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Presentation to the Rate Review Panel

April 5, 2022

Considerations for Energy Intensive Industrial Customers

Unique but key customer segment with variation within the class.

Attributes

- Large concentrated loads
- Often operate 24/7
- Sensitive to price
- Sensitive to volatility
- Connected at a higher voltage level
- Exposed to global market forces

Operating Considerations

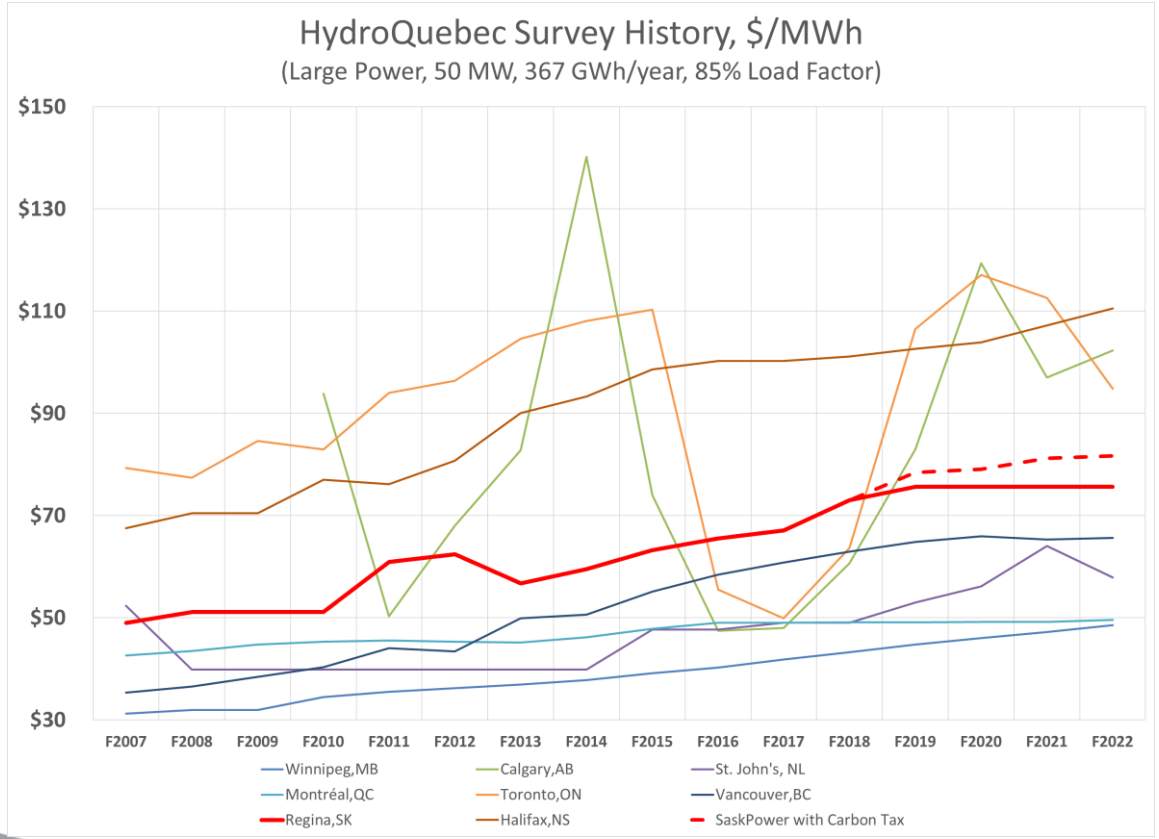
- Maximize production to spread out the fixed costs
- Production is usually proportional to energy consumption
- The decision to produce more is often determined by the incremental margin
  - Lowest price – highest input costs
  - NOT the average

Rate Application Challenge

This appears to be 3 applications packaged as one.

- **Rate Increase** to recover additional revenue that is claimed to be required. This is usually applied evenly across all rates and impacts all customers equally
- **Rate Rebalancing**: A dramatic change in the balance between the fixed and variable portion of a customer's bill
- **Carbon Pricing:** This is a growing cost that will be recovered over a smaller portion of the bill based on a plan that is outside of our control.

