015 to nearly 100 GW by the end of 2020.<sup>viii</sup>

## Loan Guarantees

Title XVII of the Energy Policy Act in the USA established a loan guarantee program for various types of energy projects that “avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases,” including renewables, and “advanced fossil energy technology” like “carbon capture and sequestration”. The US DOE issued a solicitation for up to \$8 billion in loan guarantees through the Advanced Fossil Loan Program in 2013. To date, DOE’s Loan Guarantee Program has issued more than \$34 billion in “conditional commitments” but no advanced fossil projects currently have a loan guarantee.

## Preferential Dispatch for Electricity Production in Competitive Power Markets

The “preferential dispatch” mechanism provides electricity produced by certain power plants must be bought in preference to electricity produced by other power plants using an alternative technology or fuel source such as non ccs-fossil fueled generation. The variable operating cost of electric power generators is a key factor in determining which units a power system operates (or "dispatches") to meet the demand for electricity. Plants with the lowest variable operating costs are generally dispatched first, and plants with higher variable operating costs are brought on line sequentially as electricity demand increases.<sup>ix</sup> CCS projects should receive preferential dispatch ranking when “stacking” electric power generating units for dispatching.

## Private Activity Bonds

A private activity bond is a bond issued by or on behalf of local or state government for the purpose of financing qualified projects.<sup>x</sup> Private activity bonds are well understood financing tool with deep existing market. The cheaper interest rates and longer maturities associated with PABs would make capital intensive CCS projects to have more favorable. Expanding PAB’s to CCS would cost taxpayers little as states already have volume caps for their PAB markets, CCS would simply be included as a new option.

## Production Tax Credits

Production Tax Credits (PTC) is an inflation-adjusted per-kilowatt-hour (kWh) tax credit for electricity generated by qualified energy resources and sold by the taxpayer. Currently in the US, the renewable energy PTC provides a 2.3¢ per-kilowatt-hour (/kWh), or \$23/MWh tax credit for eligible energy resources including wind, solar, geothermal, biomass, incremental hydropower, and wave and tidal energy.<sup>xi</sup> CCS/CCUS should be included as an eligible low carbon technology option for PTCs.

## Public-Private Partnership

The PPP Knowledge Lab defines a PPP as "a long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance". PPPs can lower a project’s capital costs through a blend of different rates; however, they can be politically challenging and generally jurisdictionally specific. The White House has proposed \$564 million in CCUS research as part of Mission Innovation, the public component of the PPP with Breakthrough Energy Coalition.

## Tax-Preferred or Green Bonds

A variety of activities can be funded by tax-preferred and tax-exempt bonds. Renewable projects funded by local US governments and electric cooperatives may issue Clean Renewable Energy Bonds under existing Internal Revenue Code to finance select energy projects. There is an opportunity for the CCS

community to push for the inclusion of CCS project within existing financial codes and for the creation of new green bonds through carbon valuation mechanisms.

## Conclusion

National and subnational governments will need to utilize the combination of these fiscal instruments that will incentivize private capital in their specific circumstances, and it will vary by jurisdiction. It is well understood that “one size does not fit all”. We need the entire toolkit of fiscal options, and in some circumstances, multiple policy tools need to be used in tandem.

A level playing field is critical to adequately demonstrate CCS/CCUS. CCS and CCUS should benefit from policy choices that are available to other low carbon-no carbon emitting technologies. Deploying these fiscal tools for other technologies has distorted the marketplace with governments favoring some technologies over others. Providing similar fiscal tools for all low carbon-no carbon technologies will reduce market distortion. The financial community favors technologies that are picked by government policymakers as “winners” versus the perception of “losers”. Without fair and equal treatment, CCS and CCUS will not pass the minimum threshold for major investment by the private sector. These technologies will not even be on the radar screen for the financial community.

100% of the time private investors, whether energy companies, insurance companies, mutual funds, hedge funds, or venture capital investors, will pick the technologies that have government policy support. We must carry this message of policy parity to our governments and to work to adopt fiscal policy that supports private sector investments in CCUS. The urgent time for policy parity for CCUS and CCS is now.

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<sup>i</sup> United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision*. <http://eas.un.org/unpd/wpp/>

<sup>ii</sup> International Energy Agency, *World Energy Outlook (2015)*. *Energy Access database*. <http://www.worldenergyoutlook.org/resources/energydevelopment/energyaccessdatabase/>

<sup>iii</sup> Paul Watkiss, *The Social Cost of Carbon*. <https://www.oecd.org/env/cc/37321411.pdf>

<sup>iv</sup> United Nations Framework Convention on Climate Change (UNFCCC), *Clean Development Mechanism* [http://unfccc.int/kyoto\\_protocol/mechanisms/clean\\_development\\_mechanism/items/2718.php](http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php)

<sup>v</sup> National Coal Council, *Leveling the Playing Field (2015)*

<sup>vi</sup> Klaassen, P.S., (2006), *Wind Power in Europe: A Simultaneous Innovation-Diffusion Model*, Environmental and Resource Economics

<sup>vii</sup> SEIA, Solar Industry Data: Solar Industry Breaks 20 GW Barrier- Grows 34% over 2013

<sup>viii</sup> SEIA, Solar Investment Tax Credit, <http://www.seia.org/policy/finance-tax/solar-investment-tax-credit>

<sup>ix</sup> EIA: Electric generation dispatch depends on system demand and the relative cost of operation: <http://www.eia.gov/todayinenergy/detail.cfm?id=7590>

<sup>x</sup> <https://www.irs.gov/pub/irs-pdf/p4078.pdf>

<sup>xi</sup> Renewable Electricity Production Tax Credit, <http://energy.gov/savings/renewable-electricity-production-tax-credit-ptc>