UNITED STATES OF AMERICA
UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF ELECTRICITY DELIVERY AND ENERGY RELIABILITY

2009 NATIONAL ELECTRIC TRANSMISSION CONGESTION STUDY

COMMENTS OF
CLEAN LINE ENERGY PARTNERS LLC

June 29, 2010

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Clean Line Energy Partners LLC ("Clean Line") respectfully submits these comments in response to the Department of Energy's ("DOE") 2009 National Transmission Congestion Study ("Congestion Study"). Clean Line appreciates the DOE's efforts to gather and review vast amounts of transmission congestion information across the nation, run models, and develop a preliminary list of congestion areas in the Eastern and Western Interconnections.

We urge DOE to make additional National Interest Electric Corridor (NIETC) designations in order to relieve congestion associated with the wind Conditional Congestion Area in the East and expand the NIETC in the West to include the southern part of Nevada, New Mexico and Arizona. New transmission in these regions will ensure that existing congestion is eliminated and that there is enough additional capacity to allow new renewable resources to serve distant loads.

Clean Line is an independent developer of long haul, high voltage direct current (HVDC) transmission lines across the United States. Clean Line focuses exclusively on connecting the best renewable energy resources in North America with robust electricity demand centers. Clean Line provides transmission solutions to generators and load-serving utilities to efficiently interconnect clean energy with consumers.

As the United States moves to achieve its ambitious renewable energy goals, a dramatic expansion of the transmission grid is necessary to relieve congestion, which increases wholesale costs, and is by far the most efficient way to incorporate renewable resources. Clean Line will play an instrumental role in expanding much needed transmission capacity and accelerating the delivery of renewable energy throughout the U.S. The need for lines like those that Clean Line is developing will continue to grow as electricity demand increases in the United States and as the demand for clean power sources accelerates. Technology improvements in wind and transmission make the efficient transportation of wind energy more feasible now than ever before.

Background

Clean Line is developing several HVDC transmission lines that will export wind and solar energy from some of America's best resources to load centers and customers in regions without abundant, indigenous renewable energy resources. Clean Line has already made significant progress on transmission projects in western Oklahoma and the surrounding region as well as the upper Midwest. The Company is developing the Plains & Eastern Clean Line to deliver wind and solar generated electricity, produced in southwestern Kansas, northwestern Oklahoma and the Texas panhandle, to the Tennessee Valley Authority and other areas of the southeastern United States. The Plains & Eastern Clean Line will consist of two ±500 or 600 kilovolt direct current overhead transmission lines and is scheduled to deliver up to 7,000 MW of associated energy to the TVA network and surrounding areas beginning in late 2015.

In Kansas and Missouri, Clean Line is actively developing the Grain Belt Express Clean Line, a high voltage direct current transmission line that will connect approximately 3,500 MWs of wind in western Kansas to load centers in eastern Missouri and the surrounding region.

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Currently, Kansas has approximately 1,026 MWs of wind generation in operation. The Grain Belt Express will allow for exponential growth of the vast wind resources in Kansas.

In the upper Midwest, Clean Line is actively developing the Rock Island Clean Line, a high-voltage, direct current transmission line that will connect 3,500 MW to 4,500 MW of wind from the tri-state Iowa, South Dakota and Nebraska area with load centers near Chicago and the surrounding region. Although wind energy in the Upper Midwest has grown impressively in recent years, the construction of new projects will be forced to stop if additional transmission lines are not built soon. The Rock Island Clean Line will help alleviate this deficiency.

Clean Line is also developing the Santa Fe Clean Line, a high voltage direct current transmission line that will connect the robust wind resources of northeastern New Mexico to load centers in the Nevada and California region. This line will allow for new generation to be developed in eastern New Mexico, including resource areas that are otherwise stranded due to the lack of transmission.

Eastern Interconnection

In the 2009 Congestion Study, DOE notes that the development of additional wind resources in Kansas and Oklahoma could improve the economic vitality of the states' rural counties, enhance reliability, and potentially reduce electricity costs to consumers, all of which is not possible without additional transmission capacity. Each line that Clean Line is developing begins in a resource region that DOE has designated as a Type 1 Conditional Constraint Area for wind resources, as noted in Figure 2. Additional available transmission capacity in these areas will enable new renewable resources to be developed to serve the load centers in the eastern and southeastern United States.