SaskPower comparisons should consider Carbon Tax impacts



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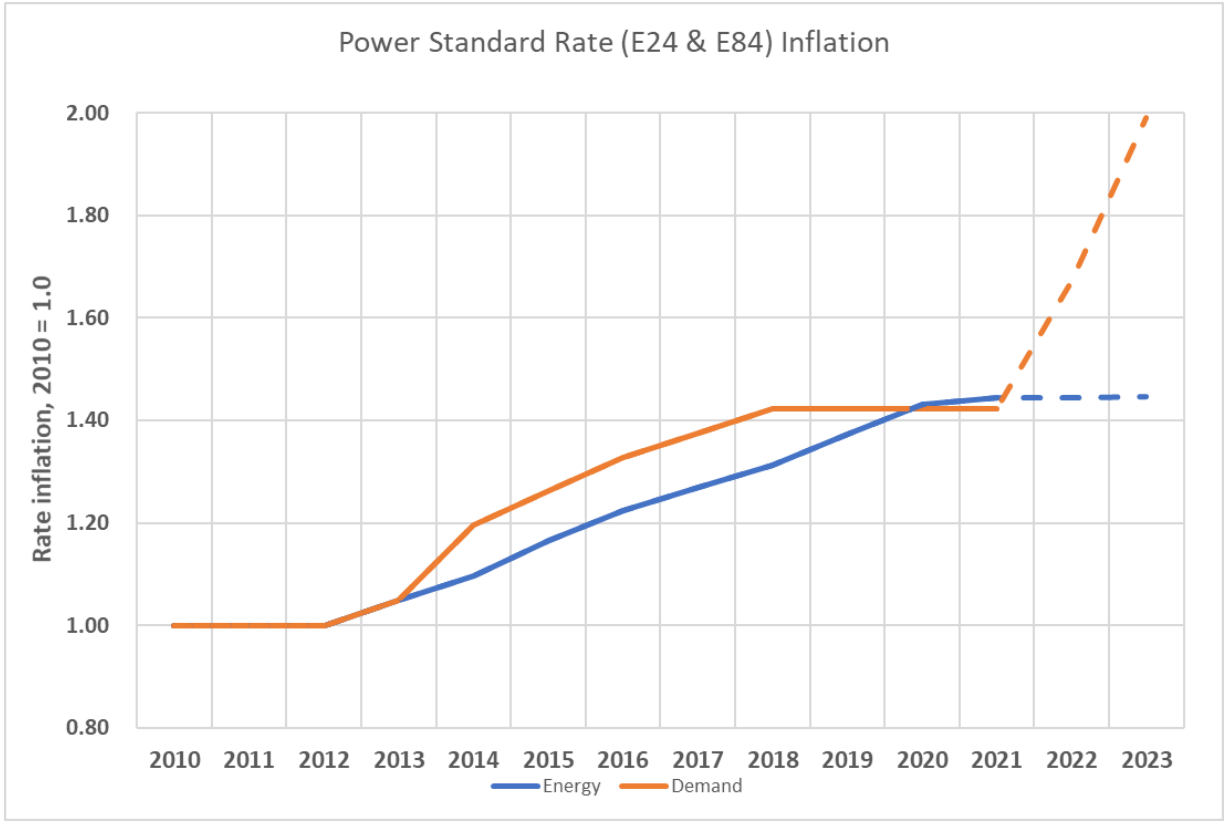
This application is a material divergence from the historical pattern



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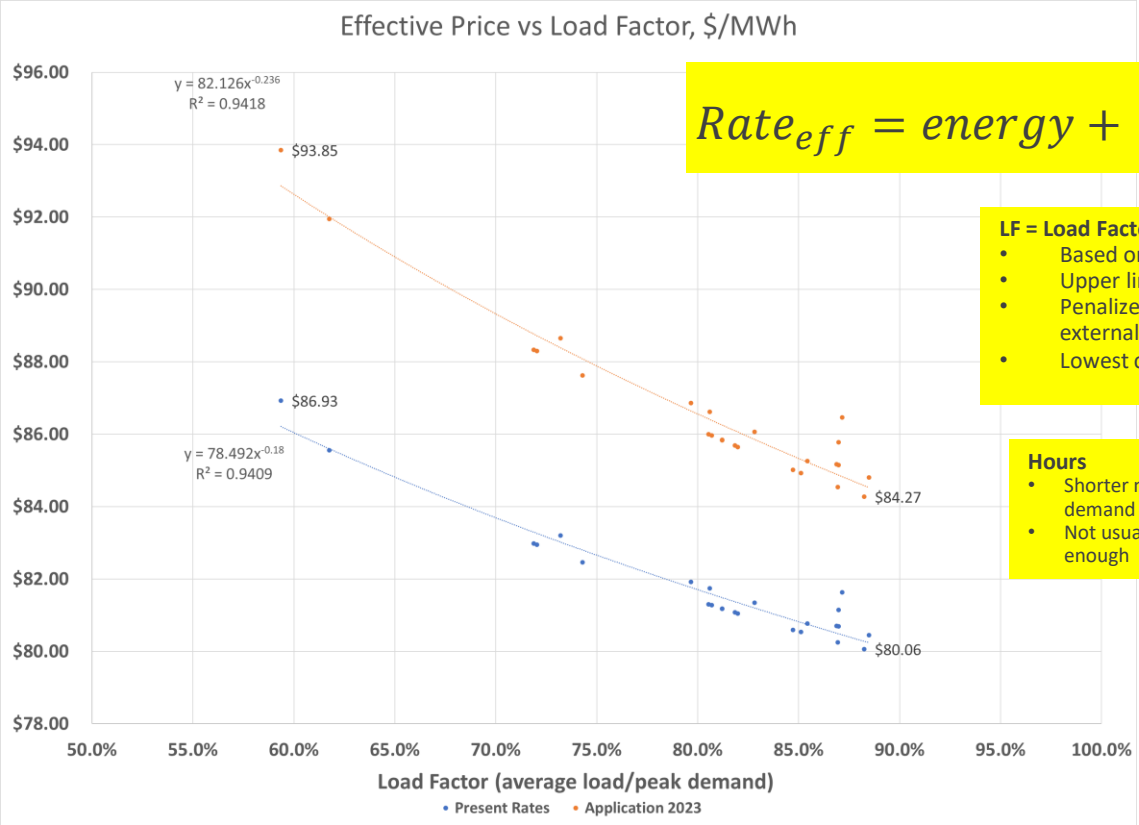
The application increases cost and volatility for flexible loads, preferential treatment for flat loads



