

BC HYDRO & FORTIS BC

RESOURCE OPTIONS UPDATE

TECHNICAL ENGAGEMENT – RUN-OF-RIVER

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FOR GENERATIONS

July 06, 2015

BACKGROUND & OBJECTIVES OF THIS MEETING

BCH is updating its Resource Options Inventory for use in long term planning

This meeting follows the Run of River technical engagement meeting held in March, where feedback was elicited on draft results

Objectives for today:

- To inform industry stakeholders of the 2015 resource assessment findings
- To address issues raised as a result of the March engagement meeting

RECAP OF MARCH MEETING: CHANGES MADE IN 2015 UPDATE

- Screening of potential sites updated
- Updated at-gate cost components
 - Penstocks, Intake and Powerhouse civil works, Turbine, Generator, Electric balance of plant
- Updated construction camp cost to include camp operating allowance

Screen/Exclusion Criteria	# of Removal
Conservancy Areas	94
Salmon Species Presence	79
Parks, Biodiversity Areas, Protected Areas	5
Wildlife Management Areas	1
Existing EPAs/BCH Facilities	14

RECAP OF MARCH MEETING: CHANGES MADE IN 2015 UPDATE (CONT)

- Revised the environmental and social permitting cost to a tiered approach
- Updated water rental rates
- Escalated remaining costs by 2% per year

Project Size	Cost
< 0.5 MW	\$750,000
0.5 – 10 MW	\$1,000,000
10 – 15 MW	\$1,500,000
> 15 MW	3% of capital

ISSUES RAISED IN MARCH

1. Screening of salmon bearing streams from resource selection

- BC Hydro agrees screening may underestimate potential and maintains significant environmental and social issues and real costs with including projects with salmon impacts
- Requires major re-work and could lead to significant communication
- Commentary to be included in current update-addressing the issue; and methodology reconsidered for next update

2. Exclusion of storage potential

- BC Hydro agrees storage potential should be included in assessment
- Requires new methodology, and will be included in next update
- BC Hydro welcomes industry information on small storage hydro development

3. Project O&M costs

- BCH is willing to reconsider cost assumptions and requested actual cost information from stakeholders. To date, insufficient material has been received to support a change to O&M assumptions.
- BCH continues to welcome data and will consider any data received in next update

ISSUES RAISED IN MARCH (CONT)

4. Exclusion of cancelled EPA locations

- Agree to include cancelled EPAs as potential resources
- Will require a fair amount of effort to add them back in, and so will be included in next update

