

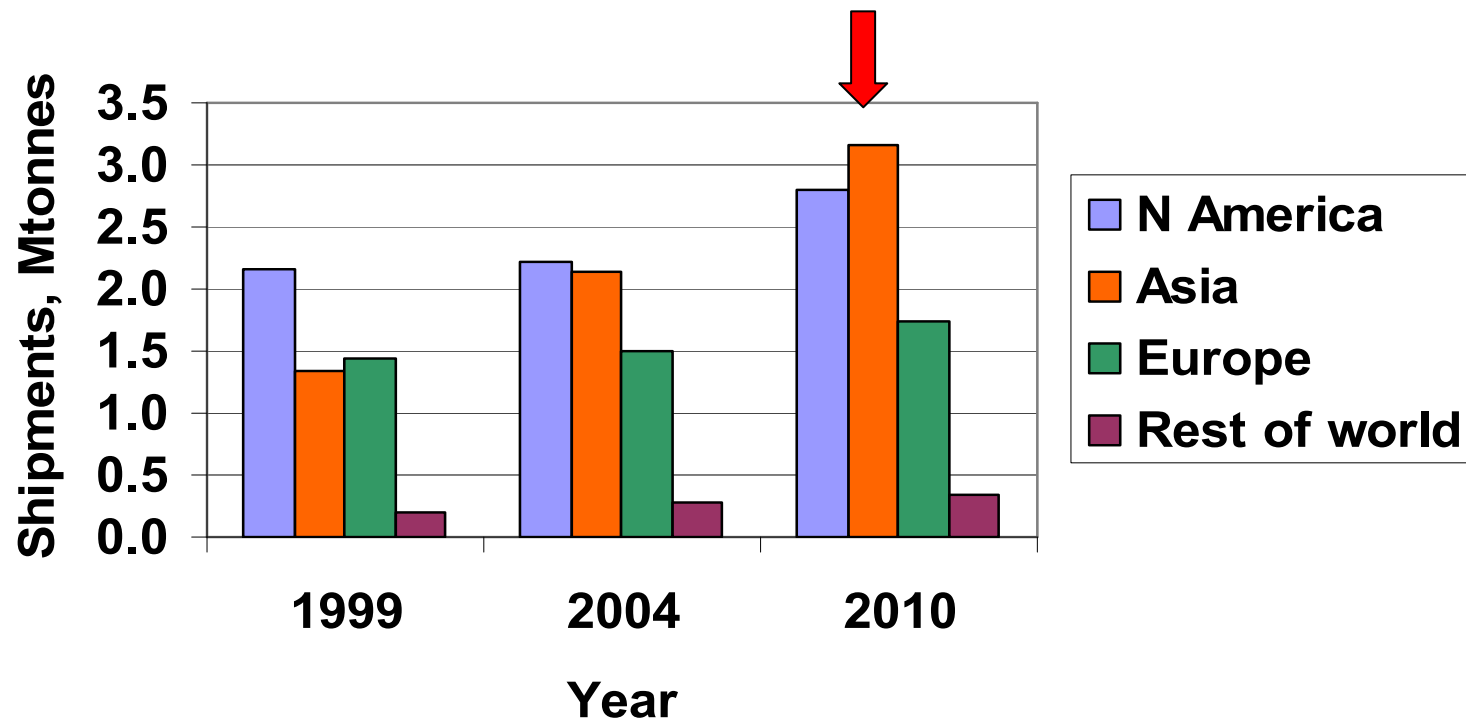


# The Global Composites Industry

## Trends, Opportunities and Challenges

**Dr Deborah Pullen,  
NCN Programme Director**

# Global Market

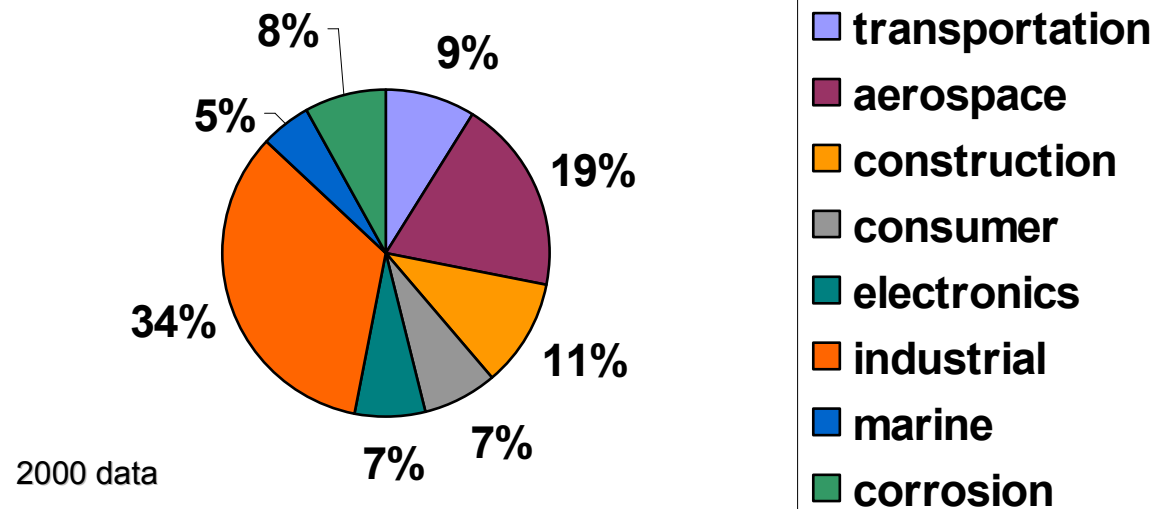


Total Revenue finished parts £25billion

# UK Composites Market



ncn

National Composites Network  
A node of the Materials KTN

**No Employees(No.):10000-12000**

**Turnover: £800 million finished parts (compared with £25billion