

IDEA[®]22 MIAMI BEACH

The World's Preeminent Event for
Nonwovens & Engineered Fabrics

Understanding the State of the North American Nonwovens Industry and a Market Gone Mad

Brad Kalil, Director of Market Intelligence & Economic Insights

Today's Discussion



- Nonwoven's Are...
- Past
- Present
- Future

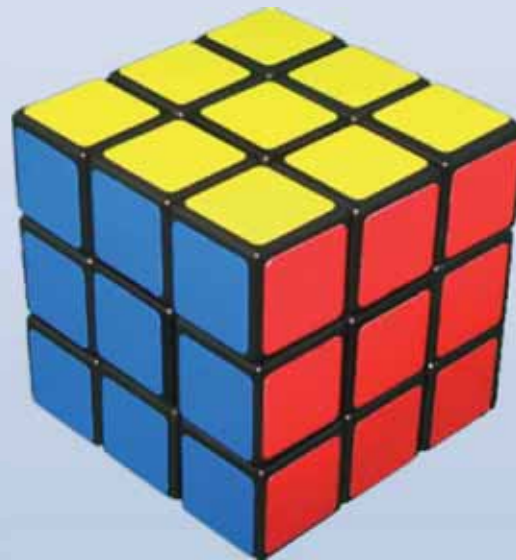


Nonwovens Are...



Engineered Material Solutions

“A nonwoven is an engineered fibrous assembly, primarily planar, which has been given a designed level of structural integrity by physical and/or chemical means, excluding weaving, knitting or paper making.”



- Has Many Facets
- Can Be Confusing
- Challenging and
- Misinterpreted
- **Measurement**

Nonwovens Are...



Successful, growing, continuously evolving,
dynamic, and extremely diverse industry

Absorbent Hygiene
Filtration (Air and Liquid)
Wipes
Medical/Surgical
Disposable PPE
Other Disposable

Vehicle Construction
Building Construction
Home & Office Furnishings
Geosynthetics
Apparel (Durable PPE)
Other Durable

262 Categories

A \$17.7B Industry in North America

2020 Nonwoven Material at the Producer Level

Nonwovens Are...



Growth Exceeds GDP Growth

Variety of Forming and Bonding Processes

Variety of Raw Materials

Variety of End-Uses

Tends to Stay Where Produced

Very Successful and Dynamic Industry
In North America

Nonwovens Are...

Raw Material Supplier



Nonwoven Manufacturer



Machinery Supplier

Brand Owner



End Product Manufacturer

Today's Discussion



- Pre-Pandemic
 - Steady Capacity Growth
 - Size by Process and End Use
 - Increasing Operating Rates

