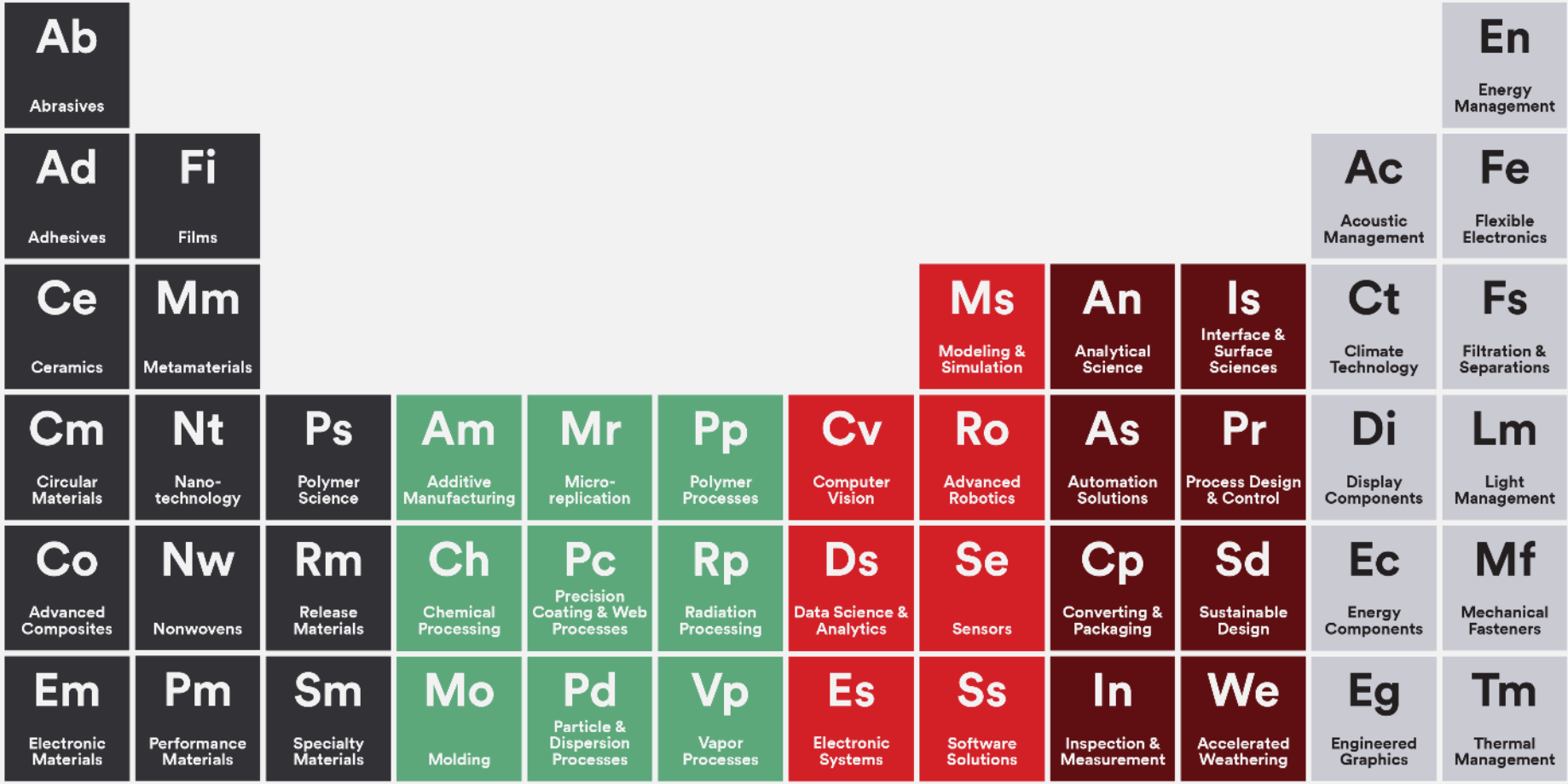
3M Science. Applied to Life.™

Lessons learned through 3M's COVID response

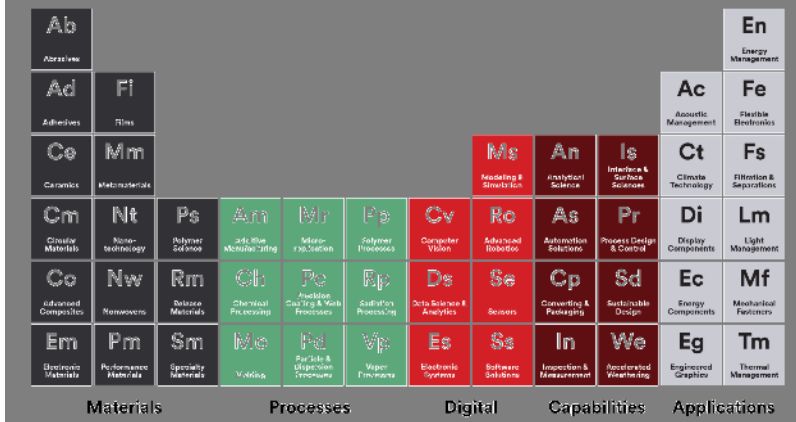
Charles Avery
Senior Vice President, Manufacturing Operations

3M Technology Platforms

49 innovative technologies



Deep material science expertise



Manufacturing at scale

3M

Value proposition

Strong, iconic brands

PELTOR™ SCOTT SAFETY
3M Post-it Filtrete
Scotch-Brite Scotch Command BRAND

Unmatched global reach

Bringing our technologies into the future

1990s

Simple microfeatures

Optical & light management

Electronics | Safety

Today

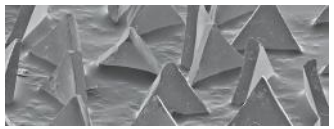
Increased feature complexity

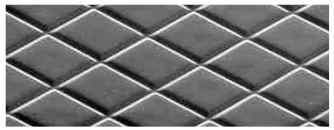
Mechanical product applications

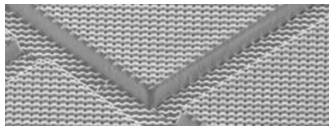
Data centers

Industrial manufacturing | Semiconductor

Electronics | Safety







2030 and beyond

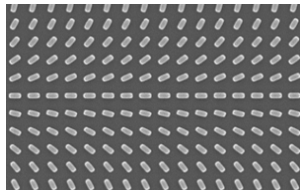
Creation of nanoscale features

Advanced optical properties

Augmented/virtual reality | Optical / thermal / acoustic applications

Data centers | Industrial manufacturing | Semiconductor

Electronics | Safety



Manufacturing surfaces with ultra-precise features to enable a broad range of products

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Helping the world respond to COVID-19

Addressing the pandemic from all angles and across all relevant stakeholders

Ensuring the safety of our employees

Our top priority is the safety of our employees. We updated safe workplace protocols globally, executed new safety protocols across our operations and implemented pandemic support programs.

Helping protect healthcare workers and first responders

Since the initial COVID-19 outbreak, 3M has doubled our global output of N95 respirators to a rate of more than 1.1 billion per year, or nearly 100 million per month. 3M will double its capacity again to 2 billion per year by 2021

