

# Impacts and Trends of COVID-19 on NYISO Load

Analysis through 9/30/2021

**Chuck Alonge & Maxim Schuler** Demand Forecasting & Analysis

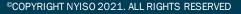
Load Forecasting Task Force

October 21, 2021; Teleconference

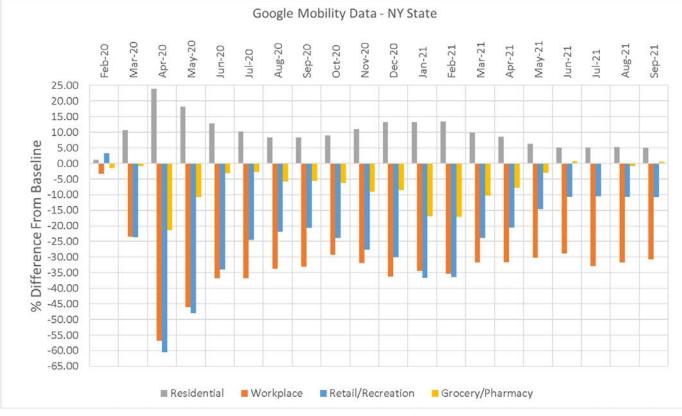
#### Back-to-Normal Index (Moody's Analytics)



Source: CNN/Moody's Analytics: https://www.cnn.com/business/us-economic-recovery-coronavirus



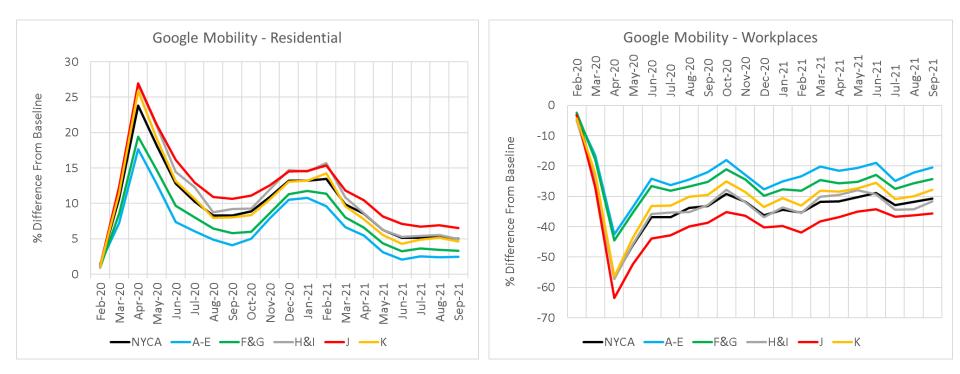
### New York Insights – Google Mobility



Source: Google Mobility Data, <a href="https://www.google.com/covid19/mobility/">https://www.google.com/covid19/mobility/</a>



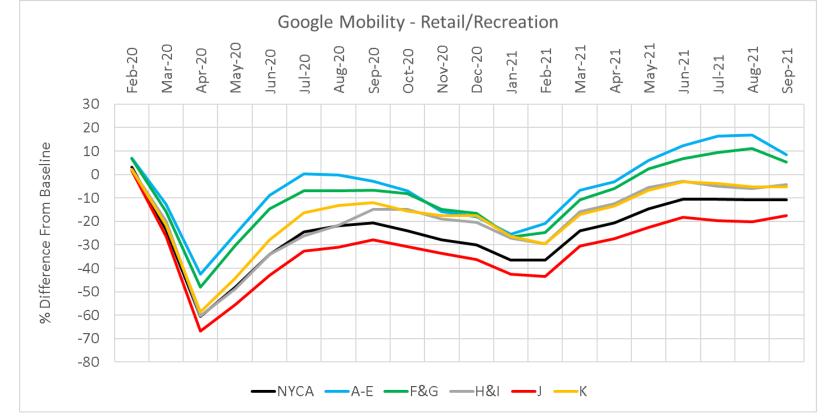
### **Regional Insights – Google Mobility**



Source: Google Mobility Data, <a href="https://www.google.com/covid19/mobility/">https://www.google.com/covid19/mobility/</a>