THE PAST  THE CURIOUS

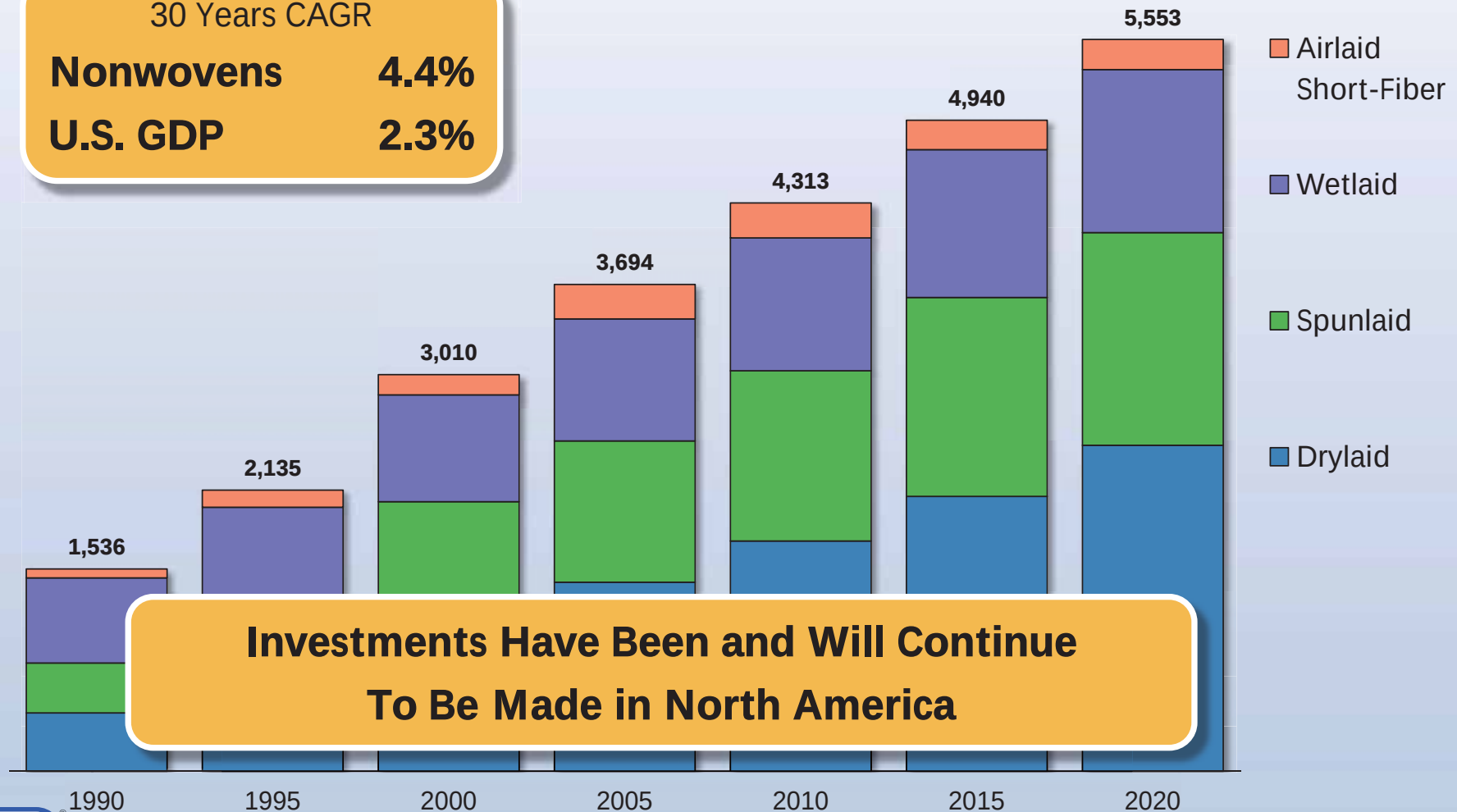
North America Investments Exceed GDP

North America Capacity by Process, 1990 to 2020, in Thousands of Tonnes

30 Years CAGR

Nonwovens 4.4%

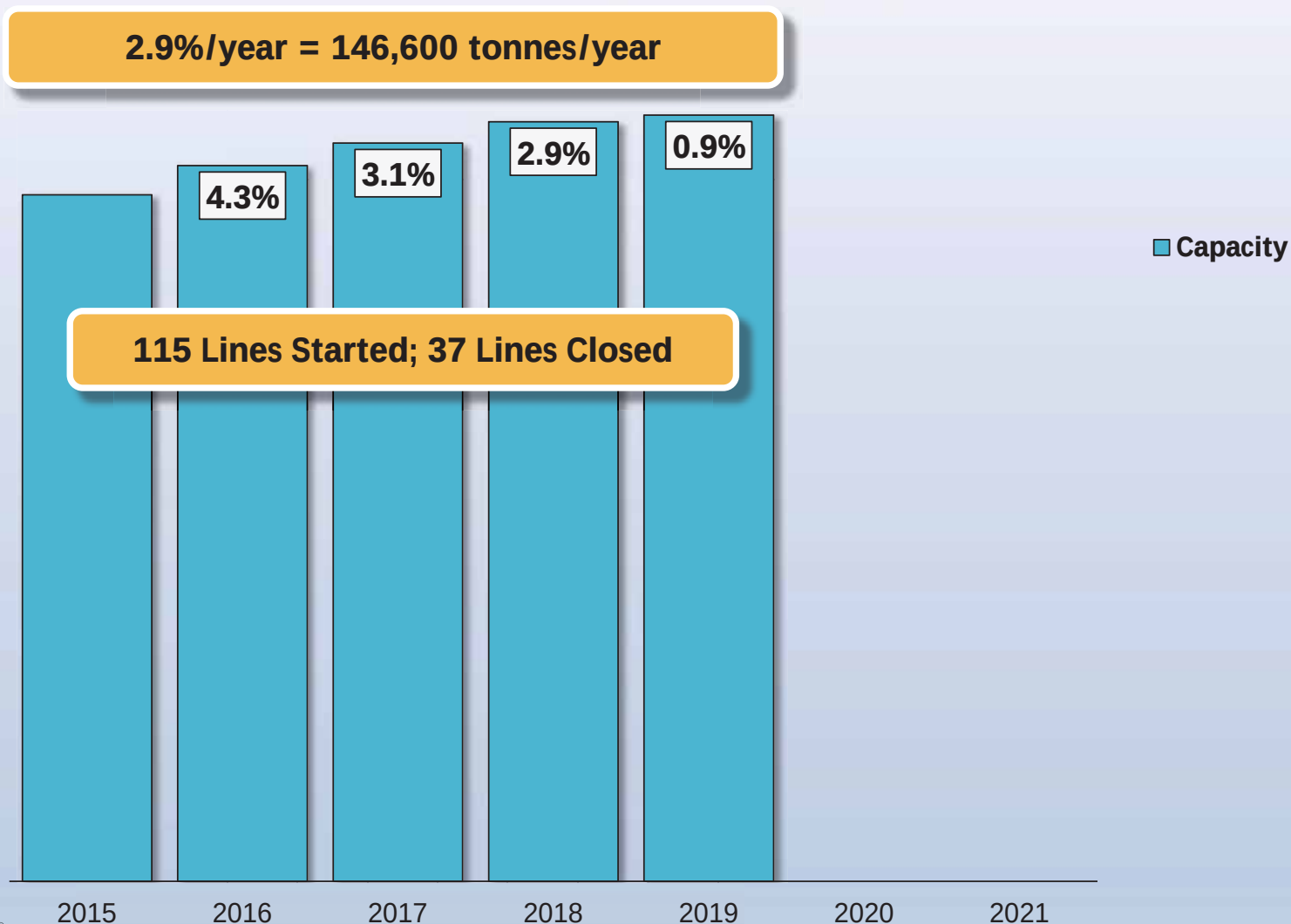
U.S. GDP 2.3%



**Investments Have Been and Will Continue
To Be Made in North America**

