

Electric Vehicle Council of Ottawa



April 27, 2020

Electric Vehicle Council of Ottawa Monthly Meeting

Agenda

- ▶ Covid 19 impact on air pollution - Mike
- ▶ Overview of Agile Tariffs in the UK - Mitchell
- ▶ EV Care while it's not in use - Nicolas
- ▶ EV News - Mitchell
- ▶ Future events
- ▶ Round table discussions

The Pandemic and Pollution

How the pandemic is impacting pollution.

April 2020

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Pollution has made the pandemic worse.

Air pollution has intensified the effects of the pandemic

- Air pollution kills 100,000+ people in the United States every year
- 7 million people worldwide die from air pollution each year



A single bus owns a usually crowded highway on the outskirts of New Delhi, India, on April 5, after the Indian government ordered a three-week lockdown slow the spread of the COVID-19 pandemic.

PHOTOGRAPH BY NASIR KACHROO, NURPHOTO/GETTY IMAGES

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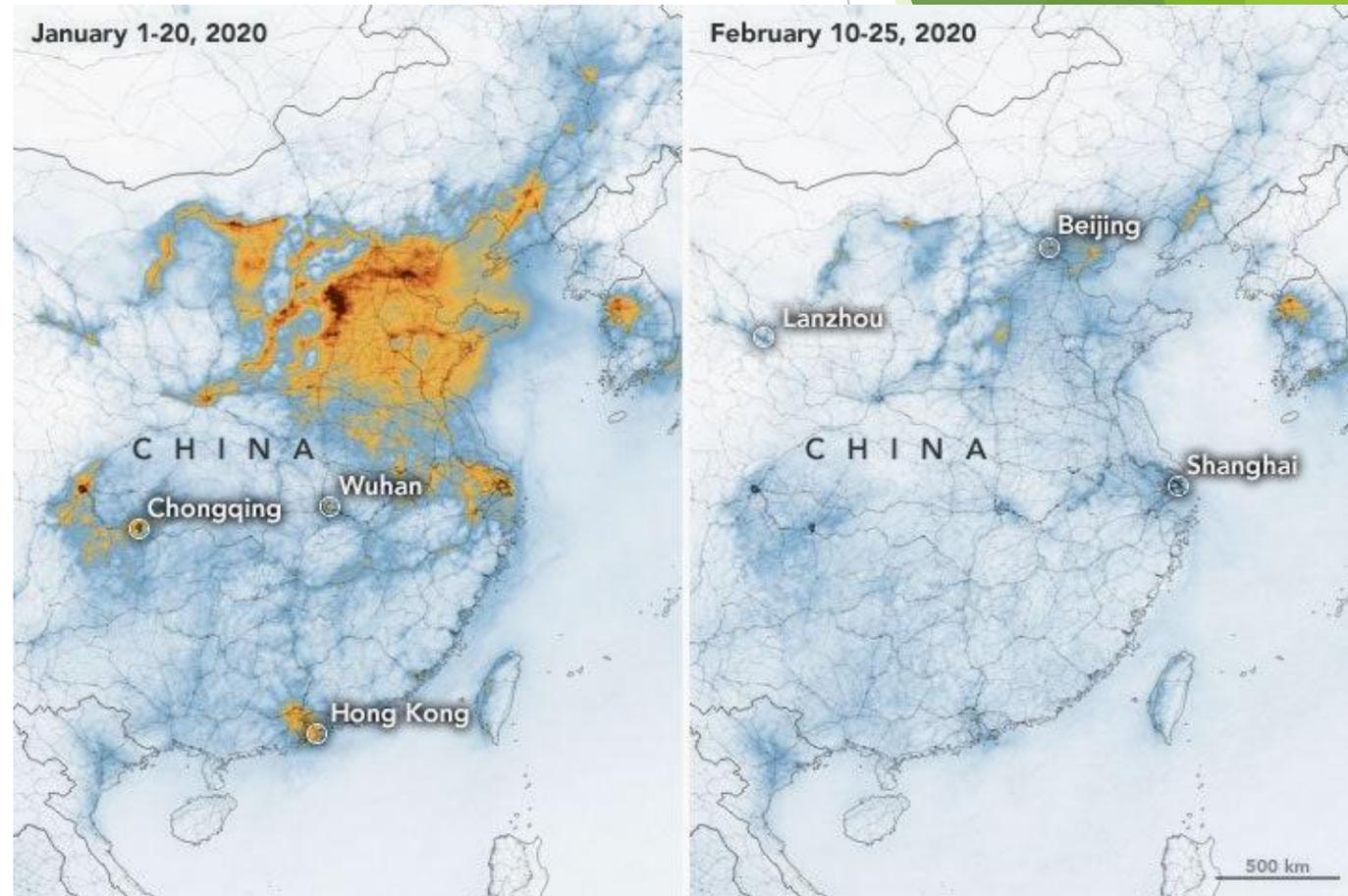
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Long-term exposure to air pollution makes effects of pandemic more lethal

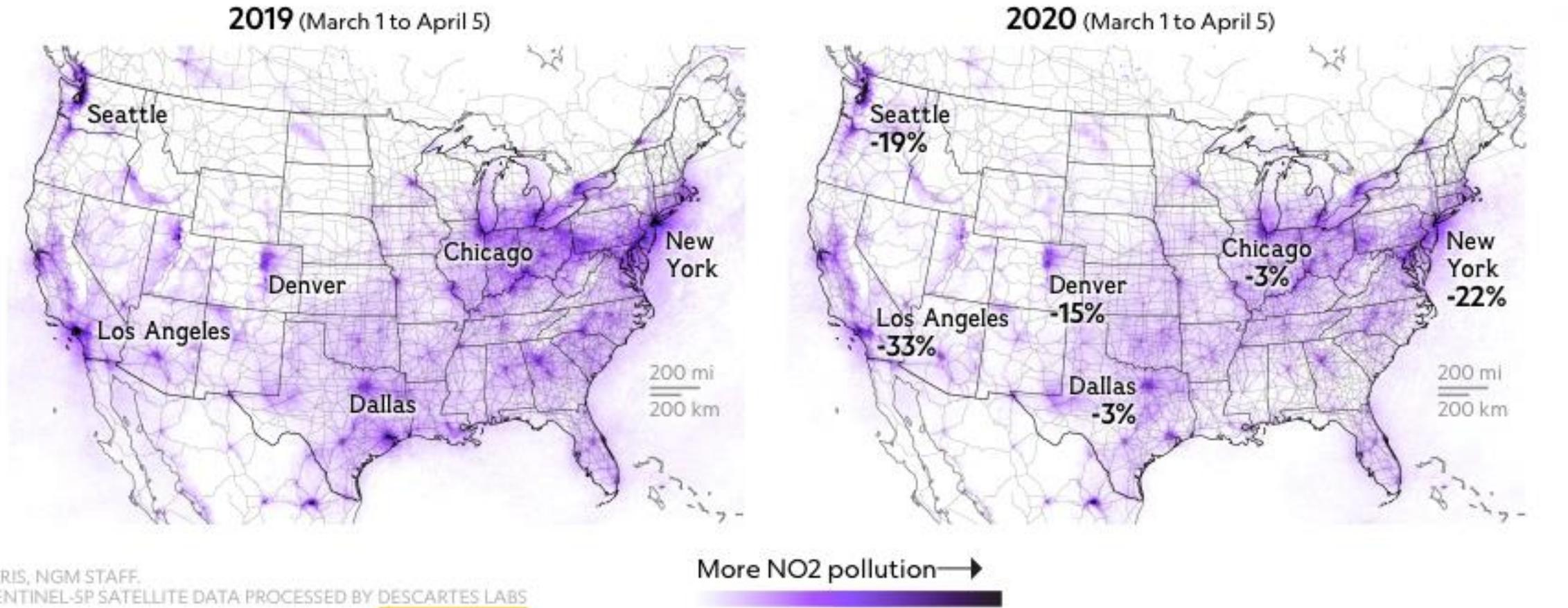
- Researchers at Harvard University's T.H Chan School of Public Health found that death rates from the virus are 15% higher in counties with higher PM2.5 air pollution.
- PM2.5 are fine particles that penetrate deep into the lungs and cause conditions that increase complications in coronavirus patients.