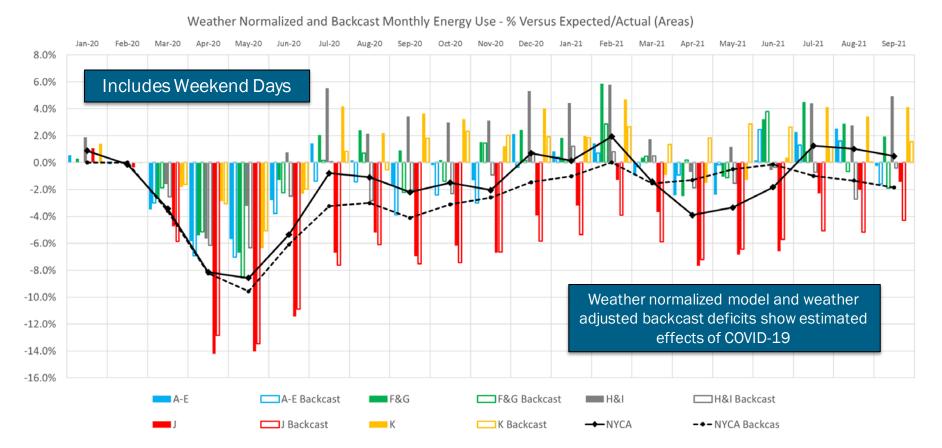
### **Regional Insights – Google Mobility**



Source: Google Mobility Data, <a href="https://www.google.com/covid19/mobility/">https://www.google.com/covid19/mobility/</a>



#### Impacts on Daily Energy by Month



#### Model Explanation - Impacts on Daily Energy by Month

#### Weather Normalized Difference (Solid Bars in Previous Chart)

- Equals: Weather Normalized Load Expected Load
- Weather Normalized Load is calculated via Zonal models regressing daily energy against daily weather variables and binaries. These models estimate what the load would have been on a given date under normal weather conditions
- These models are fit through the most recent 12 months of data, and have recent weather response signals.
- Expected Load is the pre-COVID baseline annual load forecast, shared out on a daily basis using the 10-year history of daily weather-normalized energy
- This difference reflects non-weather driven changes in load levels, including economic, virus, and other impacts. The comparison is weather neutral as normal weather is used on both sides of the comparison

#### Weather Adjusted Backcast Difference

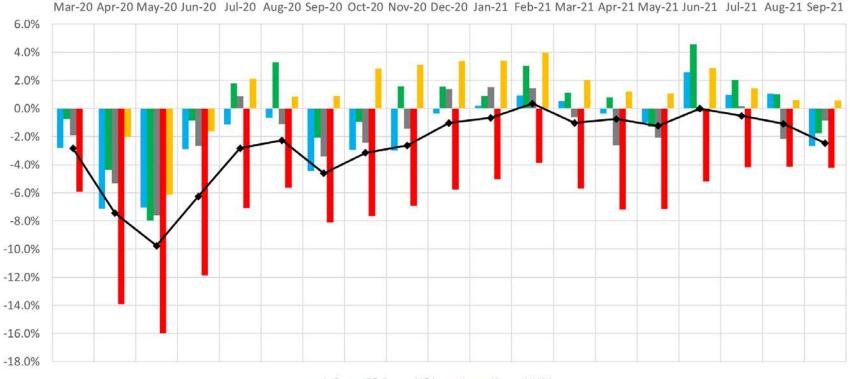
(Hollow bars in Previous Chart)

- Equals: Actual Load Backcast Load
- Backcast Load is the load generated by the Zonal hourly day-ahead models using actual weather, where the model estimation period ends in February 2020. Thus, these backcasts estimate what the load would have been on a given day under pre-COVID conditions
- These models were fit through February 2020, so they do not contain the most recent weather response signals
- This difference reflects non-weather driven changes in load levels, including economic, virus, and other impacts. The comparison is weather neutral as actual weather is used on both sides of the comparison



#### **Regional Impacts on Peak Demand**

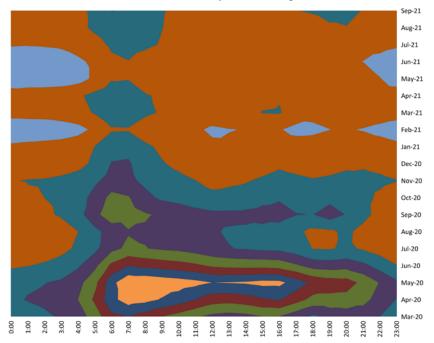
2020-2021 Backcast Peaks - % Versus Actual (Areas)



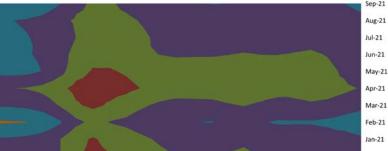
🗖 A-E 💶 F&G 📖 H&I 💻 J 💴 K 🔶 NYCA

#### Impacts on Hourly Load Patterns (Monthly)

NYCA Load Profile - Weekday Diurnal Load Changes



	<b>0.0%-2.0%</b>
% Difference	<b>-2.0%-0.0%</b>
from Expected	<b>-4.0%2.0%</b>
	■ -6.0%4.0%



