BC Hydro Rate Design Application – Meeting with Association of Major Power Consumers of British Columbia

SUMMARY | 27 JUNE 2014 | 10 A.M. TO 11.45 A.M. | Office of Bull Housser Tupper #900 – 900 Howe Street, Vancouver

TYPE OF MEETING	Topic Specific 1:1 Meeting – Association of Major Power Consumers of British Columbia (AMPC): Load Curtailment/Interruptible Rates for Transmission Service Customers
FACILITATOR	Gordon Doyle, Regulatory Manager: Regulatory and Rates, BC Hydro (BCH)
PARTICIPANTS	Executive Director of AMPC; Bull Housser & Tupper; Canfor; Catalyst; ERCO Worldwide; West Fraser; Howe Sound Pulp and Paper; Mining Association of BC; Teck; Skookumchuk
BC HYDRO ATTENDEES	Gordon Doyle, Kathy Lee, Greg Simmons, Craig Godsoe, Jeff Christian (Lawson Lundell; BCH external counsel)
AGENDA	1. Background 2. BCH's need for capacity and the value of capacity 3. Recap of 2007 BCH load curtailment program, and outline of long-term capacity requirements 4. Next steps

MEETING MINUTES

ABBREVIATIONS

AMPC…….Association of Major Power Consumers of British Columbia
BCH ...... BC Hydro
CPCN…….Certificate of Public Convenience and Necessity
DSM ...... Demand Side Management
F………….Fiscal year
GWh/year…….Gigawatt hour per year
IEPR……..Industrial Electricity Policy Review Task Force
IRP……….Integrated Resource Plan
MW…….Megawatt
SCGT…….Simple Cycle Gas Turbine
ToU………Time of Use rate
UCC ……..Unit Capacity Cost

1. Presentation: Background

Gordon Doyle reviewed the key drivers for a load curtailment program for Transmission service customers, including the October 2013 Industrial Electricity Policy Review Task Force (IEPR) final report and the B.C. Government's November 2013 response (slides 2-3).

	FEEDBACK	RESPONSE
1.	Is the 2015 date referred to in the B.C. Government's response to the IEPR final report calendar or fiscal?	Calendar year.

2. Presentation: Need for Capacity (Timing/Characteristics) and Value of Capacity

Kathy Lee described BCH's need for capacity as identified in the 2013 approved Integrated Resource Plan (IRP), and the long term planning capacity characteristics BCH is looking for (including 8 to 16 hours per day). Kathy referred to the uncertainty in the seven year period between F2017 and F2023, including peak load growth, liquefied natural gas proponent final investment decisions and Demand Side Management (DSM) deliverability. Kathy also outlined the generation capacity alternatives available to BCH and their costs as represented by Unit Capacity Costs (UCCs) (slides 4-15).

	FEEDBACK	RESPONSE
1.	What is the assumption concerning Burrard Thermal Generating Station (Burrard)?	BCH cannot rely on Burrard for firm energy pursuant to sections 3, 6 and 13 of the *Clean Energy Act*. For capacity, Burrard is phased out of BCH's resource stack by 2016 as the Interior to Lower Mainland Transmission Reinforcement

		Project, Mica Units 5 and 6, and the Meridian substation project are brought on line pursuant to the *Authorization for Burrard Thermal Electricity Regulation*.
2.	What is the status of Revelstoke Unit 6 – has BCH received a Certificate of Public Convenience and Necessity (CPCN) for Revelstoke Unit 6? Is it a 'done deal'?	Revelstoke Unit 6 is not a 'done deal'. There is no commitment to build Revelstoke Unit 6 at this time. It is a contingency resource in the IRP with an earliest in-service date of Fiscal (F) 2021. BCH is exempt from the requirement to obtain a CPCN for Revelstoke Unit 6 per section 7 of the *Clean Energy Act*. BCH intends to move Revelstoke Unit 6 through the B.C. *Environmental Assessment Act* to keep it 'shelf-ready' but minimize costs.
3.	What is the DSM target for capacity and how is the target estimated?	The DSM target is 7,800 GWh/year of energy with 1,400 MW of associated capacity savings. This does not include any load curtailment contribution. Load shapes (for end use, if applicable, otherwise for rate class) are used to translate the estimated energy savings into estimated peak savings.
4.	On slide 8, what is the difference between morning and evening peak? The difference suggests there is some value in these hours.	The difference is about 400-500 MW.
5.	On slide 9, what is the assumption behind the DSM portion of the graph?	DSM is assumed to follow BCH customers' overall load shape.
6.	Could BCH produce the calculations behind the UCCs shown on slide 14?	Yes. [*Note – the requested calculations were provided to AMPC on 16 July 2014*]
7.	Regarding slides 14/15, Simple Cycle Gas Turbines (SCGTs) are a common benchmark for the value of generation capacity.	Manitoba Hydro's load curtailment program for its Transmission service customers uses SCGTs for capacity valuation purposes.
8.	Would there be value add if BCH pursued load curtailment and preserved SCGTs given the *Clean Energy Act*'s 93% clean or renewable target? Would there be load curtailment value associated with outage and greenhouse gas (GHG) reduction?	There could be. This can be explored. California includes GHG reduction in its definition of cost-effectiveness (avoidance cost calculation) used for electric utility demand response programs.

