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November 22, 2013

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VIA E-FILING AND U.S. MAIL

The Honorable Eric L. Lipman
Office of Administrative Hearings
P.O. Box 64620
St. Paul, MN 55164-0620

RE: In the Matter of the Petition of Northern States Power Company d/b/a Xcel Energy for Approval of Competitive Resource Acquisition Proposal and Certificate of Need
MPUC Docket No. E-002/CN-12-1240
OAH Docket No. 8-2500-0760

Dear Judge Lipman:

Enclosed please find the Initial Brief of Invenergy Thermal Development LLC in the above-referenced docket. The document has been filed with the e-Docket system and served on the attached service list. Also enclosed is our Affidavit of Service.

Very truly yours,

WINTHROP & WEINSTINE, P.A.

/s/ Eric F. Swanson

Eric F. Swanson

Enclosures

Cc: Attached Service List

8531804v1

BEFORE THE MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS
600 North Robert Street
St. Paul, Minnesota 55101

FOR THE MINNESOTA PUBLIC UTILITIES COMMISSION
121 Seventh Place East, Suite 350
St. Paul, Minnesota 55101-2147

In the Matter of the Petition of Northern States Power Company d/b/a Xcel Energy for Approval of Competitive Resource Acquisition Proposal and Certificate of Need	MPUC Docket No. E-002/CN-12-1240 OAH Docket No. 8-2500-0760 **AFFIDAVIT OF SERVICE**

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

Mary G. Holly, of the City of Lake Elmo, County of Washington, the State of Minnesota, being first duly sworn, deposes and says that on the 22nd day of November, 2013, she served the attached **Initial Brief** to all said persons on the attached Service List, true and correct copies thereof, by E-Filing and/or by depositing the same enclosed in an envelope, postage prepaid in the United States Mail in the post office at Minneapolis, Minnesota.

/s/ Mary G. Holly
MARY G. HOLLY

Subscribed and sworn to before me this
22nd day of November, 2013.

/s/ Jane E. Justice
Notary Public

My Commission Expires: January 31, 2015

8531820v1

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INITIAL BRIEF OF INVENERGY THERMAL DEVELOPMENT LLC

November 22, 2013

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> The Commission has adopted this competitive resource acquisition process for Xcel to utilize in proposing to add certain . . . resources. The intent was to create a more open and transparent competitive process to ensure that the best resource addition is acquired for ratepayers. The Commission initiated this process . . . and is expected to follow the certificate of need requirements. T. DeBleeckere, Commission Staff, October 15, 2013 Public Hearing, Transcript pp. 5-6 (emphasis added).

INTRODUCTION

The Commission's intended "open and transparent," certificate of need-like process has created a record that consists of over 100 exhibits, comprising tens of thousands of pages. The volume, complexity and detail in this record could overwhelm the most gifted intellect. The enormity of the information also tempts a reviewer to focus on a select tree or two, while losing sight of the forest. Fortunately, the Commission mandated a view of the forest by invoking Minnesota's certificate of need requirements, so that "the best resource addition is acquired for ratepayers."

Minnesota's certificate of need requirements embody the principles of any sound resource acquisition analysis by considering cost, reliability and environmental and socio-economic factors, all within the context of Xcel Energy's and Minnesota's electric supply system. Certainly detailed analysis plays a role in such a process. However, common sense and a keen focus on the bottom line cost to Xcel ratepayers must play central roles as well. Invenergy Thermal Development LLC ("Invenergy") respectfully submits that a full consideration of the record and the certificate of need criteria, while focusing on the forest not the trees, demonstrates that the Invenergy proposals constitute "the best resource addition" for Xcel ratepayers at this time.

I. APPLICABLE LAW

Prior Minnesota Public Utilities Commission ("Commission") Orders and Minnesota's certificate of need statutes and rules all guide the Administrative Law Judge's ("ALJ") and Commission's consideration of the record in this proceeding.

A. Prior Commission Orders.

The Commission initiated this docket following years of debate and analysis of the resource needs of Northern States Power Company d/b/a Xcel Energy ("Xcel") in multiple other dockets, most notably: Xcel's Prairie Island Extended Power Uprate docket, in which the Commission ultimately terminated Xcel's certificate of need for an increase in baseload capacity at the Prairie Island nuclear plant;[1] Xcel's 2010 Integrated Resource Plan;[2] and Xcel's Black Dog repowering docket, where Xcel ultimately withdrew its request for a certificate of need for an approximately 450 megawatt ("MW") combined cycle facility at the Black Dog site[3] (collectively, the "Related Dockets"). Through its work in the Related Dockets and its Orders in the current docket, the Commission has established the need for new capacity on the Xcel system in the 2017-2019 time frame. In addition, the Commission has required a comprehensive review of the available resource options, so that Xcel ratepayers receive the benefit of the best resource to fit this need.

[1] MPUC Docket No. E-002/CN-08-509 ("EPU Docket").
[2] MPUC Docket No. E-002/RP-10-825 ("2010 IRP Docket").
[3] MPUC Docket No. E-002/CN-11-184 ("Black Dog Docket").

1. The Commission Has Established The Need For Xcel To Acquire Additional Capacity.

When it opened the current docket, the Commission first noted the interrelationship of the Related Dockets and the developments in those dockets that "suggested that the size, type, and timing of Xcel's capacity needs should be revisited. These developments include updated demand forecasts, costs of alternative resource options, and Xcel's disinclination to continue the Prairie Island power uprate project."[4] The Commission also noted the potentially tight timing of this further analysis and ultimate resource acquisition, so ordered "a competitive resource acquisition process be undertaken . . . with a schedule that overlaps the schedule for developing Xcel's five-year action plan as ordered in the resource planning docket."[5]

The Commission further stated that:

> Xcel asked to withdraw its Certificate of Need application [for the Black Dog combined cycle facility], arguing that recent events and new data demonstrated that no new generating capacity would be needed by 2014. Xcel continued to argue that it would need new capacity eventually, and continued to propose soliciting proposals from project developers. But given the significant changes in the record, Xcel argued that the Commission should re-establish the amount of power to be acquired, and the schedule for acquiring it.[6]

The Commission agreed, ultimately finding in the 2010 IRP Docket that "Xcel will need an additional 150 MW in 2017, increasing up to 500 MW by 2019. . . . Xcel should invite proposals for adding peaking resources, intermediate resources, or a

[4] Order Closing Docket, Establishing New Docket, And Schedule For Competitive Resource Acquisition Process, November 21, 2012, p. 2.
[5] *Id*., p. 3.
[6] Notice and Order for Hearing, June 21, 2013, p. 1.

combination of the two."[7] The Commission opened the current docket to select the resource or resources that best meet Xcel's need.

2. The Commission Set The Certificate Of Need Criteria As The Guide For Final Resource Selection.

While the Commission has established the need for additional resources, from the beginning of this proceeding the Commission has also made clear the dynamic and comprehensive nature of the process used to select the resource or resources that will best fit this need. For example, when first soliciting comments on the resource proposals submitted, the Commission asked parties to provide input on:

> The completeness of Xcel Energy's resource proposal using certificate of need-like criteria for an out-of-state resource and the requirements outlined in the Commission's May 31, 2006 Order in Docket E002/RP-04-1752.
>
> [and]
>
> The completeness of alternative bidders' resource proposals under the requirements outlined in the Commission's May 31, 2006 Order in Docket E002/RP-04-1752."[8]

In that May 2006 Order, the Commission gave strong and clear guidance on the process to be followed in any competitive resource acquisition proceeding, stating:

> The Commission is convinced that the heightened scrutiny and rigorous factual development of the certificate of need process are required whenever Xcel competes in its own competitive procurement process. The Commission will therefore require the use of the certificate of need procedural framework whenever Xcel proposes a self-build option in the competitive resource procurement process.

---

[7] 2010 IRP Docket, Order Approving Plan, Finding Need, Establishing Filing Requirements, and Closing Docket, March 5, 2013, p. 6.

[8] Notice of Comment Period on the Completeness of Xcel Energy and Alternative Bidders' Resource Proposals, April 17, 2013 (emphasis added).

> The Company simply – and necessarily – has too much control over resource selection to use the standard process when it is a bidder. It has much more reliable and complete information about its own needs than its competitors. It also has superior information about its existing generation portfolio, the configuration of its transmission system, and any synergies that would result from adding different resources to the mix.
>
> All these advantages, combined with a clear and unavoidable conflict of interest, point to a need to use the more stringent, certificate-of-need-like process whenever the Company submits its own proposal.[9]

Thus, while a certificate of need itself is not required for a resource selected through a Commission-approved competitive bidding process,[10] the resource selection proceeding will nonetheless mirror a certificate of need process in many ways.

Of course, the record developed in such a proceeding can be voluminous. Such a process necessarily takes a broad and comprehensive view of the record developed in order to select the best fit from among the various resource alternatives available. As the Commission stated in its Notice and Order for Hearing in the current matter:

> The ultimate issue in this case is the identification of resource proposal or proposals that will provide the most reasonable and prudent strategy for Xcel to meet the needs of its service area. That issue depends, in turn, on numerous sub-issues that can be best developed in formal evidentiary proceedings. The parties may also raise and address other issues relevant to that determination.[11]

The certificate of need statute and rules provide the overall structure and framework for the Commission's analysis of these relevant issues.

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[9] MPUC Docket E-002/RP-04-1752, Order Establishing Resource Acquisition Process, Establishing Bidding Process under Minn. Stat. § 216B.2422, subd. 5 and Requiring Compliance Filing, May 31, 2006, p. 7 (emphasis added).
[10] Minn. Stat. § 216B.2422, subd. 5.
[11] Notice and Order for Hearing, June 21, 2013, p. 6 (emphasis added).

B. CON Statute And Rules.

Minnesota's certificate of need statute sets out certain factors which the Commission must evaluate before approving a final resource.[12] While certain of those factors impact all new capacity alternatives similarly (e.g., the effect of conservation programs on long-term energy demand or whether promotional activities gave rise to the capacity need), certain other factors can assist the ALJ and Commission in determining the most appropriate option for meeting the needs of Xcel and its ratepayers. Included among these relevant factors are "the relationship of the proposed facility to overall state energy needs," and the "benefits of [the] facility, including its uses to protect or enhance environmental quality, and to increase reliability of energy supply in Minnesota and the region."[13]

The Commission's certificate of need rules build on these statutory factors and set forth more specific criteria upon which to choose the appropriate resource in this proceeding.[14] These criteria reflect the "three pillars" of sound resource decision making discussed by ensuring analysis of the cost, reliability and environmental and socio-economic impact of the various resource options available to meet the identified need.[15] In order to approve a resource, the Commission's rules require it to determine that:

> A. the probable result of denial [of the facility] would be an adverse effect upon the <u>future adequacy, reliability, or efficiency of energy supply</u> to the applicant, to the applicant's customers, or to the people of Minnesota and neighboring states, . . .

[12] *See* Minn. Stat. § 216B.243, subd. 3.
[13] *Id*., subparts (3) and (5).
[14] Minn. R. 7849.0120.
[15] Ex. 69, pp. 2-3 (Ewan Rebuttal).