4:00

5:00

16:00 17:00 18:00 19:00 20:00 21:00

Zone J (NYC) Load Profile - Weekday Diurnal Load Changes

												-		-
00:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	00:6	10:00	11:00	12:00	13:00	
-8	8.0	%	6.0	%			-	16.	0%	14	1.09	6		
-	10.0	0%	8.	0%			-	18.	0%	-16	5.09	6		
-	12.0	0%	10	).09	%		-	20.	0%	18	8.0%	6		
-	14.0	0%	12	2.09	%		-	22.	0%	20	0.09	6		
							-	24.	0%	22	2.09	6		



Dec-20

Nov-20 Oct-20

Sep-20

Aug-20 Jul-20

Jun-20

May-20

Apr-20

Mar-20

23:00

#### Impacts on Hourly Load Patterns by Week (2021)

0.0%-2.0%

-2.0%-0.0%

4.0%--2.0%

-6.0%--4.0%

-8.0%--6.0%

-10.0%--8.0%

-12.0%--10.0%

-14.0%--12.0%

-16.0%--14.0%

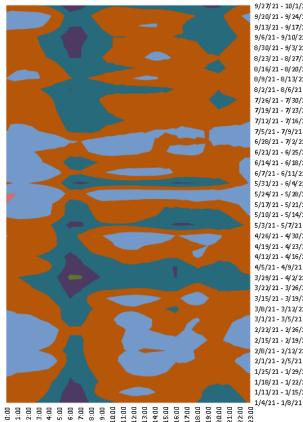
-18.0%--16.0%

-20.0%--18.0%

-22.0%--20.0%

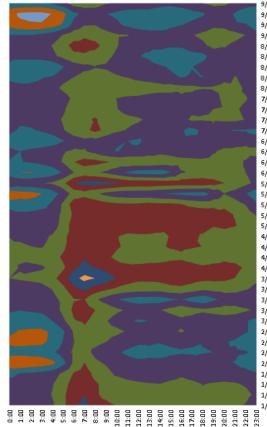
-24.0%--22.0%

NYCA Load Profile - Weekday Diurnal Load Changes



9/27/21 - 10/1/21 9/20/21 - 9/24/21 9/13/21 - 9/17/21 9/6/21-9/10/21 8/30/21 - 9/3/21 8/23/21 - 8/27/21 8/16/21-8/20/21 8/9/21-8/13/21 8/2/21-8/6/21 7/26/21 - 7/30/21 7/19/21 - 7/23/21 7/12/21 - 7/16/21 7/5/21 - 7/9/21 6/28/21 - 7/2/21 6/21/21 - 6/25/21 6/14/21 - 6/18/21 6/7/21-6/11/21 5/31/21 - 6/4/21 5/24/21 - 5/28/21 5/17/21 - 5/21/21 5/10/21 - 5/14/21 5/3/21-5/7/21 4/26/21 - 4/30/21 4/19/21 - 4/23/21 4/12/21 - 4/16/21 4/5/21-4/9/21 3/29/21 - 4/2/21 3/22/21 - 3/26/21 3/15/21 - 3/19/21 3/8/21 - 3/12/21 3/1/21-3/5/21 2/22/21 - 2/26/21 2/15/21 - 2/19/21 2/8/21 - 2/12/21 2/1/21 - 2/5/21 1/25/21 - 1/29/21 1/18/21 - 1/22/21 1/11/21 - 1/15/21

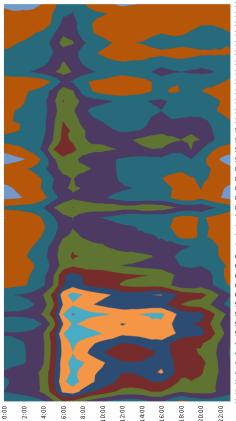
Zone J (NYC) Load Profile - Weekday Diurnal Load Changes