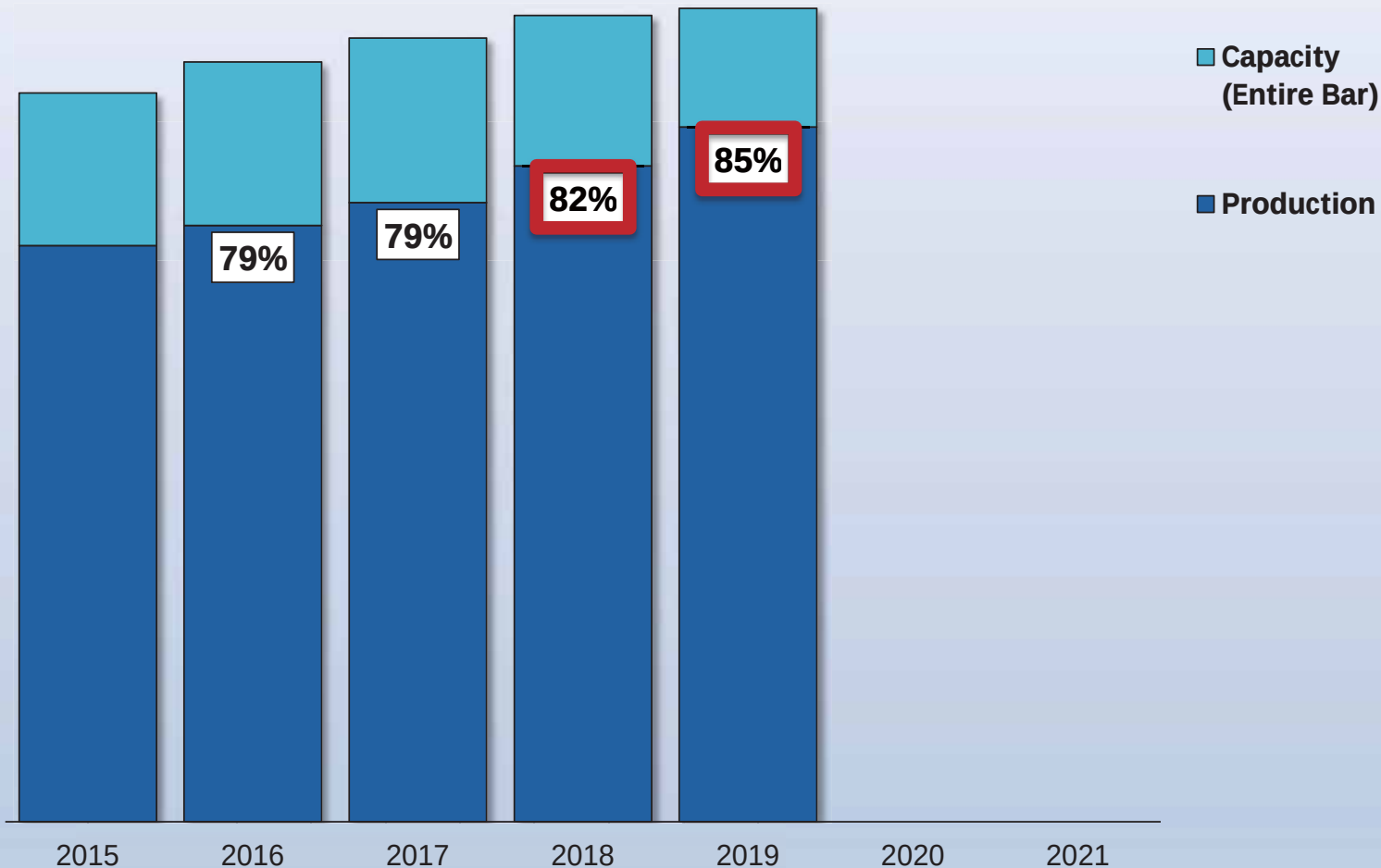
General Slowing of Capacity Growth

North American Capacity, Tonnes, 2015–2019 with AAGR



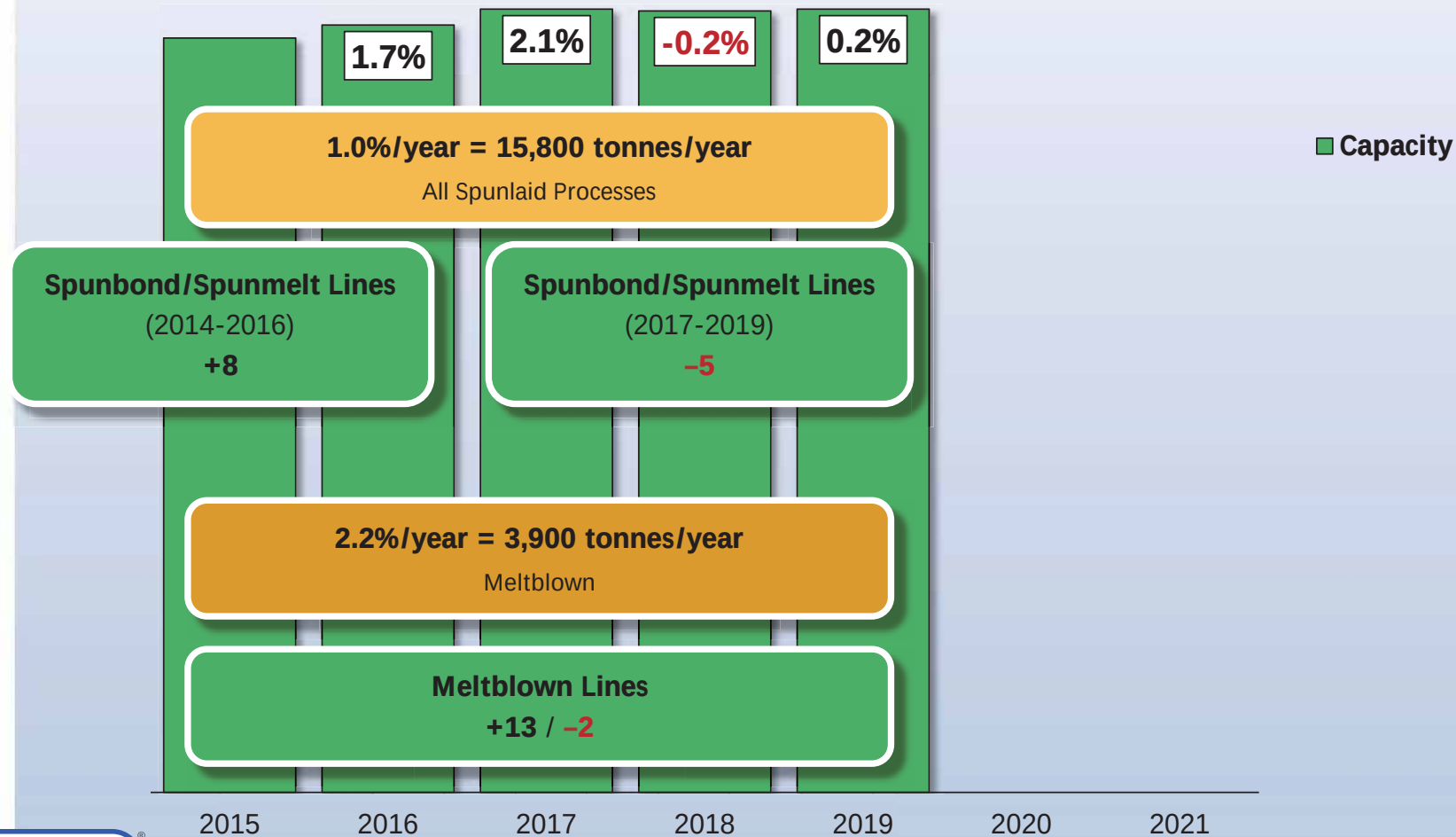
Increasing Operating Rates

North American Capacity, Production & Operating Rate, Tonnes, 2015–2019



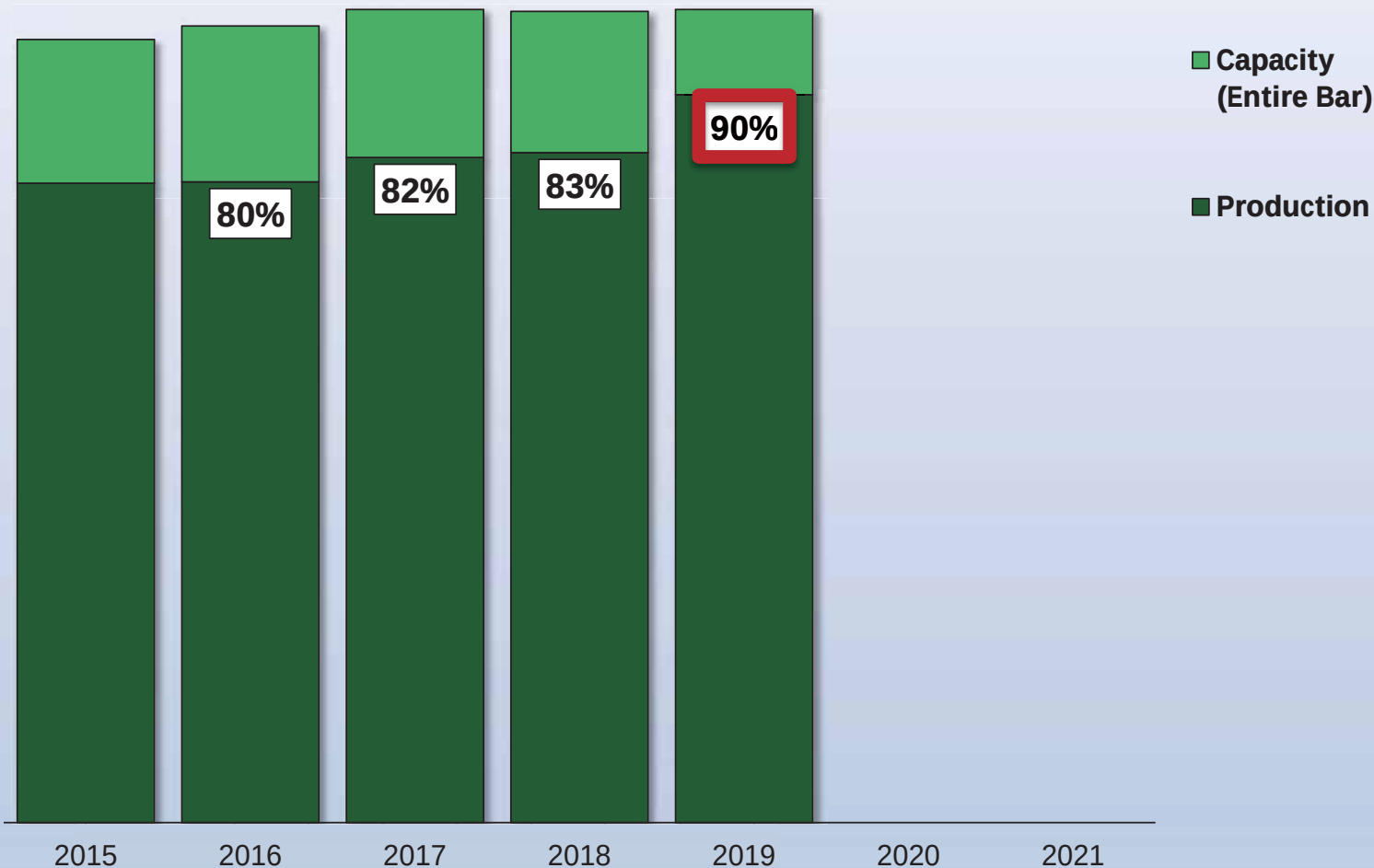
Relatively-Flat Capacity Growth