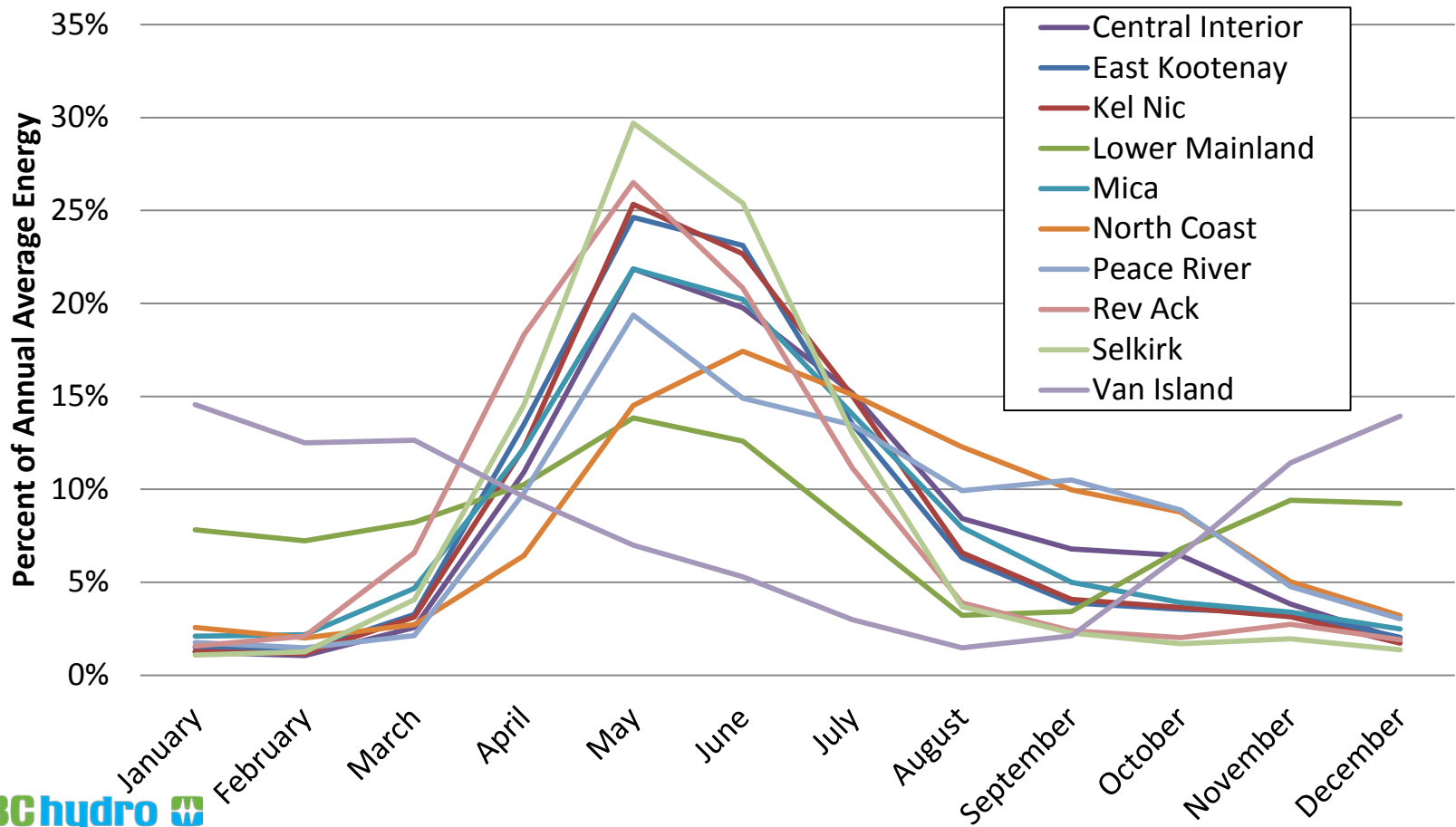
5. Project financing assumptions

- Discount rate reflects BCH's long-term view and not individual financing agreements
- Consider discount rate to be a resource valuation topic rather than resource characterization, so will be deferred to a later discussion. However, both 5% and 7% discount rate UECs are included in results.

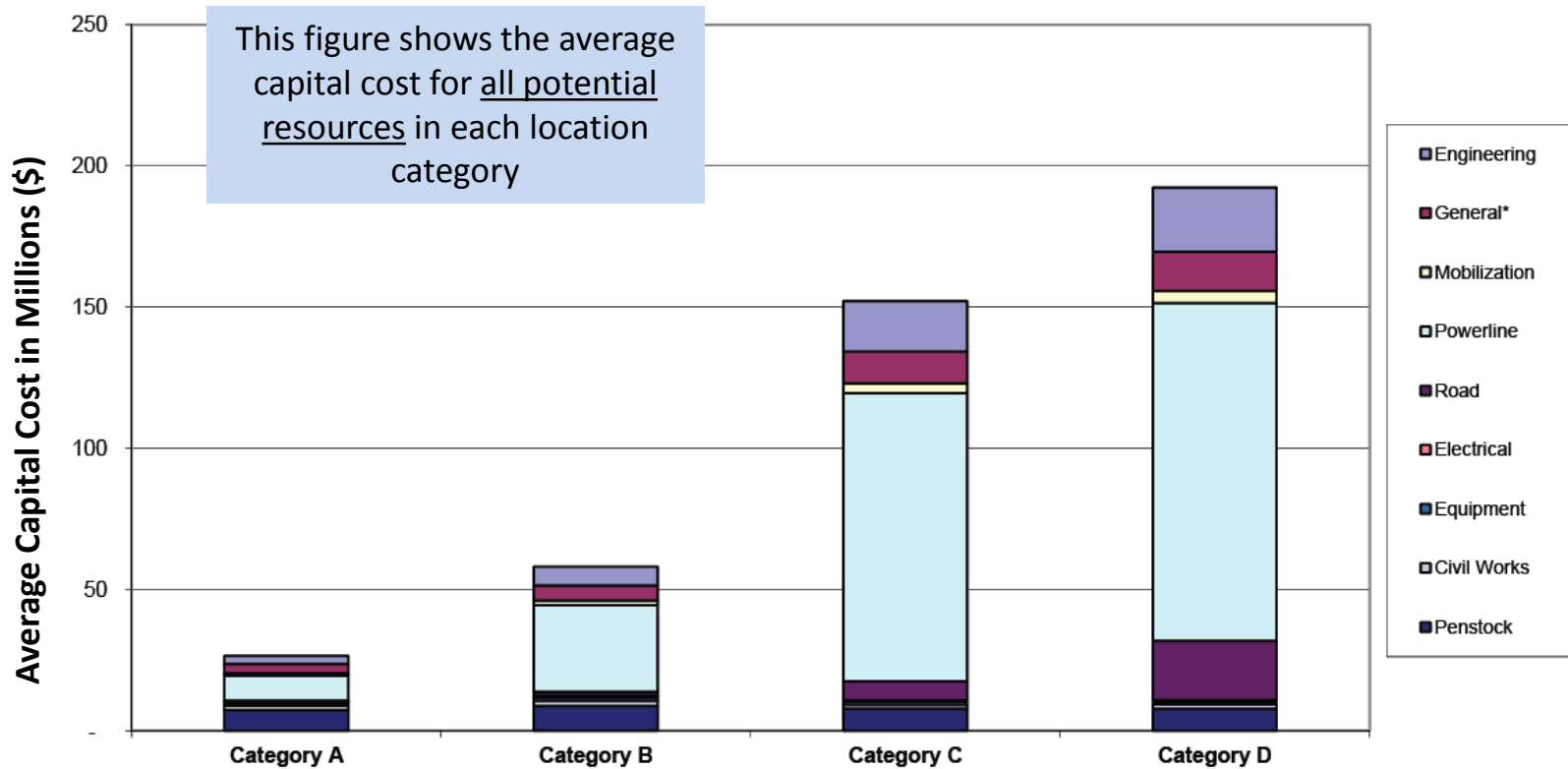
6. Include a maximum cut-off in presentation of UECs