Mean Tropospheric NO₂ Density ($\mu\text{mol}/\text{m}^2$)

0 125 250 375 ≥ 500

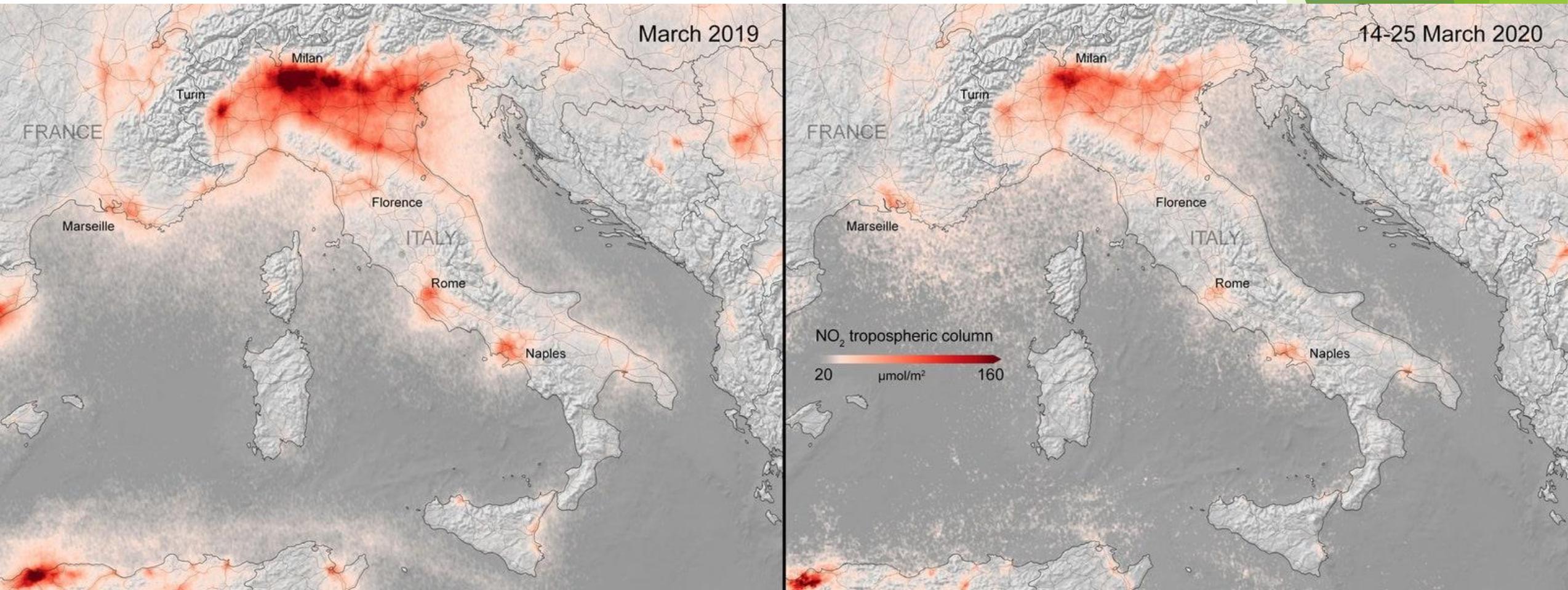
Lockdowns have resulted in major reductions in air pollution



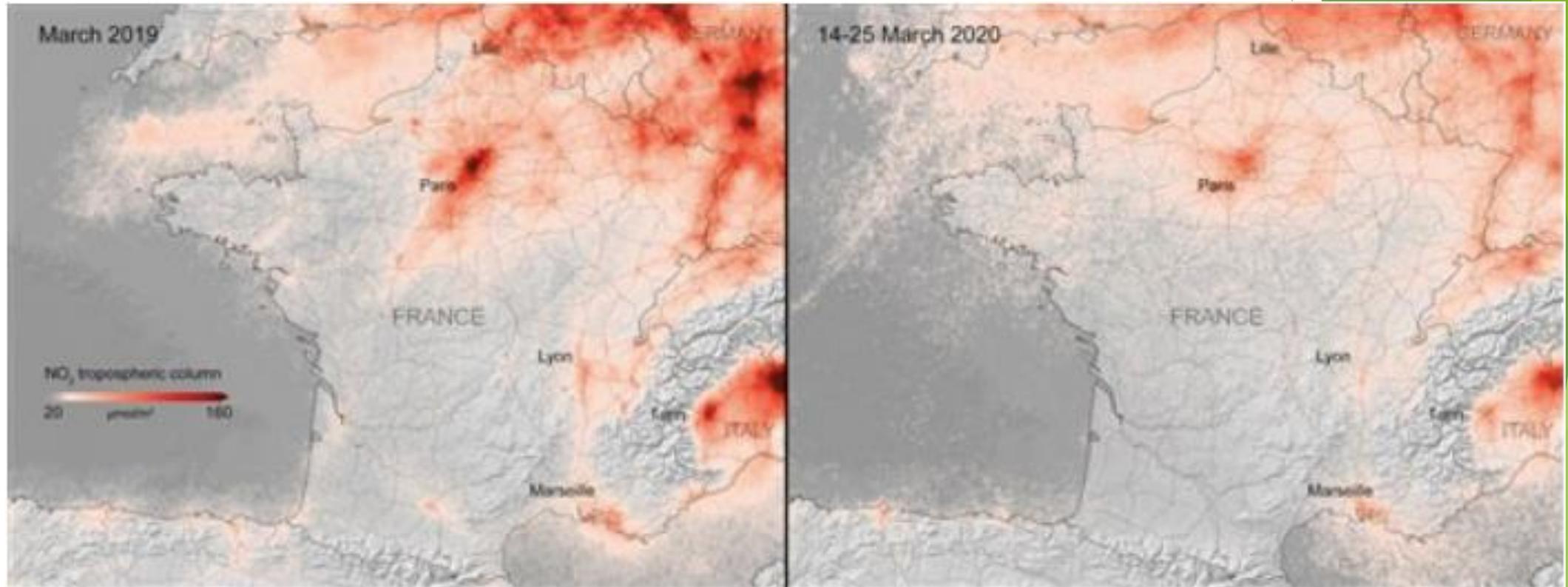
RYAN MORRIS, NGM STAFF.
SOURCE: SENTINEL-5P SATELLITE DATA PROCESSED BY [DESCARTES LABS](#)