$$Rate_{eff} = energy + \frac{demand}{LF * hours}$$

LF = Load Factor

- Based on the peak 20 minutes in a month
- Upper limit bounded by production capacity
- Penalizes maintenance and exacerbates external constraints (e.g., railways)
- Lowest cost at a **flat** load profile

Hours

- Shorter months have less energy to "spread" the demand charge over
- Not usually material until the demand charges get high enough

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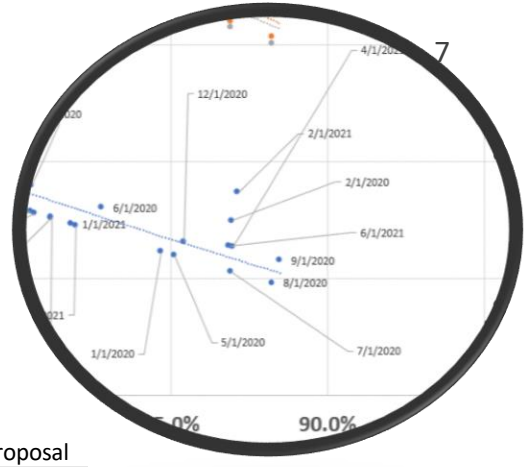
Outlier example

- As the demand charge is increased the impact of a shorter month is exacerbated
  - Peak is based on the highest 20 minutes, regardless of the number of hours in the month
- Should we prorate the demand charge to accurately reflect the value of capacity in all months?
- Or – should capacity have different values in different months?



	hours	SP proposal	% of year	counter proposal
Jan	744	$ 11,586	8.5%	$ 11,808
Feb	672	$ 11,586	7.7%	$ 10,665
Mar	744	$ 11,586	8.5%	$ 11,808
Apr	720	$ 11,586	8.2%	$ 11,427
May	744	$ 11,586	8.5%	$ 11,808
Jun	720	$ 11,586	8.2%	$ 11,427
Jul	744	$ 11,586	8.5%	$ 11,808
Aug	744	$ 11,586	8.5%	$ 11,808
Sep	720	$ 11,586	8.2%	$ 11,427
Oct	744	$ 11,586	8.5%	$ 11,808
Nov	720	$ 11,586	8.2%	$ 11,427
Dec	744	$ 11,586	8.5%	$ 11,808
$/MVA-year		**$ 139,032**		**$ 139,032**

