The Relationship of the SunZia Southwest Transmission Project to the High Plains Express Project

Norm "Mick" Meader of the Cascabel Working Group, September 20, 2010

Summary Points

1. Although the Cascabel Working Group has been focused on the SunZia project for nearly a year, we have only now learned that the SunZia Project is considered an integral part of the 500-kV High Plains Express Project (HPX) proposed to run from east-central Wyoming to Phoenix, although the sponsors are different (some participate in both). HPX currently has eleven sponsors, one of which is the Salt River Project.

2. The SunZia Southwest Transmission Project is effectively the southern leg of two legs of the HXP Project between Corona, New Mexico, and Phoenix.

3. Although the Cascabel Working Group and others have asked several times about the possibility of a more northerly route for SunZia, we have only now learned that a northern HPX leg runs from Corona, New Mexico, to Phoenix via Springerville, Arizona. The beginning and end points of these northern and southern routes are essentially identical. The northerly route was proposed some three years ago and is moving forward.

4. This more northerly route does what SunZia's southern route does – carry power from the wind-generating area of central New Mexico to Phoenix for use in predominantly the Phoenix area and California. The redundancy of this is apparent.

5. These projects were both conceived in late 2006 to early 2007. Currently the SunZia Project is about three years ahead of the HPX Project in its timeline.

6. From where the SunZia and High Plains Express routes separate in New Mexico, the preferred SunZia route would cut ~130+ miles of new corridor, almost all in Arizona, whereas the High Plains Express route would cut none. This northerly route is thus much more in accord with Section 503 of the Federal Land Policy Act for siting new transmission lines, which the BLM is required to honor.

Relationship of the SunZia Project to the High Plains Express Project

The following discussion reports on recently discovered information about the SunZia Southwest Transmission Project and its relationship to the High Plains Express Project. This provides a broader and significantly different perspective on SunZia.

The High Plains Express initiative is a comprehensive plan for a new 500-kV transmission network that connects Wyoming, Colorado, New Mexico, and Arizona. The SunZia Project is considered an integral part of this system (Figures 1). Initial concepts for the HPX Project were formulated in early 2007, shortly after the SunZia Project was initially conceived, and include two 500-kV lines that would be either single- or double-circuited their full length.

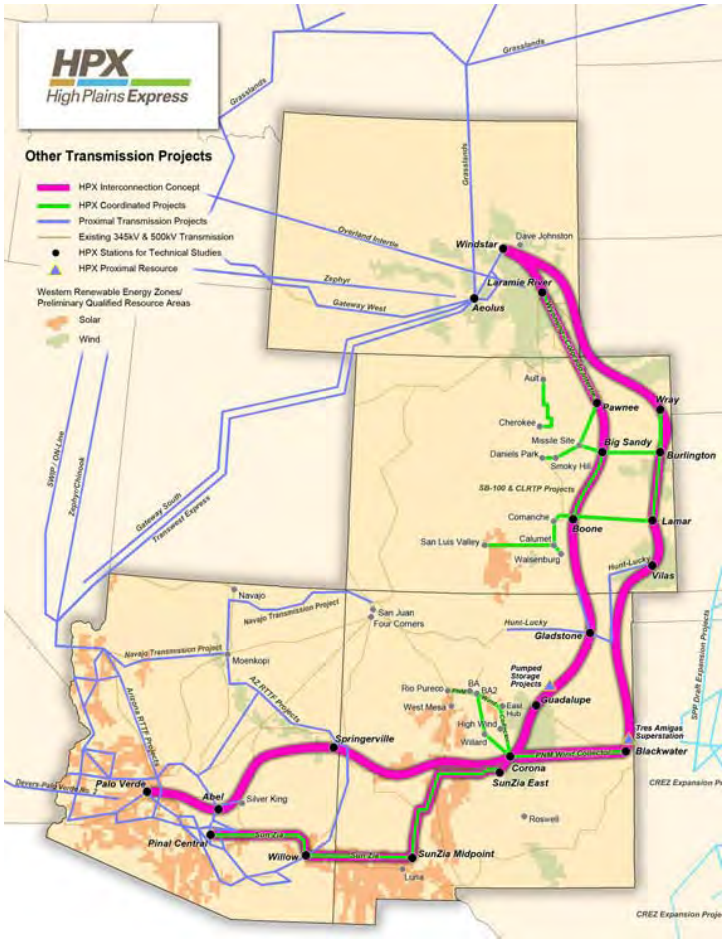

Figure 1. The High Plains Express Project. The SunZia Southwest Transmission Project is considered an integral part of this project and is denoted by the green-within-red line at the bottom.[1]