Cleaner air in Europe

40% reduction in NO₂ emissions in Italy since the virus hit.



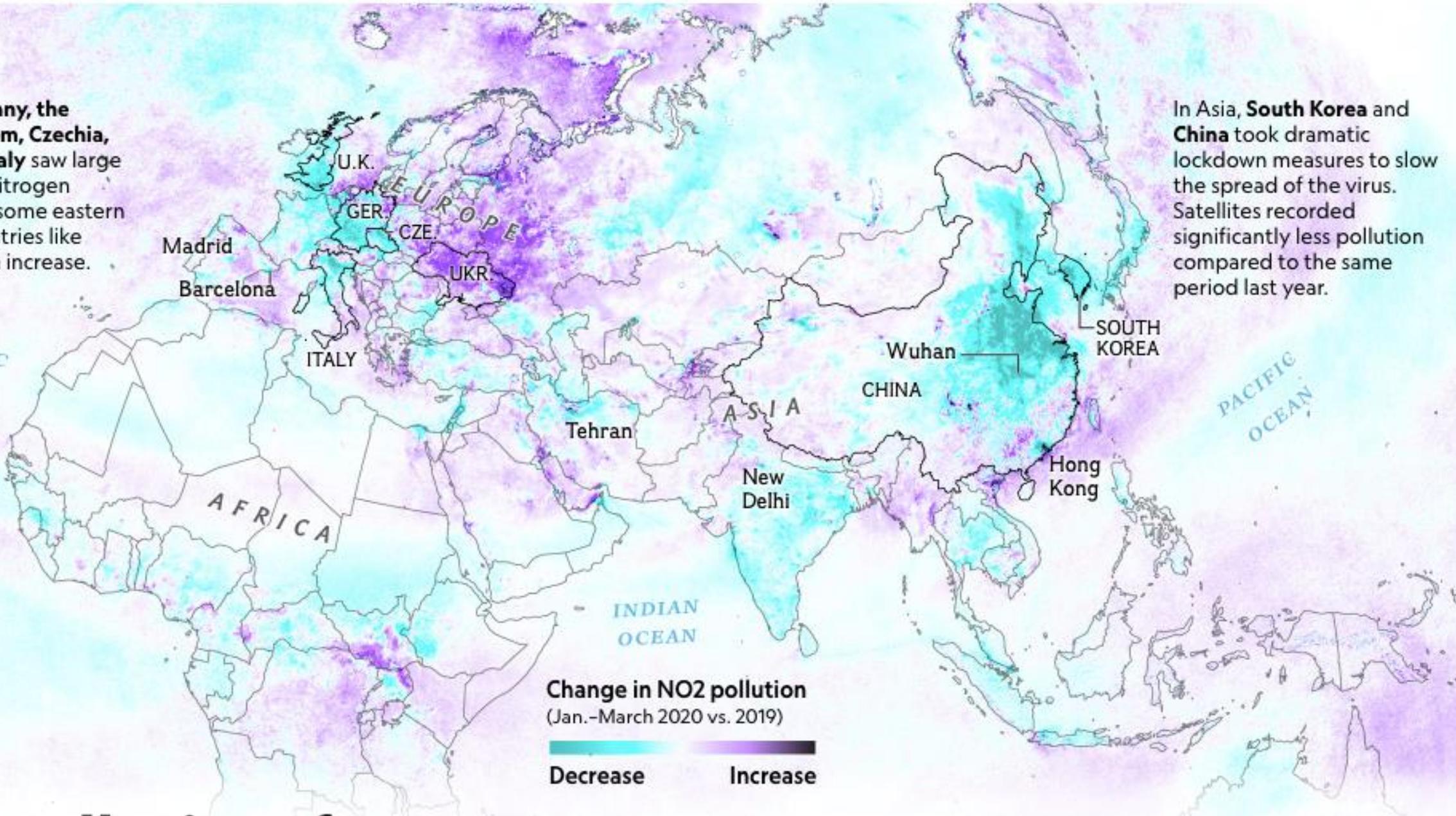
Cleaner air in Europe



— Average nitrogen dioxide concentrations from air pollution across France in March 2019, left, and March 14 to 25, 2020, as mapped by the Copernicus Sentinel-5P satellite, a reduction that the European Space Agency says is due to the strict quarantine measures during the coronavirus outbreak. European Space Agency / via Reuters

Areas in **Germany, the United Kingdom, Czechia, and northern Italy** saw large reductions in nitrogen dioxide, while some eastern European countries like **Ukraine** saw an increase.

In Asia, **South Korea** and **China** took dramatic lockdown measures to slow the spread of the virus. Satellites recorded significantly less pollution compared to the same period last year.



Change in NO2 pollution
(Jan.-March 2020 vs. 2019)

Decrease Increase

Other impacts

- Nearly 8 in 10 flights globally have been cancelled
- Waters in Venice are clear



North America, March



North America, April



Europe, March



Europe, April



Possible Future?

- In India, people are reporting seeing the Himalayas for the first time in Punjab.
- In Delhi, nitrogen dioxide (NO₂) has dropped more than 70%
- “We are now, inadvertently, conducting the largest-scale experiment ever seen...”

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Diksha Walia

@Deewalia



What nature really is and how we screwed it up.

This is Dhauladhar mountain range of Himachal, visible after 30 yrs, from Jalandhar (Punjab) after pollution drops to its lowest level. This is approx. 200 km away straight. [#Lockdown21](#) [#MotherNature](#) [#Global healing](#).