3. Recap of 2007 BCH Load Curtailment Program, and BCH's Long-Term Capacity Requirements

Kathy Lee reviewed BCH's 2007 load curtailment program, which was developed for operational contingency, and differentiated the 2007 load curtailment program from what BCH now requires. BCH is looking for longer-term commitments (for example, a 5 year termination notice) with a high degree of customer response certainty (slides 16-17).

	FEEDBACK	RESPONSE
1.	Would there be an energy credit for the load curtailed during each event?	Typically load curtailment contracts provide for this. However, this is getting into the pricing structure, and BCH is focusing at this time on the need for and value of capacity as the first of a series of meetings/stakeholder engagement for a potential system-wide load curtailment program for Transmission service customers.

2.	Would BCH permit aggregation to get to the 8 hours?	Potentially yes, but this is getting into structuring. Aggregation could impact pricing.
4. Next Steps		
Gordon Doyle set out what BCH thinks are the next steps for a potential BCH system wide load curtailment program for Transmission service customers. Gordon also briefly reviewed other potential Transmission service customer rates/programs such as a local load curtailment program and its connection to Tariff Supplement No.6, a 'freshet' rate and a voluntary Time of Use rate (ToU) (slides 17-18).		
FEEDBACK		**RESPONSE**
1.	AMPC is prepared to put together a term sheet for 'core' system-wide load curtailment program provisions such as notice period, frequency and recovery periods. AMPC's term sheet characteristics will reflect its view of the system value of curtailable loads based on three considerations: the displacement of planning capacity, the displacement of contingency reserves and facilitation of trade options. Capital investment will need to be addressed, especially if BCH is pursuing long-term load curtailment contracts. Contracts may have to be mill-specific and so BCH will also need to get customer-specific input.	BCH would welcome AMPC preparing a term sheet. BCH will also prepare a term sheet for the fall of 2014 after completing its jurisdictional review and obtaining further input from AMPC and Transmission service customers.
2.	Some members of AMPC expressed interest in a freshet rate. BCH was encouraged to look at Transmission service customers' ability to provide voltage support such as incentives to put VARs back into the system. Perhaps Burrard is a proxy for VAR support.	
3.	There were comments that the differential for ToU would be small. Would one proxy be the seasonal time of delivery factors of BCH's most recent call for power? There was also a comment that some Transmission service customers would not be able to take advantage of a ToU due to 24x7 operations.	Yes. Catalyst made this point in its submission to the IEPR.
5. Closing Comments		
Richard Stout thanked BCH for making the presentation to AMPC members.		

LOAD CURTAILMENT/ INTERRUPTIBLE RATE

GORDON DOYLE & KATHY LEE

JUNE 27, 2014

BC hydro

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Today's agenda

- **Drivers**
- **BC Hydro's need for system/generation capacity**
  - **Timing**
  - **Characteristics**
- **Value of capacity resources to BC Hydro**
- **Recap: 2007 Load Curtailment Program**
- **Long term capacity resource requirements**
- **Next Steps**

Drivers for today's discussion

- October 2013 final Industrial Electricity Policy Review (IEPR) report:
  - Recommendation #13 : "BCH should work with its industrial customers and the Commission to develop options that take advantage of industrial power consumption flexibility, such as time of use rates and interruptible rates."

- Approved 2013 Integrated Resource Plan (IRP):
  - Recommendation #2: "Implement a voluntary industrial load curtailment program from F2015 to F2018 to determine how much capacity savings can be acquired and relied upon over the long term."

- November 2013 Government Response to IEPR:
  - "A rate design review process will be launched to examine ways to provide industrial customers with more options to reduce their electricity costs."
  - "BCH will implement a voluntary load curtailment program with industrial customers starting in 2015."

Need For Generation Capacity - Timing

Based on the approved IRP:

<table>
<tr><th></th><th>Now to F16</th><th>F17 to F18</th><th>F19 to F23</th><th>F24 onwards until around F2030</th></tr>
<tr><td>Base Resource Plan (BRP)</td><td>Surplus</td><td rowspan="2">Surplus
Plans on successful Demand Side Management (DSM) delivery of 950 MW and Electricity Purchase Agreement (EPA) renewals of 150 MW by F2018</td><td>Planned market reliance (<300 MW)</td><td rowspan="2">Surplus
Plans on successful Site C build out, DSM delivery of 1,700 MW and EPA renewals of 550 MW by F2024</td></tr>
<tr><td>BRP with Expected Liquefied Natural Gas (LNG)</td><td>Surplus</td><td>Planned market reliance (<300 MW) and gas peakers to meet LNG capacity need</td></tr>
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Need For Generation Capacity - Timing

On an expected basis (F2019 to before Site C):