- In response to feedback, will use a \$200/MWh cut off when reporting UECs in publically available summary presentation material

MONTHLY ENERGY PROFILES BY TRANSMISSION REGION



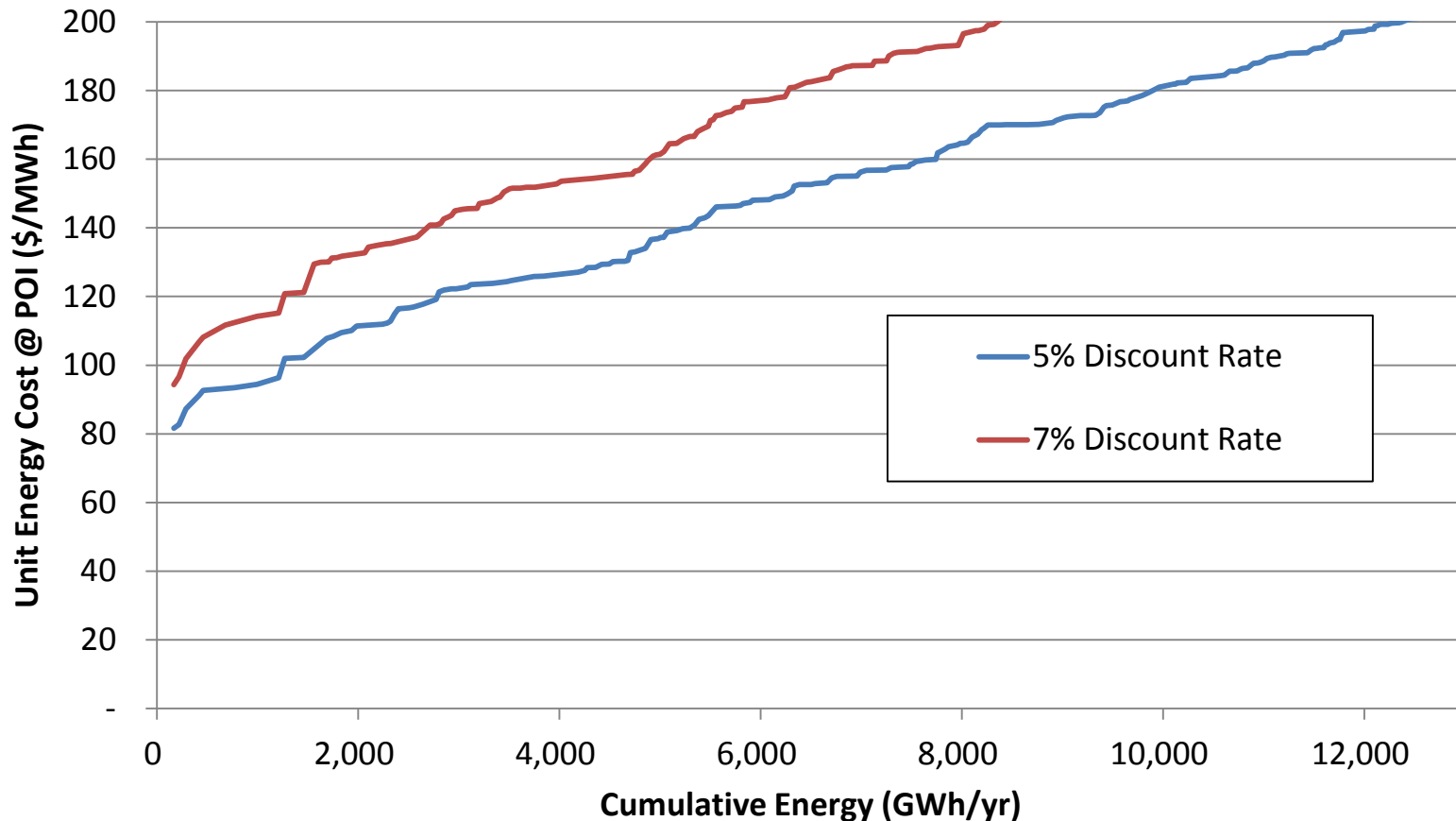
AVERAGE CAPITAL COST BREAKDOWN BY SITE LOCATION CATEGORY



