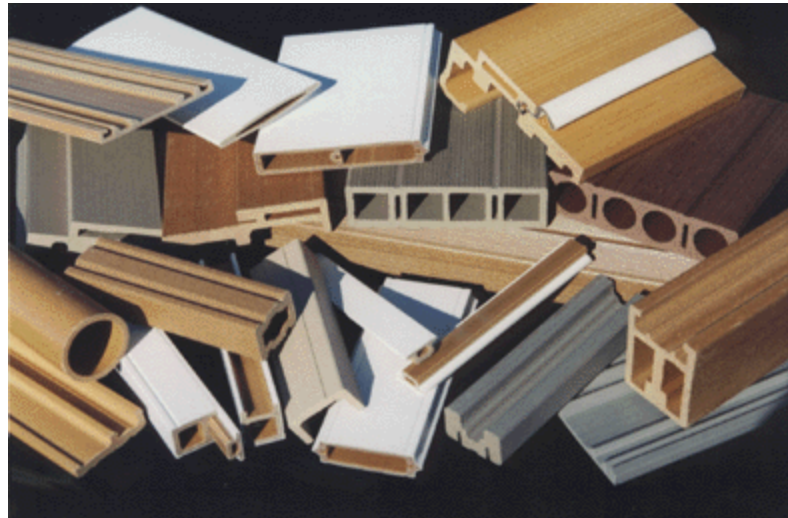


# Current and Emerging Applications for Natural & Wood Fiber Composites



A presentation to the:

**7<sup>th</sup> International Conference of Woodfibre-Plastic Composites**

**May 19-20, 2003**

**Madison, WI**



# Wood & natural fiber composites are the fastest growing plastics AND building products market segment...

Growth has averaged more than 25% a year since 1998

- No other segment of the plastics industry have grown faster
- No other building products have seen such strong market demand

Materials were developed to find outlet for plastic scrap

- Now, highly engineered products are emerging with superior performance

Range of plastic resins and fiber reinforcements used today:

- Polyethylene (PE)
- Polyvinyl chloride (PVC)
- Polypropylene (PP)
- Others: ABS, ASA, PU
- Pine, cedar (softwood) fiber
- Oak, maple (hardwood) fiber
- Sisal, flax, hemp, kenaf, cotton & other crop fibers
- Rice hulls, peanut shells



There is a broad range of applications from building products to infrastructure and consumer goods...