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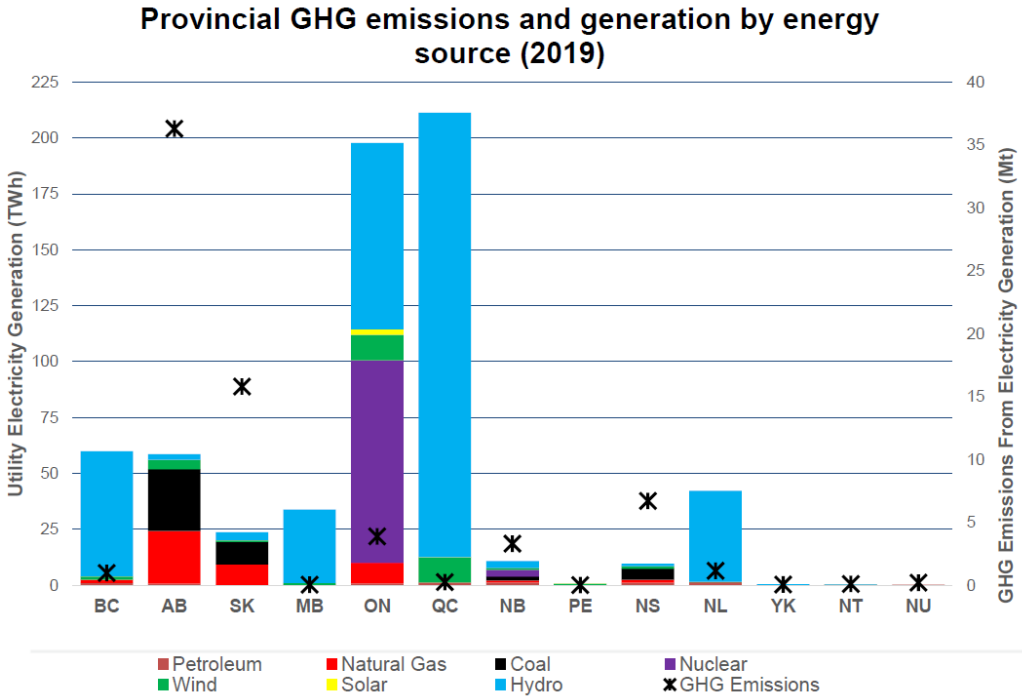
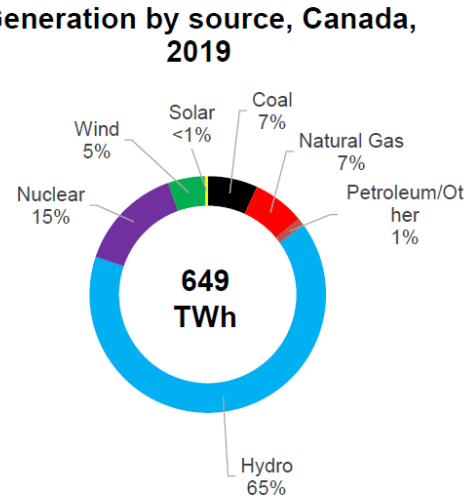
NZ2035 will be a joint effort

Net-Zero Electricity means having the electricity sector achieve, in effect, no emissions of GHGs by 2035, or offsetting any emissions by other actions

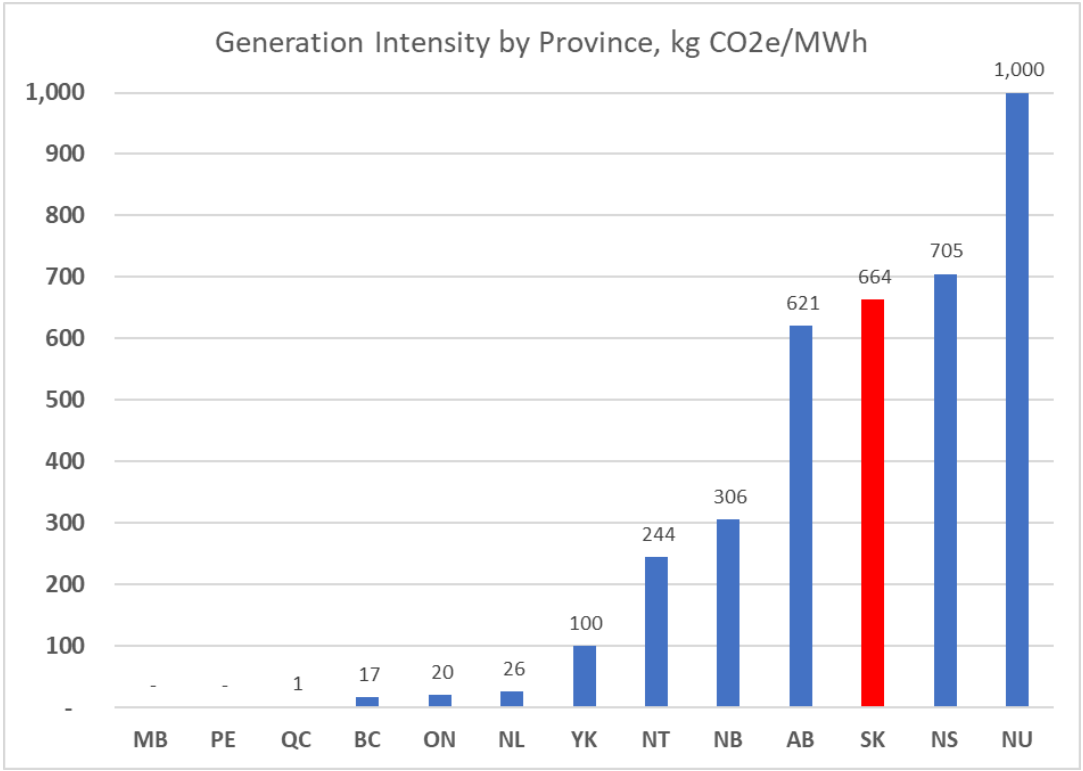
The presentation understates our challenge in SK