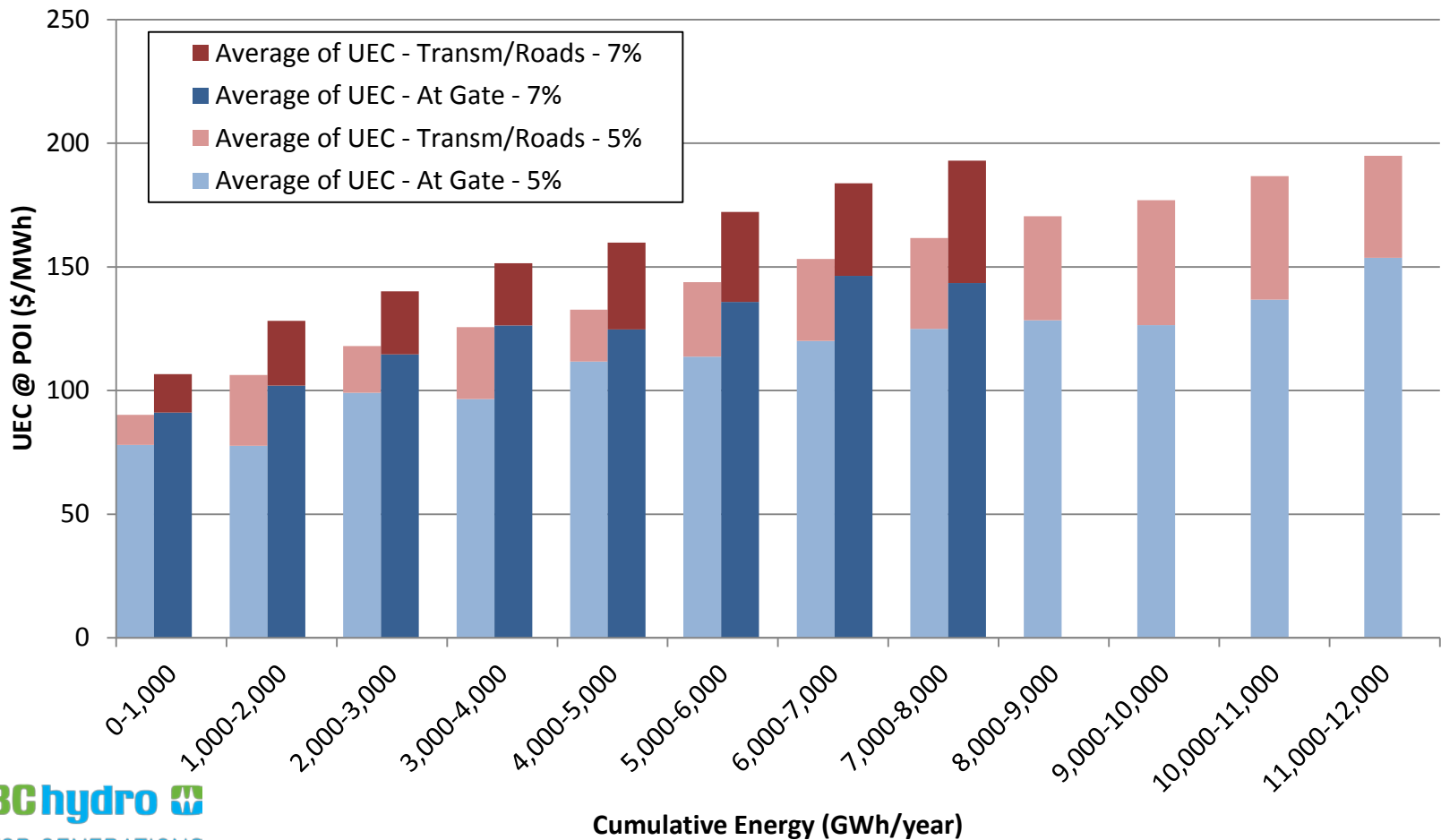
Site Category A: < 50 km radius from a major town or city centre
 Site Category B: 50 to 199 km radius
 Site Category C: 200 to 399 km radius
 Site Category D: >= 400 km radius
 * General Costs include bonding, insurance, environmental and social costs