globally)**

**Export: 40%**

**Forecast 5 yr growth pa : 4%**

# Cost vs Performance



ncn

National Composites Network  
A node of the Materials KTN

Importance of Cost

Construction

Automotive

Recreation

Mass Transit

Civil Aerospace

Defence

Space Applications

Biomedical

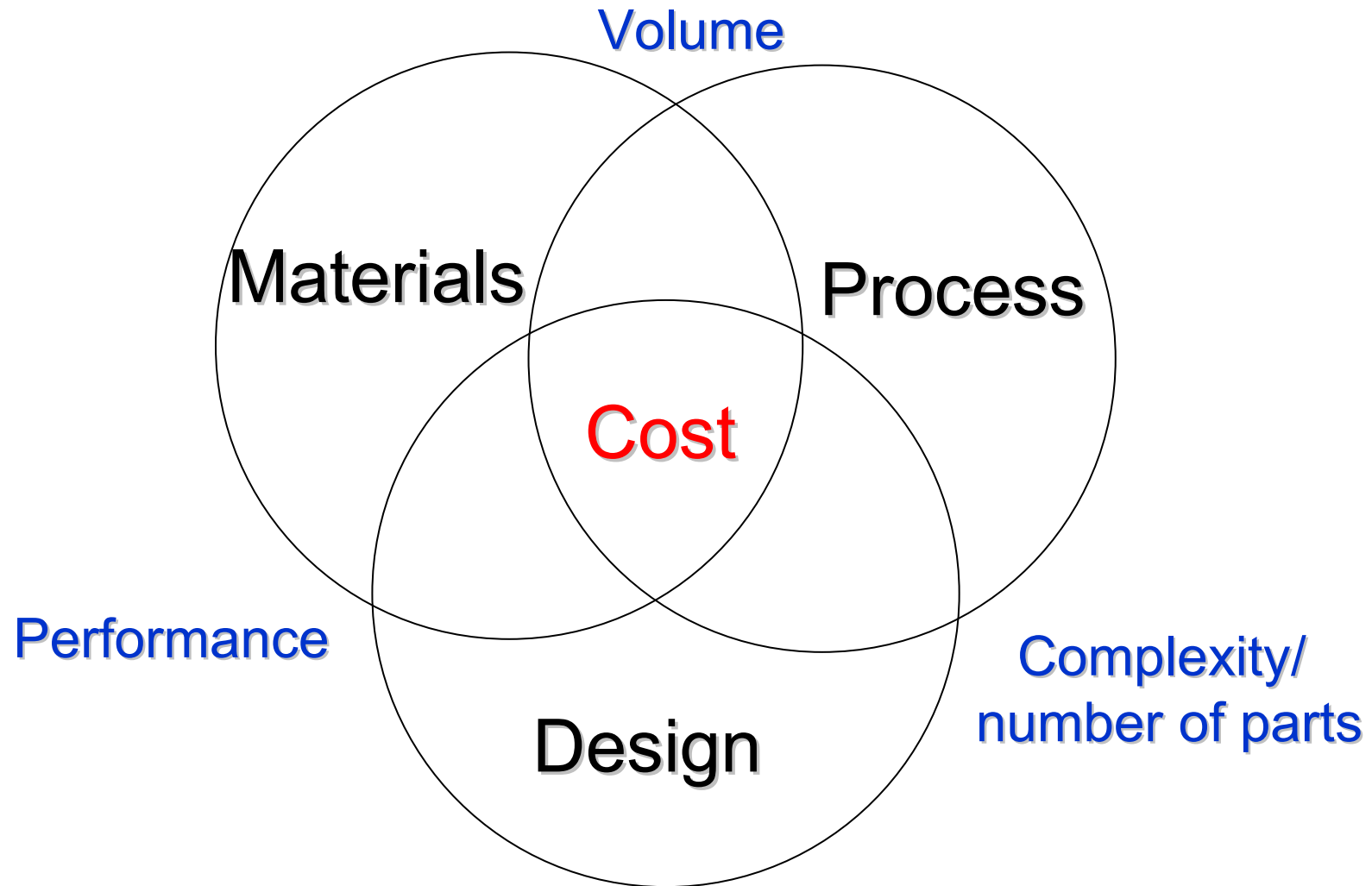


Importance of Performance

# Component Priorities

- **COST, including tooling**
- **Specific mechanical properties**