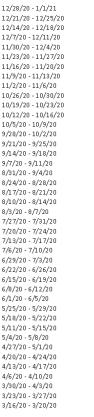


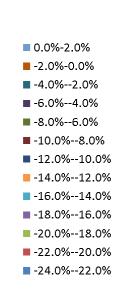
9/27/21 - 10/1/21 9/20/21 - 9/24/21 9/13/21 - 9/17/21 9/6/21-9/10/21 8/30/21 - 9/3/21 8/23/21 - 8/27/21 8/16/21 - 8/20/21 8/9/21-8/13/21 8/2/21-8/6/21 7/26/21 - 7/30/21 7/19/21 - 7/23/21 7/12/21 - 7/16/21 7/5/21 - 7/9/21 6/28/21 - 7/2/21 6/21/21 - 6/25/21 6/14/21-6/18/21 6/7/21-6/11/21 5/31/21 - 6/4/21 5/24/21-5/28/21 5/17/21 - 5/21/21 5/10/21 - 5/14/21 5/3/21-5/7/21 4/26/21 - 4/30/21 4/19/21 - 4/23/21 4/12/21 - 4/16/21 4/5/21 - 4/9/21 3/29/21 - 4/2/21 3/22/21 - 3/26/21 3/15/21 - 3/19/21 3/8/21 - 3/12/21 3/1/21 - 3/5/21 2/22/21 - 2/26/21 2/15/21 - 2/19/21 2/8/21 - 2/12/21 2/1/21 - 2/5/21 1/25/21 - 1/29/21 1/18/21 - 1/22/21 1/11/21 - 1/15/21 1/4/21 - 1/8/21

#### Impacts on Hourly Load Patterns by Week (2020)

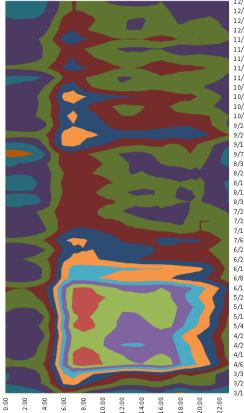
#### NYCA Load Profile - Weekday Diurnal Load Changes





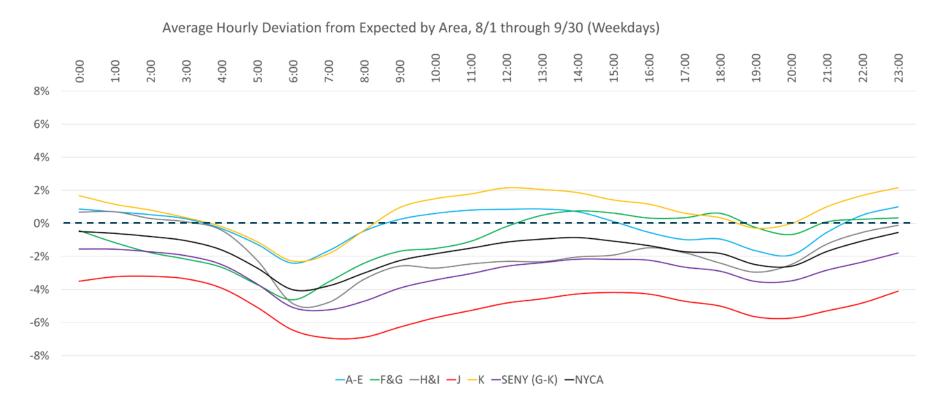


#### Zone J (NYC) Load Profile - Weekday Diurnal Load Changes

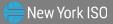


12/28/20 - 1/1/21 12/21/20 - 12/25/20 12/14/20 - 12/18/20 12/7/20 - 12/11/20 11/30/20 - 12/4/20 11/23/20 - 11/27/20 11/16/20 - 11/20/20 11/9/20 - 11/13/20 11/2/20 - 11/6/20 10/26/20 - 10/30/20 10/19/20 - 10/23/20 10/12/20 - 10/16/20 10/5/20 - 10/9/20 9/28/20 - 10/2/20 9/21/20 - 9/25/20 9/14/20 - 9/18/20 9/7/20 - 9/11/20 8/31/20 - 9/4/20 8/24/20 - 8/28/20 8/17/20 - 8/21/20 8/10/20 - 8/14/20 8/3/20 - 8/7/20 7/27/20 - 7/31/20 7/20/20 - 7/24/20 7/13/20 - 7/17/20 7/6/20 - 7/10/20 6/29/20 - 7/3/20 6/22/20 - 6/26/20 6/15/20 - 6/19/20 6/8/20 - 6/12/20 6/1/20 - 6/5/20 5/25/20 - 5/29/20 5/18/20 - 5/22/20 5/11/20 - 5/15/20 5/4/20 - 5/8/20 4/27/20 - 5/1/20 4/20/20 - 4/24/20 4/13/20 - 4/17/20 4/6/20 - 4/10/20 3/30/20 - 4/3/20 3/23/20 - 3/27/20 3/16/20 - 3/20/20