- Reduce market reliance

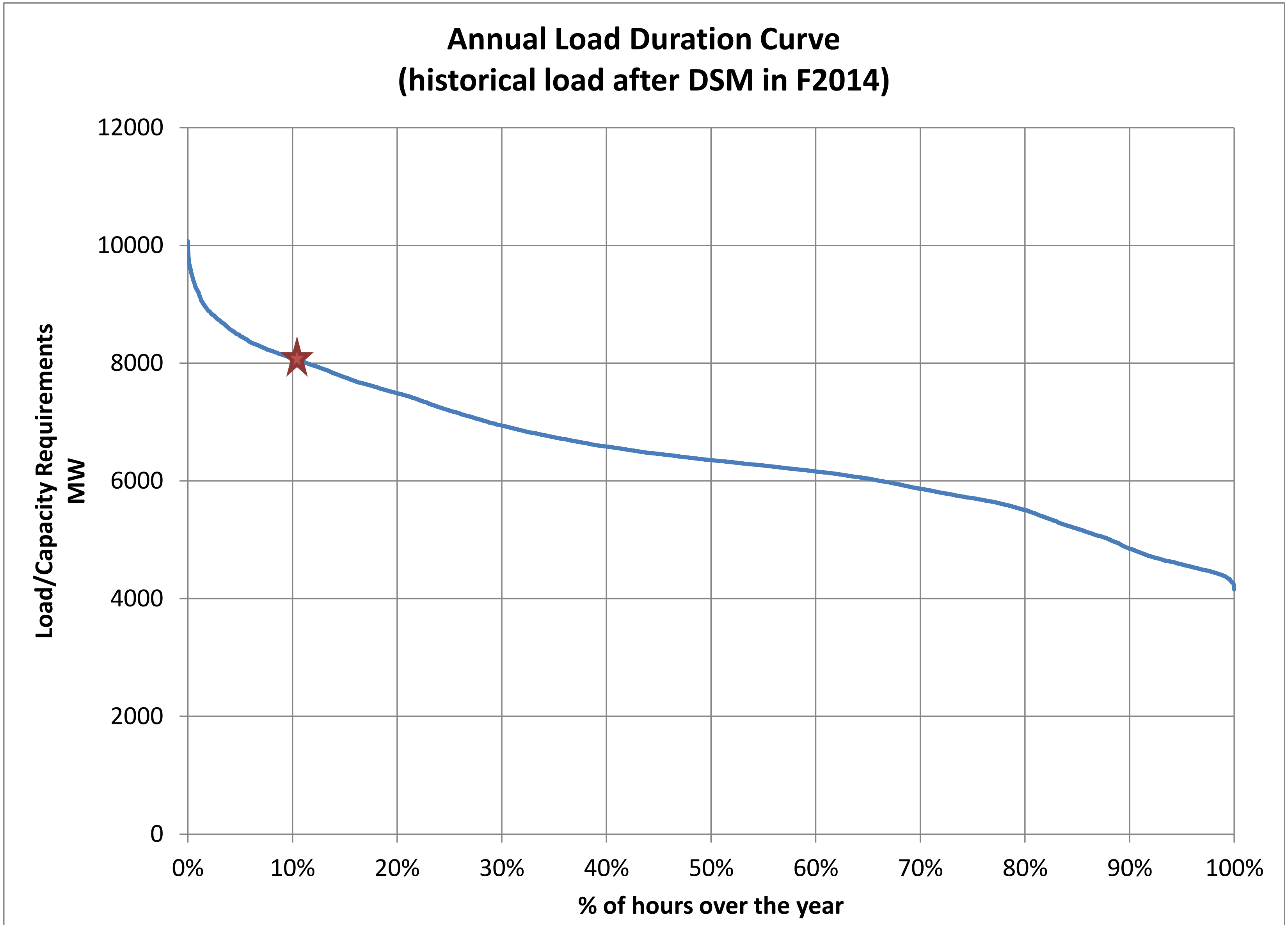
On a planning contingency or longer term basis:

- Load growth
- LNG load
- DSM deliverability and its capacity contribution
- Contribution from intermittent Independent Power Producer (IPP)/EPA renewals
- Site C approval