What is most noteworthy about this map is that a 500-kV transmission line is already planned for what we have wanted to champion – a northerly route for the SunZia Project in Arizona. This alternative has already been laid out and modeled as part of the HPX system. On the following page (Figure 2) is a more detailed figure comparing this northerly route with SunZia's route. This is taken from the 2008 feasibility study for the High Plains Express Project[2].

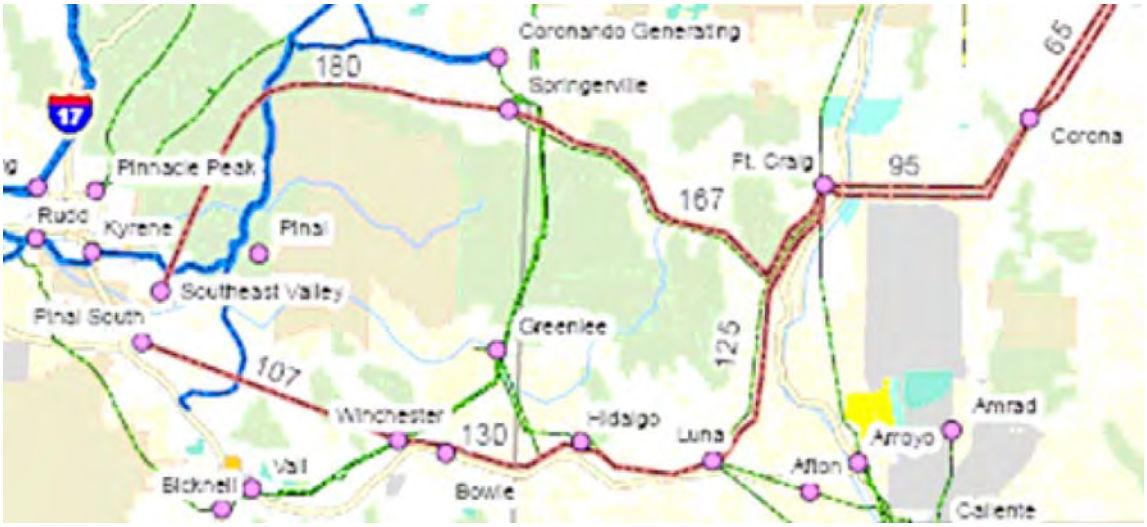

Figure 2. An early map showing the proposed HPX extensions (red lines) into Arizona. The lower red line is what is now the SunZia Southwest Transmission Project[3]. The green lines are current 345-kV lines, and the blue lines are 500-kV lines. Purple dots are substations or power plants.

While the quality of this diagram is poor, it depicts the 500-kV lines in red that are part of HPX. What is now the SunZia Project is the lower red line (this figure appears to be preliminary, conceived before the SunZia Project was fully developed). In this initial configuration, the SunZia Project was centered on the Bowie power plant (see associated report) and appears to pass through the Winchester substation to reach Phoenix via the San Pedro River Valley. The present relationship of the SunZia Project with the HPX project is shown in Figure 3 (enlarged from Figure 1).