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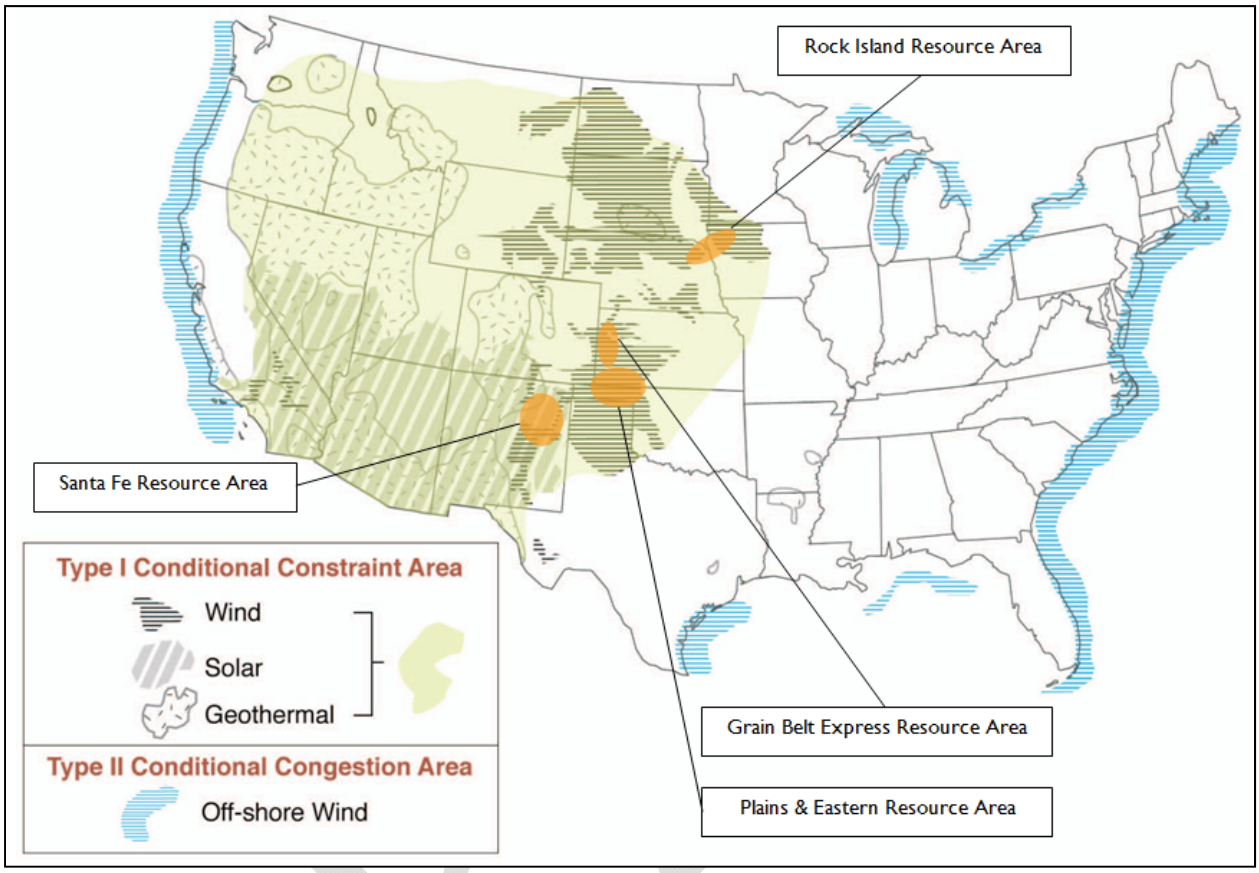
Figure 2

Type I and Type II CCA's with Clean Line Resource Areas



Source: National Electric Transmission Congestion Study, December 2009. US Department of Energy

There is additional evidence of congestion that DOE should consider when it designates future Critical Congestion Areas and NIETCs. The following reports and discussions point to significant congestion in SPP that needs to be relieved. Designating these resource areas as NIETCs will ensure that backstop authority is in place as new inter-regional lines get built. Each of the reports noted below make the case that only new transmission can both relieve existing congestion and ensure that enough capacity is available to develop and export the thousands of megawatts of new renewable resources waiting to be developed.