7,181 10:21 AM - Apr 3, 2020 · New Delhi, India



3,034 people are talking about this



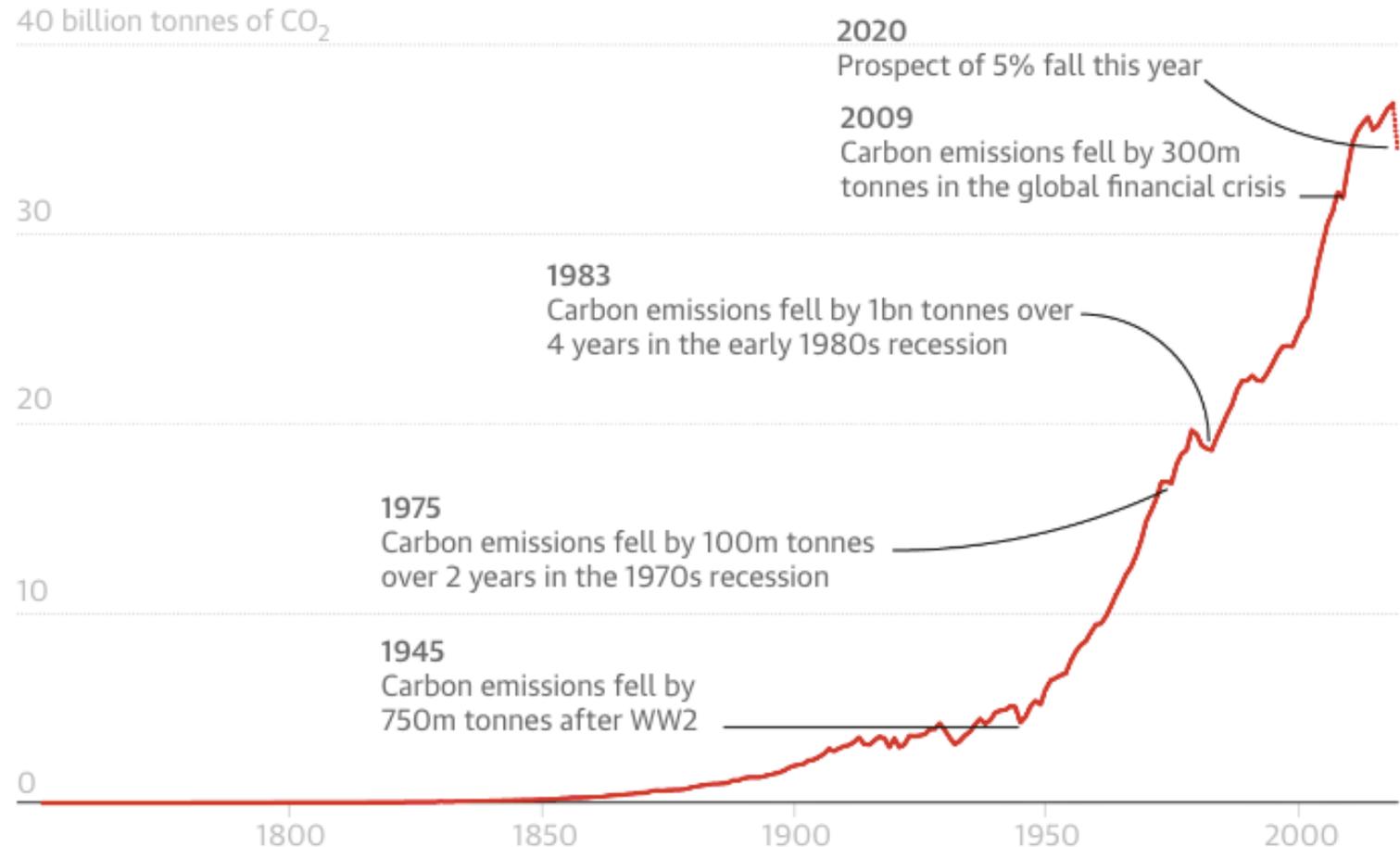
Lower air pollution will be temporary

- As economies resume pollution will return assuming we go back to business as usual.
- The pandemic has given many people a glimpse of air with drastically less pollution.
- EV groups should capitalize on the realization that with fewer combustion cars on the road - ie. if all cars were EV's - the skies would always be more like what they are right now minus the pandemic.

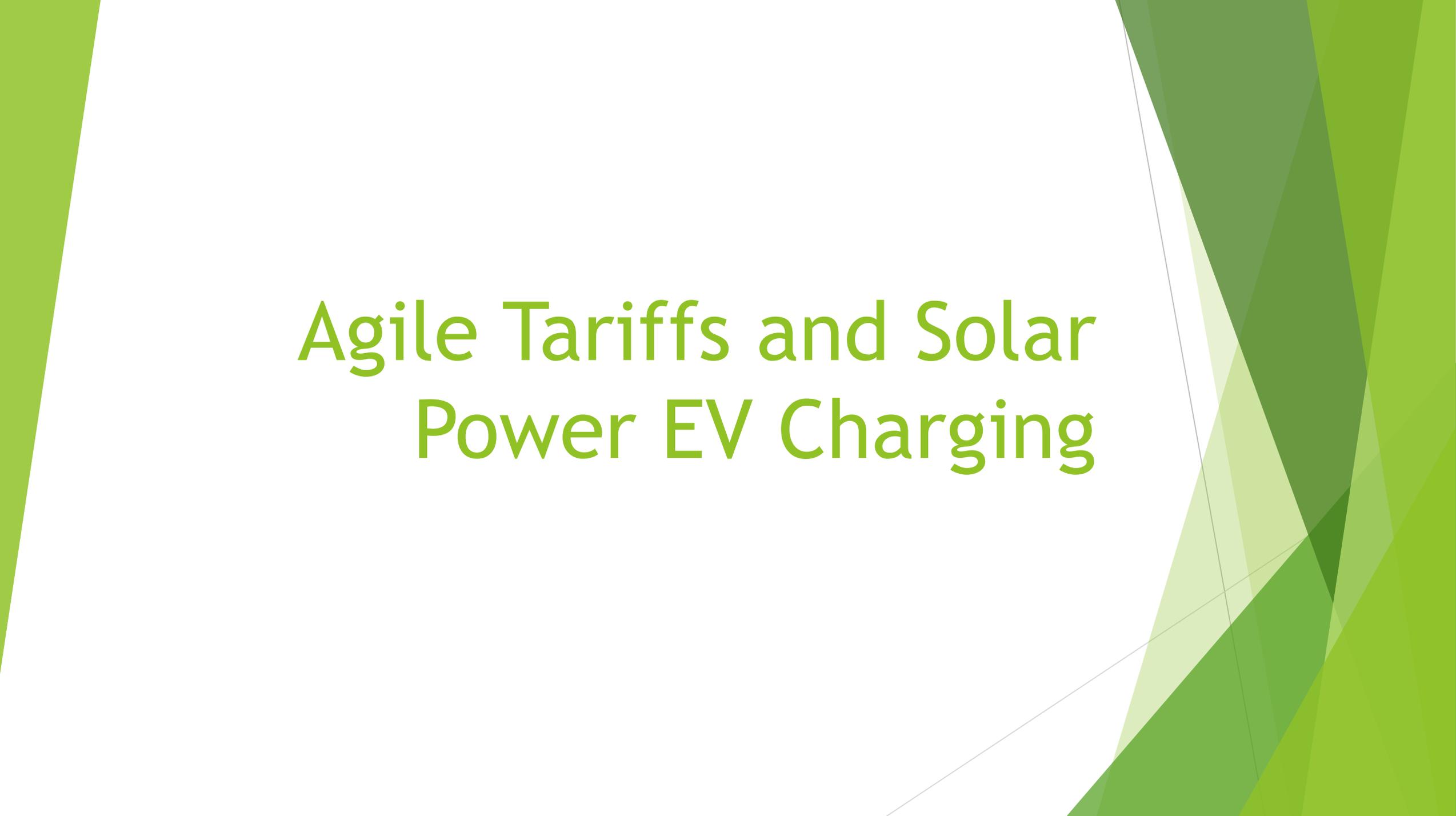
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The coronavirus pandemic could result in a 5% fall in global carbon emissions