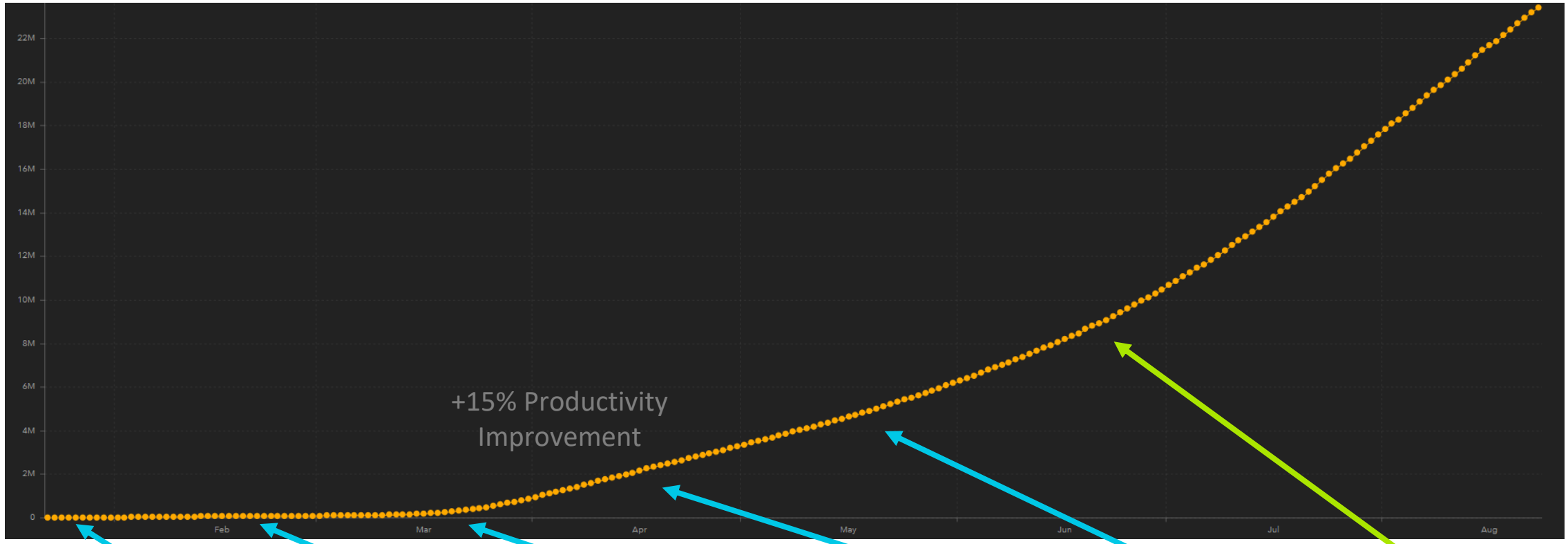
Partnering with other companies

We are partnering with other companies on a range of innovative solutions to protect healthcare workers and first responders.