Canada's Electricity Generation





Our relatively high intensity creates an additional cost risk in addition to what is being asked for in the Application.



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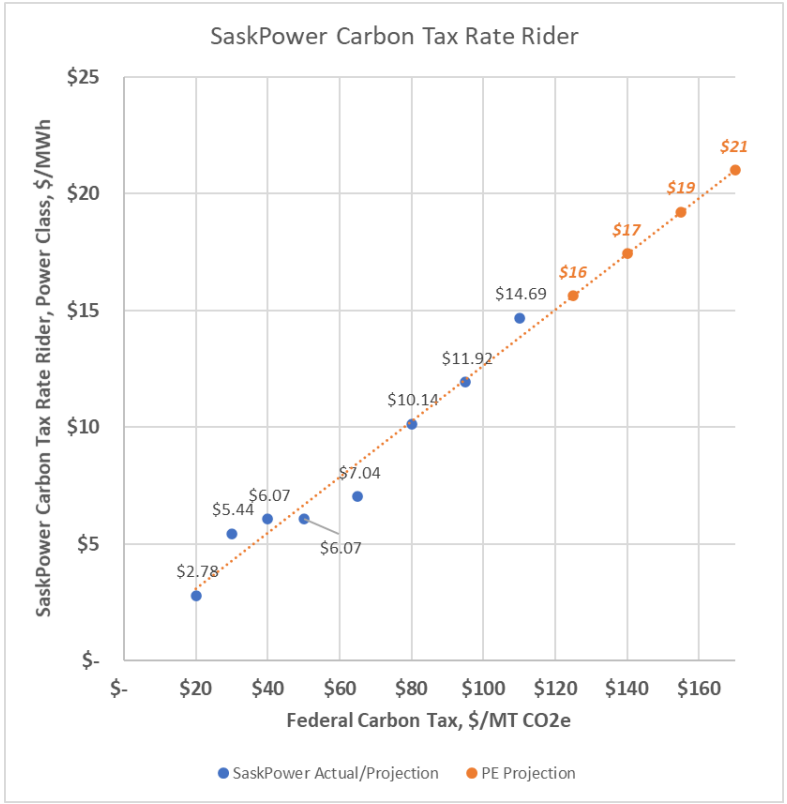
Business will assume that the Carbon Tax Rate Rider will follow the Federal Tax increases*