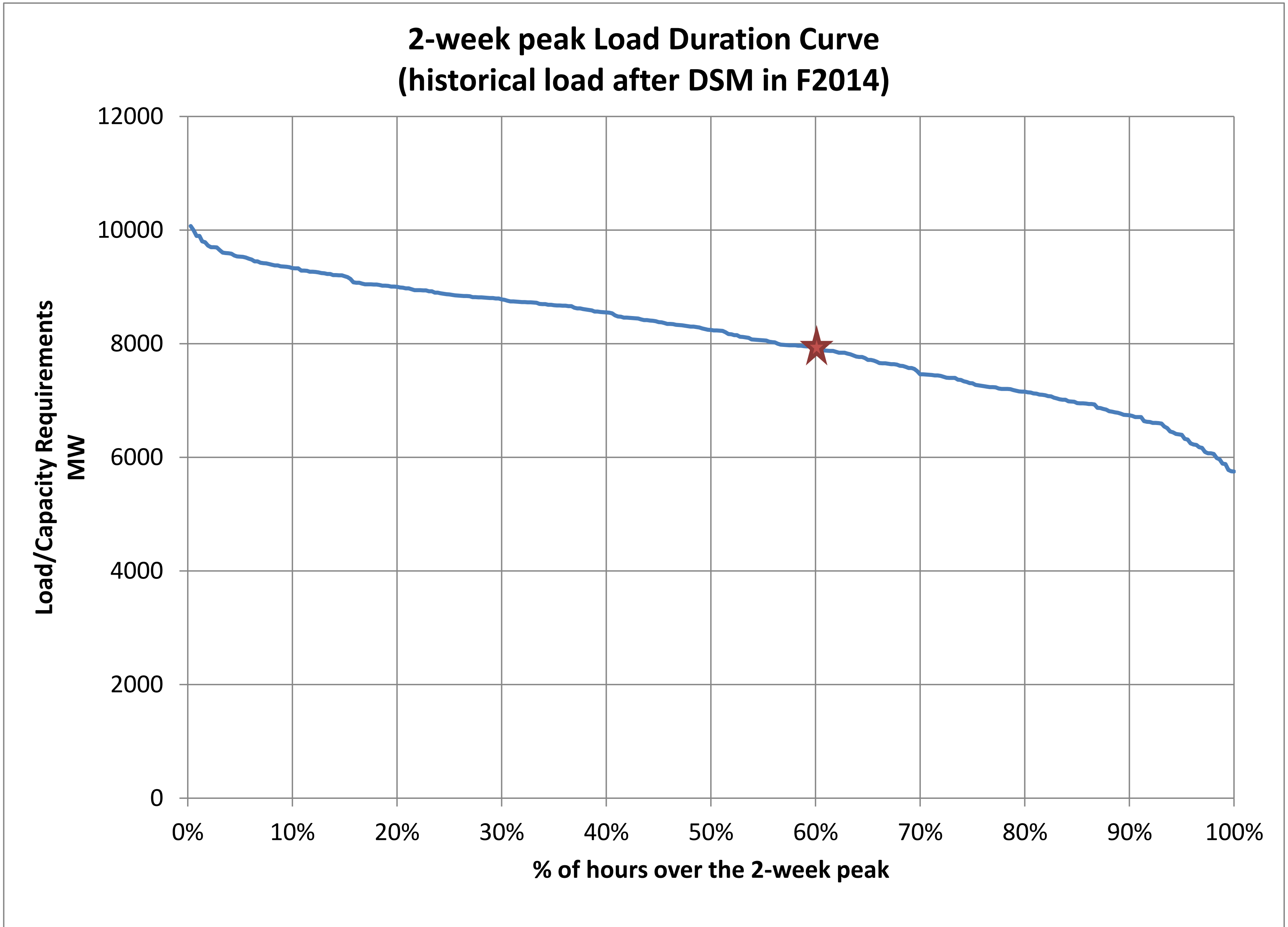
Limited capacity resource options before Pumped Storage:

- Revelstoke Unit 6 (Rev 6)
- Default capacity resource after Rev 6: Simple Cycle Gas Turbines (SCGTs) (within the *Clean Energy Act*'s 7% non-clean headroom)

Need For Generation Capacity - Characteristics



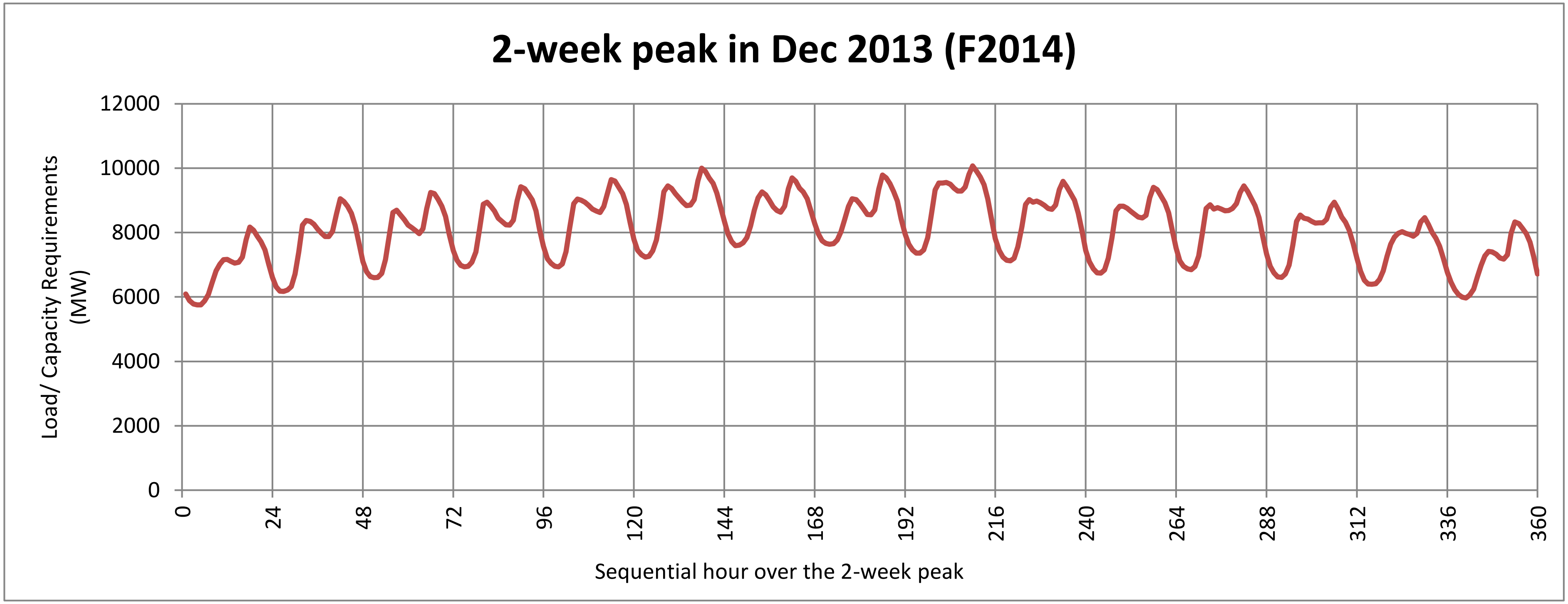
Need For Generation Capacity - Characteristics