Photo courtesy of Ford

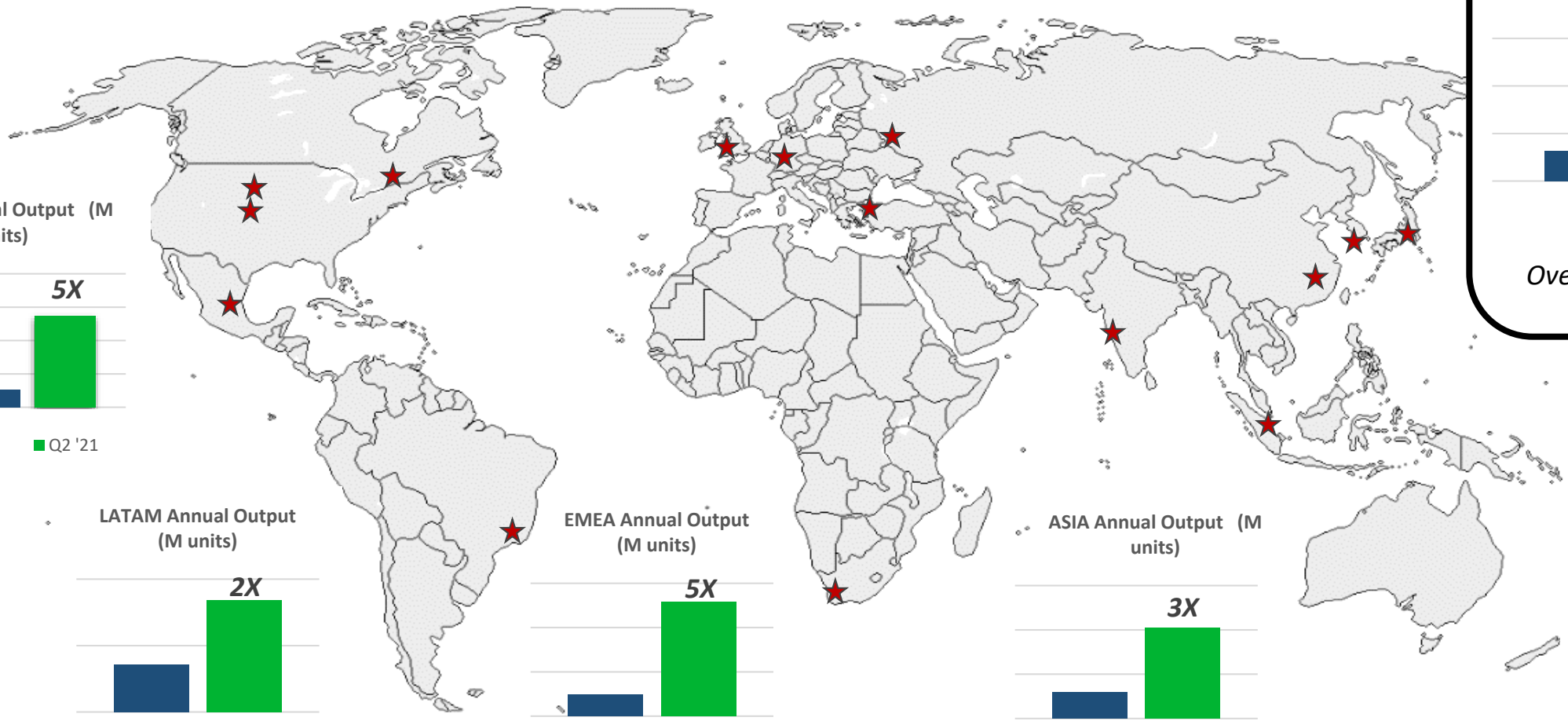
Accelerating Respiratory Supply

https://coronavirus.jhu.edu/map.html

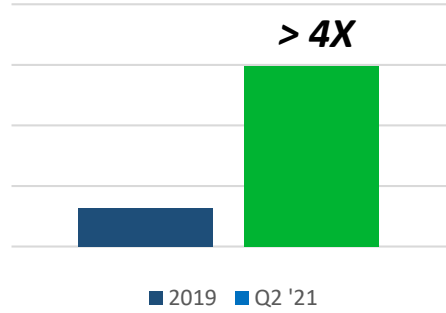


Dec 2019	*Jan 2020*	*Feb 2020*	*Mar 2020*	*Apr 2020*	*May 2020*	*June 2020*
3M ERT set-up	Move to 24/7 Production	P1 Investment N95 Respirators	P2 Investment Powered Air Purifying Respirators	P3/4 Investment N95 Respirators	P5 Investment N95 Respirators	New Assets Coming Online

Evolution of 3M N95 Respirator Global Supply



WW Annual Output (million units)



Over 2B units in 2020

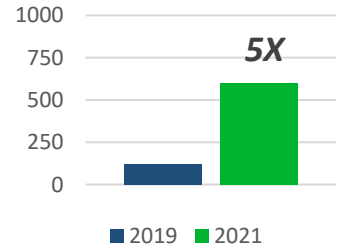
USAC Annual Output (M units)

LATAM Annual Output (M units)

EMEA Annual Output (M units)

ASIA Annual Output (M units)

GCA Annual Output (M units)



*includes disposable respirators that WHO considers to be equivalent protection to N95 and those with great protection