WINDOWS/DOORS



ROOFING



GARDEN STRUCTURES



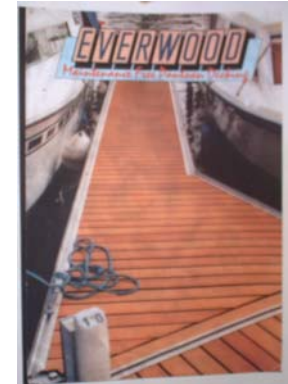
RAILINGS



PATIO FURNITURE



DOCKS/SEA WALLS



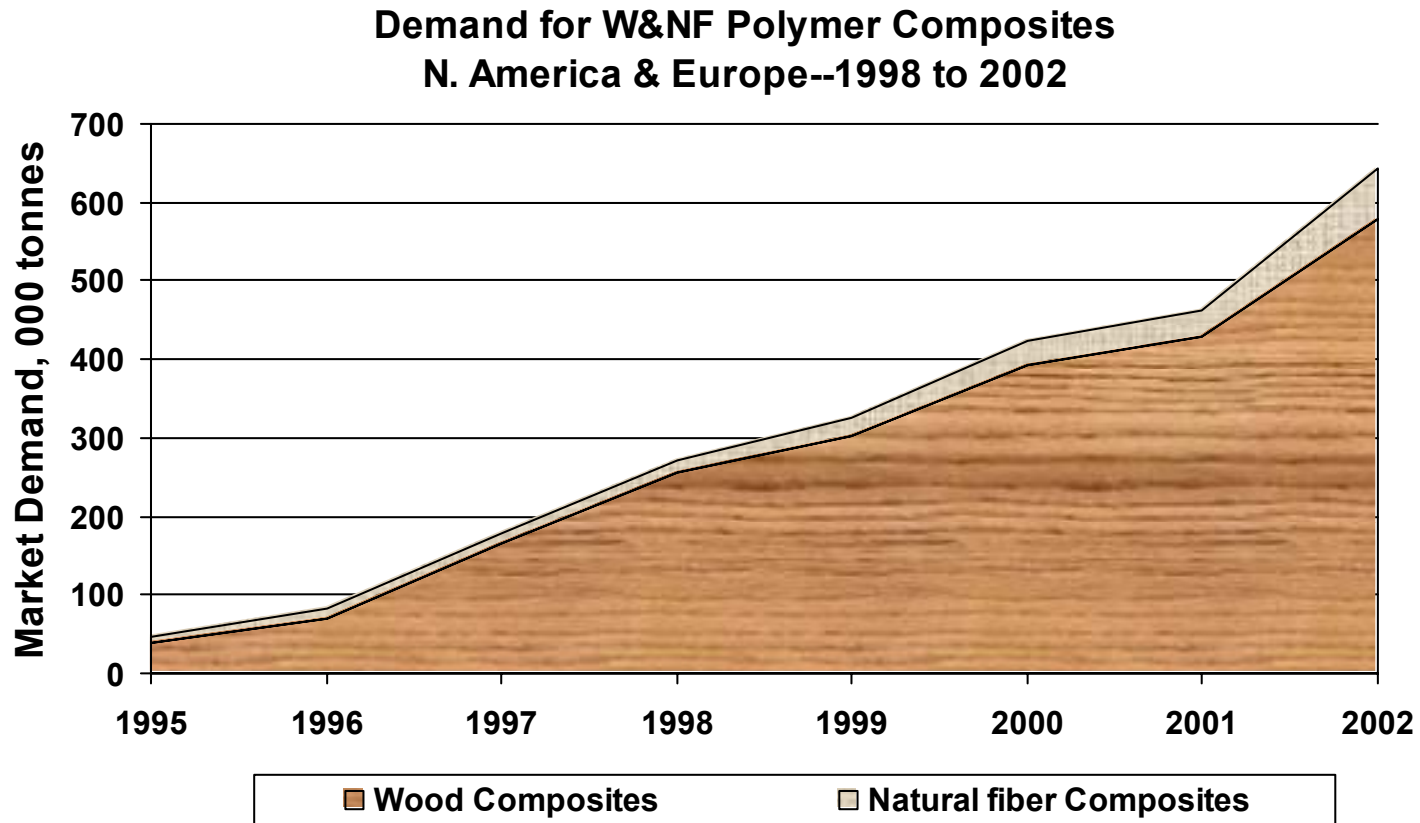
DECKING



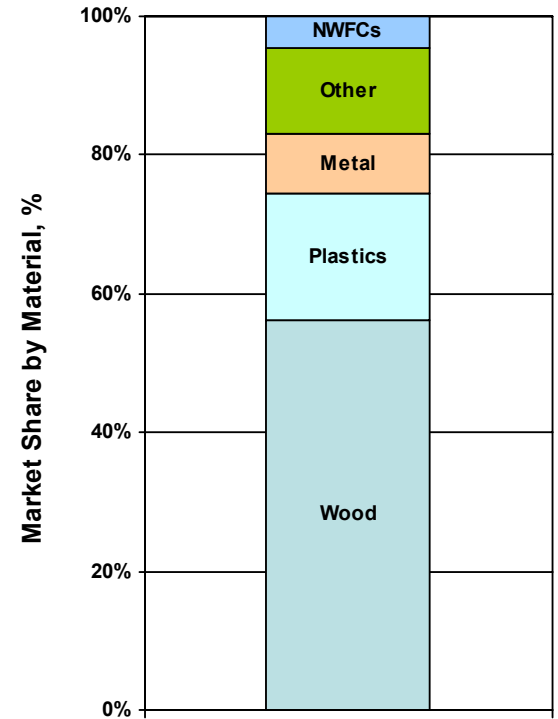
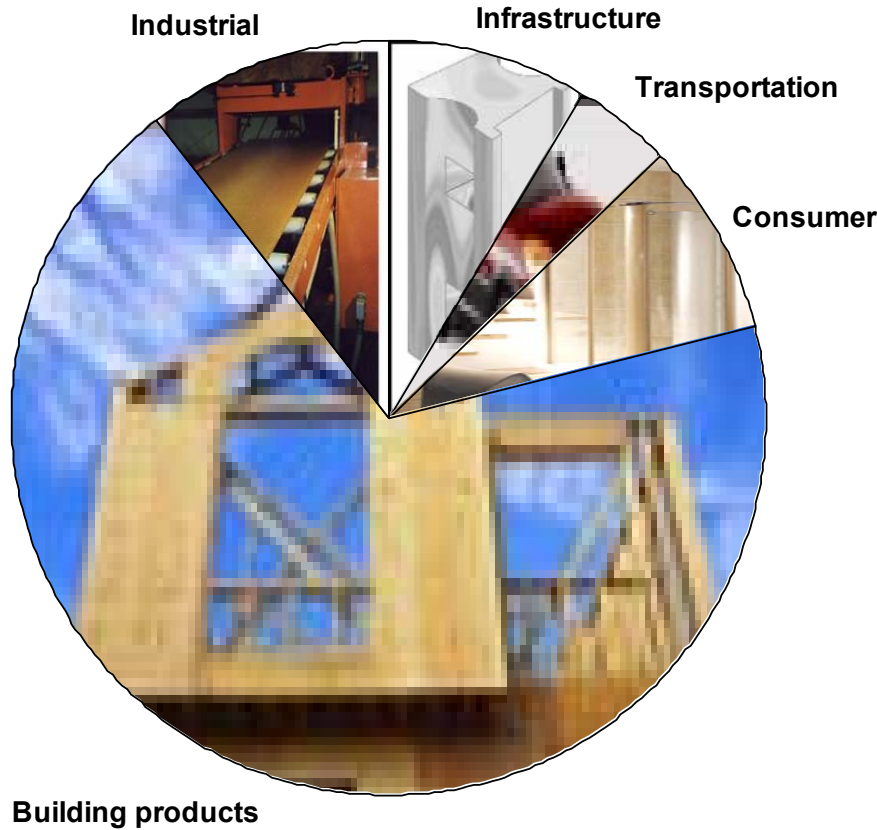