Need For Generation Capacity - Characteristics

Reliably serve load during peak periods:

- 2 week cold snap
- multiple occurrence in the winter
- November to February



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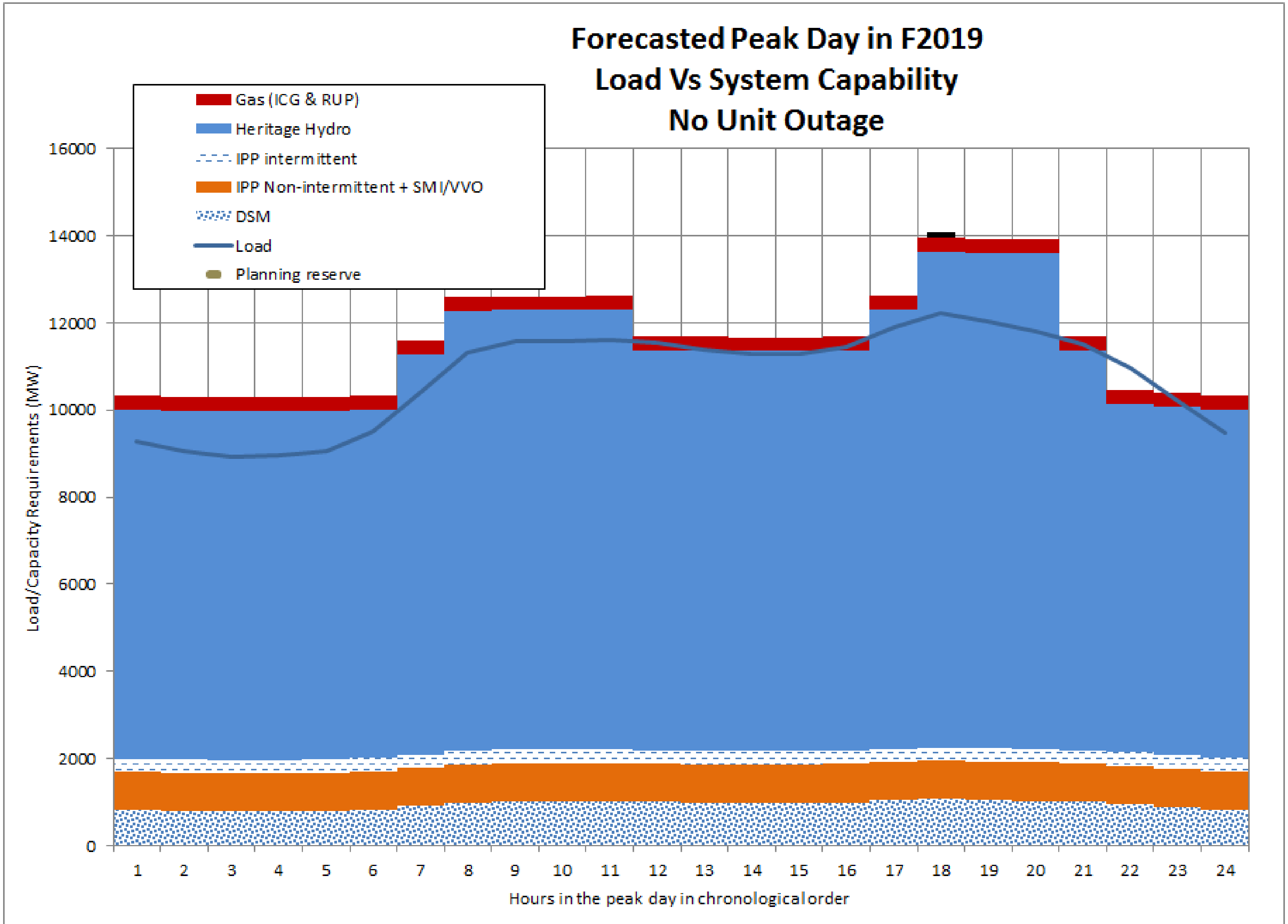