North American Spunlaid Capacity, Tonnes, 2015–2019 with AAGR



Significantly Improving Operating Rates

North American Spunlaid Capacity, Production & Operating Rate, Tonnes, 2015–2019



Today's Discussion

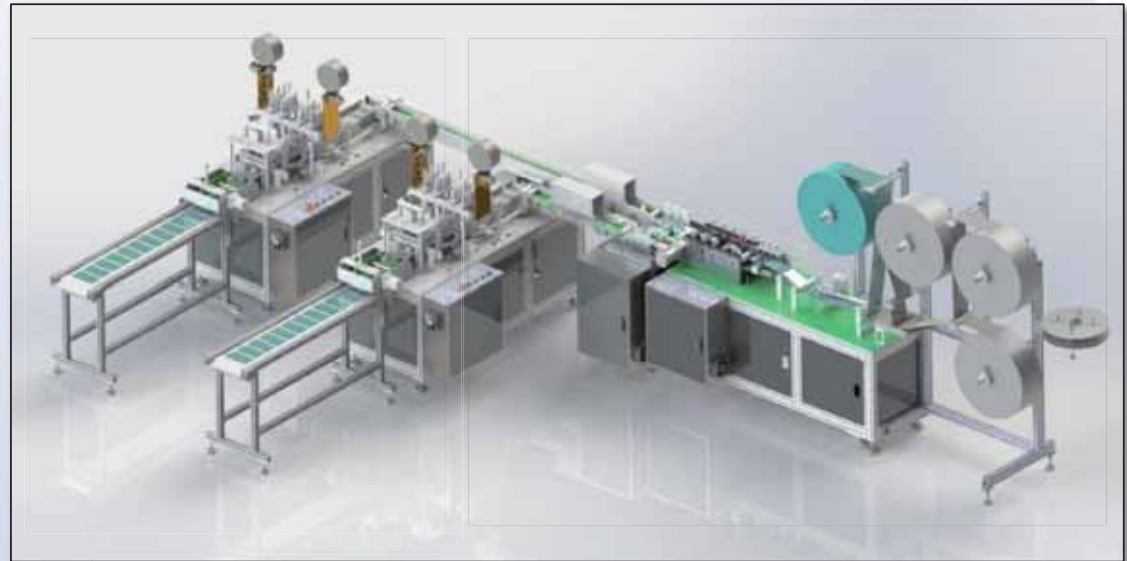


- Pandemic, 2020-2021
 - The Great Pivot
 - Meltblown
 - Increasing Operating Rates