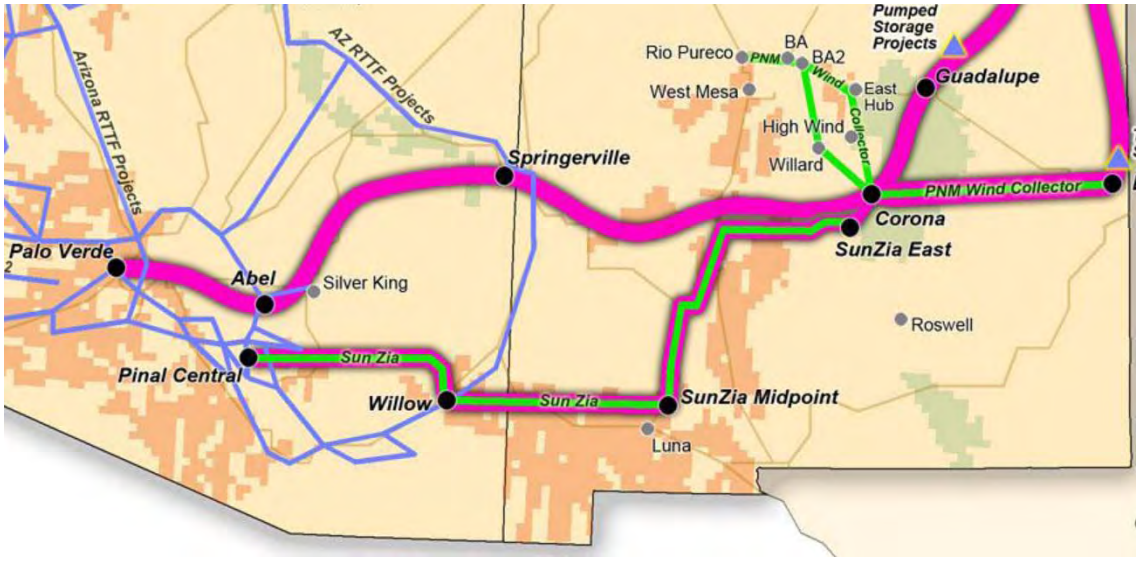

Figure 3. A more current map showing the relationship of the SunZia Project, now fully developed, to the HPX Project (taken from Figure 1). Blue lines are transmission lines proposed to gather Arizona renewable energy.

What is remarkable about this diagram is that both SunZia and this northerly transmission route begin at exactly the same point in the wind-generating area near Corona, New Mexico, and end at almost the exactly same point east of Phoenix. The straight-line distance between the Pinal South substation (now the Pinal Central substation) and the Southeast Valley substation (now the

Abel substation) is ~20+ miles. The northerly route is 442 miles long, while the southerly SunZia route is 457 miles long. Figure 4 shows the transmission scheme for modeling transmission capacity in the HPX system.

Figure 4: **Transmission Modeling**

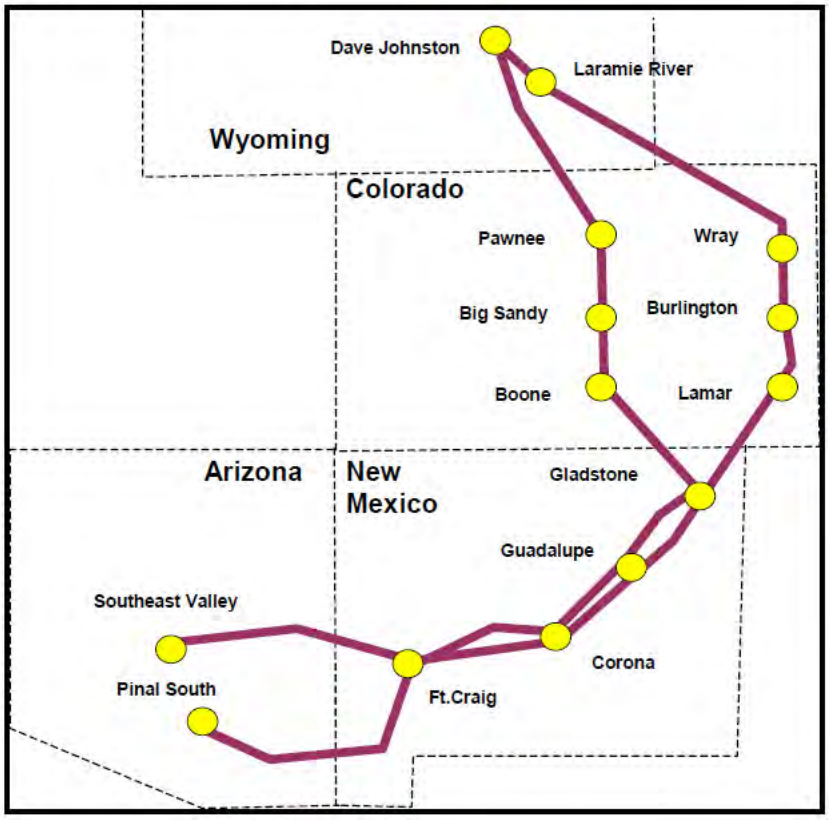

Figure 4. Configuration of 500-kV lines used for modeling transmission capacity in the HPX system[2]. The SunZia lines run from Corona through Ft. Craig to Pinal South (now Pinal Central), while the northerly Arizona HPX line runs from Corona through Ft. Craig to Southeast Valley (now Abel) east-northeast of Phoenix. Yellow dots are substations where energy is uploaded or downloaded. All lines in this diagram would be either single- or double-circuited.