UEC AT POI

For resources with UEC @ POI <\$200/MWh, UEC @ POI changed on average - \$2.50/MWh from 2013 analysis



SUPPLY CURVE BREAKDOWN FOR 5% AND 7% DISCOUNT RATE



THANK YOU

Resource Options Report Update

- Final 2015 KWL report and Run of River resource assessment update will be posted on website by end of July

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General information

- www.bchydro.com/generationoptions

EXTRA SLIDES

TOTAL RUN-OF-RIVER HYDRO POTENTIAL IN BC: 5% DISCOUNT RATE

Price Bundle (\$/MWh)	Number of Projects	Average Annual Energy (GWh/yr)	Installed Capacity (MW)	Dependable Generating Capacity (MW)
80-90	3	289	81	3
90-100	5	921	272	9
100-110	5	622	177	14
110-120	12	943	249	18
120-130	19	1,719	462	33
130-140	17	803	242	7
140-150	15	969	278	15
150-160	22	1,474	414	24
160-170	14	637	187	8
170-180	24	1,504	445	9
180-190	23	1,231	360	11
190-200	31	1,257	371	27
200-250	143	4,431	1,357	39
250-300	163	3,972	1,266	57
300-350	142	3,236	989	30
350-400	134	2,177	667	17
400-450	141	2,019	631	18
450-500	137	2,088	637	19
500-550	118	1,245	407	15
550-600	101	1,047	338	7
600-650	142	1,431	444	12
650-700	103	803	262	6
700-750	117	903	288	6
750-800	86	549	183	5
800-850	100	735	238	4
850-900	97	756	241	6
900-950	88	703	220	4
950-1000	89	685	220	3
1000+	4,997	13,984	4,377	119
Total	7,088	53,134	16,303	543

Dependable Generating Capacity (DGC) is defined as the capacity that can be generated 85% of the time in December and January

TOTAL RUN-OF-RIVER HYDRO POTENTIAL IN BC: 7% DISCOUNT RATE

Price Bundle (\$/MWh)	Number of Projects	Average Annual Energy (GWh/yr)	Installed Capacity (MW)	Dependable Generating Capacity (MW)
90-100	2	220	65	1
100-110	3	239	68	2
110-120	3	751	220	8
120-130	4	419	130	0
130-140	11	955	251	27
140-150	14	826	228	22
150-160	16	1,470	397	19
160-170	12	601	175	9
170-180	15	775	226	11
180-190	15	997	292	11
190-200	17	1,066	299	16
200-250	112	5,083	1,512	56
250-300	134	3,804	1,181	38
300-350	131	3,220	1,012	37
350-400	106	2,535	786	38
400-450	123	2,172	665	13
450-500	124	1,851	569	17
500-550	94	1,349	422	12
550-600	119	1,828	554	16
600-650	101	1,068	350	13
650-700	84	951	303	9
700-750	107	977	314	9
750-800	112	1,083	340	6
800-850	85	655	209	5
850-900	87	747	233	6
900-950	75	457	155	2
950-1000	83	508	170	6
1000+	5,299	16,527	5,178	134
Total	7,088	53,134	16,303	543