Review of the SunZia Southwest Transmission Project Economic Report
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Introduction

SunZia has released two reports, "SunZia Southwest Transmission Project Economic Impact Assessment" and "Impacts of Potential Alternative Generation Facilities" that it now includes on its website and which the November 23, 2011 edition of the *Albuquerque Journal* summarized in a front-page article entitled "SunZia Project Promises Jobs." The numbers published are misleading because the units on the data tables in these reports are in error. What are called "jobs" in most of these tables are actually "job-years of work," or FTEs. This error affects both the jobs supported by building the transmission project and alternative (renewable) generation facilities. While job-years of work is an important economic parameter to calculate, what is most important is how many people can actually get a job, what kind of job that is, and how long it will last.

This review has been delayed because the main report contained a major error in Table 6.1, which summarized jobs by year for Arizona. I alerted Dr. Alberta Cherney, the principal author of the study, to this error, and she has now provided a corrected version, which allows me to discuss the report's numbers accurately.

Jobs Created by the Transmission Project Itself

These numbers include four types of jobs: (1) construction labor jobs, (2) construction materials jobs (jobs associated with the manufacturing materials required to build the project), (3) indirect jobs created in industries doing business with materials manufacturers, and (4) induced jobs, or jobs created in the general economy by the spending of direct job wages and salaries.

Numbers released by SunZia state that building SunZia itself will create a total of 6,200 jobs; however, these are actually the job-years of work summed together over the project's four-year construction period. Thus the average number of jobs that SunZia supports is 1,550/year; the maximum employment associated by SunZia occurs in year 3, when a total of 2,459 jobs are supported (Figure 1).

As a further example of this confusion, Senator Jeff Bingham stated in a press release dated October 5, 2011 regarding the fast-tracking of permitting of SunZia that the project would create 3,408 direct jobs during the construction period. Again, these are job-years of work, not jobs. The average number of direct jobs supported during the four-year construction period is 842/year; the maximum number of direct jobs supported is 1,353, reached in 2015 (Figure 2).

The number of actual construction jobs supported by SunZia (workers hired by SunZia) averages 491/year, reaching a maximum of 780 in 2015 (Figure 3). Seventy percent of these jobs will go to people outside the states of New Mexico and Arizona. This is to say, the average number of people employed by SunZia in Arizona and New Mexico will be 147/year. In addition, only