subject to clarification on how the collected taxes will be reinvested in SK

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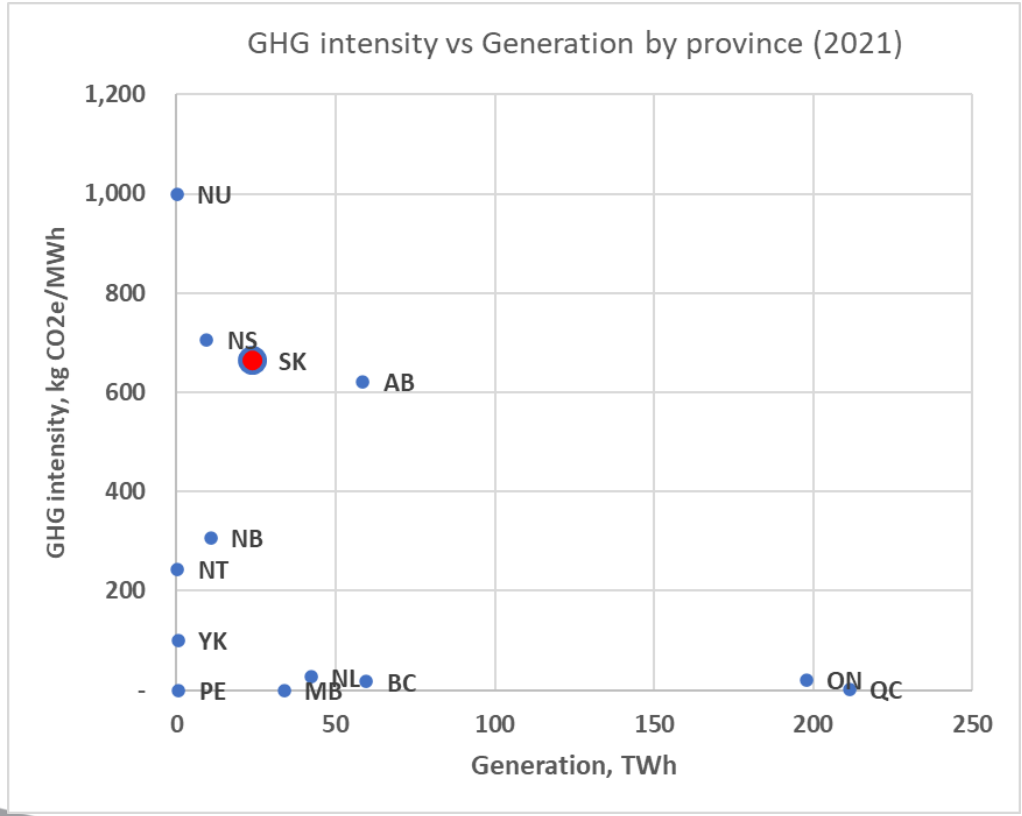
SK has a relatively small generating base over which to spread the cost to reduce its intensity.