FENCING



Composite producers have enjoyed double-digit growth in demand since the early 1990s...



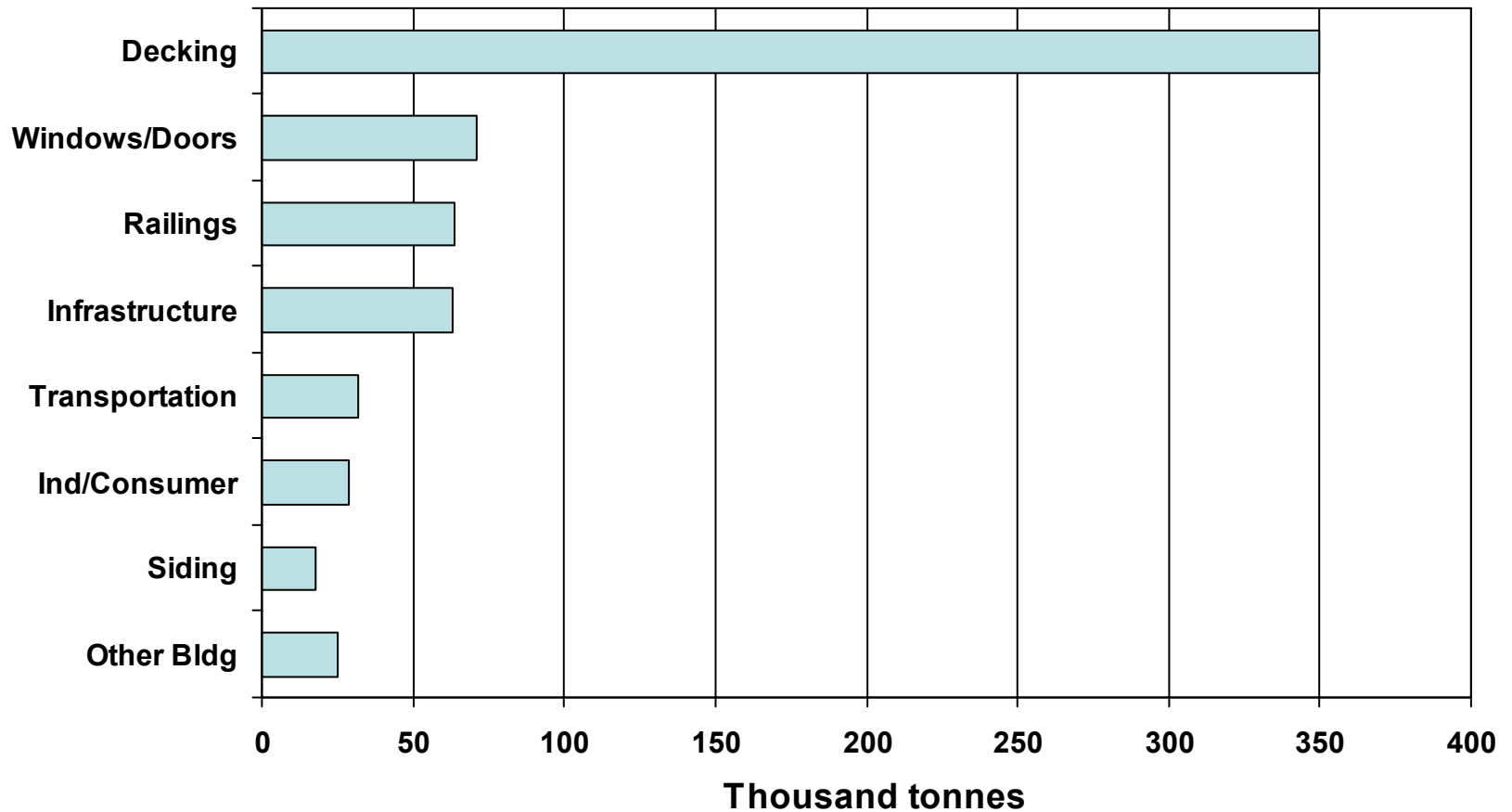
# Consumption of wood, plastics, metal and other materials in target applications totaled 13 million tonnes....