B. a more reasonable and prudent alternative to the proposed facility has not been demonstrated by a preponderance of the evidence on the record, considering:

(1) the appropriateness of the size, the type, and the timing of the proposed facility compared to those of reasonable alternatives;

(2) the cost of the proposed facility and the cost of energy to be supplied by the proposed facility compared to the costs of reasonable alternatives . . .;

(3) the effects of the proposed facility upon the natural and socioeconomic environments compared to the effects of reasonable alternatives; and

(4) the expected reliability of the proposed facility compared to the expected reliability of reasonable alternatives;

C. by a preponderance of the evidence on the record, the proposed facility, or a suitable modification of the facility, will provide benefits to society in a manner compatible with protecting the natural and socioeconomic environments, including human health, . . . and

D. the record does not demonstrate that the design, construction, or operation of the proposed facility, or a suitable modification of the facility, will fail to comply with relevant policies, rules, and regulations of other state and federal agencies and local governments.[16]

As discussed below, a full review of the record of this proceeding demonstrates that Invenergy's Cannon Falls Expansion ("Expansion") and Hampton Energy Center ("Hampton") proposals best meet these criteria and most appropriately meet the current capacity needs on the Xcel system.

[16] Minn. R. 7849.0120.

II. OVERVIEW OF INVENERGY AND ITS CANNON FALLS EXPANSION AND HAMPTON ENERGY CENTER PROPOSALS

A. Invenergy Offers Proven Project Development, Construction And Operations Expertise, With A Strong Financial Platform.

Invenergy has a strong history of providing resources matching the size, type and timing of new capacity identified by the Commission as needed to serve Xcel and its customers. Indeed, along with a substantial renewable energy supply portfolio, Invenergy has developed over 7,500 MW of utility-scale renewable and natural gas-fueled power generation facilities in the United States, Canada, and Europe. This portfolio includes more than 5,700 MW of projects in operation, with more than 1,800 MW under contract or in construction. Moreover, Invenergy's senior executives have worked together as a core group for over two decades. The expertise on the Invenergy team covers the gamut of fully integrated in-house capabilities, including project development, permitting, transmission, interconnection, energy marketing, finance, engineering, project construction, operations and maintenance.[17]

Regarding Invenergy's thermal qualifications, Mr. Shield explained that Invenergy has a large portfolio of natural gas-fueled electric generating facilities in the United States and Canada. This portfolio includes green-field projects initiated by Invenergy, as well as facilities acquired and completed by it. Operating projects in North America total 2,245 MW and include the Cannon Falls Energy Center. In addition to these operating projects, Invenergy is developing new environmentally-friendly natural gas-fueled electric generating facilities across North America. Invenergy's projects provide

[17] Ex. 70, pp. 4-6, 10-12 (Shield Direct).

economic and reliable power, with minimal impact on air and water resources. In total, Invenergy and its affiliate have funded more than $10 billion in corporate and power project financings in the last seven years.[18]

B. Invenergy Has A Proven Track Record With Xcel And In The Cannon Falls Community.

Invenergy's track record in Minnesota mirrors its experience elsewhere, evincing strong relationships with all stakeholders, including utilities, suppliers and the local communities in which Invenergy operates. The Cannon Falls Energy Center commenced commercial operations in 2008. The project consists of two simple cycle, dual fuel GE 7FA combustion turbines, providing 357 MW of peaking capacity. The project receives natural gas via Greater Minnesota Transmission and Northern Natural Gas. Xcel purchases the output of the project under a long-term power purchase agreement reviewed and approved by this Commission.[19]

The existing Cannon Falls facility has proven itself to be a fully dispatchable, operationally flexible and highly efficient peaking generation resource, providing reliable generating capacity to Minnesota and the Xcel system. In fact, the facility has had a 96.9% Capacity Availability Factor over the last two years. After adjusting for planned outages, the Cannon Falls facility has shown a reliability of 99.2% since the 2008 commercial operation date.[20]

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[18] *Id*., pp. 6-9.
[19] *Id*., pp. 5-7.
[20] *Id*., p. 12.

Invenergy has also built strong ties to the local community, as evidenced by the public hearing testimony of Cannon Falls City Administrator Aaron Reeves – the only host community to testify in this proceeding. Mr. Reeves expressed the support of the city council, the city's economic development authority, the county and the school district. As Mr. Reeves noted, the city, county and township conducted an extensive public hearing process prior to construction of the existing Cannon Falls facility, culminating in a host agreement between Invenergy, the city, the county and the schools. Mr. Reeves further testified that "Invenergy has been an excellent business partner in Cannon Falls," generating zero complaints from citizens or businesses while involving itself in the community and financially supporting the schools and other local projects. Given its experience with Invenergy, Mr. Reeves testified that Cannon Falls views the Expansion as "an excellent economic development opportunity for the city" and that the city sees "no issue at all with providing the necessary local approvals that would move forward quickly."[21]

C. Cannon Falls Expansion.

With the Expansion proposal, Invenergy offers approximately 179 MW of dispatchable, operationally flexible and highly efficient peaking capacity to fit the needs for the Xcel system and the State, as identified by the Commission and as demonstrated in this record.[22] The Expansion can be operational as early as January 1, 2016 with

[21] Public Hearing, October 15, 2013, Transcript pp. 30-34; *see also* Ex. 70, Attachment 3 (Shield Direct).
[22] Ex. 70, Attachment 1 (Shield Direct) contains the PUBLIC version of the Cannon Falls Expansion Proposal, while TRADE SECRET Ex. 71 contains the full proposal.

commercial operation beginning June 1, 2016 if necessary to meet Xcel's need by 2017.[23] Only Invenergy indicated an ability to meet such an aggressive in-service date. However, Invenergy also clarified that its pricing would remain the same for either a June 1, 2016 or a June 1, 2017 commercial operation date, thereby providing front end flexibility to Xcel that no other proposer offered, including Xcel itself.[24] In addition, Invenergy offered in-service dates of June 1, 2018 and June 1, 2019, adding to the flexibility of its proposal and enabling a "best fit" to the system needs.[25] Finally, in response to Xcel's inclusion of a "replacement cost" assumption in its analysis of the Expansion, Invenergy offered an additional power purchase agreement ("PPA") term giving Xcel the option to extend the PPA in five year increments at a reduced capacity price for up to three additional five year terms.[26] No other bidder has offered such back end flexibility to its proposal.[27]

As the record proves, the Expansion offers a number of important features and benefits that result in a compelling value proposition for Xcel and its ratepayers. In addition to the strong community support noted above, the Expansion will employ the same proven and reliable technology already used at the Cannon Falls site. Additionally,

[23] Ex. 70, Attachment 1, pp. 4, 8 (Shield Direct).
[24] Ex. 69, p. 4 (Ewan Rebuttal); TRADE SECRET Ex. 87, Attachment SR-R-9, pp. 3-4 (Rakow Rebuttal).
[25] *Id*.
[26] Ex. 69, p. 17 (Ewan Rebuttal).
[27] As will be discussed further below, neither Xcel nor the Department ever modeled the impact of adding the Expansion or Hampton to the Xcel system with a June 1, 2017 in-service date. In fact, Xcel examined no option for either the Expansion or Hampton beyond a 2016 in-service date and the Department examined only a 2019 date for the Expansion, finding the savings resulting from the later in-service date were "substantial." Transcript Vol. 1, p. 102 (Wishart); Transcript Vol. 2, p. 55 (Rakow).

the Expansion will be located just south of the Twin Cities metropolitan region, providing geographic diversity relative to other Xcel generation resources yet also utilizing existing infrastructure such as the operations and maintenance building, fuel oil unloading and storage facilities, transmission system and natural gas pipeline facilities and other equipment. As such, Invenergy is able to minimize the cost of the project and minimize any adverse impact to the surrounding community and existing land uses. The Expansion will be developed and constructed by a skilled, experienced, and well-funded team that is a part of an organization that is among the top energy development companies in the United States. The personnel and operations necessary for the Expansion will be integrated with the existing Cannon Falls facility, resulting in cost-saving synergies.[28]

The cost savings achievable with the Expansion will flow directly to ratepayers by way of a fixed price PPA to be executed and in which Invenergy assumes the construction and operation cost risk associated with the Expansion. Invenergy's performance will be backed by security in the amount of $15 million upon execution of the PPA, reduced to $5 million for the full term of the PPA upon reaching the commercial operation date, providing assurance to the Commission, Xcel and Xcel's ratepayers that Invenergy will fulfill the commitments it has made in its proposal.[29]

Regarding potential environmental impacts, given that the Expansion will be located on 9.3 acres of vacant land that is directly north of the existing Cannon Falls units

[28] Ex. 70, pp. 12-14 (Shield Direct).
[29] *Id*., p. 14.

and in an industrial park, no re-zoning will be required.[30] The record demonstrates that the Expansion would have a minimal visual impact to the surrounding area and minimal impact to the local topography or to soil compaction or erosion issues, particularly as compared to a greenfield site.[31] The Expansion will require only a modest amount of water for evaporative cooling on hot summer days and for emission controls when firing back-up fuel and that water can be supplied via the existing infrastructure. No surface water will be used.[32]

The Environmental Report makes clear that, as a peaking facility, the Expansion will operate a limited number of hours annually. In addition to limiting the number of operating hours, potential emissions will be limited through use of pipeline quality natural gas with dry low NOx burners for the majority of its operating time. Additionally, a water injection system will minimize NOx emissions when fuel oil is used as an emergency back-up fuel.[33]

Regarding other potential impacts, the record demonstrates that traffic impact during construction will be fairly minor, with no adverse impact to traffic during operations.[34] The Expansion will comply with State noise standards and does not produce solid waste. Finally, Invenergy has identified all relevant permits for the project and will continue its strong record of compliance on all regulatory matters.[35]

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[30] Ex. 65, p. 17 (Ewan Direct).
[31] *Id.*; Ex. 38, p. 23 (DOC EERA Environmental Report).
[32] Ex. 65, p. 17 (Ewan Direct); Ex. 38, pp. 17-18 (DOC EERA Environmental Report).
[33] Ex. 38, p. 37 (DOC EERA Environmental Report).
[34] Ex. 65, p. 18 (Ewan Direct); Ex. 38, p. 58 (DOC EERA Environmental Report).
[35] Ex. 65, pp. 18-19, 33 (Ewan Direct).

D. Hampton Energy Center.

Invenergy's Hampton Energy Center Proposal ("Hampton") calls for the development of approximately 357 MW of peaking capacity using two simple cycle, approximately 179 MW GE 7FA Combustion Turbine Generators ("CTG") to be located at a new site in Dakota County, Minnesota.[36] As with Cannon Falls, Hampton can be operational as early as January 1, 2016, with commercial operation beginning June 1, 2016 if necessary.[37] Again, only Invenergy indicated an ability to meet such an aggressive in-service date and also clarified that its pricing for Hampton would remain the same for either a June 1, 2016 or a June 1, 2017 commercial operation date, providing unique front end flexibility to Xcel.[38] Invenergy also offered in-service dates of June 1, 2018 and June 1, 2019 for Hampton, adding to the flexibility of its proposal to enable a "best fit" to the system needs.[39] As with the Expansion, in response to Xcel's inclusion of a "replacement cost" assumption in its analysis, Invenergy offered an additional power purchase agreement ("PPA") term giving Xcel the option to extend the PPA in five year increments at a reduced capacity price for up to three additional five year terms.[40]

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[36] Ex. 70, Attachment 2 (Shield Direct) contains the PUBLIC version of the Hampton Energy Center Proposal, while TRADE SECRET Ex. 72 contains the full proposal. During the evidentiary hearings it became apparent that the Department and Xcel modeled the Expansion solely as a single 357 MW addition of capacity, despite Hampton actually consisting of two 179 MW turbines. Transcript Vol. 1, p. 105-106 (Wishart), stating that "the Hampton Corners combustion turbines were paired together, therefore Strategist was forced to select those as a combination." (Emphasis added.)

[37] Ex. 70, Attachment 1, p. 8 (Shield Direct).

[38] Ex. 69, p. 4 (Ewan Rebuttal); TRADE SECRET Ex. 87, Attachment SR-R-9, pp. 3-4 (Rakow Rebuttal).

[39] *Id*.