Both of these lines are designed to bring predominantly wind-generated electricity to the Phoenix metropolitan area and will be competing for the same wind resources. While building both lines is ideal in terms of strengthening the western electrical grid, the redundancy of these projects is apparent. What is perplexing is that this northerly route has been part of the HPX plan since its inception in early 2007, and we have not been informed of this. When we have inquired about the possibility of routing SunZia farther north, no one has mentioned this existing, already-proposed alternative.

While a fundamental purpose of the HPX system is to bring renewable energy to areas of demand, this is not a renewable-energy system per se. The optimum economical use of this system requires approximately a 50/50 mix of renewable and fossil fuel or nuclear energy[3]. This system is designed to interconnect with both types of generation. This is needed because (1) renewable energy cannot fully meet growing demand, and (2) significant connection with

conventional energy sources is required to compensate for fluctuating renewable energy output and to maintain network reliability. This is just as true for the SunZia Project as it is for HPX. One goal of this network is to connect the abundant wind resources of Wyoming to markets throughout Colorado, New Mexico, and Arizona. The SunZia Project would eventually carry power uploaded from throughout this system. While SunZia begins in central New Mexico, once it is connected with the full HPX Project, it will be transporting energy gathered from throughout this region, not merely wind energy from central New Mexico.

Relationship of the High Plains Express and SunZia Projects to Existing Transmission Corridors

Of major concern in projects such as this is the creation of major new utility corridors where none existed before. Section 503 of the Federal Land Policy and Management Act requires "that in order to minimize adverse environmental impacts and a proliferation of separate rights-of-way, [existing] corridors will be used to the extent practical." The full text of this section is given below. It is also the philosophy of organizations such as the Wilderness Society to advocate following existing corridors wherever possible in siting new transmission lines to minimize environmental impact. The northerly High Plains Express route is far more in accord with these principles.

> **RIGHT-OF-WAY CORRIDORS**
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> *Sec. 503.* [*43 U.S.C. 1763*] In order to minimize adverse environmental impacts and the proliferation of separate rights-of-way, the utilization of rights-of-way in common shall be required to the extent practical, and each right-of-way or permit shall reserve to the Secretary concerned the right to grant additional rights-of-way or permits for compatible uses on or adjacent to rights-of-way granted pursuant to this Act. In designating right-of-way corridors and in determining whether to require that rights-of-way be confined to them, the Secretary concerned shall take into consideration national and State land use policies, environmental quality, economic efficiency, national security, safety, and good engineering and technological practices. The Secretary concerned shall issue regulations containing the criteria and procedures he will use in designating such corridors. Any existing transportation and utility corridors may be designated as transportation and utility corridors pursuant to this subsection without further review.

From where the SunZia and High Plains Express routes separate in New Mexico, SunZia's initial preferred route across the Galiuro Mountains at Aravaipa would cut ~130 miles of new corridor, essentially all of it in Arizona, whereas the High Plains Express route would cut none (Figure 5). For 75% of its length in Arizona, this SunZia route is unassociated with preexisting roads, utility lines, or pipelines. Choosing a northerly route to carry wind-generated power to Phoenix is thus much more in accord with Section 503 of the Federal Land Policy Act, which the BLM is required to follow.

Given that the proposed northern High Plains Express route uses existing EHV corridors and also begins and ends at essentially the same points that the SunZia Project does, Section 503 would seem to imply a legal preference for that route for a new transmission system. The High Plains Express project is designed to accomplish the very same thing that SunZia does, transport wind-

generated electricity from central New Mexico near Corona to Phoenix for distribution in the Phoenix metro area and southern California. Giving full consideration to this northerly route should be a priority before the BLM commits to any southerly route.