Scaling 3M’s Pandemic Response

CAPACITY

15%
Productivity gains from existing operations

20+
# of new respirator lines being qualified

100s
New machines add suppliers to support our response

AGILITY

10+
Number of trade restrictions that were managed

61
Days to qualify a temporary site for respirator production

Many
Public/Private partnerships to accelerate response

SCALE

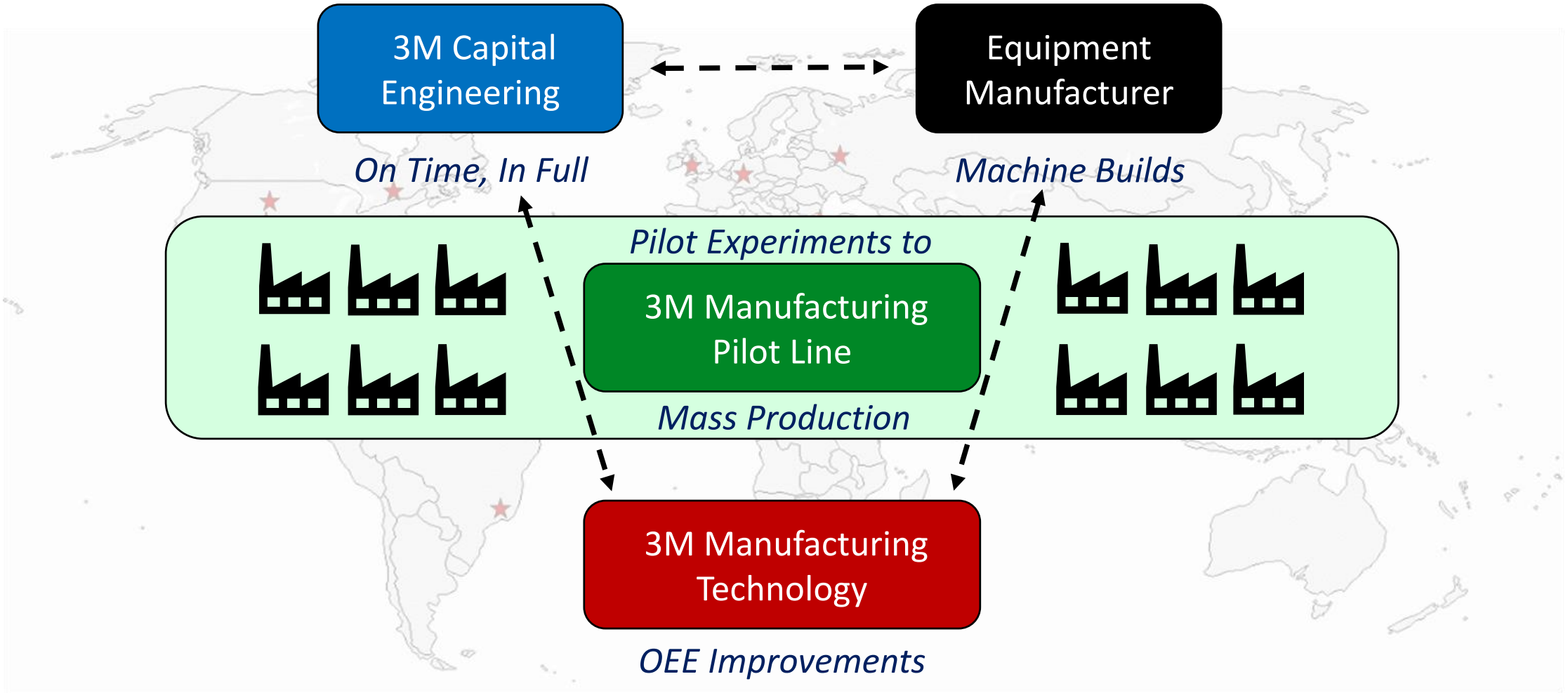
1000+
# of enterprise employees supporting our respiratory scaleup

100s
of experiments to qualify new materials and processes & 30+ MOCs

4x
number of respirators produced in 2020 could circle the world 4x

50+/200+
planes & ocean containers from APAC to deliver 155M respirators to FEMA

Leveraging 3M Expertise and Global Architecture

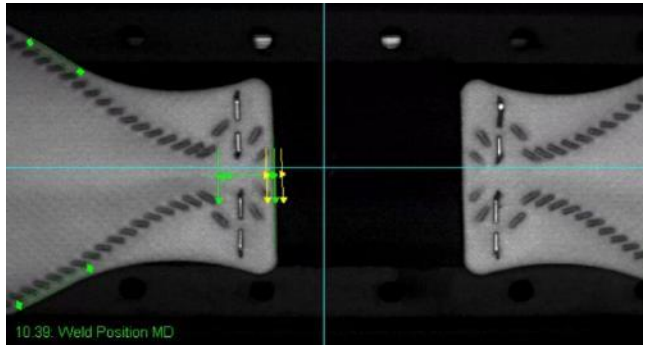


Critical to define RACI and focus resources on one Pacesetter

Robust Engineering Problem Statements

Define the Problem Statements

Identify the forms of waste on the shop floor and develop engineering problem statements that are impacting performance