#### **Impacts on Hourly Load Patterns (Area)**



# **Questions/Discussion**



#### Impacts on Hourly Load Patterns (Area)

Hour	A-E	F&G	H&I	J	К	SENY (G-K)	NYCA
0:00	1%	0%	1%	-3%	2%	-2%	0%
1:00	1%	-1%	1%	-3%	1%	-2%	-1%
2:00	1%	-2%	0%	-3%	1%	-2%	-1%
3:00	0%	-2%	0%	-3%	0%	-2%	-1%
4:00	0%	-3%	0%	-4%	0%	-2%	-2%
5:00	-1%	-4%	-2%	-5%	-1%	-4%	-3%
6:00	-2%	-5%	-5%	-6%	-2%	-5%	-4%
7:00	-2%	-4%	-5%	-7%	-2%	-5%	-4%
8:00	0%	-2%	-3%	-7%	0%	-5%	-3%
9:00	0%	-2%	-3%	-6%	1%	-4%	-2%
10:00	1%	-2%	-3%	-6%	1%	-3%	-2%
11:00	1%	-1%	-2%	-5%	2%	-3%	-2%
12:00	1%	0%	-2%	-5%	2%	-3%	-1%
13:00	1%	0%	-2%	-5%	2%	-2%	-1%
14:00	1%	1%	-2%	-4%	2%	-2%	-1%
15:00	0%	1%	-2%	-4%	1%	-2%	-1%
16:00	-1%	0%	-1%	-4%	1%	-2%	-1%
17:00	-1%	0%	-2%	-5%	1%	-3%	-2%
18:00	-1%	1%	-2%	-5%	0%	-3%	-2%
19:00	-2%	0%	-3%	-6%	0%	-4%	-2%
20:00	-2%	-1%	-2%	-6%	0%	-3%	-3%
21:00	-1%	0%	-1%	-5%	1%	-3%	-2%
22:00	1%	0%	-1%	-5%	2%	-2%	-1%
23:00	1%	0%	0%	-4%	2%	-2%	-1%

Average Hourly Load Deficit By Area 8/1 - 9/30 (Weekdays)



#### Impacts on Hourly Load Patterns (Zone)

Hour	Α	В	С	D	Е	F	G	Н	I	J	К
0:00	0%	5%	0%	0%	0%	-1%	0%	-2%	2%	-3%	2%
1:00	0%	5%	0%	-3%	0%	-2%	0%	-3%	2%	-3%	1%
2:00	0%	5%	0%	-3%	0%	-3%	0%	-4%	2%	-3%	1%
3:00	0%	4%	0%	-3%	0%	-3%	-1%	-4%	2%	-3%	0%
4:00	-1%	4%	-1%	-4%	-1%	-4%	-1%	-5%	1%	-4%	0%
5:00	-2%	2%	-2%	-3%	-2%	-5%	-2%	-7%	0%	-5%	-1%
6:00	-4%	0%	-2%	-3%	-3%	-6%	-3%	-9%	-3%	-6%	-2%
7:00	-3%	0%	-1%	-3%	-1%	-4%	-3%	-7%	-4%	-7%	-2%
8:00	-2%	1%	-1%	-1%	3%	-3%	-2%	-5%	-3%	-7%	0%
9:00	-2%	1%	0%	0%	5%	-2%	-2%	-3%	-2%	-6%	1%
10:00	-1%	2%	-1%	1%	5%	-2%	-1%	-4%	-2%	-6%	1%
11:00	0%	2%	-1%	1%	5%	-1%	-1%	-3%	-2%	-5%	2%
12:00	0%	3%	-1%	0%	5%	0%	-1%	-3%	-2%	-5%	2%
13:00	0%	3%	-1%	-2%	4%	1%	0%	-3%	-2%	-5%	2%
14:00	0%	3%	0%	-3%	4%	1%	0%	-3%	-1%	-4%	2%
15:00	0%	3%	-1%	-5%	2%	1%	0%	-3%	-1%	-4%	1%
16:00	-1%	3%	-1%	-6%	0%	0%	0%	-3%	-1%	-4%	1%
17:00	-1%	3%	-1%	-7%	-1%	1%	0%	-3%	-1%	-5%	1%
18:00	-2%	3%	-1%	-6%	-2%	1%	0%	-5%	-1%	-5%	0%
19:00	-3%	2%	-2%	-7%	-2%	0%	0%	-5%	-2%	-6%	0%
20:00	-3%	2%	-2%	-7%	-2%	-1%	-1%	-5%	-1%	-6%	0%
21:00	-2%	3%	-1%	-3%	0%	0%	0%	-4%	0%	-5%	1%
22:00	-1%	4%	0%	1%	0%	0%	1%	-4%	1%	-5%	2%
23:00	0%	4%	0%	2%	0%	0%	1%	-4%	1%	-4%	2%

Average Hourly Load Deficit by Zone, 8/1 - 9/30 (Weekdays)



## Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system