In 2009, the DOE Electricity Advisory Board concluded that increasing transmission capability will help to ensure a reliable electric supply and provide greater access to economically priced power. Furthermore, the Board concluded that "the possibility of a national renewable portfolio standard will require significant new transmission to bring these resources, which are often remotely located, to consumer load centers."[1]

In the 2009 Congestion Study, DOE was correct to designate the wind resources in the Southwest Power Pool (SPP) as a Type 1 Conditional Constraint Area because it has some of the most abundant wind in the country. The potential of these resources is much greater than SPP's demand for renewable energy. In April 2009, SPP stated the belief that it "could only absorb only 20%-30% of the wind potential in our region."[2] According to one estimate by the National Renewable Energy Laboratory ("NREL"), Oklahoma alone could produce in excess of 267,000 MW of high capacity factor wind energy. In comparison, average demand in the entirety of SPP is only about 26,000 MW.[3] Additional transmission capacity, like that proposed by the Plains & Eastern Clean Line, is needed to ensure that SPP's surplus wind potential is not left untapped.

Significant Transmission Upgrades Are Needed to Relieve Congestion in Western SPP

There is a present need for transmission that enhances the ability of power to flow from western SPP, where the richest wind resource is located, eastward to locations with high electricity demand. In the Wind Integration Study commissioned by SPP, Charles River Associates finds that as more wind is installed, "power flows from western SPP to eastern SPP

[1] Electricity Advisory Committee, *Keeping the Lights On in a New World*, January 2009, 45.
[2] http://www.spp.org/publications/Renewable_Energy_Conference_white_paper%20_04%2014%2009.pdf, 4.
[3] http://www.spp.org/publications/Intro_to_SPP_Presentation.pdf.

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increase significantly."[4] The study continues, stating "[t]o accommodate the increased West-to-East flows while meeting the reliability standards of the SPP Criteria, a number of transmission expansions were required."[5] In the absence of new transmission, generation will continue to be curtailed in SPP, as noted below and renewable development will be halted due to the inability to move power to load centers.

Figure 3
SPS Curtailment

Price Level ($/MWh)	2009 Hours
<0	26
0 to 10	51
10 to 20	1,649
Total	1,726
Percent of Year	19.7%

Since SPP can use only a fraction of its renewable potential, the increasing demand for renewable energy in the Southeast will create a demand for additional export capability. SPP borders the Electric Reliability Council of Texas ("ERCOT") to the South, the Western Electricity Coordinating Council ("WECC") to the West, and the Midwest ISO ("MISO") and Entergy to the East. Because SPP's electrical frequency is asynchronous with ERCOT's and WECC's frequencies, the ability to export to these neighboring regions is constrained. SPP's Wind Integration Study found that "[a] concern is that SPP has limited DC connections with ERCOT (to the south) and WECC (to the west)."[6]

Presently, the DC ties between SPP and ERCOT are of limited use for exporting wind power because ERCOT already has more wind generation than can be delivered to its load centers. Additionally, export capability into WECC is restricted by the low electricity demand in eastern New Mexico and Colorado. However, the development of long haul DC lines will allow the robust wind resources of western SPP and New Mexico to access markets in California,

[4] SPP Wind Integration study
[5] SPP Wind Integration study, 20, 1-2.
[6] SPP Wind Integration Transmission Study, 30

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which has the most aggressive renewable portfolio standard in the country. Exports to the East and West appear to be most promising to realizing SPP's wind potential, but only if HVDC transmission lines are developed to efficiently export power over long distances.