Guardian graphic. Source: Global Carbon Project (GCP), Carbon Dioxide Information Analysis Center (CDIAC)

The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the left and right sides of the frame, creating a modern, dynamic feel. The central area is a plain white space where the text is located.

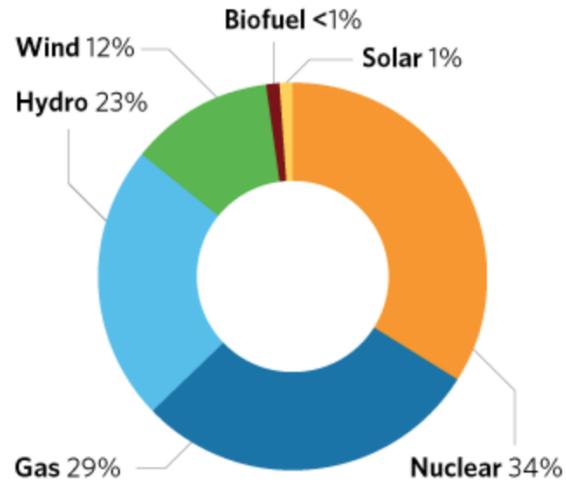
Agile Tariffs and Solar Power EV Charging

Background

- ▶ Ontario removed time-of-use rates from electricity as a result of the COVID outbreak, with rates representing off-peak hours 24 hours per day
- ▶ ToU rates were designed to de-incentivize use of electricity during costliest times to produce power, usually the result of natural gas power plants
- ▶ Major provincial peaks occur in summer when AC use is high (most urban areas), but some rural areas with electric heat have peaks in winter

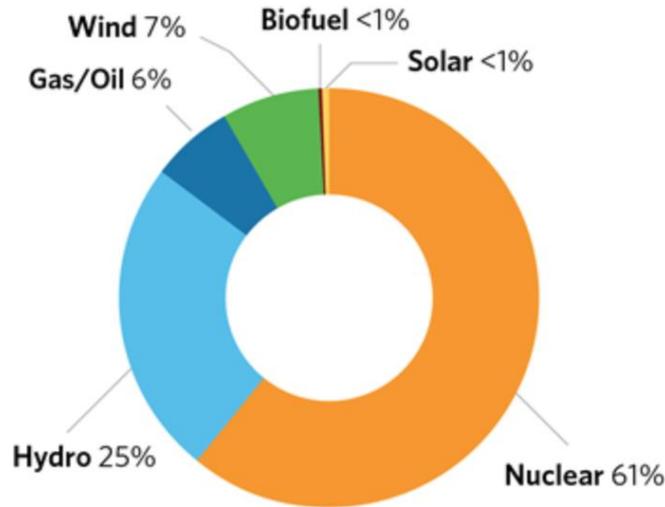
Current Electricity Grid

Ontario's current installed generation capacity



Nuclear	13,009 MW or 34%
Gas/Oil	11,270 MW or 29%
Hydro	9,065 MW or 23%
Wind	4,486 MW or 12%
Biofuel	295 MW or <1%
Solar	478 MW or 1%

Current generation production (TWh)



Nuclear	90.4 TWh or 61%
Hydro	36.4 TWh or 25%
Gas/Oil	9.5 TWh or 6%
Wind	11.0 TWh or 7%
Biofuel	0.4 TWh or <1%
Solar	0.7 TWh or <1%

Year	Nuclear	Hydro	Gas/Oil	Wind	Biofuel	Solar
2019	90.4 TWh 61%	36.4 TWh 25%	9.5 TWh 6%	11.0 TWh 7%	0.4 TWh <1%	0.7 TWh <1%
2018	90.1 TWh 61%	36.2 TWh 25%	9.6 TWh 6%	10.7 TWh 7%	0.4 TWh <1%	0.6 TWh <1%
2017	90.6 TWh 63%	37.7 TWh 26%	5.9 TWh 4%	9.2 TWh 6%	0.4 TWh <1%	0.5 TWh <1%
2016	91.7 TWh 61%	35.7 TWh 24%	12.7 TWh 9%	9.3 TWh 6%	0.49 TWh <1%	0.46 TWh <1%

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UK Electricity Grid

UK solar smashes generation records during Covid-19 pollution slump

Joshua S Hill 24 April 2020 0 Comments

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Photo by chuttersnap on Unsplash

[f](#) UK solar has smashed out a new generation record of 9.68GW this week thanks in large part to a significant slump in air pollution levels resulting in clearer skies.