[40] Ex. 69, p. 17 (Ewan Rebuttal).

Like the Expansion, Hampton incorporates a number of features and benefits that make it a compelling value proposition to meet the need identified by the Commission for Xcel and its ratepayers. As with the Expansion, Hampton will include a fully dispatchable and operationally flexible highly efficient peaking generation resource, providing reliable generating capacity. Similarly, Hampton will be located just south of the Twin Cities metropolitan region, providing geographic diversity relative to other Xcel generation resources.

Regarding the site, Invenergy has optioned property immediately adjacent to the site of the new 345 kV Hampton Substation. This location will concentrate industrial land use in one area and thus require minimal changes to existing land use. Hampton will also interconnect to an existing natural gas pipeline of Greater Minnesota Transmission ("GMT") that runs less than one-half mile from the proposed project site. This ideal location with its close proximity to gas and electrical infrastructure minimizes cost, minimizes disruption to existing land usage and minimizes overall community disturbance.

Finally, Hampton offers the same personnel and operations benefits as the Expansion, similar negligible impacts to traffic, noise, water resources impacts and air emissions, and Hampton will be backed by similar security, providing assurance to the Commission, Xcel and its ratepayers that Invenergy will meet the commitments set forth in its Hampton Proposal.[41]

[41] Ex. 70, pp. 15-16 (Shield).

III. INVENERGY'S PROPOSALS BEST MEET THE COMMISSION'S CERTIFICATE OF NEED CRITERIA

The record of this proceeding demonstrates that the Invenergy proposals to provide combustion turbines to fit Xcel's peak capacity needs best meet the Commission's certificate of need criteria and should be chosen to fill the capacity needs on Xcel's system in the 2017 – 2019 time frame. As discussed below, the Invenergy proposals:

- Impose far lower capacity costs on Xcel ratepayers than the combined cycle intermediate resource offered by Calpine and provide a more predictable cost than the Xcel "self-build" proposal;
- Provide the appropriate type of resource for the Xcel system, given the decreasing load factor and the increasing penetration of wind and solar resources on the Xcel system;
- Provide Xcel the needed capacity resources reliably and efficiently, given the ability to utilize existing infrastructure;
- Preserve maximum flexibility to meet Xcel's needs going forward, given the dynamic nature of the Xcel, State and regional systems and load forecasts;
- Minimize environmental impacts and bring substantial benefits to a supportive local community; and
- Accomplish these results in full harmony with other applicable policies, rules and regulations.

A. The Probable Result Of Denial Of The Invenergy Proposals Would Be An Adverse Effect Upon The Future Adequacy, Reliability, Or Efficiency Of Energy Supply.

The Commission Order concluding Xcel's 2010 IRP Docket informs the size, type and timing of resources necessary in this proceeding. In that Order, the Commission stated that: "Xcel will need an additional 150 MW in 2017, increasing up to 500 MW by

2019. . . . Xcel should invite proposals for adding peaking resources, intermediate resources, or a combination of the two."[42] The Commission identified this need based on Xcel's 2011 forecast, as developed in the 2010 IRP Docket.[43] While the Commission has thus established the need for additional resources for the Xcel system by 2017, the Commission left the determination of the precise type of resource most needed to this docket. As discussed below, the record developed in this proceeding shows two significant developments since the Commission Order that the ALJ and Commission must consider in selecting an appropriate resource or resources – the addition of significantly greater Intermittent Resources to the Xcel system and Xcel's continually declining load factor.

The bidders in this docket collectively propose three different types of resources to fill the need existing on the Xcel system in the 2017-2019 time frame: (1) "Capacity Resources," in the form of combustion turbines, as proposed by both Invenergy and Xcel and providing principally peaking capacity; (2) "Energy Resources," namely the Calpine proposal to add 345 MW of combined cycle intermediate resources, providing both capacity and energy; and (3) "Intermittent Resources," in Geronimo's solar energy proposal.[44] As discussed below, given the greater Intermittent Resources on the Xcel

[42] 2010 IRP Docket, Order Approving Plan, Finding Need, Establishing Filing Requirements, and Closing Docket, March 5, 2013, p. 6.
[43] *Id*., p. 4; *see also* Ex. 76, p. 3 (Shah Direct).
[44] As Mr. Ewan and Mr. Norman discussed, the term "Capacity Resources" refers to dispatchable, quick-start facilities such as the combustion turbines proposed by Invenergy and Xcel, whereas "Energy Resources" refers to baseload and intermediate resources such as combined cycle facilities or coal plants which require greater start-up time. "Intermittent Resources" include renewable resources such as wind and solar which

system and Xcel's continually declining load factor, the addition of Invenergy's proposed Capacity Resources best support the continued adequacy, reliability and efficiency of the Xcel system.

1. Invenergy's Proposals Provide Needed Capacity Resources For The Xcel System Beginning In 2017.

No one can dispute that Xcel will add dramatically greater wind energy to its system than envisioned by the Commission at the time it initiated this proceeding.[45] At that time, the Commission and Xcel both anticipated that Xcel would add 200 MW of wind energy to its system through a wind acquisition proceeding.[46] Instead, Xcel ultimately petitioned the Commission to acquire 750 MW of wind, a change significant enough that the Commission required Xcel to file a Notice of Changed Circumstances in both the 2010 IRP Docket and in the current docket. The Commission stated:

> [T]he proposed acquisition of 750 MW of wind generation constitutes a change in circumstances that may significantly influence the selection of resource plans. The Commission will therefore require Xcel to file a notice of changed circumstances in the resource plan and competitive resource acquisition dockets, to ensure that parties in both cases are notified of the change. . . . The Department and Xcel have represented that the record in the competitive resource acquisition and wind acquisition dockets will

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require the utility to accept power deliveries unless curtailment events arise and require the utility to have other resources available to balance the system and meet customer needs when the Intermittent Resources are not available. *See* Ex. 65, p. 23, fn. 1 (Ewan Direct); Ex. 73, p. 4, fn. 4 (Norman Rebuttal).

[45] *See* Transcript Vol. 2, p. 10 (Ewan).

[46] 2010 IRP Docket, Order Approving Plan, Finding Need, Establishing Filing Requirements, and Closing Docket, March 5, 2013, p. 4.

reflect updated modeling and analysis of Xcel's resource needs in light of the proposed acquisitions.[47]

As a result of dramatically increasing its acquisition of wind resources, Xcel will have significantly more Intermittent Resources on its system in the 2017-2019 time frame than assumed at the time of the Commission Order. With such resources, Xcel must accept power deliveries except when curtailment issues arise.[48] However, given wind's unpredictable nature, Xcel must simultaneously maintain sufficient amounts of flexible and efficient quick-starting resources – Capacity Resources – to balance the system.[49] As Calpine's witness Mr. Hibbard acknowledged, "combustion turbines in particular can be used as fast-start, fast-ramp resources, and provide net-load-following capability in off-line and on-line mode."[50] Indeed, the Invenergy proposals provide Capacity Resources with the ability to start quickly (achieving minimum load within 20 minutes and full load within 30 minutes) and then can be ramped up and down to follow load as needed.[51]

In addition to the dramatic increase in wind now planned for Xcel's system, Xcel will be adding significant new solar energy resources. Minnesota enacted its first-ever solar energy mandate after the Order initiating this docket. Under that mandate, investor-owned utilities such as Xcel must provide one and one-half percent of their retail electric

[47] MPUC Docket Nos. E-002/RP-10-825, E-002/CN-12-1240, E-002/M-13-603 and E-002/M-13-716, Order Requiring Notice of Changed Circumstances and Granting Intervention, October 4, 2013, p. 4.
[48] Ex. 65, p. 23, fn. 1 and p. 27 (Ewan Direct); Ex. 73, p. 4, fn. 4 and pp. 16 – 20 (Norman Rebuttal).
[49] Ex. 65, p. 27 (Ewan Direct); Ex. 73, pp. 16-20 (Norman Rebuttal).
[50] Transcript Vol. 1, pp. 62-63 (Hibbard); Ex. 93 (Hibbard presentation to Clean Energy Regulatory Forum, April 2012).
[51] Ex. 65, p. 7 (Ewan Direct).

sales to retail customers in Minnesota with solar energy resources.[52] As such, the solar energy mandate will add even more Intermittent Resources to the Xcel system. Solar resources, like wind resources, require the utility to accept delivery except in curtailment events.[53] However, solar resources too are not always available, again requiring the utility to maintain sufficient additional capacity to ensure the integrity of the overall system and to maintain system balance.[54]

Xcel's increasing levels of Intermittent Resources raise two specific concerns for the system going forward – the need to manage for the variability of those resources on a continual basis and the need for quick-starting resources in the event of extreme and unexpected drop offs in generation.[55] These concerns typically lead utilities to add Capacity Resources in the form of peaking facilities as they add Intermittent Resources.[56] However, Xcel lags far behind its own subsidiary Public Service Company of Colorado ("PSCo") in this regard. Indeed, the record demonstrates that PSCo has nearly twice as much peaking capacity as wind capacity – capacity that proved beneficial when PSCo experienced an unexpected wind ramp down of nearly 800 MW within 30 minutes last year.[57] In contrast, Xcel's current peaking capacity fails to even match its existing wind capacity.[58] After the addition of another 750 MW of wind, Xcel's peaking capacity will

[52] Minn. Stat. § 216B.1691, subd. 2f; *see also* Transcript Vol. 2, p. 10 (Ewan).
[53] Ex. 65, p. 23, fn. 1 (Ewan Direct).
[54] *Id*.
[55] Ex. 73, pp. 16-17 (Norman Rebuttal).
[56] *Id*.
[57] *Id*., pp. 17-18.
[58] *Id*.

decrease to only two-thirds of its wind capacity,[59] leaving it particularly vulnerable to wind ramp down events.

Capacity Resources of the type Invenergy proposes best complement the Intermittent Resources on Xcel's system. As discussed above, Intermittent Resources require additional resources to provide balancing and to provide quick-start capabilities in the event of ramp down events. Calpine witness Mr. Hibbard agreed that combustion turbines provide "fast-start, fast-ramp resources, and provide net-load-following capability in off-line and on-line mode."[60]

In contrast, Mr. Hibbard also acknowledged that a combined cycle facility such as that proposed by Calpine can only provide balancing functions when on-line and requires "on the order of several hours" to come on-line from a cold start.[61] Moreover, such a facility is "often operated as close to the most efficient operational point, with a dispatch range that is narrow relative to its size, limiting ramp/flexibility potential."[62] Thus, given the substantial penetration of Intermittent Resources on the Xcel system – a penetration only growing over the next few years – the Invenergy offers of Capacity Resources best fit the needs of the Xcel system.