The Great Pivot

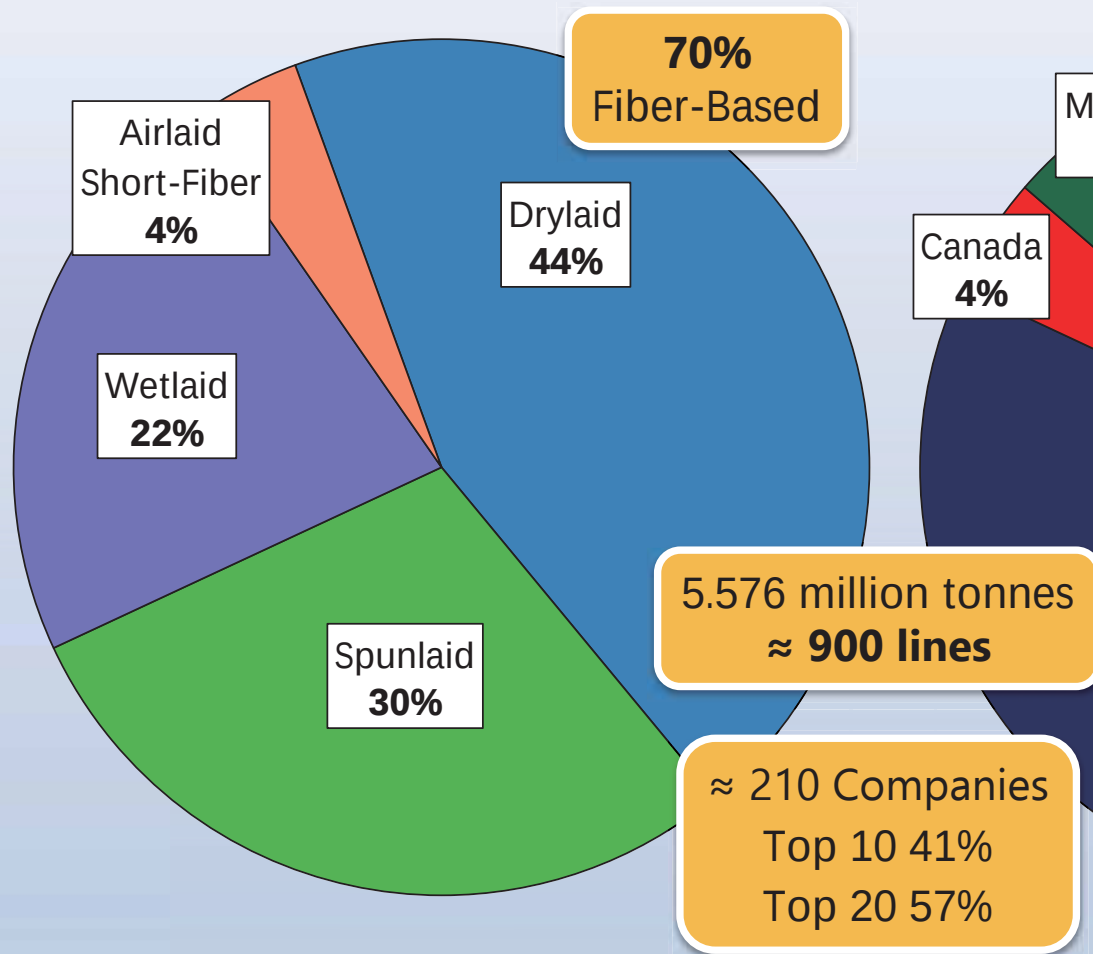
The Nonwovens Industry Responds



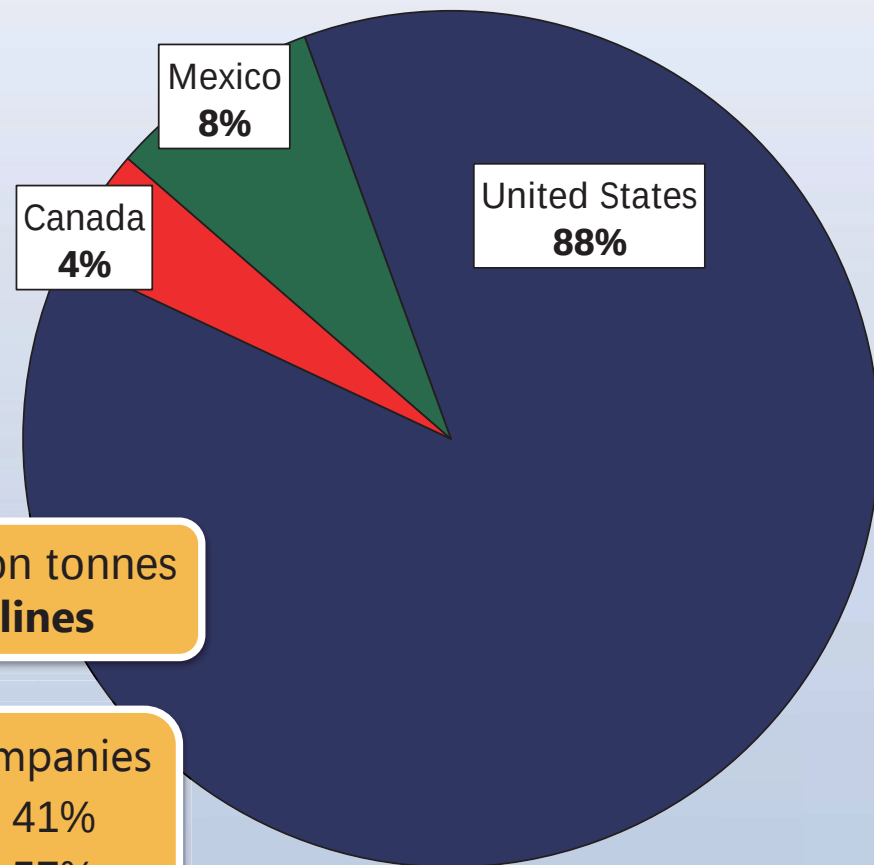
North American Capacity End of 2021

North America Capacity in Tonnes, 2021

Capacity by Process

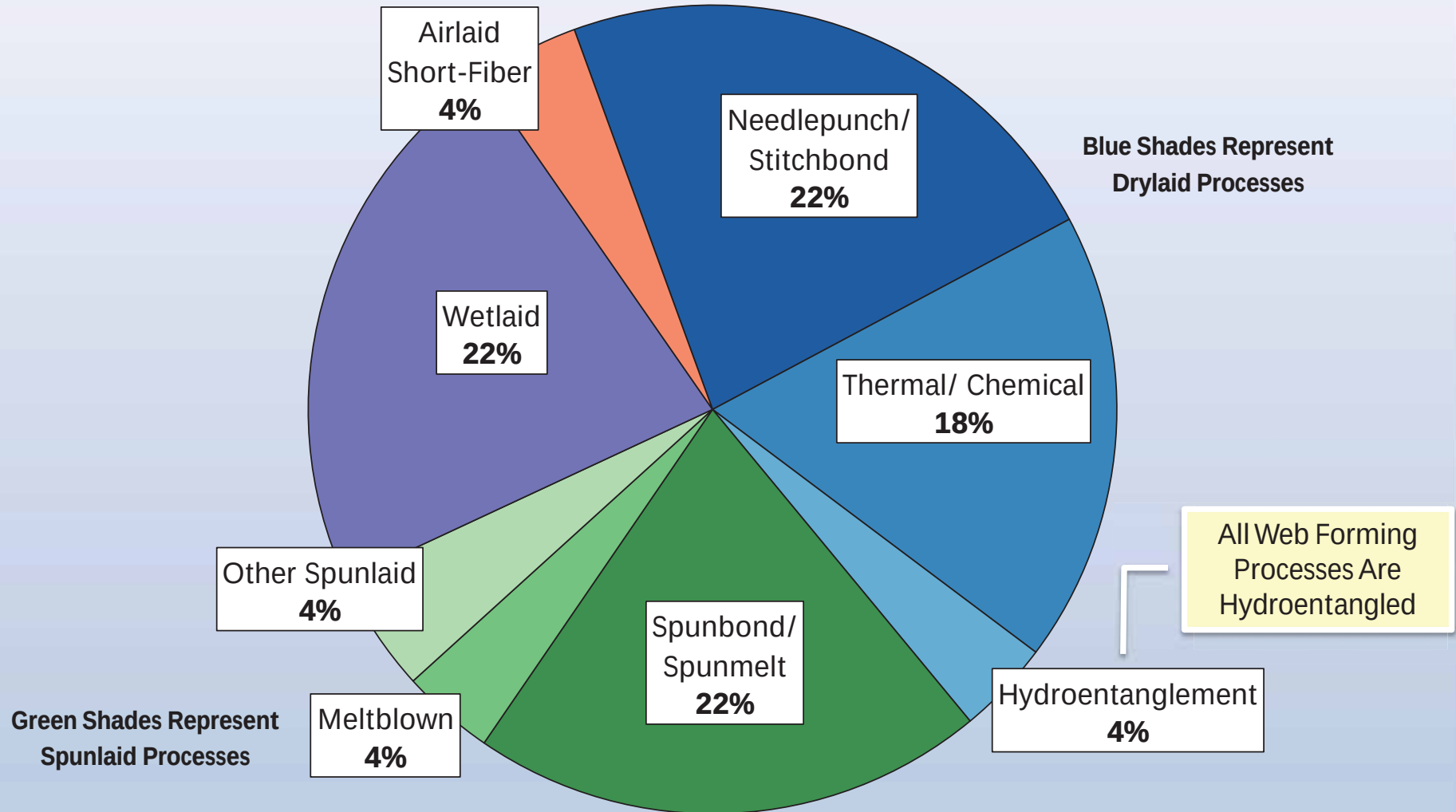


Capacity by Region



Variety of Processes & Attributes