Renewable electricity overtakes fossil fuels in UK for first time

New offshore windfarms opening in third quarter mark milestone towards zero carbon



▲ Ten years ago fossil fuels made four fifths of the UK's electricity supply. Photograph: Islandstock/Alamy

30% of UK electricity demand

UK Electricity Grid

- ▶ Surplus green energy is lowering energy market prices
- ▶ Sometimes prices are negative, meaning that producers are encouraging customers to increase their electricity consumption to absorb excess electricity.
- ▶ Typically occurs at night when electricity production is at lowest
- ▶ COVID scenario reducing energy demand during middle of day

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Households to be paid for daytime green electricity use during lockdown

Fall in energy use combined with bright, breezy weather leads to lowest electricity prices in 10 years

- [Coronavirus - latest updates](#)
- [See all our coronavirus coverage](#)
- [Coronavirus latest - at a glance](#)



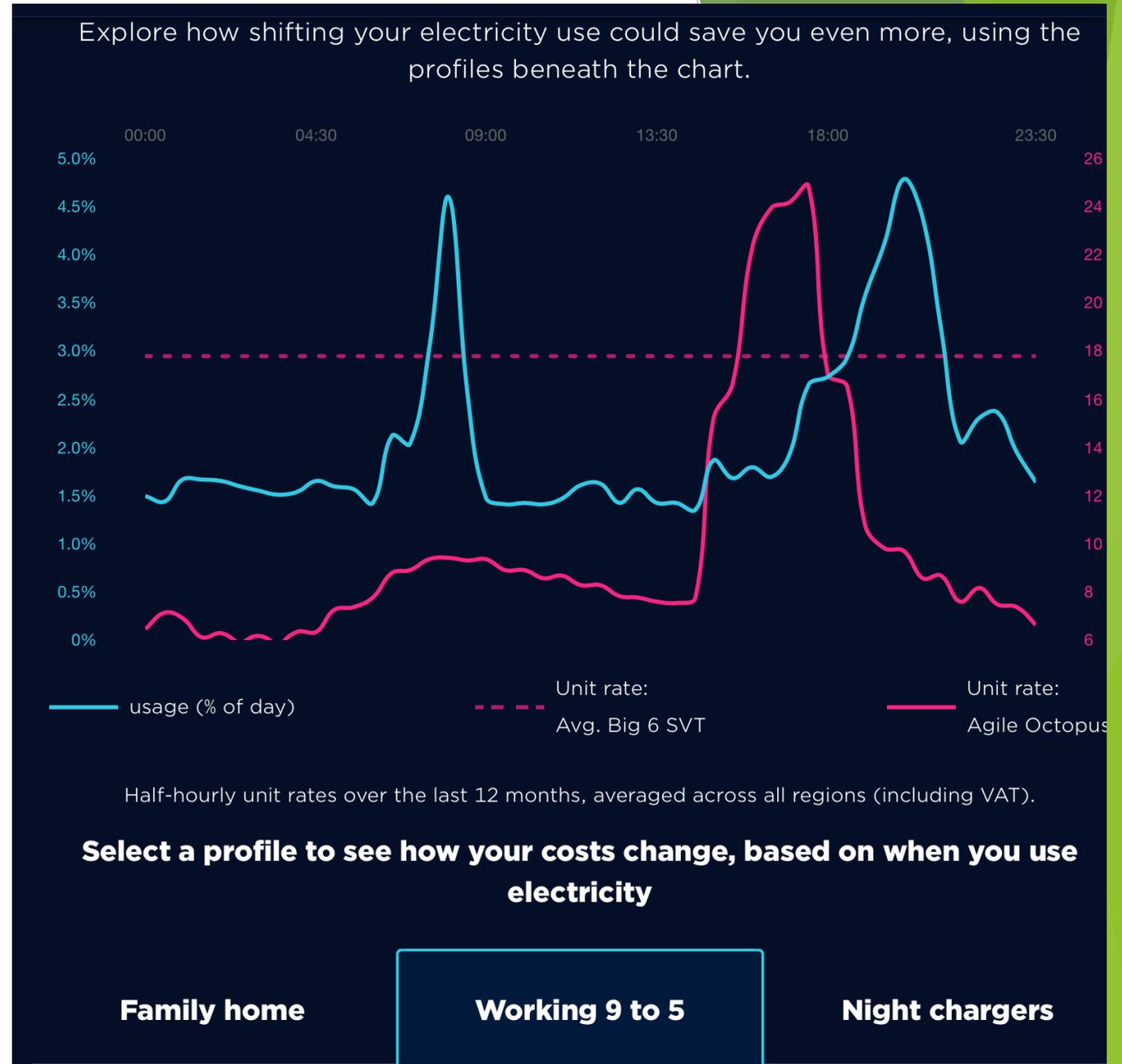
▲ Teesside Windfarm, near Redcar, north-east England. Windfarms contributed 40% of UK electricity on Sunday morning. Photograph: Bill Allsopp/Alamy

Thousands of British homes will be paid to use electricity during the day for the first time, as wind and solar projects produce a surge in clean energy during the [coronavirus lockdown](#).

Agile Electricity Tariffs

- ▶ Electricity providers tariffs that adapt every 30 minutes to market conditions - Consumers see true cost of real-time electricity production
- ▶ Customers are made aware a day ahead of what electricity prices will be
- ▶ Allows customers to adjust electricity usage according to price

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<https://octopus.energy/agile/>

Agile Electricity Tariffs

Agile Octopus rates



08:30 - 09:00	1.41 p/kWh
09:00 - 09:30	-0.29 p/kWh
09:30 - 10:00	-1.34 p/kWh
10:00 - 10:30	-2.10 p/kWh
10:30 - 11:00	-3.11 p/kWh
11:00 - 11:30	-1.83 p/kWh
11:30 - 12:00	-2.10 p/kWh
12:00 - 12:30	-2.10 p/kWh
12:30 - 13:00	-3.15 p/kWh
13:00 - 13:30	-2.81 p/kWh
13:30 - 14:00	-3.15 p/kWh
14:00 - 14:30	-3.15 p/kWh
14:30 - 15:00	-3.15 p/kWh
15:00 - 15:30	-3.15 p/kWh
15:30 - 16:00	-2.94 p/kWh
16:00 - 16:30	10.08 p/kWh

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Key Takeaways

- ▶ Increasing green energy causes plenty of uncertainty with variable generation
- ▶ Unable to be turned up or down like traditional fossil-fuel electricity plants
- ▶ Plenty of challenges related to a more renewable-focused grid
- ▶ Total rethink of electricity usage, with more consumer-focused approach
- ▶ Shift consumers from dirtiest-most expensive times of electricity production to cleanest and cheapest times of electricity production
- ▶ **EVs, as large electrical storage devices, can play an increasingly important role in the delivery of a cleaner electrical grid with smart policy and grid planning**

EV Care while not in use

- ▶ https://www.youtube.com/watch?v=GxQBHRElim0&ab_channel=OutofSpecMotoring

Summary:

- ▶ Keep battery at 40-50%
 - ▶ Be mindful of phantom drain
- ▶ Make sure the inside is clean
- ▶ Ventilate it periodically
- ▶ Be mindful of interior temperature in the sun
- ▶ Be weary of flat spots
 - ▶ Regular drives (every 2 weeks)
- ▶ Wash your car

The incoming carmaggedon

- ▶ Steps if not being used for more than 30 days
 - ▶ Change oil
 - ▶ Top off the tank and add fuel stabilizers
 - ▶ Put it on a battery tender
 - ▶ Don't use the parking brake
 - ▶ Check your engine bay for critters before trying to start it again
- ▶ Alternative: Drive it for 15 minutes every 2 weeks
 - ▶ Italian tune-up
- ▶ Just buy an EV, they're easier to live with
- ▶ Wash your car!