Additional Export Capability is Needed from SPP to Support Wind's Growth

SPP has repeatedly identified the need to build additional transmission to fully develop wind potential in the region and to export it to neighboring regions. On April 24, 2009, SPP responded to the Arkansas Public Service Commission in Docket No. 08-144-U, In the Matter of a Notice of Inquiry Regarding the Expanded Development of Sustainable Energy Resources in Arkansas. SPP stated, "The potential for development of significant renewable resources in terms of wind and solar resources within SPP is almost unlimited and can be more fully realized only if SPP and its neighbors work together to coordinate bulk power planning and operations to effectively integrate and deliver renewable resources within the SPP footprint and to markets throughout the United States." [7]

As DOE is aware, SPP is in the process of implementing significant upgrades to its AC transmission system. On April 27, 2010, SPP's Board of Directors approved "Priority Projects" totaling $1.14 billion of investment. The stated purpose of these projects is to relieve congestion, improve SPP's generation interconnection queue, and enhance transfer capability from SPP West to SPP East. The Priority Projects will heighten the ability of wind farms to transmit power within SPP. However, additional transmission capacity is needed to increase the

[7] Response of Southwest Power Pool, Inc. to Order No. 8 Estimate of the Impact of Proposals to Adopt Federal, Renewable Portfolio Standards, Renewable Electricity Standards, and Energy Efficiency Resource Standards, 2-3.

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ability to export wind power out of SPP. The combination of SPP "Priority Projects" and additional export capability is needed to capitalize on the rich wind resources in SPP.

Table 4
Wind Capacity Potential by State

Windy Land Area >= 40% Gross Capacity							
		Factor at 80m				Wind Energy Potential	
Ranking (by Capacity Potential)	State	Total (km^2)	Excluded (km^2)	Available (km^2)	Available % of State	Installed Capacity (MW)	Annual Generation (GWh)
1	**Texas**	**180,822**	**15,426**	**165,397**	**24%**	**826,983**	**3,240,930**
2	Nebraska	165,445	10,012	155,433	78%	777,165	3,084,090
3	South Dakota	163,281	10,004	153,277	77%	766,383	3,039,460
4	**Kansas**	**163,170**	**11,105**	**152,065**	**71%**	**760,324**	**3,024,280**
5	North Dakota	160,497	21,932	138,564	76%	692,821	2,728,620
6	Montana	98,309	18,737	79,571	21%	397,857	1,529,560
7	Iowa	72,119	8,400	63,719	44%	318,595	1,232,860
8	Wyoming	70,268	17,787	52,482	21%	262,410	1,043,890
9	**Oklahoma**	**55,593**	**6,038**	**49,555**	**27%**	**247,773**	**952,678**
10	New Mexico	39,573.80	2,424.70	37,149.10	11.80%	185,745.30	712,877

Source: NREL & AWS Windpower

As noted in Table 4 above, Oklahoma, Kansas and Texas are all ranked in the top ten in wind capacity potential. Each state has significantly more potential than the capacity of the SPP market. Developers are advancing projects totaling tens of thousands of MW in the Resource Area. Over 32,600 MW of wind projects are in the SPP Generation Interconnection Queue. Of these projects, 26,628 MW are located in the tri-state region of Kansas, Oklahoma, and Texas (only the northern part of the Texas panhandle is located in SPP). Many of these project will not be completed because there in not enough transmission capacity to export power to other load centers.

Additional Transmission is Needed to Import Power into the Southeast

TVA's Board of Directors adopted a goal to derive 50% of its power from low- or zero-carbon emitting resources by the year 2020. To meet this goal, TVA issued a Request for Proposal ("RFP") in December 2008 to procure power from renewable energy sources. As a result of this RFP, TVA entered into power purchase agreements with over 1,380 MW of wind

power projects, all located outside of TVA's service territory. Importing wind energy – even with the added cost of transmission – proved to be the most attractive option in TVA's competitive RFP process. However, further wind energy imports will require an extensive expansion of TVA's import capabilities and those of other utilities in the southeastern United States.