North America Capacity by Detailed Process, 2021



PPE Related Nearly a Third

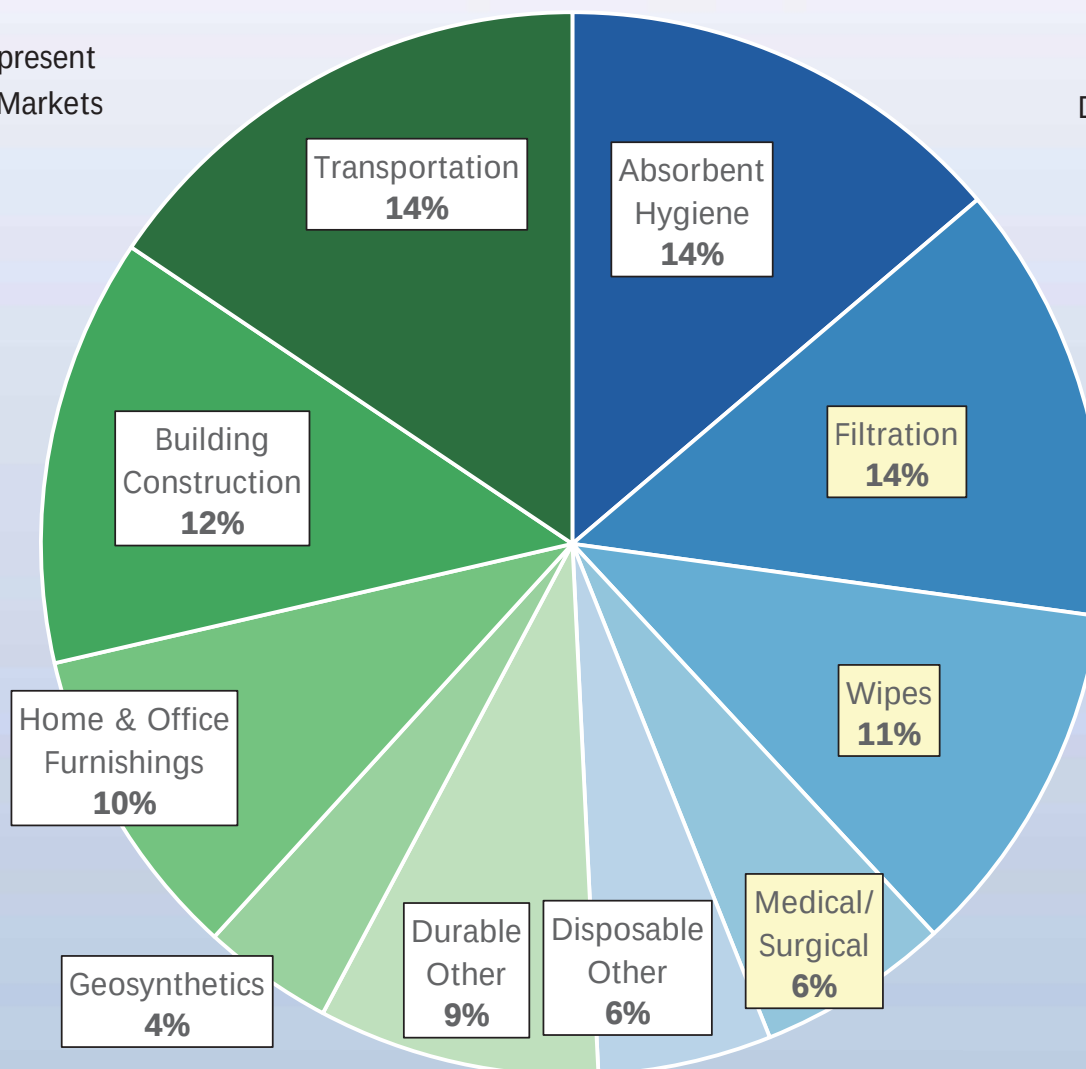
North America Production by End Use in Tonnes, 2020

Green Shades Represent
Durable End-Use Markets

49%

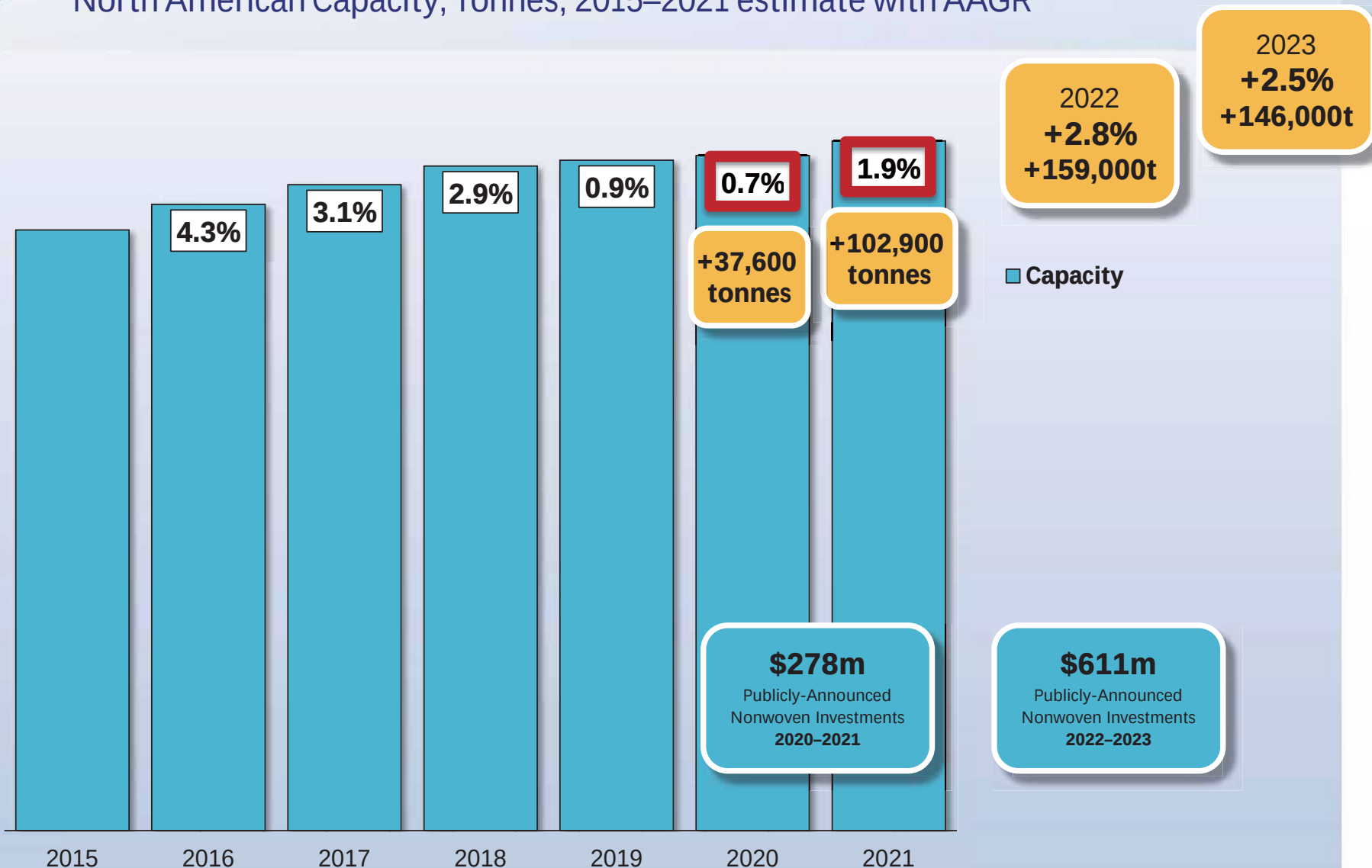
Blue Shades Represent
Disposable End-Use Markets