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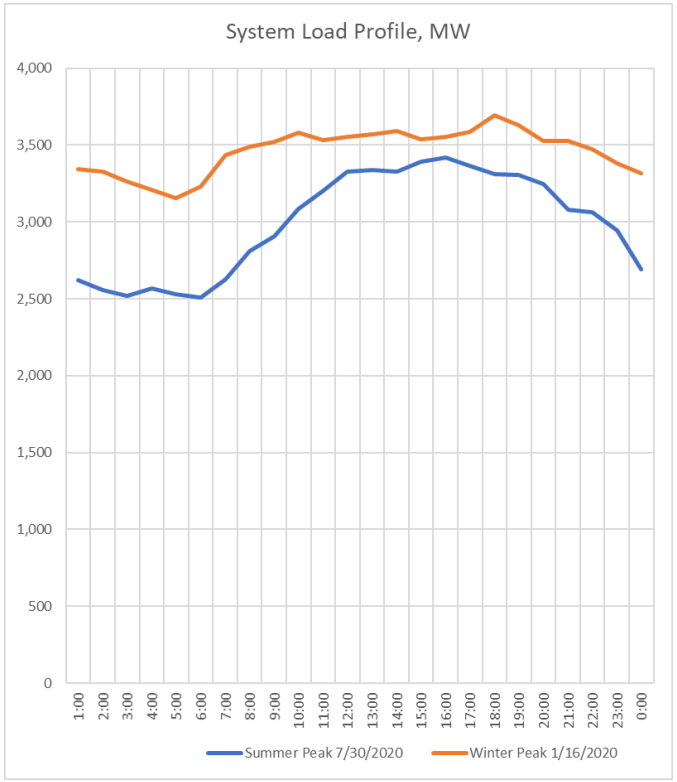
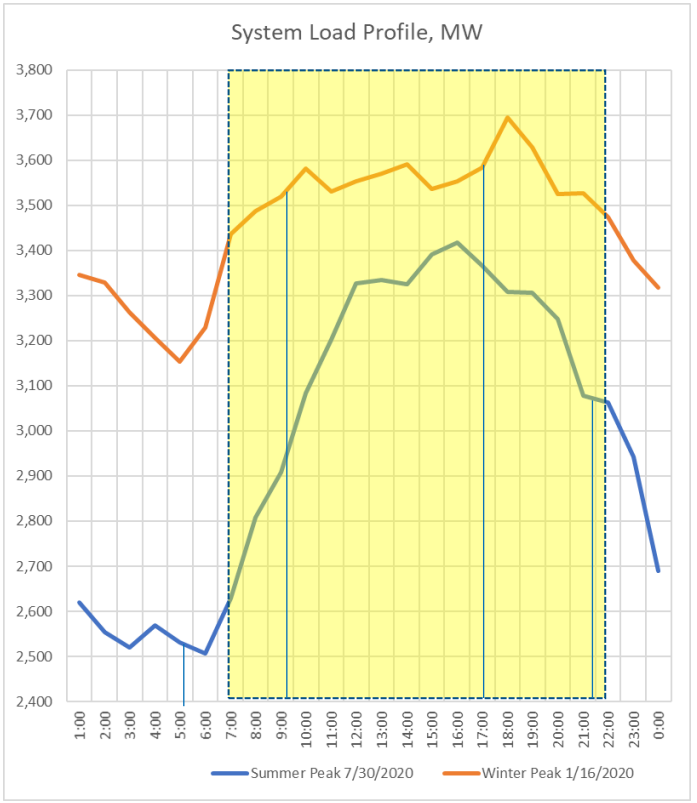
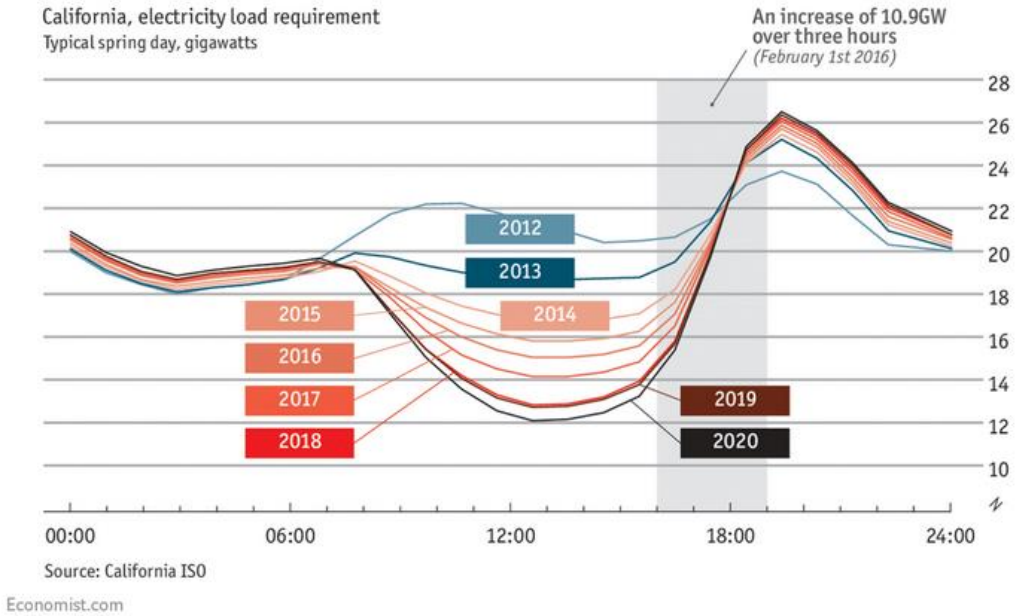
Increasing the *provincial* load factor and renewable generation that follows load are complementary paths forward.