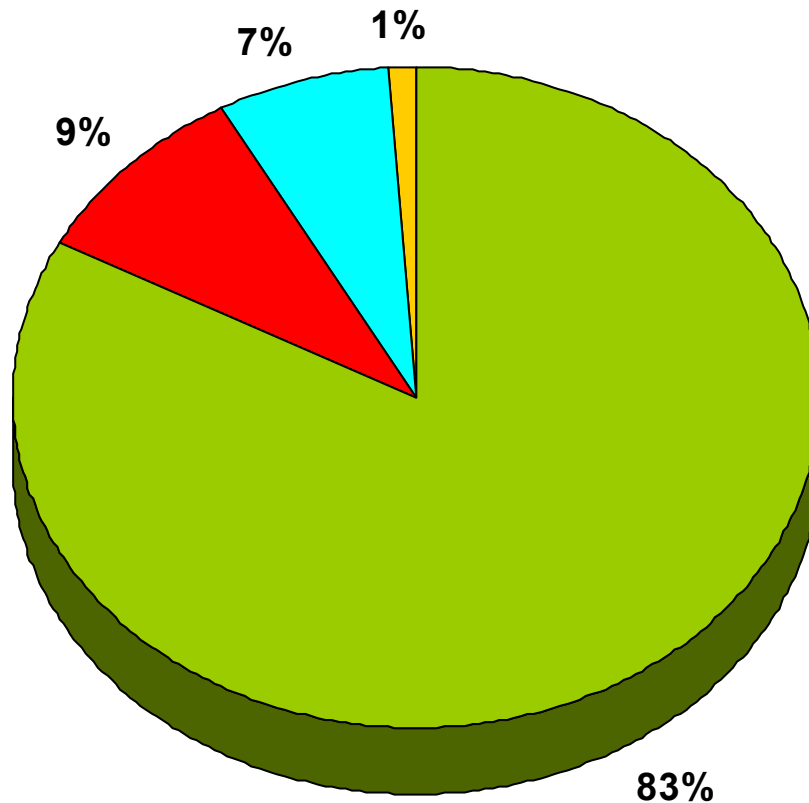
Current penetration of the addressable market is quite small overall at 4%



Decking is the largest application with 53% of total volume, and is gaining share of the market...