51%



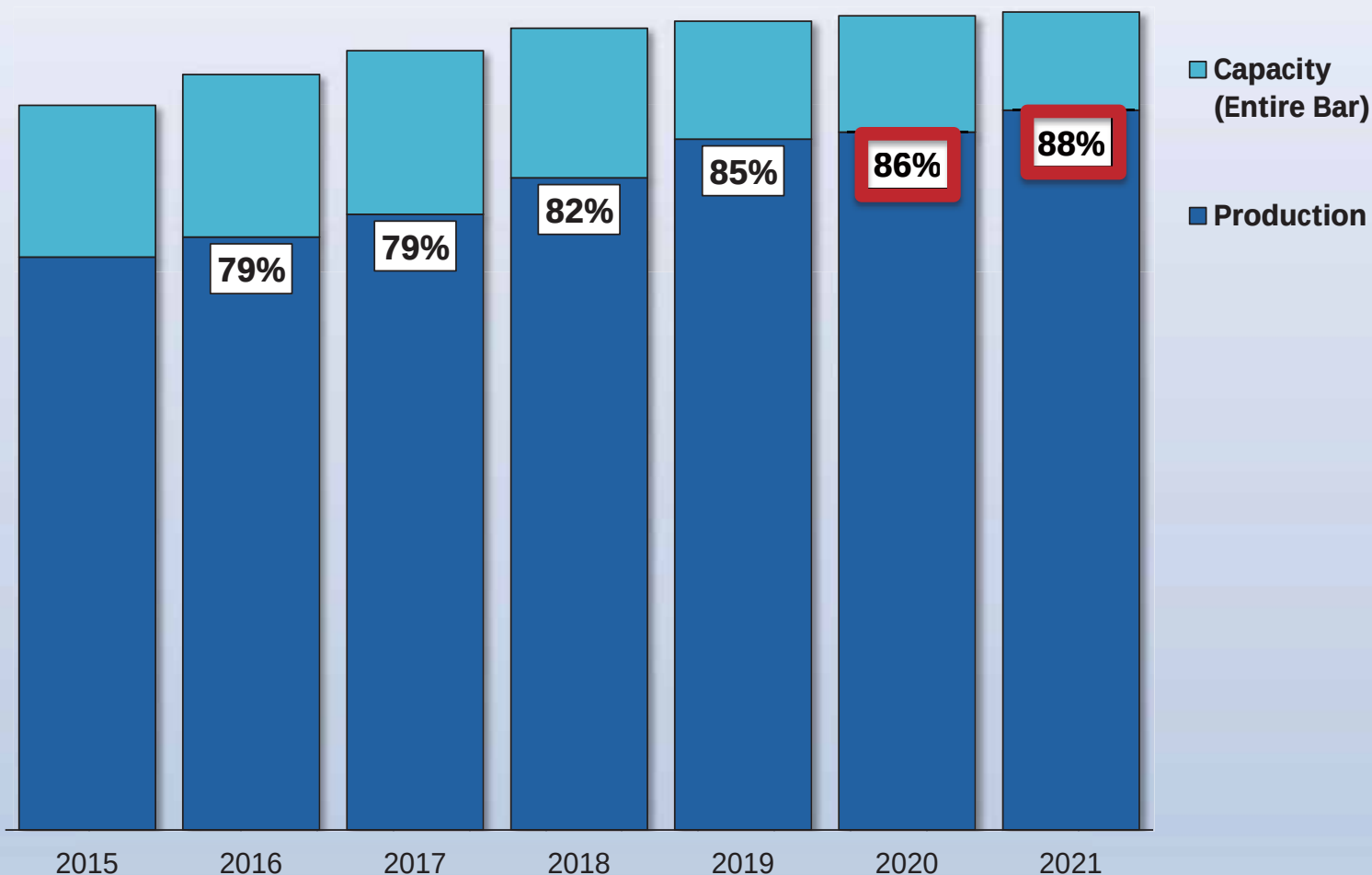
Industry Reacts with Spunlaid

North American Capacity, Tonnes, 2015–2021 estimate with AAGR



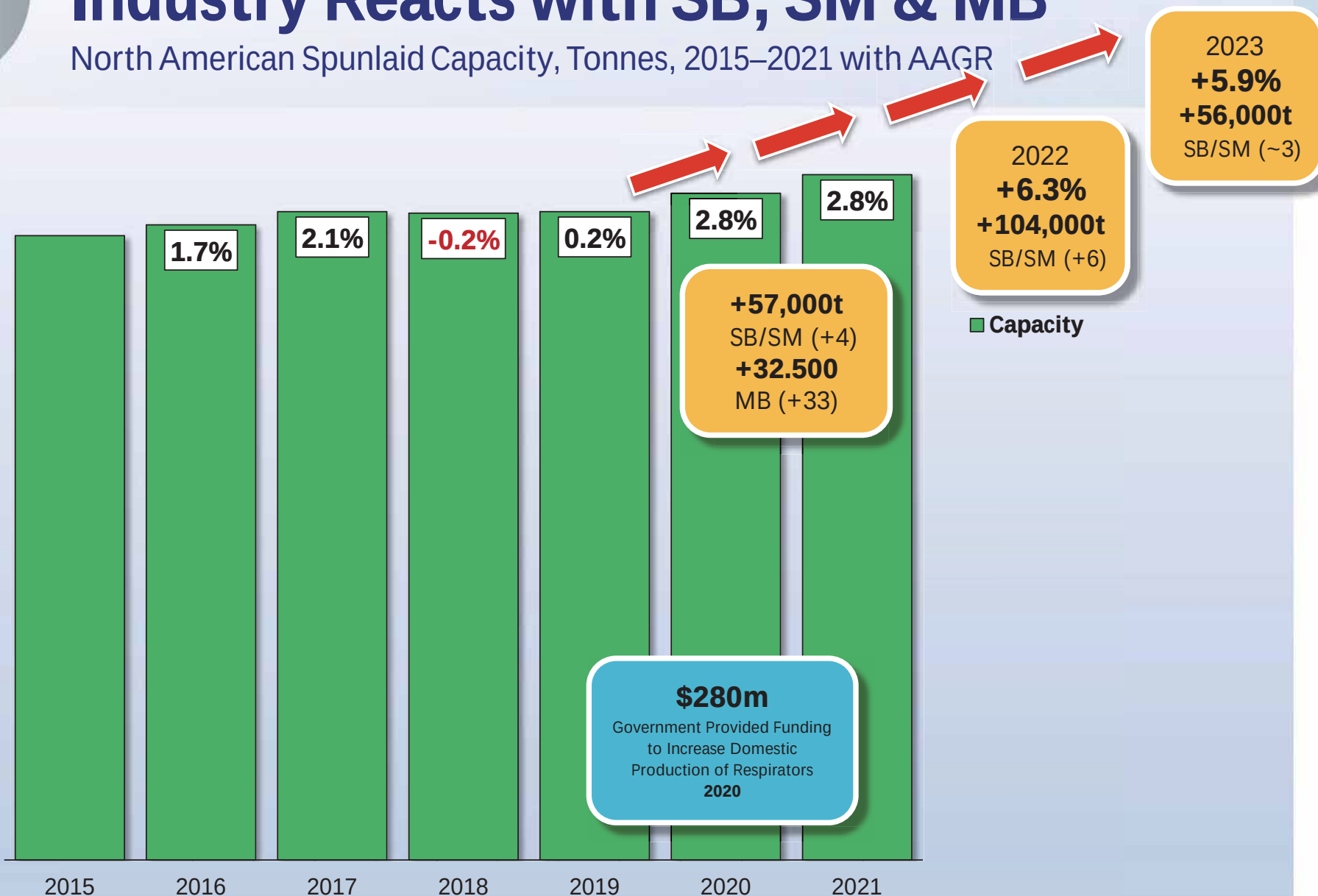
Operating Rates Tick-Up

North American Capacity, Production & Operating Rate, Tonnes, 2015–2020



Industry Reacts with SB, SM & MB

North American Spunlaid Capacity, Tonnes, 2015–2021 with AAGR



Rising Operating Rates

North American Spunlaid Capacity, Production & Operating Rate, Tonnes, 2015–2020



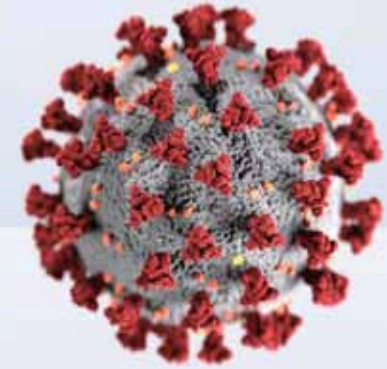
Today's Discussion



- The Future, Post-Pandemic
 - COVID-19 Impact
 - Supply Response
 - Demand Possibilities



COVID-19 Impact



Short-Term Response

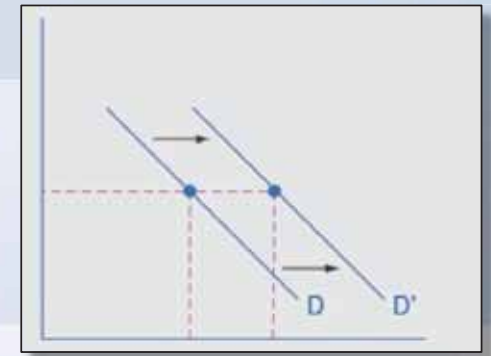
- Demand Outstripping Supply
 - Disinfecting Wipes
 - Respirators & Face Masks
 - Isolation Gowns

Long-Term Behavioral Change

- Wipes