Prior Department modeling has shown the impact of significant Intermittent Resources to the Xcel system. As Mr. Norman noted, previous Strategist modeling by

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[59] *Id*, p. 19.
[60] Transcript Vol. 1, pp. 62-63 (Hibbard); Ex. 93 (Hibbard presentation to Clean Energy Regulatory Forum, April 2012).
[61] Transcript Vol. 1, pp. 42-43 (Hibbard).
[62] Transcript Vol. 1, pp. 62-63 (Hibbard); Ex. 93 (Hibbard presentation to Clean Energy Regulatory Forum, April 2012).

the Department in the Black Dog Docket found that any need for combined cycle generation was typically delayed by the addition of large amounts of wind generation.[63] Specifically, the Department stated that its modeling showed that "addition of a combined cycle is delayed to 2020 or later under certain circumstances, usually involving large quantities of wind additions."[64]

Xcel's forecasts, and its continually declining load factor, further lead to the conclusion that Capacity Resources best match Xcel's current need. As the Department noted, in Xcel's most recent (2013) forecast:

> Xcel predicts a significant change in the overall load factor of its system. Specifically, Xcel's prediction that customers will use less energy overall while making higher demands on Xcel's peak means that Xcel predicts that its load factor will decrease significantly over time, with customers demanding ever more from Xcel's peak while using less energy overall.[65]

In fact, Xcel's September 2013 update to its forecast showed a capacity need of just 93 MW in 2017, as compared to the 2010 IRP Docket forecast showing a 150 MW need.[66] Moreover, the declining load factor in this most recent update continues a trend for Xcel dating back to 2004 and mirrors the trend seen nationwide over that same time span.[67] No modeling is necessary to discern that a utility system needing greater capacity at peak, while requiring less energy overall, requires Capacity Resources, not Energy

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[63] Ex. 73, pp. 21-22 (Norman Rebuttal), citing MPUC Docket No. E-002/CN-11-184, Department of Commerce Letter, March 1, 2012, p. 2.
[64] MPUC Docket No. E-002/CN-11-184, Department of Commerce Letter, March 1, 2012, p. 2.
[65] Ex. 76, p. 10 (Shah Direct).
[66] Ex. 44, p. 7 (Wishart Direct).
[67] Ex. 65, pp. 23-24 (Ewan Direct).

Resources to best fit its customers' needs and ensure customers a continued adequate electric supply.

2. The Invenergy Capacity Resource Proposals Will Reliably Meet The Needs On The Xcel System.

In assessing resource addition proposals, Minnesota rules require the Commission to consider more than simply ensuring that the utility has an adequate supply. The rules also require the Commission to consider the reliability and efficiency of that supply.[68]

Invenergy's combustion turbine proposals offer superior reliability to the Xcel system. Invenergy proposes adding identical combustion turbines to those currently employed at the existing Cannon Falls site. Those turbines have shown very high reliability both in terms of their starting reliability and in terms of an extremely low forced outage rate of less than one percent over the last four years.[69] No party challenged these facts. Moreover, neither Xcel nor Calpine provided similar statistics regarding their ability to run units with such high starting reliability and low forced outage rates.

In a misguided attempt to raise doubts regarding the reliability of Invenergy's proposals, Calpine questioned Invenergy's plan to procure interruptible gas supply for its facilities, hypothesizing that the facilities may not be available when needed due to a lack of gas supply.[70] In fact, operating a peaking facility such as the Expansion or Hampton facility with interruptible gas supply makes sense and saves ratepayers significant

[68] Minn. R. 7849.0120 (A).
[69] Transcript Vol. 2, pp. 9 – 10 (Ewan).
[70] *See, e.g.,* Ex. 51, pp. 13-14 (Hibbard).

expense.[71] As both Invenergy and Xcel explained, the Xcel system peaks in the summer when gas supply is readily available.[72] Both companies also explained that the existing Cannon Falls facility operated by Invenergy has historically seen the vast majority of its operating hours in the summer, to meet those peak needs, with only forty hours of operation in the past four winters combined.[73] In addition, both the Expansion and Hampton will have a back-up supply of fuel oil in the unlikely event that the facilities will be called upon when natural gas is not available.[74]

The current Cannon Falls facility operates with an interruptible gas supply and the record is devoid of evidence indicating that this has created concerns.[75] As Xcel testified, it currently has other peaking plants on its system that use an interruptible gas supply and the company has always found itself "to have more than sufficient resources during the winter months. We've always found ourselves to have plenty of capacity in the winter and having those units on interruptible gas has not been a problem."[76] Similarly, "the units have always run reliably during the summer months."[77]

Xcel acknowledged that "the use of an interruptible natural gas supply can deliver significant cost savings without a significant impact on reliability, so long as the unit can operate on back-up fuel oil or there are other system units available to meet the

[71] Ex. 69, pp. 8-9 (Ewan Rebuttal).
[72] *Id*.; Ex. 47, p. 21 (Wishart Rebuttal).
[73] *Id*.
[74] Ex. 69, p. 9 (Ewan Rebuttal).
[75] *See, e.g.,* Transcript Vol. 2, pp. 33-34 (Shah).
[76] Transcript Vol. 1, p. 118 (Wishart).
[77] *Id*., p. 119.

demand."[78] Xcel further testified that it is "very unlikely" that the Expansion would ever be dispatched in the winter and that it is "very unlikely" that gas supply to the Expansion would ever be interrupted in the summer.[79] Nonetheless, Xcel witness Wishart modeled the Expansion project assuming no available natural gas in the winter months and no back-up fuel oil supply. Even with these extreme assumptions, "the project's cost effectiveness does not change."[80]

Thus, the record supports both the reliability of the Invenergy proposals and the reasonableness of using an interruptible gas supply. Requiring a firm gas supply would only add unnecessary costs to ratepayers, lessening the efficiency of the system while not increasing the reliability. Indeed, the Department analyzed the cost savings of an interruptible gas supply for the Expansion and found a savings of approximately $35 million compared to the use of firm supply.[81] In contrast, Xcel's modeling which assumed zero availability for the Expansion in the winter months (an unrealistic assumption) added only $1 million of cost compared to the Expansion being available. Obviously, interruptible fuel supply at the Expansion represents the efficient choice for the Expansion and does nothing to lessen the reliability of the Xcel system.

3. The Invenergy Proposals Will Efficiently Meet Ratepayer's Needs.

Consideration of the most efficient means of meeting Xcel's needs must also consider the characteristics of Xcel's system. As discussed above, the Xcel system

[78] Ex. 47, p. 20 (Wishart Rebuttal) (emphasis added).
[79] Transcript Vol. 1, pp. 117-118 (Wishart).
[80] Ex. 47, pp. 20-21 (Wishart).
[81] Ex. 87, p. 10 (Rakow Rebuttal).

continues to add significant Intermittent Resources while also showing a declining load factor. This continually declining load factor augurs the need for additional Capacity Resources. As Mr. Norman discussed, a lower load factor indicates a system where supply resources will sit idle for periods of time until higher load conditions occur.[82] On such systems, ratepayer costs are minimized with Capacity Resources. A Capacity Resource such as a combustion turbine imposes significantly lower capacity costs on the system than an Energy Resource such as a combined cycle or coal plant.[83]

Not only do Capacity Resources minimize ratepayer costs in such circumstances, they maximize the utility's flexibility -- increasing future efficiency -- as well. As Mr. Norman testified in response to questions from Judge Lipman:

> [M]aintaining or procuring capacity in a way that minimizes fixed commitments or minimizes capacity payments is also a way of protecting yourself from things not turning out quite the way you expect it to or need it to. . . . The Invenergy proposal capacity payments are, I would say, materially lower than capacity payments proposed from Calpine.[84]

Not surprisingly, Xcel's recent analyses of its system needs have shown a preference for the kind of Capacity Resource proposed by Invenergy. In the Black Dog Docket, Xcel withdrew its application for a certificate of need for a combined cycle facility, stating that the proposal was no longer in the best interest of ratepayers given the softening demand and lower energy forecasts now seen for its system.[85] Given those lower energy needs, which the record shows continues to hold true, Xcel stated that "it is

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[82] *Id*., p. 11.
[83] *Id*.
[84] Transcript Vol. 2, p. 26 (Norman).
[85] MPUC Docket No. E-002/CN-11-184, Xcel Motion to Withdraw Application, p. 2.

more likely that the next resource should be a combustion turbine,"[86] rather than a combined cycle facility such as that proposed by Calpine. Indeed, in the current docket Xcel itself has proposed only combustion turbine Capacity Resources similar to the Invenergy proposals.

4. Summary Regarding Adequacy, Reliability And Efficiency Of Supply.

In the 2010 IRP Docket, the Commission established a need on the Xcel system of 150 MW of capacity in 2017 and up to 500 MW by 2019. Since that decision, Xcel has committed to adding significant new Intermittent Resources to its system. In addition, forecast updates suggest a need in 2017 possibly lower than the 150 MW identified by the Commission, with a continually decreasing load factor. Each of these factors indicates a need for lower capital cost, quick starting facilities in the form of Capacity Resources. Invenergy proposes highly reliable and efficient combustion turbines at sites that take advantage of existing infrastructure, ensuring Xcel ratepayers an adequate, reliable and efficient electric supply.

B. A More Reasonable And Prudent Alternative To The Invenergy Proposals Has Not Been Submitted.

As noted above, the ALJ and Commission have before them three different types of resources proposed to fill the need existing on the Xcel system in the 2017 to 2019 time frame: (1) "Capacity Resources," as proposed by both Invenergy and Xcel and providing principally peaking capacity by using combustion turbines; (2) an "Energy Resource," namely Calpine's proposed 345 MW of combined cycle intermediate

[86] *Id*.

resources; and (3) an "Intermittent Resource," in Geronimo's solar energy proposal.[87] Thus, a fundamental decision for the ALJ and Commission in this proceeding is whether a Capacity Resource, or an Energy Resource, or a combination of the two will best meet the needs of the Xcel system at this time.[88]

As set forth below, the record demonstrates that for the time frame at issue the Capacity Resources proposed by Invenergy fit the needs of the Xcel system and do so efficiently and reliably. Calpine's combined cycle intermediate facility imposes excess costs in the form of high capacity payments and provides unneeded energy. Xcel's Capacity Resource proposals offer the appropriate resource type, but create substantially more risk for ratepayers than the Invenergy proposals due to Xcel not providing fixed cost pricing and the due to the inability to verify that all operating costs have been included in the modeling done in this proceeding.

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[87] This brief focuses principally on the choice between the smaller combustion turbine proposals of Invenergy and Xcel and the 345 MW combined cycle proposal of Calpine. Geronimo offers an Intermittent Resource that, at best, meets only a portion of the identified need in this docket and does so at significant cost. While Invenergy supports development of solar energy projects, it joins the Department in recommending that those projects be developed in a separate docket. *See* Ex. 65, p. 31 (Ewan Direct); Ex. 43, p. 83 (Rakow Direct). Such a proceeding can help Xcel meet the new mandate as cost-effectively, reliably and reasonably as possible. Ex. 70, pp. 17-18 (Shield Direct). For the current need, solar energy simply cannot compete on cost and other factors. As Dr. Rakow noted, "if Geronimo had been closer, state policy preferences regarding renewables may have been a consideration, but it was too far removed [from the other proposals] to be considered." Transcript Vol. 2, p. 56 (Rakow).

[88] As the Commission stated, this proceeding should examine the potential of adding "peaking resources, intermediate resources, or a combination of the two." 2010 IRP Docket, Order Approving Plan, Finding Need, Establishing Filing Requirements, and Closing Docket, March 5, 2013, p. 6.

1. Calpine's Combined Cycle Facility Would Impose Unnecessary Costs On Xcel Ratepayers.

To meet a need of 150 MW of capacity in 2017 (or less if Xcel's September 2013 updated forecast proves accurate), increasing to up to 500 MW of capacity by 2019, Invenergy offered two Capacity Resource proposals – the approximately 179 MW combustion turbine Expansion project at Cannon Falls and two approximately 179 MW combustion turbines, for a potential combined 357 MW project at Hampton. For both proposals, Invenergy offered pricing assuming in-service dates ranging from 2016 to 2019, including identical pricing for either a 2016 or 2017 date.[89] As the Department recognized, modeling suggests that the flexible in-service dates for the Expansion could provide substantial cost savings to ratepayers.[90] While the Department did not conduct any detailed modeling of Hampton, Invenergy offered the same flexible structure and slightly *lower* pricing overall for Hampton as for Cannon Falls.[91] Thus, Invenergy offers flexible Capacity Resource additions that can meet the needs of the Xcel system on an incremental and as needed basis.