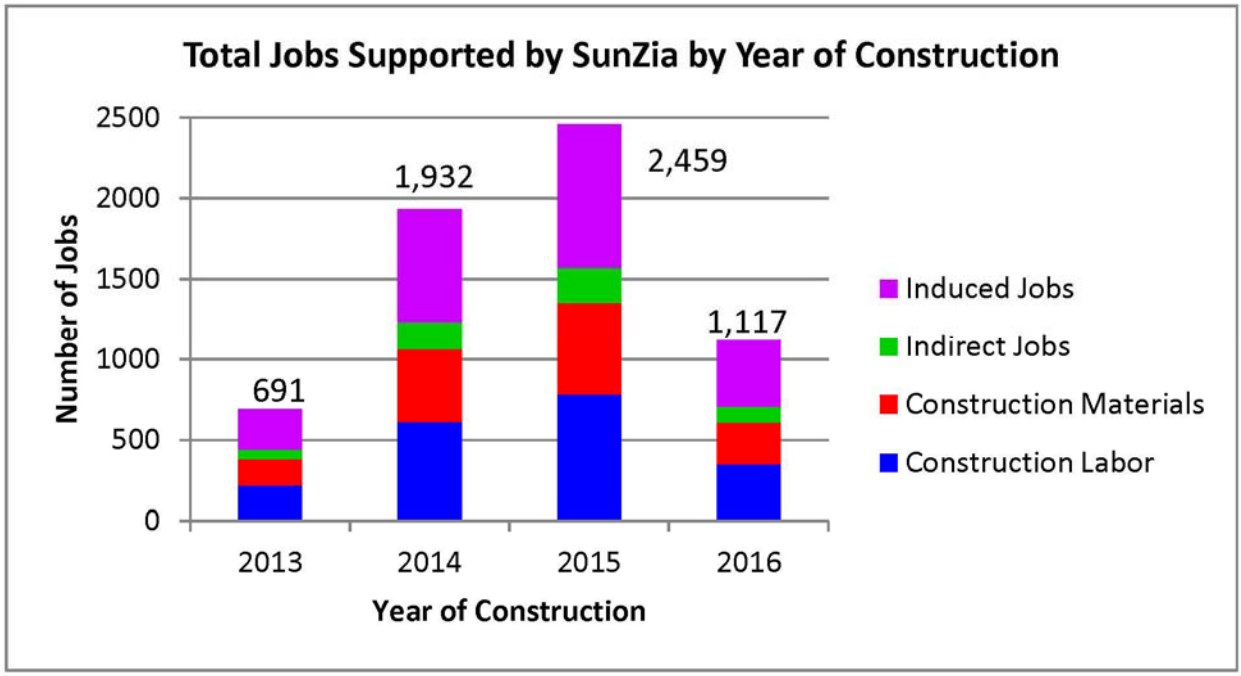

Figure 1. Total jobs supported by SunZia by year of construction. Induced jobs, those created by spending direct salaries and wages, represent the largest category. These would include department store and restaurant jobs, for example.

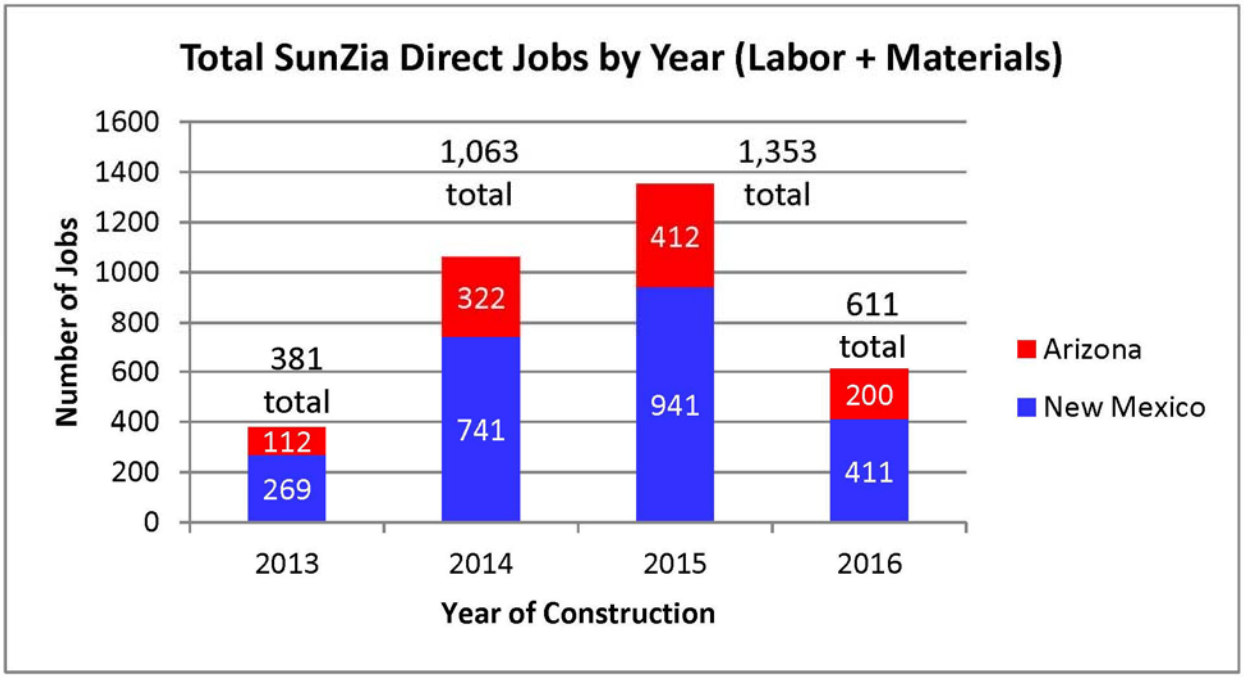

Figure 2. Direct jobs supported by SunZia by construction year. Direct jobs average 842/year for the four years of the project, reaching a peak of 1,353 in 2015.