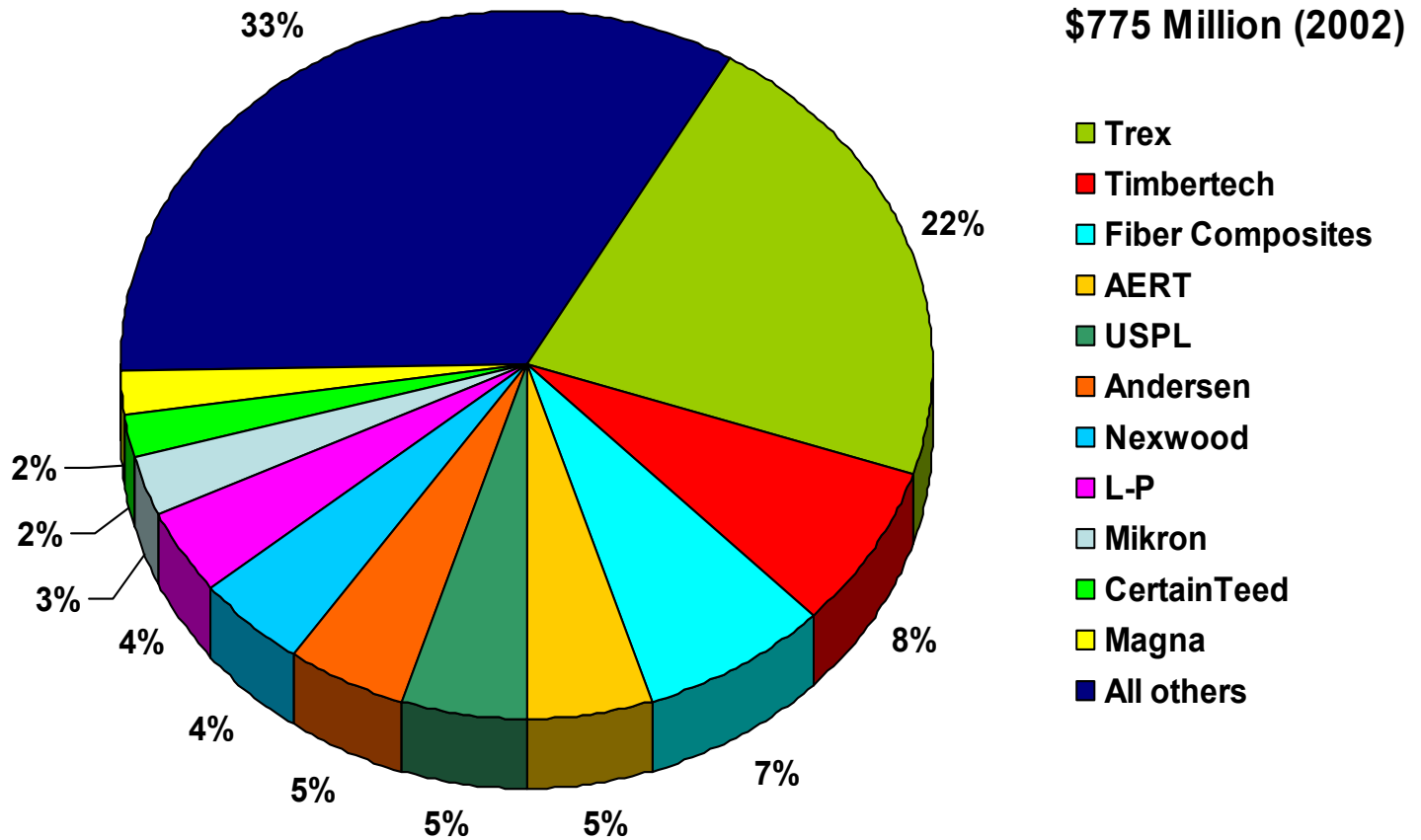
PE-based systems are the dominant product type, followed by PVC and PP with minor volumes of other resins...