In juxtaposition, Calpine offers a one-time addition of 345 MW of combined cycle capacity. Of course, combined cycle capacity carries a higher capacity cost (and lower energy cost) than a Capacity Resource such as a combustion turbine.[92] Additionally, while Calpine offered pricing for in-service dates of 2018 or 2019, the Department's

[89] Ex. 69, p. 4 (Ewan Rebuttal); TRADE SECRET Ex. 87, Attachment SR-R-9, pp. 3-4 (Rakow Rebuttal).
[90] Ex. 86, p. 11 (Rakow Rebuttal); Transcript Vol. 2, p. 55 (Rakow).
[91] *See* TRADE SECRET Ex. 87, Attachment SR-R-9, pp. 3-4 (Rakow Rebuttal).
[92] Ex. 69, p. 8 (Ewan Rebuttal).

modeling indicated little difference in the total cost to ratepayers depending on the in-service date.[93] As such, the Calpine proposal offers less flexibility in terms of both size and in-service dates as compared to the Invenergy proposals. Moreover, comparing the capacity pricing offered by Invenergy with that offered by Calpine demonstrates that the Calpine proposal, if accepted, would impose substantially higher capacity payments on Xcel ratepayers.[94] The record simply cannot support placing this burden on ratepayers.

The Calpine combined cycle Energy Resource proposal imposes these substantial costs without delivering corresponding benefits. Calpine attempts to justify selection of a combined cycle resource by arguing that "the selection of [combined cycle] technology rather than or at least in addition to [combustion turbine] technology provides a hedge against the risk that increasingly stringent control requirements lead to greater than expected retirements of baseload coal-fired capacity since [combined cycle] capacity can operate in baseload and intermediate roles."[95] However, Xcel has already made significant investments in self-built and contracted combined cycle facilities, including Calpine's existing Mankato facility. These facilities are only lightly used relative to their capabilities and relative to combined cycle facilities on other utility systems.[96] In fact, not only has the utilization of Xcel's owned combined cycle facilities continued to lag

[93] Ex. 86, p. 11 (Rakow Rebuttal).
[94] *See* Ex. 87, TRADE SECRET ATTACHMENT SR-R-9, pp. 3-6 (Rakow Rebuttal) (showing the difference in capacity costs between the Expansion and Calpine on a per MW basis) and Ex. 45, HIGHLY SENSITIVE TRADE SECRET ATTACHMENT 2, p. 8 of 10 (Expansion) and p. 10 of 10 (Calpine) (Wishart Direct) (showing the year-by-year difference in total capacity costs).
[95] Ex. 51, pp. 25-26 (Hibbard Direct).
[96] Ex. 73, pp. 28-31 (Norman Rebuttal); Ex. 65, pp. 25-27 (Ewan Direct).

behind the national median, in 2012 Calpine's existing combined cycle plant was utilized only about one-third as much as the national median and far less that either Riverside or High Bridge.[97]

In other settings, Calpine witness Mr. Hibbard has noted the potential of existing gas units such as Xcel's combined cycle facilities to provide additional power production as opposed to building new units. In an August 2010 report which Mr. Hibbard co-authored, a section of the report titled "Existing Gas Units Have Untapped Power Production Potential" states: "Despite declines in natural gas prices, existing gas units have significant untapped power production potential, which can be expanded during off peak periods without constructing new generation."[98]

Both Xcel and the Commission Staff have also previously noted the enormous untapped potential of Xcel's currently owned and contracted for combined cycle fleet. As Mr. Norman pointed out, in the 2010 IRP Docket Staff summarized the situation as follows:

> Xcel explained that, when [Xcel] looks at the operation of its system in 2017-2019, the resources to be added likely will not operate many hours. Thus, ***a combustion turbine peaking resource may meet that need most cost-effectively***… Over the last several years, Xcel has invested in more than 1,000 MW of combined cycle capacity (i.e., roughly 500 MW at High Bridge and 500 MW at Riverside). According to Xcel, 'the capacity factor of those two plants today is roughly 20 percent.' Xcel's Strategist modeling configured the units to operate at 30 percent into 2018. Thus, according to [Xcel], '***there is a huge amount of available production capacity on [Xcel's] system***' if the High Bridge and Riverside facilities

[97] Ex. 65, p. 26 (Ewan Direct) (showing a national median capacity factor for combined cycle facilities of over 50%, while Mankato has operated at between 11 and 17% for the years 2009-2012).
[98] Ex. 91, p. 13; Transcript Vol. 1, pp. 54-55 (Hibbard).

> were to operate at the 30 percent assumed in Strategist. Moreover, 'they can operate at 70-80 percent,' so ***Xcel does not believe another combined cycle addition benefits the system at this time.***[99]

Given the fact that Calpine's Mankato facility has not operated at greater than a 17% capacity factor in the past four years, Staff's and Xcel's observations understate the amount of untapped energy production capacity.[100]

Given this untapped capacity, to the extent energy needs on the Xcel system materialize faster than currently anticipated, Xcel already has Energy Resources available that can be called on rather than contracting for the cost of a new combined cycle power plant.[101]

Mr. Norman demonstrated the available energy on Xcel's existing combined cycle fleet by setting up a hypothetical scenario. He assumed a combination of: (1) using Xcel's existing owned and contracted combined cycles to absorb all growth on the Xcel system through 2019 (i.e., ignoring the ability of new wind or other resources to meet any portion of that growth); (2) the unanticipated retirement of approximately 500 MW of coal-fired capacity on the Xcel system; and (3) Xcel's existing owned and contracted

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[99] Ex. 73, pp. 28-29, quoting Staff Briefing Papers, MPUC Docket No. E-002/RP-10-825, February 20, 2013, p. 5.

[100] Other analyses similarly demonstrate the untapped capacity at combined cycle facilities. For example, an American Clean Skies Foundation document for which the authors acknowledged Calpine witness Hibbard's contributions, stated that 87% of MISO's combined cycle fleet operated at below a 30% capacity factor in 2011. While Mr. Hibbard stated that he could not verify the accuracy of the statement, he also stated that "I have no reason to doubt it sitting here." Transcript Vol. 1, p. 59. Moreover, the statement is consistent with Xcel's experience where 100% of its combined cycle fleet operated at below a 20% capacity factor in that same year. Ex. 65, p. 26 (Ewan Direct) (showing the highest capacity factor in 2011 on the Xcel fleet of four combined cycle facilities at 17% for High Bridge).

[101] Ex. 73, p. 29 (Norman Rebuttal).

combined cycles absorbing all of the lost generation from the 500 MW of unexpectedly retired coal-fired capacity. In addition, to further "stress test" this hypothetical scenario, Mr. Norman assumed that the "baseline" capacity factors for the existing combined cycle facilities (e.g., the capacity factor floor from which generation at the combined cycles could increase) were at July 2012 levels – i.e., at historical capacity factor monthly average highs on the Xcel system for combined cycle resources.[102]

Given the above assumptions, Mr. Norman then analyzed the average unutilized generation among Xcel's existing and contracted combined cycle facilities. That analysis continued to show significant generating "headroom" among the existing self-owned and contracted combined cycle facilities, such that (1) all anticipated Xcel energy growth through 2019; plus (2) lost generation from the unanticipated retirement of 500 MW of coal-fired capacity could be absorbed by the existing combined cycle facilities.[103]

As the record makes clear, adding even more combined cycle capacity to the Xcel system, with its corresponding higher capacity cost, simply makes no economic sense in the face of the existing resources, most notably the existing Calpine combined cycle plant, remaining under-utilized.

2. Invenergy Offers Greater Flexibility, Greater State Benefit And Greater Price Certainty For Xcel Ratepayers Than Xcel's "Self-Build" Proposal.

Xcel proposes the only other Capacity Resource in this proceeding, also proposing combustion turbines. Specifically, to meet an identified 150 MW need in 2017 (or

[102] *Id*., pp. 29-30.
[103] *Id*., pp. 30-31.

perhaps less as indicated in Xcel's September 2013 update) and up to a 500 MW need in 2019, Xcel proposed a total of 645 MW of Capacity Resources, consisting of three 215 MW combustion turbine generators – one to be located at Black Dog and two to be located in North Dakota.[104] By providing significantly greater capacity than the Commission has determined is needed, the Xcel proposals commit greater resources than necessary and leave less flexibility going forward to adapt to continued changes in both the supply side and the demand side of the business.[105] In addition, by proposing two North Dakota facilities, Xcel locates these Capacity Resources far from its most significant load and bring no ancillary benefits to the Minnesota economy.

In contrast, Invenergy proposes to construct its facilities in supportive local communities, creating over 100 construction jobs and generating local tax revenues approximating $500,000 per generating unit each year.[106] Invenergy also sized its proposals to better match Xcel's need and also offers a proposed 20 year PPA, providing ratepayers the benefit of a re-evaluation of Xcel's resource needs at the end of that contract, as opposed to locking ratepayers in for the life of an Xcel-owned facility.[107] Invenergy also offered an additional PPA term giving Xcel the option to extend the PPA in five year increments at a reduced capacity price for up to three additional five year

[104] Ex. 49, pp. 2-3 (Alders Direct).
[105] *See* Ex. 65, pp. 31-32 (Ewan Direct).
[106] *Id*., pp. 12-13.
[107] *Id*., pp. 31-32.

terms.[108] To the extent capital costs rise significantly over the next 20 years, this optionality could prove extremely valuable to Xcel ratepayers.

Of course, Xcel's unique role as both "bidder" and "buyer" in this proceeding creates challenges when comparing Xcel's proposal with other parties' formal bids. Most importantly, as both bidder and buyer Xcel fails to offer ratepayers the benefit of a fixed-price proposal.[109] In an effort to compensate for that fact, Xcel proposed a rate rider for each of the three 215 MW units in its proposal.[110] The rider would adjust the return on equity applicable to the investment in each unit "to reflect any difference between [Xcel's] baseline estimated capital cost and the actual capital cost of the unit."[111] If the actual capital cost exceeded the estimate by more than 10%, Xcel proposed a 1% (or 100 basis point) reduction in the return on equity applied to that unit's capital cost. Conversely, if Xcel brought the unit on line below the estimated cost by 10% or more, Xcel would receive a bonus of 1% (or 100 basis points) above its authorized return on equity.[112]

Xcel's proposal fails to "level the playing field" for two principal reasons. First, by its terms, Xcel's proposal relates solely to its capital costs, leaving all non-capital costs unchecked. Of course, projects also have associated operating and maintenance ("O&M") costs and general and administrative costs separate and apart from their capital

[108] Ex. 69, p. 17 (Ewan Rebuttal).
[109] *Id*. at 32.
[110] Ex. 49, p. 5 (Alders Direct).
[111] *Id*.
[112] *Id*. The Xcel proposal also suggested a one-half percentage point decrease/increase if capital costs exceeded/fell short of the estimated cost.

costs. For the Xcel "self-build" proposals, Department witness Dr. Rakow stated that "Xcel should have included that, to the extent there are such costs, things like fixed O&M, variable O&M."[113] The Department did not ask information requests of Xcel to further explore this issue.[114] Rather, for its modeling, the Department "gave Xcel the inputs we were going to use . . . so it's up to them to figure out how to allocate the costs we gave them."[115] Thus, not only do Xcel's operating costs remain unchecked by any "rider" type mechanism, it is unclear how such a mechanism could even be devised and those costs remain opaque in the economic analyses done to date. This lack of firm cost control measures stray from the clear expression of the Commission intent that:

> Reliable information is clearly critical to a fair bidding process and a least-cost outcome. All bidders should be held to the cost information provided in their bids, which the Commission will evaluate in the course of this contested case proceeding."[116]

Second, as to capital costs, the Xcel proposal does not hold customers harmless. In contrast to a fixed price proposal such as that offered by Invenergy, Xcel still seeks full capital cost recovery, albeit with a modestly reduced return on those costs if they exceed the capital cost estimate by more than 10 percent. Xcel's proposal would only slightly soften the blow to ratepayers in the event of capital cost overruns. When coupled with the fact that Xcel offers no recourse against higher than expected operating costs,

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[113] Transcript Vol. 2, p. 54 (Rakow) (emphasis added).
[114] *Id*.
[115] *Id*.
[116] Order Extending Bidding Deadline and Refining Procedural Framework, March 5, 2013, p. 4 (emphasis added).

the Xcel proposal "leaves ratepayers with essentially unlimited exposure to the risk of cost overruns."[117]

In summary, the Invenergy proposals meet the needs on Xcel's system and do so while imposing substantially lower capacity costs on Xcel ratepayers than Calpine's combined cycle facility. While Xcel also offers peaking resources, Xcel offers far more capacity than identified by the Commission as necessary and offers no meaningful protection to ratepayers in the event of cost overruns.