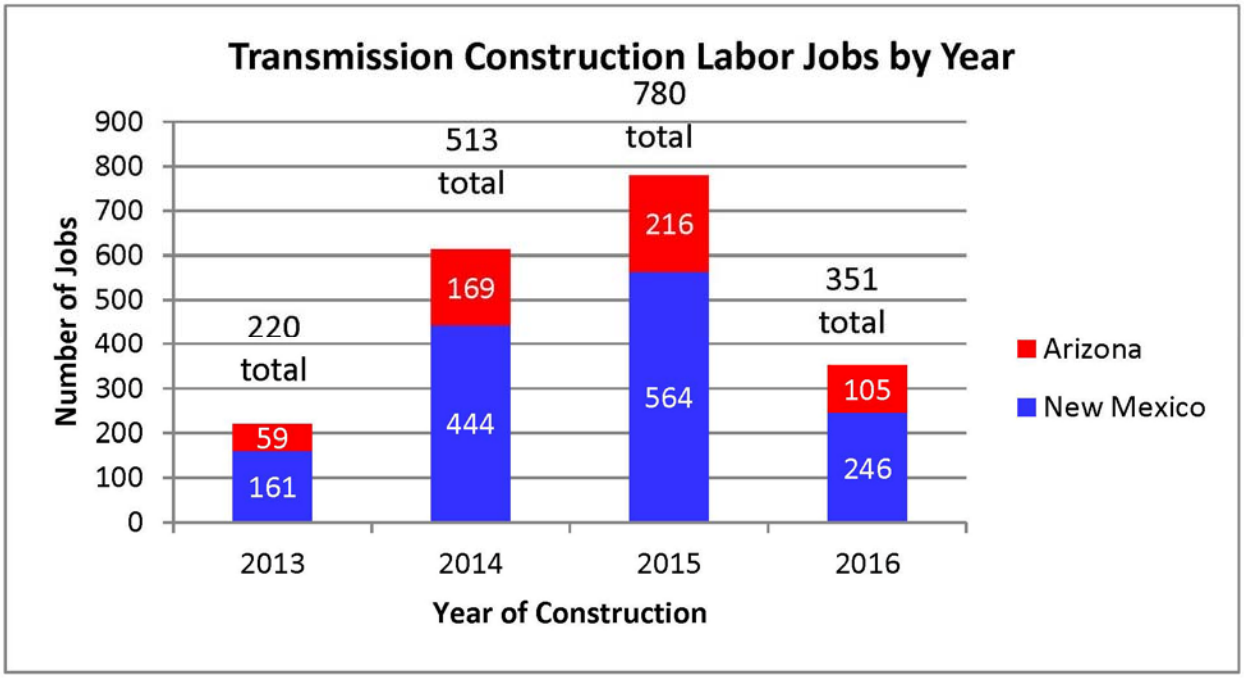

Figure 3. Total construction labor jobs – the number of people hired by SunZia – for New Mexico and Arizona for the four-year construction period. Note that 70% of these jobs will go to workers from outside these states.

10% of those people hired will be from those counties that the project crosses. In the six counties in New Mexico affected, an average of 35 people/year will be employed; in the three counties in Arizona, an average of 14 people/year will be employed. These numbers are averages for all counties *combined*, not individual counties.