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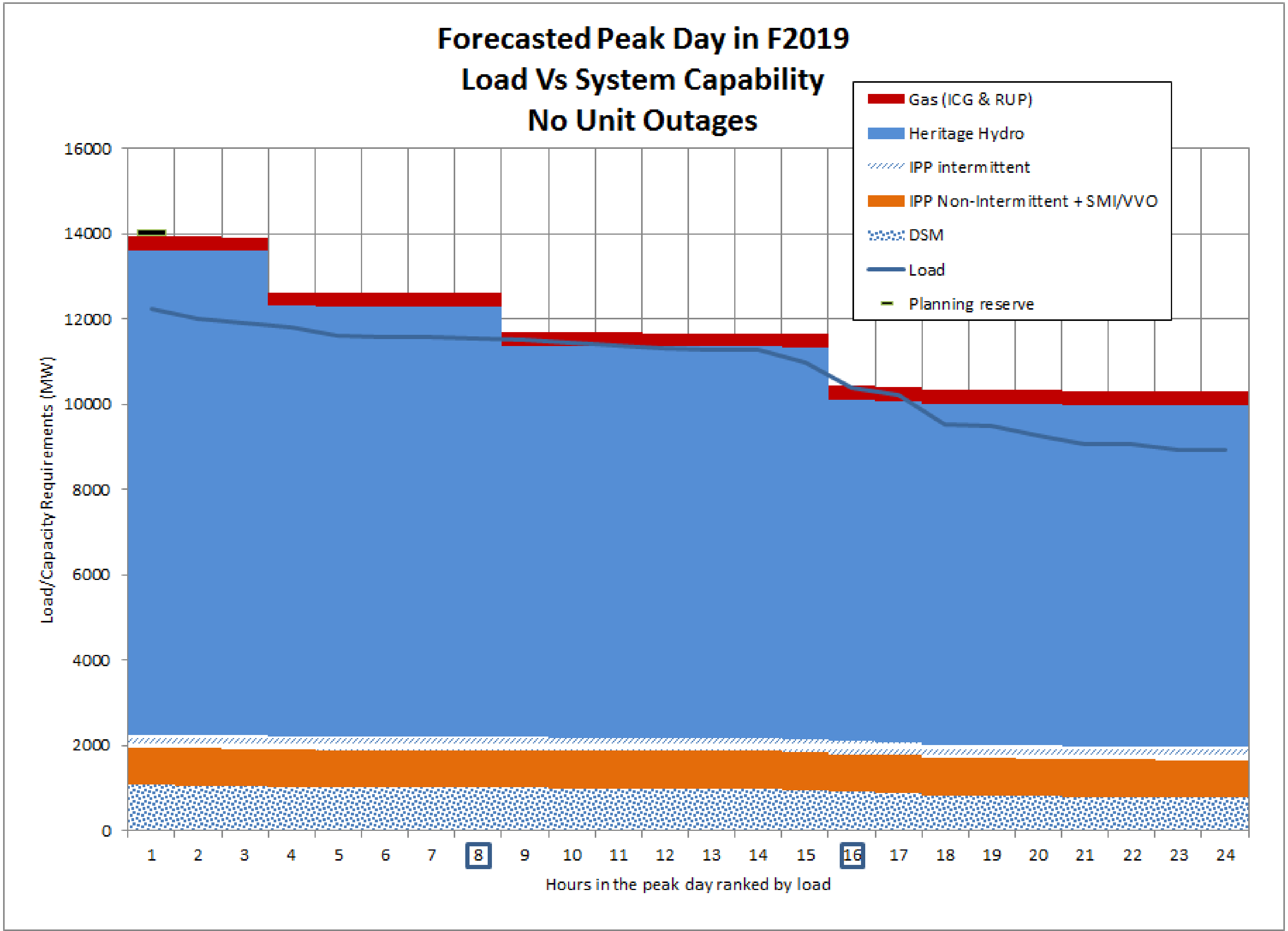