3. The Strategist Modeling Results Provide Useful Information But Fail To Support Selection Of Other Resources Above The Invenergy Proposals.

The record of this proceeding contains three sets of Strategist modeling results, two from the Department and one from Xcel.[118] Xcel's Strategist modeling shows Invenergy's Expansion proposal (with an early in-service date of 2016) as being a part of the overall least cost set of resources, together with the Xcel self-build at Black Dog.[119] The Department's modeling initially did not place the Expansion proposal as high. However, with the modeling results presented in its rebuttal testimony, the Department stated:

[117] Ex. 69, p. 14 (Ewan Rebuttal).
[118] Strategist is a complex resource planning software which includes detailed modeling of every unit on Xcel's system and includes an hourly generation dispatch simulation that attempts to calculate total costs and associated air emission costs related to various combinations of resources. Ex. 44, pp. 19-21 (Wishart Direct); Transcript Vol. 1, p. 92 (Wishart).
[119] Ex. 44, p. 26 (Wishart Direct).

[M]y analysis showed the two top performing packages as:

1. Invenergy's Cannon Falls proposal (ICT1) with Xcel's Black Dog unit 6 (BD6); and

2. Calpine's Mankato proposal.[120]

While the Expansion obviously fared well in both Xcel and Department modeling results, the ALJ and Commission must exercise caution and not rely too heavily on those results. As Invenergy noted before knowing the final results of the Xcel or Department modeling, Strategist can be a useful tool but has limitations.[121] In addition, the results of any modeling exercise are only as sound as the inputs and assumptions built in to the model. Input biases such as fuel charges, forced outage rates and run hour assumptions can all skew a model's results.[122] Each of these concerns is present in this case, requiring a tempered view of the Strategist results.

First, the record demonstrates the limitations of Strategist. As Calpine noted, "Strategist is a 'black box' model, one whose unit commitment and dispatch model is opaque and admittedly simplistic."[123] Xcel itself has noted some of Strategist's limitations, including the fact that the model's design "makes it difficult for us to use the model to evaluate the benefits of quick start combustion turbines relative to our generic turbines."[124] Production cost models such as Strategist also fail to reflect cycling

[120] Ex. 87, p. 3 (Rakow Rebuttal).
[121] Ex. 65, p. 15 (Ewan Direct).
[122] *Id*.
[123] Ex. 51, p. 8 (Hibbard Direct).
[124] Ex. 73, pp. 34-35 (Norman Rebuttal) (citing Xcel comments in the 2010 IRP Docket, filed August 2, 2010 at p. 4-9.

intricacies, which can lead to a distorted comparison of resources. As Mr. Norman explained:

> There are incremental cycling costs incurred by combined cycle utilization to balance intermittent generation (which will be the case without adequate peaking generation on the system), and which may need to be addressed outside the Strategist model (or other production cost dispatch model architectures). Combined cycles will operate less efficiently when cycling (both existing Xcel-owned and contracted resources as well as future combined cycle additions), and must operate at partial load to adequately balance intermittent resources. Because most production cost models do not account for this well, this leads to the potential to overstate the benefits of combined cycles.[125]

Second, any model is only as good as the assumptions plugged in to it. In the case of the Invenergy proposals, numerous decisions made on the front end of the Xcel and Department modeling inappropriately punished the Invenergy proposals.[126] For example, both the Department and Xcel assumed an in-service date of June 2016. As Mr. Ewan explained, Invenergy indicated its capability to achieve an aggressive development schedule and provided pricing for that early in-service date. However, Invenergy did not mean to imply that June 2016 was the only agreeable in-service date and, in fact, clarified in response to an information request that it would hold its pricing the same with an in-service date of June 2017.[127] Despite this clarification, neither Xcel nor the Department ever modeled the Invenergy proposals with an in-service date of 2017.[128] By not modeling a 2017 start date, these model results penalized the Invenergy proposals by adding a full year of cost on the front end when compared to any other proposal.

[125] Ex. 73, p. 34 (Norman Rebuttal).
[126] Ex. 69, pp. 3-6 (Ewan Rebuttal); Transcript Vol. 2, pp. 7-9 (Ewan).
[127] Ex. 69, p. 4 (Ewan Rebuttal); Transcript Vol. 2, p. 8 (Ewan).
[128] *See* Transcript Vol. 1, p. 102 (Wishart) and Transcript Vol. 2, p. 55 (Rakow).

Xcel's modeling also distorted the variable operation and maintenance expense associated with the Expansion.[129] Mr. Wishart assumed a run time per start approximately half of that experienced by Invenergy over the last five years of operation at Cannon Falls. Revising the run time per start to equal something more reflective of actual performance would further lower the cost of the Expansion.[130]

Further, the modeling incorrectly "rewards" high forced outage rates.[131] Xcel's modeling effectively reduced the capacity of each project by the forced outage rate that the particular entity proposed. Invenergy proposed a lower forced outage rate than the other parties, reflective of the extremely high reliability experienced to date at Cannon Falls.[132] However, this lower forced outage rate then had the perverse effect of adding incremental capacity payment costs to the Invenergy proposals, again making them appear more expensive than other resources.[133]

In addition, the modeling assumed air emissions at the level currently permitted at Cannon Falls. However, actual emissions have been far lower than permit levels and Invenergy anticipates that both the Expansion and Hampton will be permitted on a more restrictive basis than the existing Cannon Falls facility. By overstating the emissions and then applying externality costs to those overstated levels, the modeling again inappropriately penalizes the Invenergy proposals.[134]

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[129] Ex. 69, p. 4 (Ewan Rebuttal).
[130] *Id*.
[131] *Id*., p. 5.
[132] *Id*.; Transcript Vol. 2, p. 8 (Ewan).
[133] *Id*.
[134] Ex. 69, p. 5 (Ewan Rebuttal).

Finally, the modeling results differed widely between the Department and Xcel, given the different approaches and assumptions made by the two parties. As Xcel witness Mr. Wishart explained, a few key decisions made by the modelers appear to account for the majority of the difference in results. For example, Xcel "locked" the model's long-term expansion plan in order to evaluate all resource proposals in the context of the same plan and to get a "cleaner comparison of just the economics of one proposal versus the other."[135] The Department did not "lock" the expansion plan, meaning that with each bid portfolio studied Strategist created different sets of other resources for the period 2020 through 2036.[136] According to Mr. Wishart, the Department's modeling decision means that its model results "are not a direct comparison between bid proposals, but rather a comparison of the bids plus the cost of some generic plants that were added by Strategist."[137]

The Department modeling also ended at 2036 (as opposed to Xcel's analysis which ran through 2050) and then included substantial "end effects" adjustments to both the Invenergy Expansion and to Black Dog.[138] An "end effects" adjustment incorporates into the results "an estimate of the long-term cost of a resource instead of modeling the long-term cost."[139] For Black Dog, the impact of the Department's adjustment meant "a

[135] Transcript Vol. 1, pp. 97-98.
[136] Ex. 47, p. 7 (Wishart Rebuttal).
[137] *Id*.
[138] The Department did no detailed modeling of Hampton but presumably the same adjustment would have been applied.
[139] Ex. 47, pp. 13-14 (Wishart Rebuttal).

$10 million penalty for the project."[140] Invenergy's Expansion proposal fared even worse, with Xcel explaining that "the Department's model applies a $50 million 'end effects' penalty to the Invenergy bid. . . . The magnitude of the 'end effects' adjustment is very non-intuitive."[141] Nothing in the record explains the basis for this substantial penalty.

The limitations and differing assumptions built in to the Strategist modeling performed for this proceeding mean that Strategist cannot provide any definitive answer as to "the best" resources to meet Xcel's system needs and certainly cannot lead to a decision to select a resource other than the Invenergy proposals. However, Strategist need not provide perfect oracle-like results in order to provide useful information to this proceeding. To the extent the ALJ and Commission believe more refined modeling would be beneficial, Invenergy witness Norman recommended several refinements which could make the modeling more useful.[142]

Even without that refinement, the Strategist modeling presented for the record shows the Expansion as part of the least cost package for meeting Xcel's ratepayer's needs. Correcting the inappropriate cost assumptions built in to this modeling would show the Expansion to be a clear "winner." In addition, after correcting these assumptions the model results for Hampton may show an even more dramatic effect.[143] As Invenergy explained, Hampton is ideally sited adjacent to both a substation and

[140] *Id*., p. 6.
[141] *Id*., pp. 13-14 (emphasis added).
[142] Ex. 73, pp. 35-37 (Norman Rebuttal).
[143] Ex. 69, p. 5 (Ewan Rebuttal).

natural gas line. Invenergy also offered alternative in-service dates for Hampton which, presumably, would have the same "substantial" impact on cost effectiveness as the alternative dates for the Expansion. Therefore, the Strategist modeling to date supports advancing both the Expansion and Hampton proposals and certainly cannot be used as a basis for choosing another resource over the Invenergy proposals.

4. The "Levelized Cost Of Energy" Analysis Provided By Calpine Offers No Probative Value.

Given his concern with the "opaque" nature of the Strategist model, Calpine witness Mr. Hibbard offered an alternative analysis for consideration. Unfortunately, his "levelized cost of energy" ("LCOE") analysis offers nothing of probative value to this proceeding. As Mr. Norman discussed, the LCOE analysis presented was overly simplistic, fundamentally flawed and designed to skew the results "to favor resource units with lower heat rates and higher capacity factors, such as combined cycle" resources.[144] In part due to those drawbacks, Xcel explained that a LCOE analysis "is only appropriately used when comparing very similar resources of the same type where cost is the principal, if not only, distinguishing factor between the resources."[145] The Energy Information Administration provides an even more blunt assessment of the value of LCOE analyses, stating that: "the direct comparison of the levelized cost of electricity across technologies is often problematic and can be misleading as a method to assess the economic competitiveness of various generation alternatives."[146] Simply put, the LCOE

[144] Ex. 73, pp. 5-6 (Norman Rebuttal).
[145] Ex. 47, p. 15 (Wishart Rebuttal).
[146] *Id*., p. 16.

analysis cannot assist the ALJ and Commission in making a wise resource choice when deciding among the various generation alternatives in this proceeding.

5. Additional Combined Cycle Resources Are Not Needed On The Xcel System At This Time.

As discussed above, Calpine attempts to buttress its combined cycle proposal in part by arguing that its combined cycle facility could meet "the need for intermediate and baseload capacity in the face of potential retirements, and the need for flexible resources to integrate variable renewable generation."[147] Calpine's argument suffers from multiple fatal flaws.