- Filtration
- Medical Apparel

Supply Chain and Logistical Issues

Demand Possibilities



- Return to Pre-Pandemic Baseline
- Baseline x2
- Somewhere in the Middle
- Or Baseline $\times < 1.1$



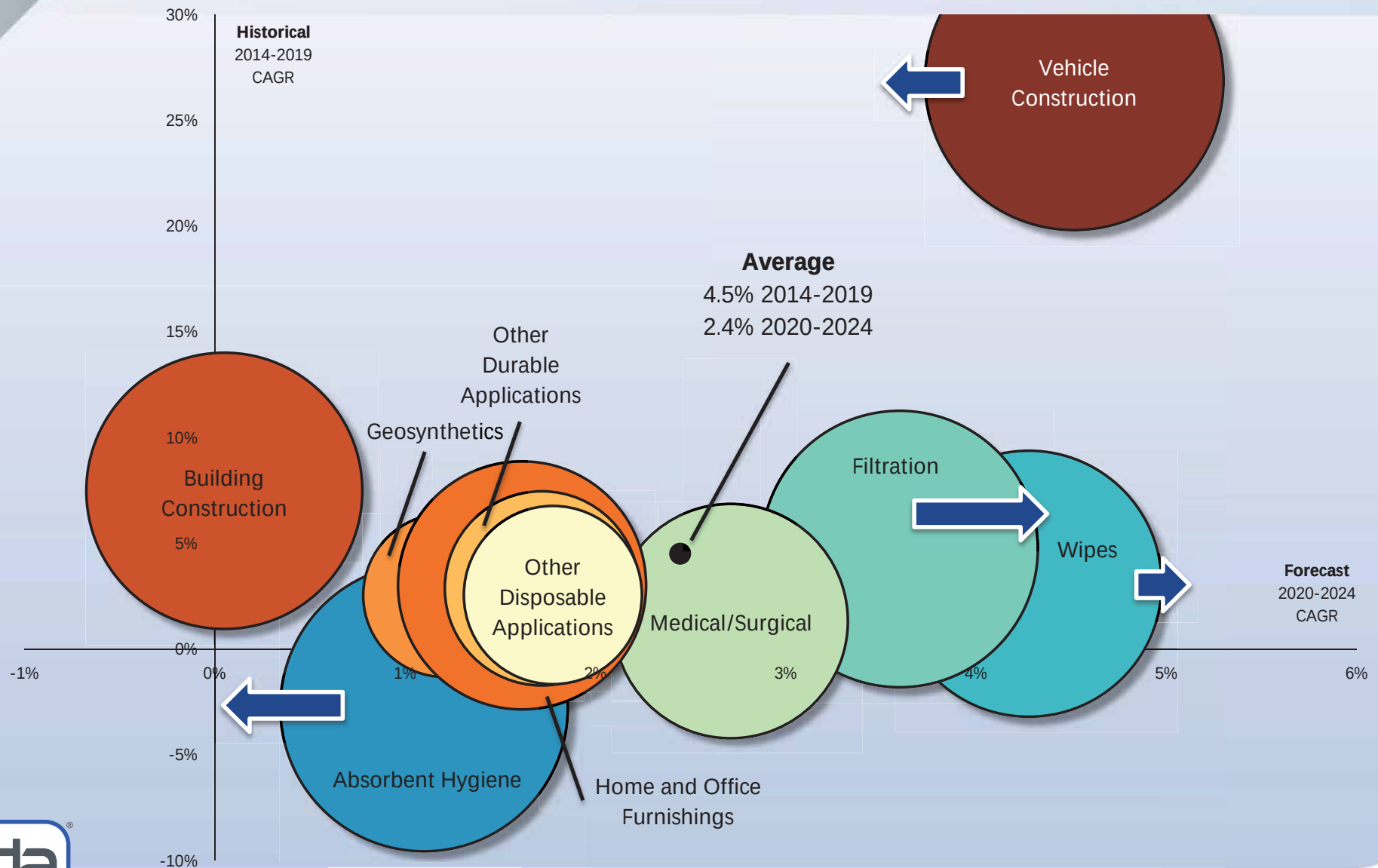
... and Supply Implications



- Return to Offshore Production
- Self-Sufficiency
 - Government Intervention
 - DPA
 - SNS
 - “Make PPE in America Act”
- Something in the Middle

Considerable Range of Growth Rates

Historical & Forecast CAGR in Tonnes of Demand by End-Use, 2019



Closing



Great Time To Be In Nonwovens

- Strong Growth Industry
 - Incredible Dynamic and Diverse
 - Engineered Material Solutions Always Needed
- Continued Capital Investments
- **Protect and Improve Lives**

Thank You

Questions

bkalil@inda.org



Association of the
Nonwoven Fabrics Industry
ADVANCING ENGINEERED MATERIAL SOLUTIONS