685,000 tonnes (2002)

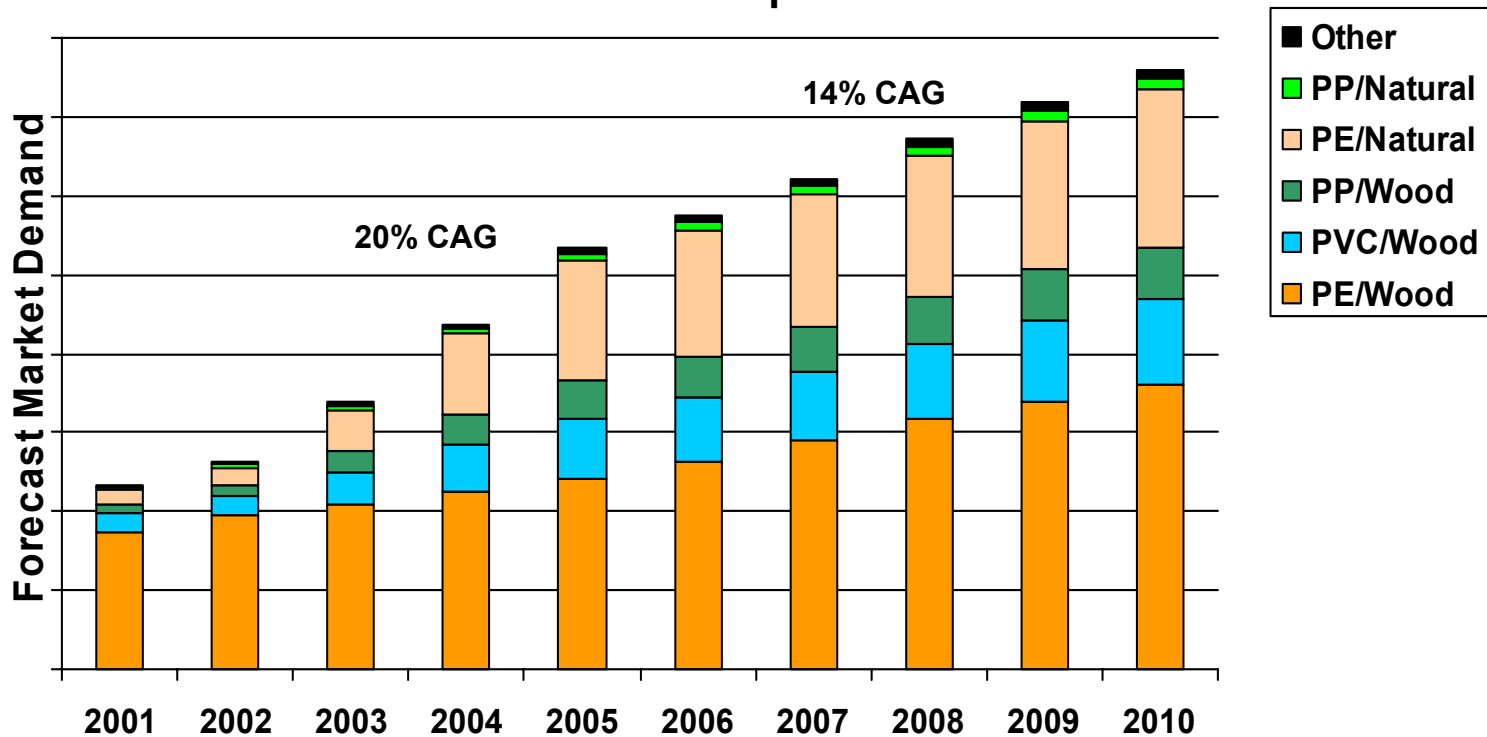
- Polyethylene
- Polyvinyl chloride
- Polypropylene
- Others

Ten suppliers account for 70% of supply. Trex has 22% share, while no European company is in the top 10...yet...