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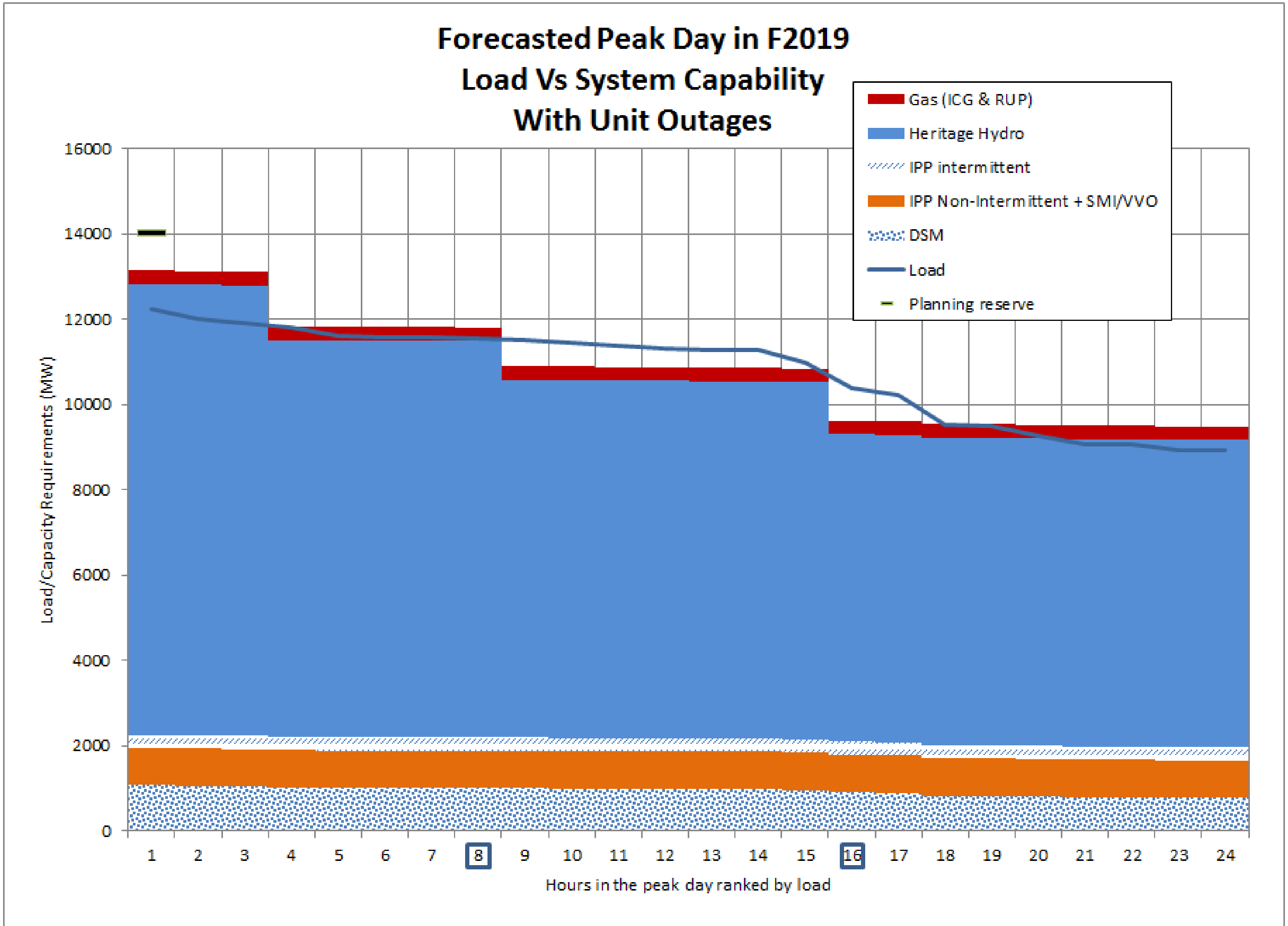
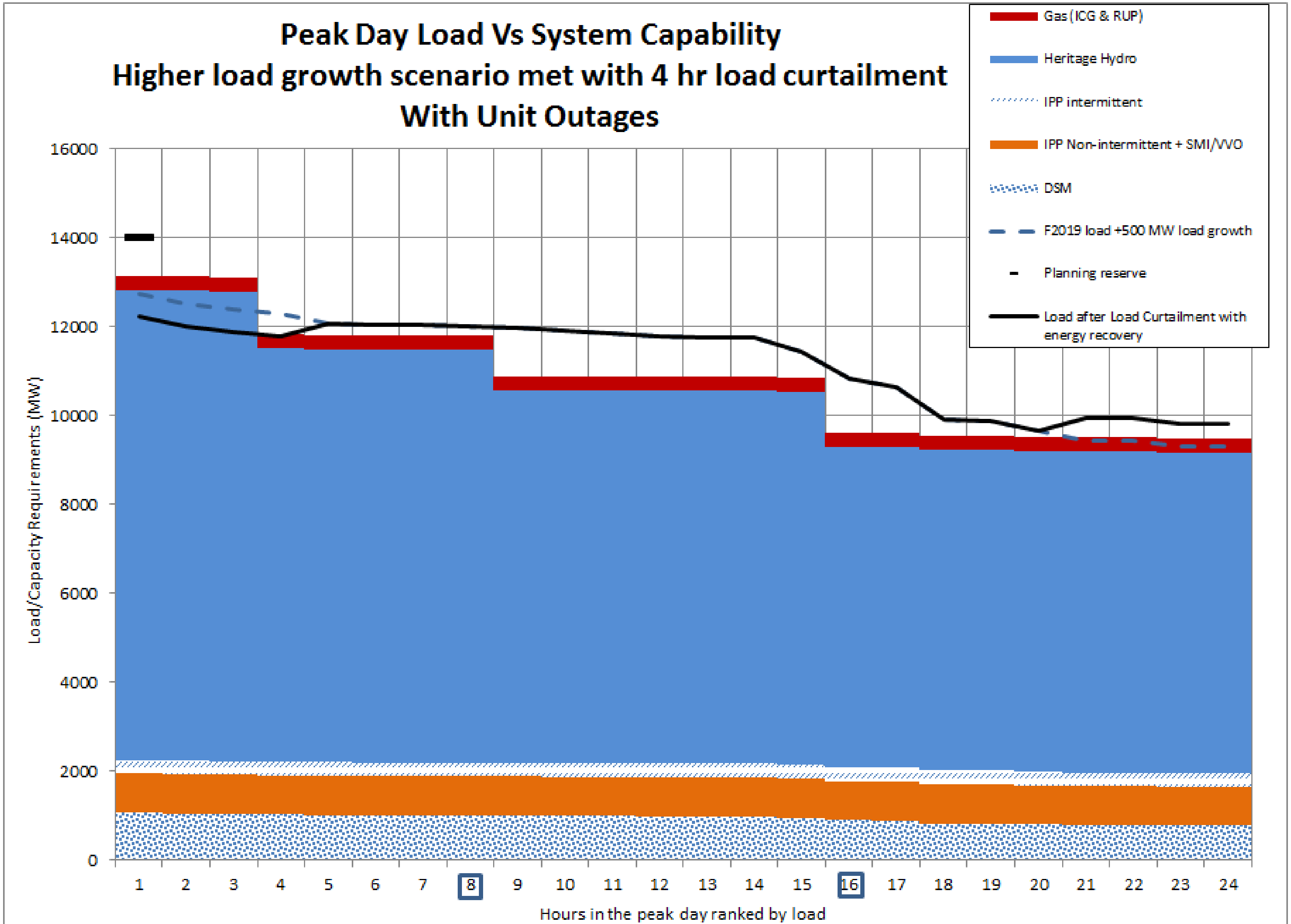