PEHV and RexEV

- ▶ Same as EV for the battery
- ▶ Not a bad idea to run the engine once in a while
 - ▶ Refer to your owner's manual
- ▶ Automatic tank burn
- ▶ Buy an EV
- ▶ Please for the love of Nikola Tesla WASH YOUR CAR
 - ▶ Relaxing
 - ▶ Makes your car all pretty
 - ▶ Two bucket method
 - ▶ Maintain that resale value

EV News - April

EV News

- ▶ Norway EV Numbers
- ▶ Mercedes AMG Electric Sports Sedans
- ▶ Mercedes Ditching Hydrogen
- ▶ Rivian Production Delays
- ▶ Lightweighting of EVs?
- ▶ Ford Mustang Cobra Jet

Norway EV Numbers

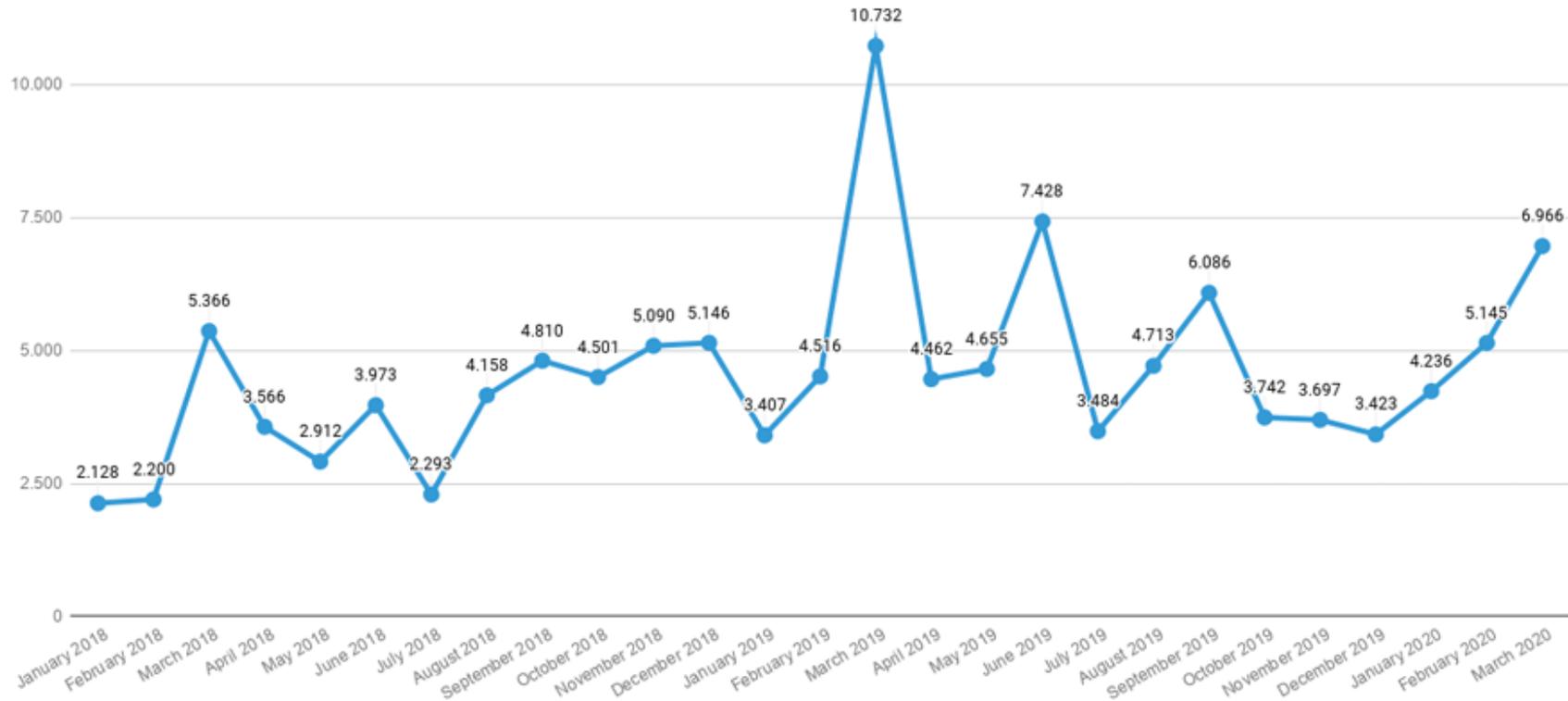
- ▶ Battery-electric = 55.9% market share (March)
- ▶ Hybrid = 26.3%
 - ▶ Plug-in Hybrid = ~20%
- ▶ 82.2% of vehicles sold were electrified

- ▶ #1 Vehicle: Audi e-tron (1,681)
- ▶ #2 Vehicle: Tesla Model 3 (997)
- ▶ #3 Vehicle: VW e-golf (629)
- ▶ <https://www.electrive.com/2020/04/03/norway-electric-cars-take-55-9-market-share-in-march/>

Norway EV Numbers

New registrations of electric passenger cars in Norway (without PHEV & HEV)

electrive.com
industry service for electric mobility



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Mercedes AMG Electric

- ▶ EQS luxury sedan will also have AMG performance model
- ▶ 600+ horsepower, possible 3 motor design
- ▶ Competition for plaid Model S
- ▶ Also looking for sport version of EQE sedan and G-class SUV
- ▶ Possible target date of mid 2022

- ▶ <https://www.electrive.com/2020/04/06/mercedes-to-offer-amg-version-of-the-eqs/>



Mercedes Ditching Hydrogen

- ▶ Original innovator of technology, with research history going back to 1993
- ▶ Developed A-Class fuel cell vehicle for market in 2010
- ▶ Developed GKC in 2013 with partnership with Nissan and Ford
- ▶ Slowly winding down development
- ▶ Cited cost (roughly double cost of equivalent battery electric)
- ▶ Continued development for fuel cells in heavy-duty transport
- ▶ <https://cleantechnica.com/2020/04/23/mercedes-benz-is-done-chasing-after-hydrogen-fuel-cell-cars/>