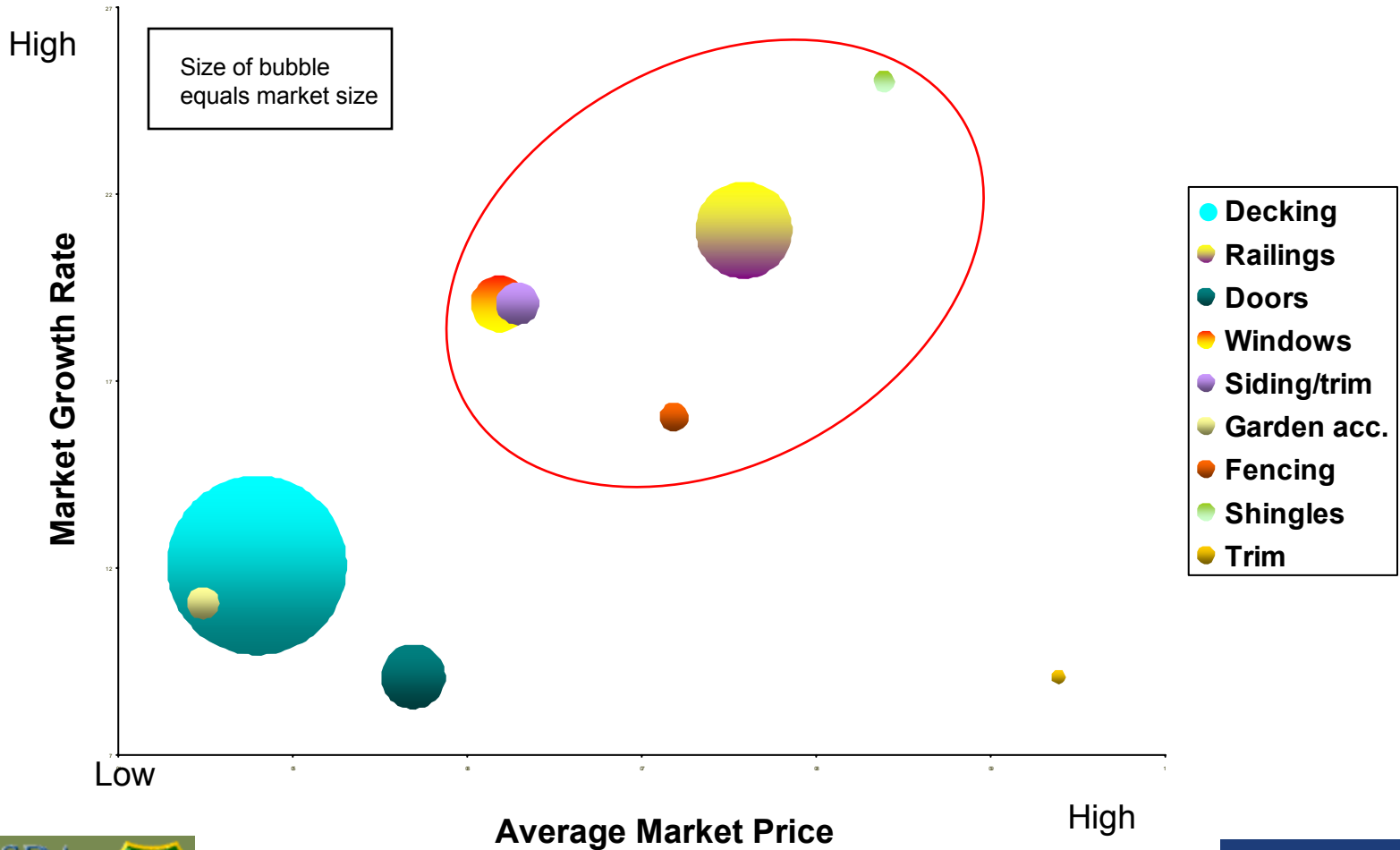


Short term ('02 to '05) growth will be 20% a year, and the rate (14% a year) will begin to temper through 2010...

**Forecast Demand for N&WF Polymer Composites  
N. America & Europe--2001 to 2010**



While all applications are attractive, several stand out as highly interesting areas: railings, windows, siding...



## Opportunities abound in WPCs, but threats also exist, and suppliers must be prepared to compete effectively...

- Ever-increasing number of suppliers will generate price pressure
  - Rivalry for market share will intensify; eventually, a shake-out will come
  - Branding will be very important to compete in decking, railing, shingles
- Supply of plastic recyclate will not be able to meet demand
  - Some producers have already elected to use virgin resin
  - Lack of sufficient supply will drive costs up
- Producers must begin to look beyond decking/railing for growth
  - Market share in decking is projected to reach 25%+
  - New applications must be developed/commercialized to sustain growth
- New additive chemistries and composite formulations needed
  - To expand range of applications, compounds must be improved
  - Additives can be used to enhance composite performance



# QUESTIONS?

[PrincipiaConsulting.com](http://PrincipiaConsulting.com)

[JMorton@PrincipiaConsulting.com](mailto:JMorton@PrincipiaConsulting.com)