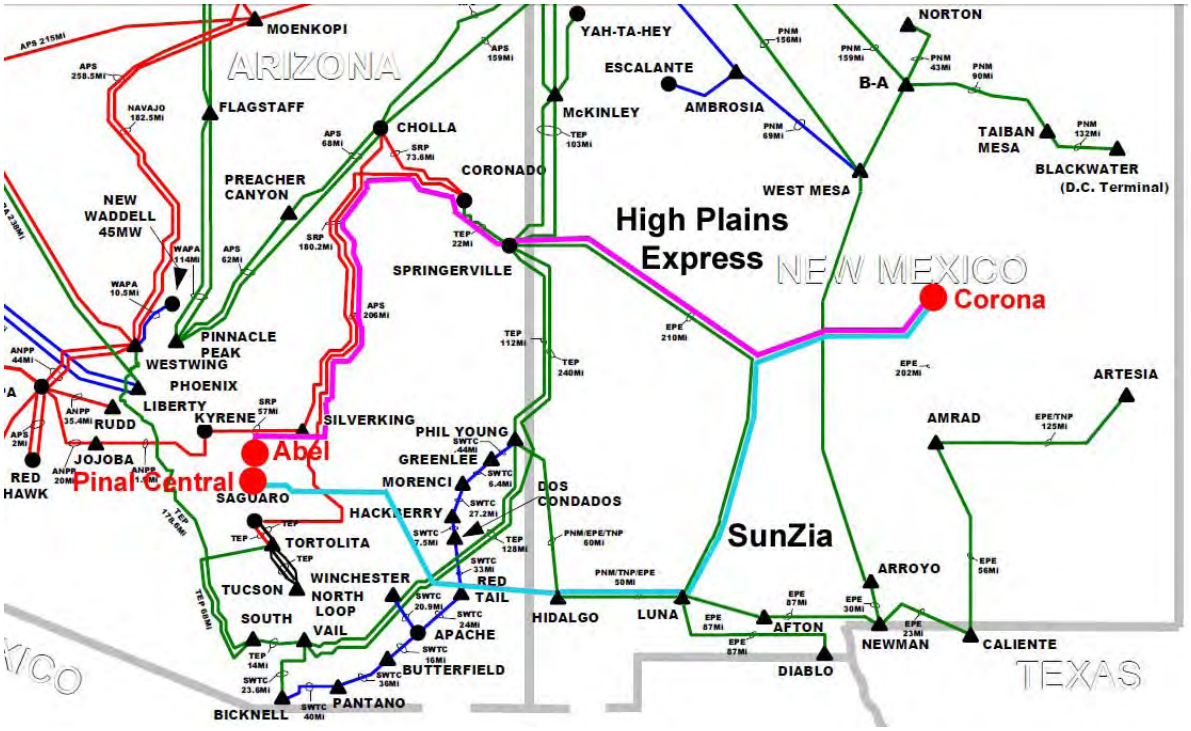

Figure 5. A schematic comparison of routes for the High Plains Express (HPX) Project and the SunZia Project between Corona, New Mexico, and Phoenix in relationship to existing extra-high-voltage lines. The HPX route is shown in purple and the SunZia route in aquamarine. From the Arizona–New Mexico border westward, more than 80% (94 miles) of the SunZia corridor is entirely new, unassociated with an existing highway or utility corridor. In contrast, the HPX route follows existing transmission corridors the full distance to Phoenix.

[1] Map available from http://www.highplainsexpress.com/site/static/maps/Project_Overlay_Map_01-11-2010.jpg. Accessed August 19, 2010. (Web site no longer available as of September 19, 2010.)

[2] *HPX Stakeholder Meeting, Update on Stage 2 Activities &Input from Stakeholders*, January 13, 2010, Albuquerque. Accessed August 18, 2010 from http://www.highplainsexpress.com/site/static/feasibilityStudyPDFs/HPX_First_Stage_Feasibility_Report_Presentation.pdf. (Web site no longer available as of September 19, 2010.)

[3] *High Plains Express Transmission Project, Feasibility Study Report*, June 2008. Accessed August 18, 2010 from http://www.highplainsexpress.com/site/static/feasibilityStudyPDFs/HPX_First_Stage_Feasibility_Report.pdf. (Web site no longer available as of September 19, 2010.)