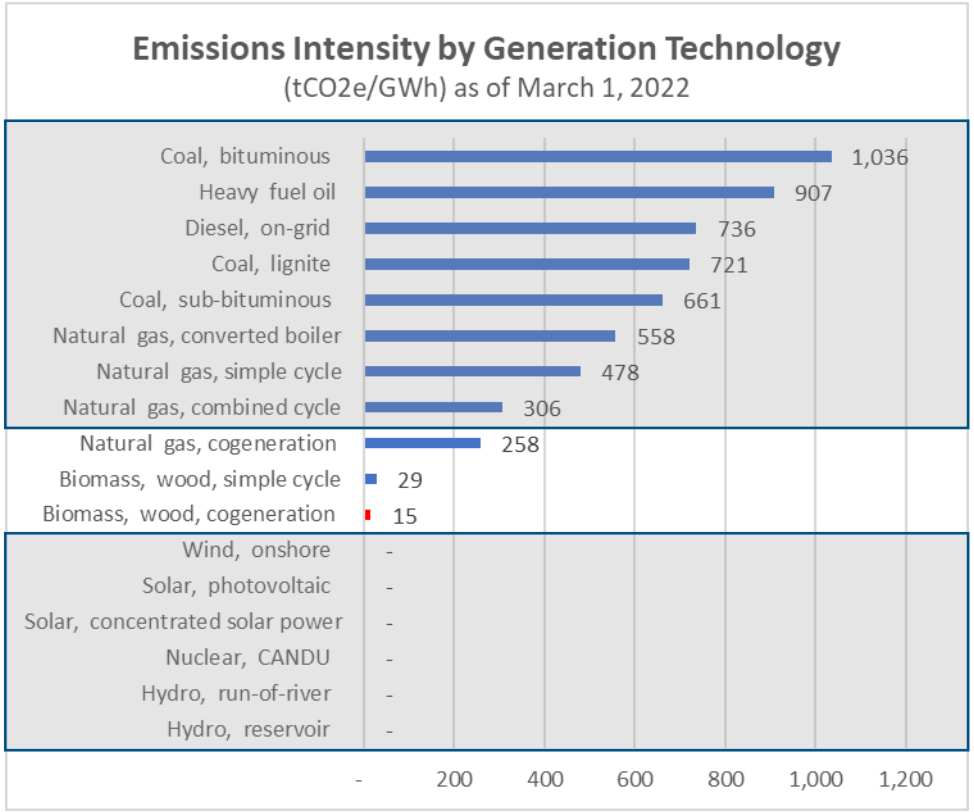


…however, some renewables can have their challenges



https://www.economist.com/graphic-detail/2018/03/28/what-a-ten-year-old-duck-can-teach-us-about-electricity-demand

Industry partnerships can provide additional low intensity energy and capacity



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Proposed Elements of our Submission

1. Stabilize the existing industrial load by mitigating the rate shock to preserve income
2. Encourage demand response to minimize fuel costs and investment in generation to firm up intermittent renewables. Have key terms defined before *implementing* the requested for rate change.
3. Encourage development of other low intensity generation options, namely biomass and natural gas cogeneration.

Demand Shock Mitigation

- Waive the Demand Ratchet if this Application is accepted
  - Presently the billing demand shall not be less than 75% of the maximum billing demand in the preceding 11 months
  - This may penalize a customer who made decision in October 2021, long before this application was made
- Increase the measurement duration for defining a peak to reduce a customer's exposure to short term fluctuations
- Calculate the Demand Charge based on the highest use in Peak hours only
  - Encourage customers to shift loads to accommodate the system and reduce the need for peaking resources

Demand Response Program Development

IRC ISO/RTO COUNCIL

Delivering the energy needs of today and beyond...

North American Wholesale Electricity Demand Response Program Comparison

2018 Edition (Updated November 2018)

This document* identifies ***57*** different types of demand response programs in North America.

Industry needs to understand the opportunity to make an effective proposal.

- There should be a pricing matrix that reflects the value to the system based on factors such as:
  - Notice period
  - Volume
  - Frequency
  - Duration
  - Recovery requirement
  - Direct vs indirect control
  - etc.

*https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjdqL_4lPz2AhWKFjQIHUaQAigQFnoECAYQAQ&url=https%3A%2F%2Fisorto.org%2Fwp-content%2Fuploads%2F2018%2F12%2F2018-Demand-Response-Program-Comparison.xlsx&usg=AOvVaw23jWFLISMqBbvxb-vSmTyv

Passive Demand Response

Demand Response programs are actively managed by the system operators, there are other methods that use pricing signals to encourage shifting consumption away from peak periods, these include:

- Time of Use rates
- Incremental energy rates
- Critical peak pricing for capacity
- Seasonal energy pricing

Customer Generation

- The proposed CRS rate and the increase in demand rates appear to be an attempt to reduce behind the meter generation
- Cogeneration is clearly the lowest intensity form of firm generation and should be encouraged through mechanisms like open calls or standing offers.

Thank You

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Data Table from the NZ2035 Discussion Paper

Utility electricity generation in terawatt hours by province

Sector	BC	AB	SK	MB	ON	QC	NB	PE	NS	NL	YK	NT	NU
Petroleum	0.9	0.7	0	0	0.7	1.2	1.2	0	1	1.3	0	0.1	0.2
Natural Gas	1.4	23.6	9.3	0	9.4	0	0.9	0	1.4	0	0.1	0.01	0
Coal	0	27.7	10	0	0	0	1.8	0	5	0	0	0	0
Nuclear	0	0	0	0	90.5	0	3	0	0	0	0	0	0
Wind	1.5	4	0.8	0.9	11.5	11.3	0.9	0.6	1.1	0.2	0	0	0
Solar	0	0	0	0	2.4	0	0	0.01	0	0	0	0	0
Hydro	55.9	2.5	3.7	32.9	83.3	198.8	3	0	1	40.7	0.4	0.3	0
total	59.7	58.5	23.8	33.8	197.8	211.3	10.8	0.61	9.5	42.2	0.5	0.41	0.2
% coal & petroleum	2%	49%	42%	0%	0%	1%	28%	0%	63%	3%	0%	24%	100%
GHG Emissions, Mt	1	36.3	15.8	0	3.9	0.2	3.3	0	6.7	1.1	0.05	0.1	0.2
intensity, kg CO2e/MWh	17	621	664	-	20	1	306	-	705	26	100	244	1,000