Building transmission to import renewable energy to the Southeast was examined in a collaborative study between Electric Power Research Institute ("EPRI") and Oak Ridge National Laboratory ("ORNL"). The study examined several potential options to connect SPP with SERC and found that connections delivering to Entergy and TVA were the most economical. The study identified a projected economic demand for new transmission links between SPP and SERC under a variety of scenarios. It stated, "The availability of surplus economic wind resource in SPP, and the relative scarcity of wind and other renewable technologies in the Southeast, creates a significant opportunity for economic transfers under a wide range of assumptions about generation technology cost and performance, regional electric market conditions, and future environmental policies."[8]

In its 2008 Strategic Plan, SPP declared that "new high voltage transmission expansion will be needed to bring wind energy to consumers."[9] The previously cited SPP Wind Integration Study concluded, "Major transmission reinforcements are needed to accommodate increased wind penetration levels."[10] SPP's EHV Overlay Study projected that SPP's transmission system would need to be expanded in order to accommodate "extensive demand for renewable energy in the US electric system."[11] The study found a need for additional export capabilities from SPP to

[8] Power Transfer Potential to the Southeast in Response to a Renewable Portfolio Standard: Final Report, Hadley, S, Key, T., and Deb, R.
[9] Strategic Plan, December 2008, Final.
[10] SPP Wind Integration Transmission Study, Final Report, January 4, 2010.
[11] http://www.spp.org/publications/spp_ehv_study_final_report.pdf, 7.

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its neighboring Regional Transmission Organizations ("RTO") and made export capabilities one of the primary metrics by which transmission expansion scenarios were scored.

Additional transmission capacity is needed to meet the reliability and renewable energy goals that the country has established. The need for additional transmission is particularly acute in the western portion of the SPP where the Plains & Eastern Clean Line will originate. This region has an outstanding wind resource whose potential greatly outstrips existing and planned transmission.

Demand for Renewable Energy Will Increase as More States Mandate Renewable Energy Targets

Developers of wind resources in the Type 1 CCAs desire access to new markets in the southeastern United States because there is an increasing demand for electricity as the population continues to grow. SERC expects its load to grow by approximately 1.69% annually over the next ten years (see Figure 5).[12]

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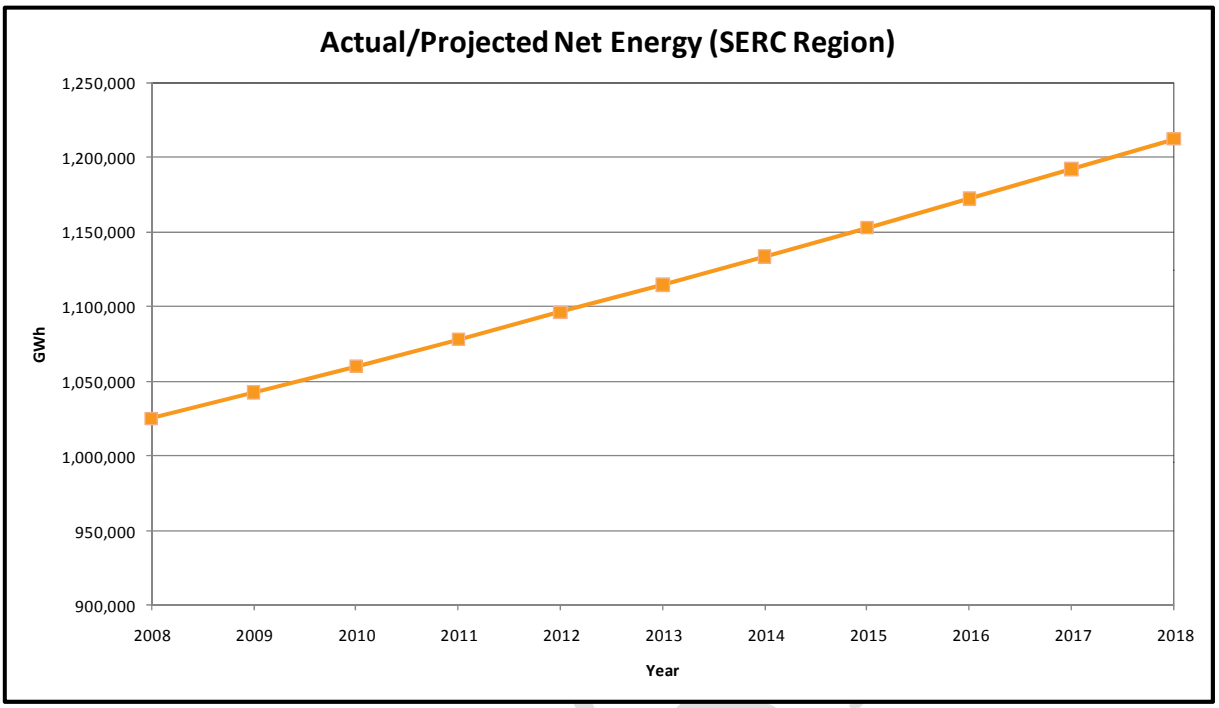
12 http://www.serc1.org/documents/SERC/SERC%20Publications/Information%20Summary/2009%20SERC%20Information%20Summary_Final%2007-28-09.pdf, 4.