First, the Commission did not initiate this proceeding to satisfy some unidentified and hypothetical need for future intermediate and baseload capacity or to replace current facilities. The Commission initiated this proceeding after finding in the 2010 IRP Docket that "Xcel will need an additional 150 MW in 2017, increasing up to 500 MW by 2019. . . . Xcel should invite proposals for adding peaking resources, intermediate resources, or a combination of the two."[148] Since the date of that Order, Xcel's September 2013 updated forecast suggests a lower need, with decreasing energy needs and a lower overall system load factor going forward. None of this indicates a need for "intermediate and baseload capacity in the face of potential retirements."

Moreover, nothing in the record supports the notion that the Xcel system will face heretofore unforeseen retirements of baseload resources in the 2017 – 2019 time frame of

[147] Ex. 53, p. 16 (Hibbard Rebuttal).
[148] 2010 IRP Docket, Order Approving Plan, Finding Need, Establishing Filing Requirements, and Closing Docket, March 5, 2013, p. 6.

concern in this proceeding. The record instead shows that Xcel's baseload resources will likely continue providing baseload power through the 2017-2019 time frame and beyond.[149] For example, in Xcel's Life Cycle Management Study of Sherco, referenced by Calpine, Xcel found favorable long-term economics for the Sherco facility relative to alternative generation resource options under a wide variety of scenarios. Xcel concluded that, even with the additional cost of selective catalytic reduction ("SCR") technology, the "continued operation of Sherco 1 and 2 is clearly the most cost-effective option."[150] Thus, future retirement of Xcel's current baseload resources appears highly speculative at best and certainly insufficient to justify saddling ratepayers with the higher capacity cost of the Calpine proposal.

Combined cycle facilities also appear highly unlikely to economically displace Xcel's Minnesota assets that traditionally operate in a baseload mode. The record demonstrates that Xcel's Minnesota baseload assets are relatively low variable cost dispatch resources on the Xcel system.[151] These favorable economics have kept Xcel's baseload resources highly utilized plants compared to other baseload generators.[152] Even in 2012 – a year of historically low natural gas prices that, in many cases, resulted in combined cycles supplanting coal-fired resources as more economical baseload choices – Xcel's Sherco 1 and 2 and Allen S. King plants were among the top-performing (from a

[149] Ex. 73, p. 23 (Norman Rebuttal).
[150] *Id*., p. 24.
[151] *Id*., p. 25.
[152] *Id*.

capacity factor perspective) assets within MISO.[153] Going forward, the economics favoring continued operation of Xcel's current baseload assets appear unlikely to significantly change and the projected dispatch costs for Calpine's proposed new combined cycle facility, under baseline expectations, do not compare favorably to the expected variable dispatch costs for a baseload plant such as Sherco 1 and 2.[154]

Finally, as discussed above, Xcel's currently owned and contracted combined cycle fleet is underutilized. These underutilized facilities are available to provide substantial additional energy if needed, "at a lower incremental cost to Minnesota ratepayers than through contracting for the (entire cost) of a new combined cycle power plant."[155] As Mr. Norman summarized, "because of the incremental 'capital investment' component of a contract with a new combined cycle plant like the Mankato Expansion, the cost to ratepayers of a contract with a new combined cycle plant would surely be higher than the 'incremental' cost associated with operating existing self-owned and contracted facilities at a higher capacity factor."[156]

Given the lack of identified need to replace existing resources, the unlikely circumstances of new combined cycle resources economically displacing existing baseload resources and the substantial available capacity on Xcel's existing combined cycle resources, adding still more combined cycle capacity fails the "common sense

[153] *Id*., pp. 25-26.
[154] *Id*., p. 27.
[155] *Id*., p. 29.
[156] *Id*.

test."[157] Rather, Xcel's modest near-term capacity needs are best met with relatively less expensive (on a capital basis) Capacity Resources. Invenergy's Expansion and Hampton proposals: (1) best fit these needs in terms of size, (2) offer flexible timing, (3) offer a fixed and economical price, and (4) ensure flexibility going forward to adapt to any continued changes on the Xcel system in terms of either its supply side resources or its capacity and energy demand. Therefore, Invenergy's proposals should be selected to fill Xcel's needs in the 2017 – 2019 time frame.

6. The Criticisms Of The Invenergy Proposals Cannot Withstand Scrutiny.

Other parties in this proceeding leveled two principal criticisms of the Invenergy proposals, neither of which survives analysis. First, Calpine has argued that Invenergy's Expansion and Hampton proposals should use firm gas supply rather than interruptible gas supply and argues that all modeling of the Invenergy proposals should include the costs of firm gas supply.[158] However, as discussed above, requiring the Expansion to use a firm gas supply adds approximately $35 million in cost, for essentially zero benefit. Xcel itself agreed that "the use of an interruptible natural gas supply can deliver significant cost savings without a significant impact on reliability, so long as the unit can operate on back-up fuel oil or there are other system units available to meet the demand."[159] Both the Expansion and Hampton have back-up fuel oil supplies. Moreover, even in the highly unlikely event of the Expansion being completely

[157] *See* Transcript Vol. 2, pp. 15-16 (Norman).
[158] *See, e.g.*, Ex. 53, p. 6 (Hibbard Rebuttal).
[159] Ex. 47, p. 20 (Wishart Rebuttal) (emphasis added).

unavailable in the winter months, Xcel testified that "the project's cost effectiveness does not change."[160]

Calpine also criticized the Invenergy (and Xcel) Capacity Resource proposals for not including selective catalytic reduction ("SCR") pollution control technology and recommended that the Commission require such technology be installed on any combustion turbine selected as a result of this proceeding. However, as both Invenergy and Xcel explained, Calpine's recommendations would simply add "wholly unnecessary" costs of $15 million to the combustion turbine proposals. SCR technology is not required on combustion turbines, given their low run time and associated low total air emissions and the combustion turbine proposals of both Invenergy and Xcel meet all applicable environmental standards.[161]

The misguided criticisms of the Invenergy proposals appear to have a single goal – to burden the facilities with unnecessary and imprudent costs, so that other proposals will look comparatively better. As such, the ALJ and Commission should swiftly reject these criticisms.

7. Xcel's Concerns Regarding Potential Power Purchase Agreement Issues Similarly Lack Merit.

Xcel also raised four specific concerns with the Invenergy proposals that it suggested would need to be addressed in any PPA if Invenergy were selected,[162] presumably in an attempt to make its "self-build" alternatives look more attractive in

[160] *Id*., pp. 20-21.
[161] Ex. 69, p. 18 (Ewan Rebuttal); Ex. 43, pp. 3-5 (Ford Rebuttal).
[162] Ex. 44, pp. 49-51 (Wishart Direct).

comparison to the Invenergy proposals. However, those four issues either resolved themselves during the course of this proceeding or have been shown to lack merit.

Xcel originally raised concerns regarding the issue of firm natural gas supply for the Expansion.[163] However, Invenergy explained that the procurement of firm natural gas for the Cannon Falls expansion would not be in the interest of Xcel ratepayers. As Invenergy discussed, its projects are designed to fill a peaking need and history indicates that the vast majority of operating hours are during the summer months at times when natural gas is readily available on an interruptible basis. In the unlikely event that natural gas is not available, the units can be operated on fuel oil.[164] As discussed above, Xcel now agrees, concluding that even if the Expansion were somehow completely unavailable in winter months, the cost effectiveness of the project remains essentially unchanged.

Xcel also raised concerns regarding Invenergy's original in-service date of 2016. However, in response to an information request from Xcel, Invenergy clarified that its proposed pricing applies with equal force in the event of a 2017 in-service date.[165]

Third, Xcel raised concerns regarding transmission interconnection costs. As Invenergy has explained, its proposals include transmission costs in its pricing and Invenergy has confidence that the electrical interconnection for the Expansion could be completed at a very affordable price provided Xcel collaborates in the best interest of

[163] *Id*., pp. 49-50.
[164] Ex. 69, p. 16 (Ewan Rebuttal).
[165] *Id*.

both parties.[166] For Hampton, Invenergy will site the facility adjacent to the new Hampton substation, providing for the lowest cost grid connections.[167]

Finally, Xcel worried that any PPA with Invenergy may be treated as a capital lease. Capital lease concerns have never been an issue for an Invenergy PPA, including its current PPA with Xcel. Therefore, it is unclear why Xcel raises this worry in the current proceeding. Nonetheless, Invenergy reviewed the capital lease structure concerns with its accounting department and sees no basis for concern with any Expansion or Hampton PPA either.[168] Moreover, Invenergy witness Mr. Ewan testified that Invenergy is prepared to negotiate the structure of the PPA in a manner that will minimize the likelihood of capital lease treatment.[169]

8. Summary Regarding Alternatives To The Invenergy Proposals.

In the words of the Commission's certificate of need rules, neither the Calpine nor Xcel alternatives have been shown to meet the needs of the Xcel system in the 2017 – 2019 time frame in a "more reasonable and prudent" manner than the Invenergy Capacity Resource proposals.

The Calpine 345 MW combined cycle facility would impose substantially higher capacity costs on Xcel ratepayers and provides far more capacity than needed in the initial years. Moreover, any "benefit" of such a facility's ability to provide energy as well as capacity is of no current value, given the lack of need for energy on the Xcel

[166] *Id.*; Ex. 65, pp. 9-10 (Ewan Direct).
[167] Ex. 70, pp. 15-16 (Shield Direct).
[168] Ex. 69, p. 16 (Ewan Rebuttal).
[169] *Id.*, pp. 16-17.

system and the substantial underutilized combined cycle capacity already available to Xcel. In fact, that substantial untapped capacity includes the existing Calpine facility at Mankato which has operated at only 11 to 17 percent of its capacity over the past four years.

While Xcel offers Capacity Resources similar to Invenergy, Xcel too proposes significantly greater capacity than needed in 2017. Moreover, the Xcel "self-build" proposals place essentially unlimited risk of cost overruns on ratepayers when compared to the fixed cost pricing of the Invenergy bids and lock ratepayers in to the long-term cost of those facilities, while the Invenergy proposals allow greater flexibility going forward.

For all of these reasons, and as more fully discussed above, the ALJ and Commission should find that neither the Calpine nor the Xcel proposals provide a more reasonable and prudent alternative to fill the Xcel system needs when compared to the Invenergy proposals.

C. Invenergy's Facilities Will Provide Benefits To Society In A Manner Compatible With Protecting The Natural And Socioeconomic Environments.

The Expansion and Hampton both bring significant benefits to the community, while protecting or enhancing the natural and socioeconomic environments. In assessing any project under this criterion, the Commission considers first "the relationship of the proposed facility, or a suitable modification thereof, to overall state energy needs."[170] As discussed above, the Invenergy proposals fit the overall State energy needs in multiple ways. The facilities provide necessary Capacity Resources to support both the influx of

[170] Minn. R. 7849.0120 C (1).

new renewable energy resources and the declining load factor experienced on Xcel's system. These facilities impose low capital costs, while having the ability to quickly provide power to the system to maintain reliability. Invenergy has built an impressive track record of reliable and efficient operation at its existing Cannon Falls facility and proposes employing the same technology at its new facilities, taking advantage of its substantial expertise and experience.