Need for Generation Capacity – Characteristics



Need for Generation Capacity - Summary

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Timing:

- **On an expected basis, limited need**
- **However, significant uncertainties on load forecast and resource delivery**

Characteristics:

- Shoulder hours during peak periods (8 to 16 hours) becoming energy constrained

Long Term System Capacity Requirements:

- **8+ hr/day**
- Capacity sustainable for 5 to 6 days/week for 2 consecutive weeks
- 2-week cold snap can happen at least 3 times a year, anytime during winter (November to February)

Value of Capacity Resources to BC Hydro

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Value is relative to generation capacity alternatives

Need	Resource Options	Unit Capacity Cost $/kW-yr	Capacity Potential
Expected in the mid term for a short time but uncertainty given self sufficiency requirement, not a long term alternative	Market	~ 30	planned reliance in current BRP <300 MW
Expected in the long term & Contingency in the mid term	Rev 6	50 - 55	488 MW
	SCGT	88*	up to 600 MW by F2024 given 18% capacity factor requirement & 93% clean objective, also permitting uncertainty
Expected in the distant future & Contingency sooner	Pumped storage	124**	

* The net cost of SCGT would depend on the dispatch cost (including gas price) relative to the benefits from reducing energy need.

** Each pump and generate cycle has about 30% energy loss which results in additional need for energy and therefore sustantial cost impact. This impact is additional to the cost shown.

Value for Generation Capacity - Summary

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- Short-term value is based on the market
- Value in learning about deferring long-term generation resources
- Both Rev 6 & SCGTs provide reliability, trade and other benefits given these characteristics:
  - winter dependable capacity
  - almost unlimited availability
  - fast acting dispatchability
- Value should reflect characteristics
- If characteristics are generally met, value between Rev 6 and SCGTs (50 to 88 $/kW-yr)

RECAP: 2007 Load Curtailment Program

- Developed for operational contingency:
  - Evergreen (1 year, renewed by actual agreement) and fixed term (commitment between 3 to 7 years) agreements
  - Insurance product - not curtailed on an expected basis
  - Only required for operational time horizon
  - 4 hour blocks once per day

- Curtailment capacity:
  - 355 MW, 309 MW and 257 MW were available in F2008, F2009 and F2010 respectively.

- Customers indicated different pricing/options would be considered if longer term commitment offered

Long Term Capacity Resource would need to be:

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- **Curtailable for 8+ hours/day**
- Curtailable from Monday to Saturday each week for 2 consecutive weeks
- 2-week of curtailment can be expected at least 3 times a year
- Available for curtailment any time during the winter (November to February)
- **Long-term commitment with 5 year termination notice**
- **High degree of certainty of customer response, including:**
  - Penalties
  - Advanced load control (‘push button technology’) – if need for notice period, short notice period

Next Steps

Load Curtailment/ Interruptible Rate:

1. BC Hydro would like to understand from customers:
   - Current flexibility; Future flexibility if capital investment, lead time?
   - Curtailment duration, frequency and recovery characteristics: threshold to and associated escalated impact on industrial processes
   - Winter; Year Round curtailment flexibility

   Feedback channels:
   - AMPC and other industrial customer associations
   - One-on-one industrial customer meetings
   - Others?

2. BC Hydro to review 2007 load curtailment and other contracts

3. Fall circulation of draft pro forma term sheet for review assuming feedback on point (1) by August 2014

Next Steps

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Voluntary Time of Use (TOU) for Transmission Service

- IEPR background paper on TOU suggested difficulty in making a TOU rate work in B.C.
- Appetite to explore voluntary TOU for Transmission Service

Regional curtailment/interruptible rate

- What is the potential?
- Deferral of regional transmission and tie to Tariff Supplement No. 5 and 6
- Opportunity in South Peace

Freshet Rate

- Unlike a “surplus rate”, a “freshet” turn-down rate (Transmission service customers decrease self generation) or “spill avoidance” rate would address a problem which is likely to last