Geothermal Energy Association Issue Brief: Including Geothermal in the Clean Energy Incentive Program

There are a significant amount of geothermal projects under development if provided market incentives could help states meet their Clean Power Plan goals. Including these projects in eligibility for the Clean Energy Incentive Plan (CEIP) would spur continued geothermal development, result in emissions reductions that would not otherwise occur, and provide a sustained market for geothermal power development.

There are significant geothermal projects under development that need incentives to be brought on-line.

The United States has a number of geothermal projects at identified sites in the west that can be constructed quickly. GEA estimates there are currently over 500 MW of geothermal power that could be brought online in less than two years with power purchase agreements.[1] These are projects where resources are identified, wells drilled, and the developer is waiting for a power purchase agreement to order equipment and build the physical power plants. Typically, once projects have reached this stage they can be brought online in 17-24 months. The most recent facility to come online in the US, Don A. Campbell Phase 2, plant reached commercial operation 10 months after the project broke ground and less than two years after Ormat commenced operation of the first phase of development in December 2013.[2]

In total, the United States has over 800 MW-1,400 MW of projects where some permitting and exploration work has advanced the project to a point where physical plant construction could begin by September 6th, 2018. Furthermore, including these fields in the CEIP could bring $221 - $387 million in externality benefits through reduced pollution by replacing coal facilities in the west.

These 800 – 1,400 MW are projects that have at least drilled a temperature gradient whole, slim-hole, or have one full sized discovery well. In addition, these projects have submitted interconnection applications and began transmission feasibility studies. Adding geothermal power to the CEIP program would be an important incentive that will help jumpstart these emission-free plants to come online and bring economic opportunity to low-income communities where these plants are located.

A boost from CEIP credits could make geothermal projects viable, lead to additional emissions reductions and promote a healthier US geothermal industry

As noted above, some projects in Phase 3 are still in the process of securing financing.
GEA estimates including geothermal power as a staple in state compliance plans and building out geothermal resources could support growth of an industry that would offset carbon by 235 million metric tons. This is the equivalent to eliminating emissions from 3-5 medium size states' power sectors. The table below shows data for select key geothermal states and the potential emissions reductions that could be achieved by fully deploying that state's geothermal resources identified by USGS.

[1] (Geothermal Energy Association, 2015)
[2] (Ormat Technologies, 2015)

Table 1: Geothermal Emissions Reduction Potential by State

(Metric Tons of CO_2)	Utah	New Mexico	Wyoming	Arizona	Idaho	Nevada	Montana	California
Current Emissions	30,822,343	17,339,683	49,998,736	40,465,035	703,517	15,536,730	17,924,535	46,100,664
CPP 2030 Emissions Goal	23,778,193	12,412,602	31,634,412	30,170,750	1,492,856	13,523,584	11,303,107	48,410,120
Potential Emissions offset by Geothermal Development	10,419,938	10,936,629	1,417,588	7,087,942	7,087,942	34,147,984	5,498,123	92,673,189

In addition, adding more intermittent power sources to the electricity grid will require more renewable baseload services to back up this generation. States with geothermal resource can use this technology for clean, emissions free, baseload services.[3] Geothermal power can easily imitate a traditional coal fired or nuclear station's generation profile to operate as baseload, and may be integrated without any additional backup. Geothermal power, in particular, operates the most efficiently when it runs continuously without interruption. Although, geothermal can also replace flexible gas peaker plants in some scenarios.

Lost in the discussion of renewable technology is the potential for rising emissions as the need to add natural gas backup to the grid increases. As is becoming common practices in places like California, and fueled by low natural gas prices, gas turbines are rapidly being commissioned to balance out intermittent generation. However, building straight baseload renewable plants, such as geothermal, in many circumstances produces fewer net emissions than coupling intermittent sources with gas turbines or energy storage.

References:

Geothermal Energy Association. (2015). *2015 Annual US Global Geothermal Power Production Report*. Washington DC: Geothermal Energy Association.

Matek, B., & Gawell, K. (2015). The Benefits of Baseload Renewables: A Misunderstood Energy Technology. *The Electricity Journal*, *28*(2), 101–112. http://doi.org/10.1016/j.tej.2015.02.001

Ormat Technologies. (2015, September 24). Ormat Technologies Inc. | Don A. Campbell Phase 2 Geothermal Power Plant in Nevada Begins Commercial Operation. Retrieved November 9, 2015

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[3](Matek and Gawell 2015)