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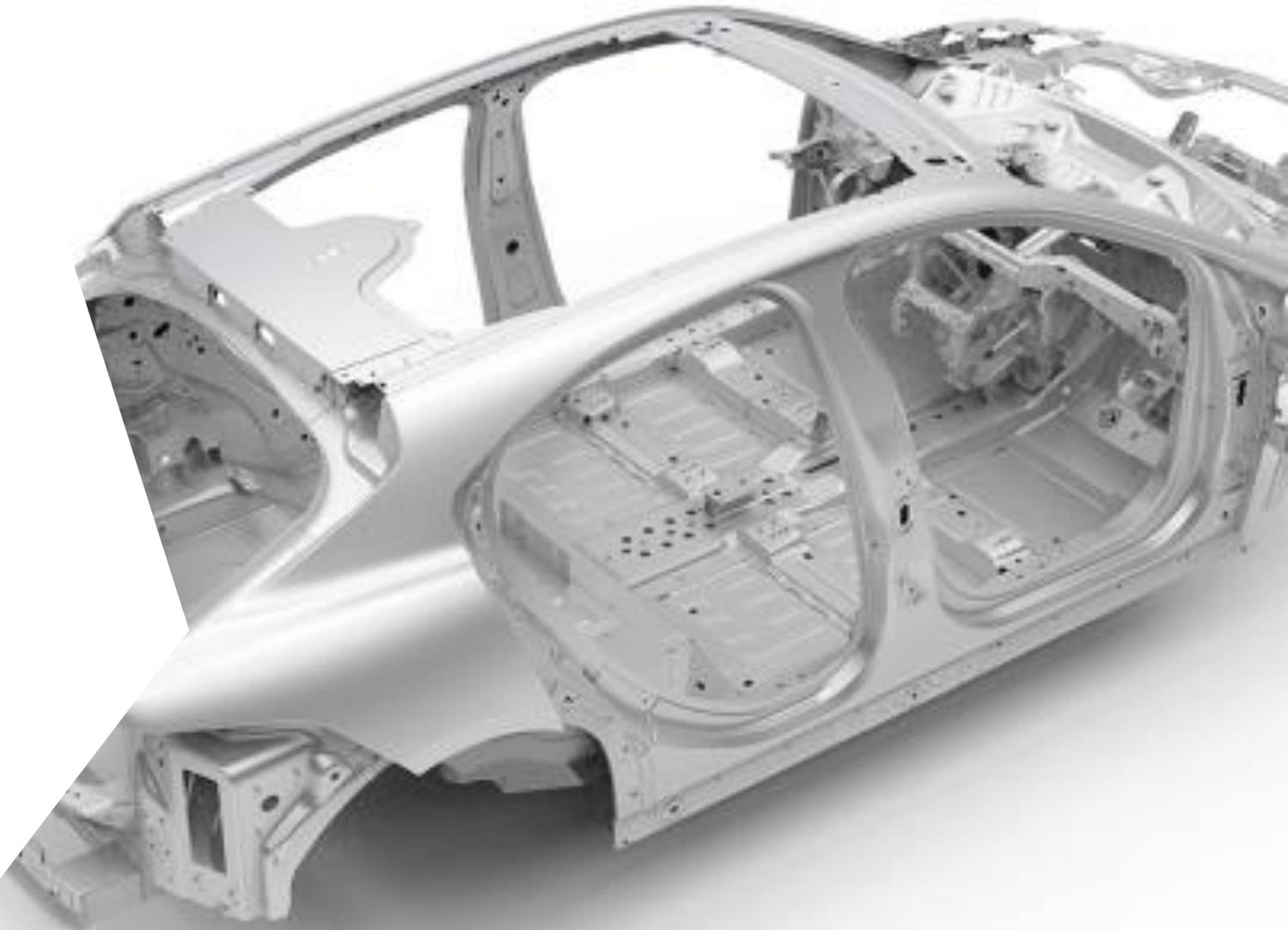


Rivian Production Delays

- ▶ First deliveries have been pushed back a year to 2021, likely sometime around Q2-Q3
- ▶ Current on-site staff include 11 fuselage engineers.
- ▶ Construction of new facilities are on hold.
- ▶ <https://www.electrive.com/2020/04/07/rivian-postpones-delivery-launch-til-2021/>

Lightweighting of EVs?

- ▶ Traditional internal combustion vehicles are getting lighter with the help of composites
- ▶ Lighter cars consume less energy, but heavier cars have greater kinetic energy that can be recovered through regenerative braking with electrified powertrains
- ▶ Lightweight materials generally produce more emissions during production, leading to 10 - 25% more emissions for manufacturing
- ▶ <https://www.electrive.com/2020/04/22/study-shows-that-light-weight-does-not-benefit-evs/>



Ford Mustang Cobra Jet



- ▶ 1400 HP, 1100 lb-ft of torque, Quarter-mile in less than 8 seconds at 170 mph
- ▶ *“We saw the Cobra Jet 1400 project as an opportunity to start developing electric power trains in a race car package that we already had a lot of experience with, so we had performance benchmarks we wanted to match and beat right now. This has been a fantastic project to work on, and we hope the first of many coming from our team at Ford Performance Motorsports.”*

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Past Events

Reaching outside the bubble!

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Past Events...that we cancelled/postponed

- ▶ April 19 Kemptville Sustainability Fair and EV Show - Postponed
- ▶ April 21 - Earth Day at City of Ottawa - postponed
- ▶ (April 24-26 Salon du véhicule électrique (Montréal)) - postponed
- ▶ (April 27-30 EMC - EVÉ 2020 - Toronto) - postponed to November 9-12

Upcoming Events

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Upcoming Events - regular

May 14 - Green Drinks

Virtual via Zoom

May 25 - Next EVCO meeting

GREEN DRINKS - MAY 14, 2020
ENERGY EVOLUTION WITH MIKE FLETCHER
CELEBRATING FROM THE CITY OF OTTAWA SUSTAINABILITY



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Every 2nd Thursday of the month
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Upcoming Events

- ▶ May 2-3 My Healthy Green Planet Expo
- ▶ - Rescheduling for September
- ▶ May 29 - 11AM-1PM - Transport Canada - Will have space for cars outside on the Mall - postponed
- ▶ June 14 Envirocenter EV Day - to be rescheduled
- ▶ - Museum of Science and Technology
- ▶ - Plug'n Drive
- ▶ Jul 1 - Aviation Museum - cancelled

Upcoming Events

- ▶ Aug 2 - Automotion 2020 - Brockville
- ▶ Aug ~5 - 3-8PM Kanata North Summerfest and EV showcase
- ▶ Aug 15 - 4th Annual EV Day in Brockville
- ▶ Sept 12 - National Capital Car Show
- ▶ Sept - Autumn Festival - Innis Ward
- ▶ October 3 - GEDO - Green Energy Doors Open
- ▶ November ~6 MIFO event

Presentations

- ▶ If you would like to present at a future meeting:
 - ▶ Send me e-mail, I will send you the template
 - ▶ Provide your slides by the Sunday before the meeting
 - ▶ I will integrate into overall presentation

Other

- ▶ Become a member of EV Society
 - ▶ <https://evsociety.ca/join/>

Roundtable!

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