The Expansion and Hampton projects also bring substantial socioeconomic benefits. The Expansion and Hampton projects will employ a peak labor force of approximately 100 and 150 workers, respectively, during their 12 month construction periods.[171] Once operational, the projects will provide an additional approximately $500,000 per year in taxes and payments in lieu of taxes to the local economy in Cannon Falls and $1,000,000 per year in Hampton assuming the installation of two generating units there.[172]

Invenergy's history demonstrates the beneficial impact its facilities can have on local communities. As Cannon Falls City Administrator Aaron Reeves stated: "Invenergy has been an excellent business partner in Cannon Falls," generating zero complaints from citizens or businesses while involving itself in the community and financially supporting the schools and other local projects. Given its experience with Invenergy, Cannon Falls views the Expansion as "an excellent economic development

[171] Ex. 65, pp. 12-13 (Ewan Direct).
[172] *Id*., p. 13.

opportunity for the city" and that the city sees "no issue at all with providing the necessary local approvals that would move forward quickly."[173]

Along with these direct benefits to the community and the business environment, the Invenergy proposals provide indirect benefits. Most notably, by providing cost-effective and reliable energy supply to the Xcel system, the Invenergy proposals will minimize the financial impact to Xcel's business and residential ratepayers at a time when they face regular and significant rate increases.[174]

The Invenergy facilities will also be compatible with the natural environment. As detailed in its proposals and in the Environmental Report, Invenergy's facilities will take advantage of substantial existing infrastructure, minimizing the impacts on existing land use. In addition, Invenergy employs Environmental, Health and Safety staffs who work together with staff at its facilities to maintain compliance with local, state and federal regulations.[175] Each facility will implement a comprehensive compliance tracking program and to ensure ongoing compliance and to alert appropriate staff to upcoming requirements.[176]

The Expansion and Hampton will fully comply with all applicable air quality regulations, including undergoing a Best Available Control Technology review.[177] Once

[173] Public Hearing, October 15, 2013 Transcript, pp. 30-34; *see also* Ex. 70, Attachment 3 (Shield Direct).
[174] Ex. 70, p. 20 (Shield Direct).
[175] Ex. 70, Attachment , p. 13 (Shield Direct).
[176] *Id*.
[177] Ex. 69, pp. 12, 18 (Ewan Rebuttal).

operational, emissions from the facilities will be minimized through multiple means.[178] Once again, Invenergy's track record speaks to its success in limiting emissions, with the Cannon Falls facility operating well below its permitted emissions levels.[179]

Regarding air emissions, Calpine contends that its combined cycle proposal is "a cleaner option" than the combustion turbines proposed by Invenergy.[180] Starting from that premise, Calpine then argues that to avoid "penalizing" its proposal, the Commission should either require all combustion turbines to install SCR technology or that it should approve only combined cycle facilities.[181] However, Calpine's combined cycle facility will not necessarily result in significantly lower emissions.[182] As Calpine acknowledged, combined cycle facilities have a longer start-up time than combustion turbines.[183] During that start-up time, combustion controls are not yet effective and emissions are higher than the "steady state" emissions from the facility.[184] Moreover, combined cycle facilities typically operate at a higher capacity factor than a combustion turbine, meaning significantly more total emissions.[185] Thus, it is not possible to state with any degree of certainty that the Calpine proposal will have less environmental impact than the Invenergy proposals.

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[178] Ex. 65, pp. 17-18 (Ewan Direct).
[179] Ex. 69, p. 5 (Ewan Rebuttal).
[180] Ex. 51, p. 30 (Hibbard Direct).
[181] *Id*., pp. 30-31; Ex. 55, p. 12 (Thornton direct).
[182] Ex. 69, p. 12 (Ewan Rebuttal); Ex. 43, pp. 4-5 (Ford Rebuttal).
[183] Transcript Vol. 1, pp. 42-43, 62-63 (Hibbard); Ex. 93.
[184] Ex. 69, p. 12 (Ewan Rebuttal).
[185] Ex. 43, p. 4 (Ford Rebuttal).

As the record proves, the Expansion and Hampton proposals meet the needs of the Xcel system at this time and do so in a manner fully compatible with the natural and socioeconomic environments. As Mr. Ewan explained:

> Invenergy's proposals provide a clean burning affordable source of peaking power to meet the very infrequent high demand power needs on Xcel's system. The projects will provide over 100 construction jobs in the state of Minnesota and ongoing operations will create additional revenue for the local community, county and school district with no increased burden for public services.[186]

D. Invenergy Will Comply With All Relevant Policies, Rules, And Regulations Of Other State And Federal Agencies And Local Governments.

Invenergy has listed the relevant permits for both the Expansion and Hampton.[187] In addition, the record demonstrates Invenergy's strong commitment to regulatory compliance.[188] The strong support Invenergy has received from the Cannon Falls community serves as evidence of the strong relationship Invenergy builds with government officials in its communities. Thus, the ALJ and Commission can have full confidence that both the Expansion and Hampton projects will comply with all applicable policies, rules and regulations.

IV. NEXT STEPS

With the record now developed, Invenergy, Calpine, Xcel and the Department suggest four different paths forward, each of which Invenergy discusses below.

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[186] Ex. 69, p. 13 (Ewan Rebuttal).
[187] Ex. 65, pp. 18-19, 21-22 (Ewan Direct).
[188] *Id.*; Ex. 70, p. 21 and Attachment 1, p. 13 and Attachment 2, p. 13 (Shield Direct).

A. Invenergy Recommendation.

For all of the reasons set forth above, Invenergy respectfully requests that the ALJ recommend and the Commission order the selection of the Expansion and Hampton projects to meet the capacity needs identified for the Xcel system in the 2010 IRP Docket and as further developed in this proceeding. Regarding Hampton, Invenergy recommends consideration of delayed in-service dates, using the pricing information already provided to Xcel.[189] Collectively, the Invenergy proposals offer flexibility and offer capacity that most efficiently and reliably meets the needs identified in this record when considering all of the relevant criteria for sound resource analysis. At a minimum, and as discussed further below, the Invenergy proposals should move forward to PPA negotiations with Xcel, given the flexibility these proposals provide – both in the 2017-2019 time frame and beyond.

When compared to the Calpine proposal, the Invenergy proposals impose substantially lower capacity costs on Xcel ratepayers and offer the flexibility of matching the size and timing requirements of Xcel in a manner not available with the Calpine proposal. Instead, Calpine offers a one-time addition of 345 MW of combined cycle capacity at a time when Xcel is adding significant Intermittent Resources, experiencing a declining load factor and when Xcel's currently owned and contracted for combined cycle plants (including Calpine's existing Mankato plant) have huge untapped capacity.

[189] That pricing information is set forth in TRADE SECRET Ex. 87, Attachment SR-R-9, pp. 3-4 (Rakow Rebuttal).

Xcel offers a Capacity Resource similar to Invenergy. However, Xcel proposes larger increments of capacity than Invenergy, not fitting the system needs as closely. Additionally, Xcel fails to offer ratepayers any significant protection from the risk of capital cost overruns and offers no protection from the risk of higher than assumed non-capital costs.

B. Calpine Recommendation.

Calpine asks the Commission to approve its Mankato facility.[190] The record fails to support such a decision. As discussed above, the need existing in the 2017-2019 time frame is a capacity need, not an energy need. While any plant (including a combined cycle plant) can provide capacity, a combined cycle plant does so at a significantly higher capacity cost.[191] Given both the declining load factor on the Xcel system and the vast amounts of untapped combined cycle capacity at current Xcel owned and contracted for facilities, any benefits related to the energy production efficiency of yet another combined cycle plant cannot compensate for these higher capacity costs. As such, the record supports a decision rejecting the Calpine proposal.

C. Xcel Recommendation.

Xcel recommends that the ALJ recommend and the Commission approve the selection of its Black Dog proposal at this time and that the remaining needs be satisfied with either Invenergy's Expansion project or the Calpine project, depending on the

[190] *See* Ex. 55, p. 13 (Thornton Direct).
[191] Ex. 69, p. 5 (Ewan Rebuttal).

results of PPA negotiations.[192] However, the details of Xcel's recommendation remain unclear. For example, Xcel noted the potential benefit of flexibility so as to best meet its needs and stated that "our (Xcel's) proposal includes the flexibility to adjust in-service dates or even cancel development of one or more units in the event of changed circumstances warrant (sic)."[193] Thus, it is unclear exactly what Xcel means when it recommends that the Commission "select" Black Dog at this time.

It is equally unclear why Xcel believes the Commission should "select" Black Dog but require Invenergy and Calpine to enter PPA negotiations. Xcel sees benefit in making Invenergy and Calpine "compete" with each other in the PPA negotiation process.[194] However, because Xcel states that it does not intend to change its cost estimates, it has "a little different dynamic than competing parties."[195] As Invenergy has discussed, Xcel's Black Dog proposal provides Xcel ratepayers virtually no protection from the risk of cost overruns. In addition, at 215 MW, Black Dog significantly overshoots the 2017 need for capacity. For those reasons and as further discussed above, the record cannot support final approval of Black Dog at this time. At minimum, Xcel should be required to continue "competing with other proposals," so that ratepayers are not burdened with excessive costs.

[192] Ex. 49, p. 8 (Alders).
[193] *Id*.
[194] Transcript Vol. 1, p. 129 (Alders).
[195] *Id*., pp. 129-130.

D. Department Recommendation.

The Department recommends that three projects move forward at this time – Invenergy's Expansion, the Calpine combined cycle plant and Xcel's Black Dog proposal.[196] However, the Department does not recommend that any project, including Black Dog, be "approved" at this time, since any two of the three projects the Department recommends may end up being the least cost option.[197]

Unfortunately, the Department never conducted a detailed analysis of Hampton and never conducted any analysis at all related to the potential of delayed in-service dates at Hampton. As Invenergy discussed above, the Department's rebuttal modeling of the Expansion showed "substantial" cost savings with a delayed in-service date. Given the similarity of the pricing structures between the Expansion and Hampton, Hampton will likely show those same substantial savings. In addition, correcting other assumptions in the modeling may show even greater benefits to ratepayers if Hampton moves forward.[198]

As Invenergy witness Mr. Ewan explained, "a full review of the record shows that Invenergy's proposals provide a superior fit to the need that must be filled."[199] However, if the ALJ and Commission have any uncertainty as to the superiority of the Invenergy resources, Invenergy has indicated that it would not object to the Expansion moving forward to PPA negotiations.[200] However, the record also demonstrates that Hampton

[196] Ex. 86, p. 21 (Rakow Rebuttal).
[197] Transcript Vol. 2, p. 52 (Rakow).
[198] Ex. 69, p. 5 (Ewan Rebuttal).
[199] *Id*., p. 15.
[200] *Id*.

may provide substantial benefits to ratepayers. Therefore, Invenergy would recommend that Hampton move forward, as well.

CONCLUSION

The current proceeding marks the first time the Commission has used a contested case process to make a resource acquisition decision among competitively bid proposals.[201] In the words of Commission Staff, in initiating this process, the Commission's "intent was to create a more open and transparent competitive process to ensure that the best resource addition is acquired for ratepayers."[202] To ensure that "best resource addition," the Commission made clear that it expected a wide-ranging analysis to select the appropriate resource, stating: "The ultimate issue in this case is the identification of resource proposal or proposals that will provide the most reasonable and prudent strategy for Xcel to meet the needs of its service area. That issue depends, in turn, on numerous sub-issues."[203]

That broad charge makes sense. The energy marketplace is dynamic and multi-faceted. Cost, reliability, efficiency and the impact of a facility on the natural and socioeconomic environments all must play a role in determining the "most reasonable and prudent strategy" for meeting the needs of Xcel and its ratepayers. A myopic view, focusing on either flawed or opaque economic models cannot substitute for a full analysis of the record and a full consideration of the likely impacts of any Commission decision. As Invenergy witness Mr. Ewan succinctly stated:

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[201] Transcript Vol. 2, p. 49 (Rakow).
[202] Public Hearing Transcript, October 15, 2013, p. 5 (DeBleeckere).
[203] Notice and Order for Hearing, June 21, 2013, p. 6 (emphasis added).

I think at the end of the day that common sense will prevail. I think the idea is to find the best resource that fits the need and in our case we think the best resource is what we represented to the Commission.

Dated: November 22, 2013

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