Figure 5

SERC Region Forecasted Growth



Source: SERC Reliability Corporation, Information Summary, July 2009

Of the projected total ten-year load increase of 190,000 GWh per year, wind resources in SPP could deliver tens of thousands of megawatt hours per year, helping to maintain and increase the percentage of clean energy. In addition, TVA has set aggressive targets for clean power even in the absence of a federal RES. TVA's Board of Directors has set a goal of obtaining 50% of its electricity from carbon-free sources. In 2009 and 2010, TVA entered into power purchase agreements with wind farms outside of its service territory totaling 1,380 MW. To meet its 50% goal, TVA will have to source clean power from thousands more MW of renewable energy projects. As such, TVA is likely to maintain a strong demand for affordable

renewable energy. Their ability to achieve these goals is limited by the minimal amount of firm transmission capacity that could be used to import energy into the TVA footprint.

DOE should take this opportunity to designate the wind resources regions identified in the 2009 Congestion Study as NIETCs. Taking this step will signal that this administration is serious about new transmission needed to eliminate congestion and deliver stranded renewables to distant markets.

Western Interconnection

As noted above, Clean Line is developing the Santa Fe Clean Line from Eastern New Mexico to the Arizona, Southern Nevada, and California region. This region has been identified by western planning organizations as a major area of concern in the West. The DOE's 2006 Congestion study identified Southern California (spanning the metropolitan areas of Los Angeles and San Diego) and three counties in Arizona as a Critical Congestion Area. DOE later designated this area a National Interest Electric Transmission Corridor (NIETC), making this region eligible for FERC backstop siting authority. Clean Line agrees with this corridor designation but feels that it should be expanded to allow for imports of renewable energy.

This area has had a history of congestion due to the large amount of imports across the region. Clean Line expects this congestion to increase as additional renewable wind resources are developed in eastern New Mexico and as solar resources are developed in Arizona. In order to meet the growing demand for electricity in the California market, Clean Line suggests that DOE consider designating the northern counties in Arizona, southern Nevada and much of New Mexico as Critical Congestion Areas and NIETCs.

Numerous transmission projects are in the planning and permitting phases of development. However, DOE cannot afford to let these projects fail as it could jeopardize

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reliability in the Western Interconnection and dramatically increase power prices in the Southwest region.

Clean Line participates in regional and sub-regional transmission planning activities in the Western Interconnection. WECC has led transmission planning efforts in the West for many years, highlighting congestion and identifying areas that may jeopardize reliability and cost consumers millions of dollars in wholesale energy costs. Clean Line urges DOE to work closely with WECC and the other transmission planning organizations in the West to consider the impacts of existing congestion on renewable energy development and the ability to that move power to major load centers. Designating additional constrained areas as Critical Congestion Areas and as NIETCs will help ensure that new transmission gets built.

Conclusion

Clean Line Energy Partners strongly supports the 2009 Congestion Study completed by the DOE and appreciates the opportunity to provide comments and suggestions on its results. The study confirms that significant congestion hampers the integration of the best wind and solar resources in the Eastern and Western Interconnections and has recognized that these Critical Congestion Areas must be relieved.

We urge the DOE to consider designating the current Type 1 wind Conditional Constraint Areas (Oklahoma, Texas Panhandle and Kansas) as Critical Constraint Areas and ultimately as NIETCs. Furthermore, we hope DOE will consider expanding the existing NIETC in the southwestern United States to include additional counties in Arizona, Nevada and New Mexico to allow for increased imports from renewables in these regions.

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Respectfully submitted,

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