Develop & Enhance Process Capability

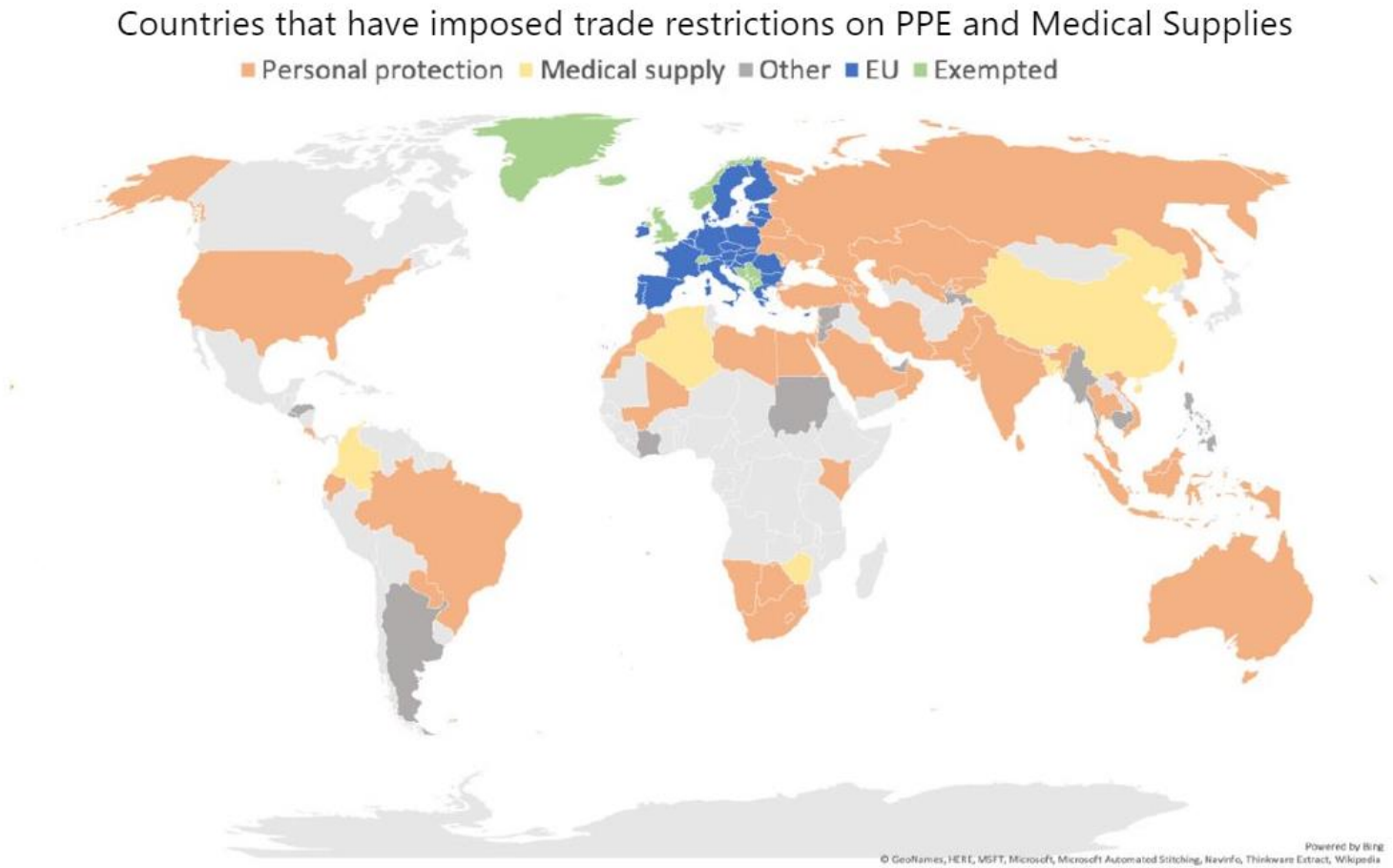
Collect, analyze and visualize machine process capability to achieve reduced waste and increased uptime

Global Alignment thru Digital Platform

Platform for capturing, standardizing, and sharing the plant knowledge leading to faster, more consistent action

Transition from Total Output to Takt Time for each Process Step

Global Export Restrictions



Source: International Trade Centre, data collected on 20 May 2020.

Supply Chain Architecture needs to account for Border Restrictions

External Partnerships Accelerated Response

Received >1000 external collaboration requests and leveraged many

Purpose Driving Team's Performance

We bring together people who have different technical expertise, industry knowledge, backgrounds and experiences.

We maintain a work environment where all our people are respected, supported, and encouraged to take initiative.

We provide purposeful work to drive the team, in addition to attract and motivate employees.

We seek and build relationships between manufacturing sites, winning together our on collective objectives.

"If you put fences around people, you get sheep. Give the people the room they need." -William L. McKnight, 3M President (1929-1966)

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