Jobs Associated with Potential Alternative Generation (Renewable) Facilities

Job projections associated with alternative generation (renewable) facilities are inflated by three factors: (1) the 36,700 jobs given are again job-years of work, not jobs, (2) the mix of renewable technology projects is unrealistically biased toward solar projects, photovoltaic projects in particular, which require more job-years of work to complete, and (3) the number of job-years of construction labor given for a 100-MW photovoltaic installation is a factor of 3-4.5 greater than that calculated from current photovoltaic projects. The latter two factors are input model parameters furnished to the economic modelers by SunZia and were not chosen by the modelers themselves.

First, using job-years to represent jobs does not inflate job numbers as seriously as for the transmission project because construction times are shorter, but it is still a significant factor. While photovoltaic projects are completed in 1 year, solar thermal projects require 2 years, wind projects 1.5 years, and geothermal projects 1.5 years. Correcting the job-years of work to jobs using these factors reduces the total number of jobs to 31,090. (This assumes that all workers will be hired at the beginning of these projects and will work the full time required to complete them.)

Second, the mix of technologies is not realistic. The original mix includes 10 solar projects (8 photovoltaic and 2 solar thermal) totally 1,120 MW of capacity compared with 12 wind projects totaling 1,200 MW of capacity. Wind generation is far more economic than solar generation and is the reason given for building this project. New Mexico wind-energy producers are unquestionably expecting to use far more than 1,200 MW of this transmission capacity. To be more realistic, changing the mix of technologies to 2 photovoltaic plants, 2 solar thermal plants, 1 geothermal plant, and 19.5 100-MW wind farms further reduces job numbers to 17,547. (The odd number of wind projects is needed to match the original 2,420 MW of renewable generation.)

Third, what inflates job numbers most significantly is the high number of construction labor job-years used for photovoltaic plants. The model uses 890 job-years (890 people working one year) to complete a 100-MW plant, whereas a survey of current photovoltaic plants indicates a range of 200 to 300 job-years/100 MW of installed capacity. Thus the modeled number is a factor of 3–4.5 too high. While comparable data for other photovoltaic job categories are much harder to determine, if SunZia photovoltaic numbers are deceased by a factor of 3.0 (using the smallest number to be most conservative), then the total Arizona photovoltaic job-years would be 1,045 rather than 3,135 and New Mexico job-years would be 789 instead of 2,368, further reducing the number of renewable-generation jobs by 3,689 to 13,878. This compares with the total of 36,700 given in the article.

One last critical factor to mention here is that 80% of the construction jobs for wind-generation installations – what seems most realistic to emphasize in this modeling – will go to workers from outside New Mexico. Crews will be brought in for much of the work. Although this would still leave 236 construction jobs for New Mexicans, it is a sobering fact.

A Missing Model Component: Nonrenewable Generation

An essential component missing from these job projections is new nonrenewable generation. SunZia was originally proposed to provide transmission capacity for the SouthWestern Power Group's yet-to-be-built 1,000-MW Bowie, Arizona, natural gas generating plant, and SunZia will provide connections for 1,000+ MW of existing natural gas generating capacity in southwestern New Mexico, although this capacity currently uses other transmission facilities. SunZia follows El Paso Natural Gas Company's pipeline corridor across southern New Mexico and Arizona, which would facilitate easy expansion of natural gas generating capacity in the area, something that is highly likely to occur.

Natural gas is currently the most economic form of electrical generation, especially compared with renewable generation, and realistic modeling would include this capacity. Integrating 800-1000 MW of new natural gas generation into the SunZia model is very reasonable – it could easily be more – and is required to produce a fuller and more robust economic assessment. The amount of renewable generation included in the model would need to be reduced to accommodate this, which would reduce the number of renewable energy-related jobs. As a basic reference, the SouthWestern Power Group states that building its 1,000-MW Bowie power plant would create 500-600 construction (labor) jobs.

Summary

This analysis shows that the number of jobs associated with SunZia is far less than that reported by SunZia. While job-years of work is an important parameter to calculate in assessing economic impact, what is most important is how many people can actually get jobs. This analysis does not question any of the job numbers calculated for the transmission project itself but merely explains them. The modeling of renewable generation jobs is, however, based upon highly unrealistic model parameters and is not credible.