- **Predictable performance**
- **Everything else!**
  - High quality finish
  - Damage tolerance
  - Integration into production process
  - No visible trimmed edges
  - Structural integrity over lifetime
  - Consistency and traceability
  - Recyclability
  - High tolerances
  - Added value
  - Performance in harsh environments
  - Impact energy absorption
  - Etc etc

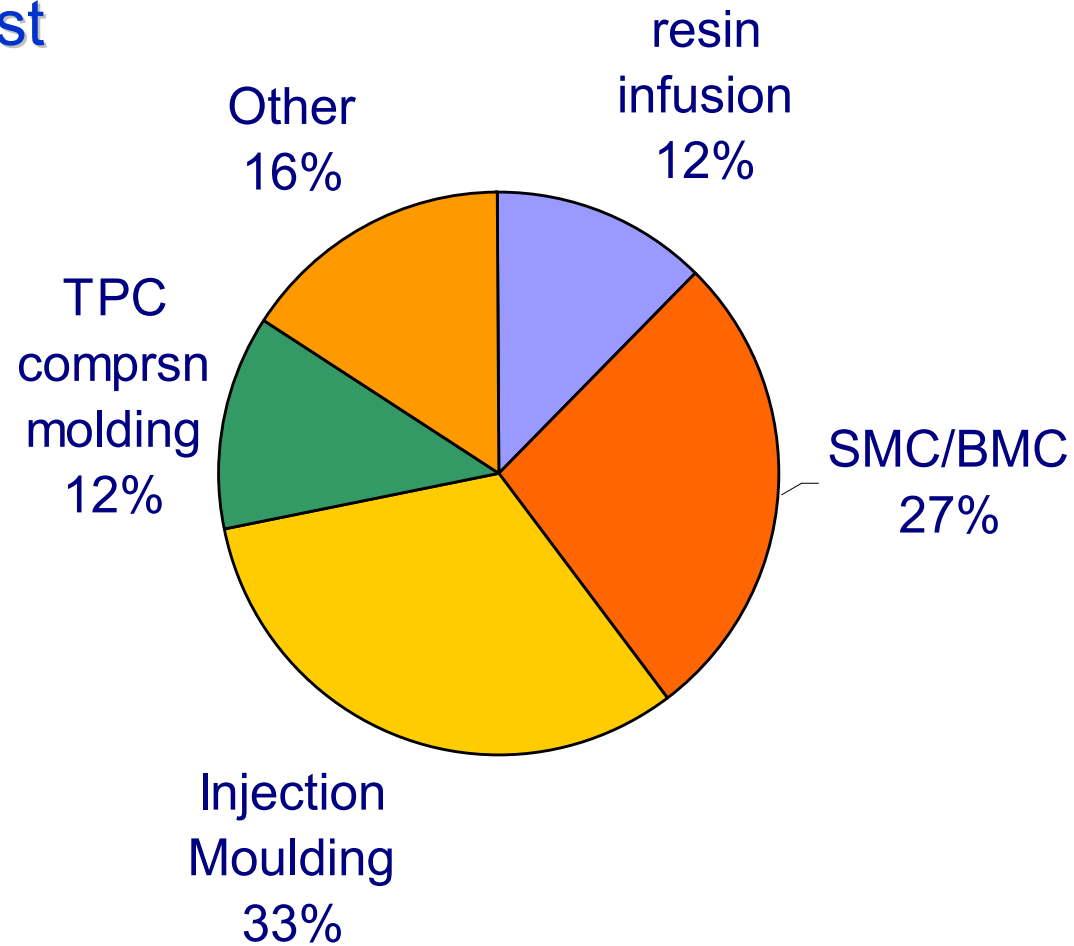
# Choices for Manufacturers



# Manufacturing Methods



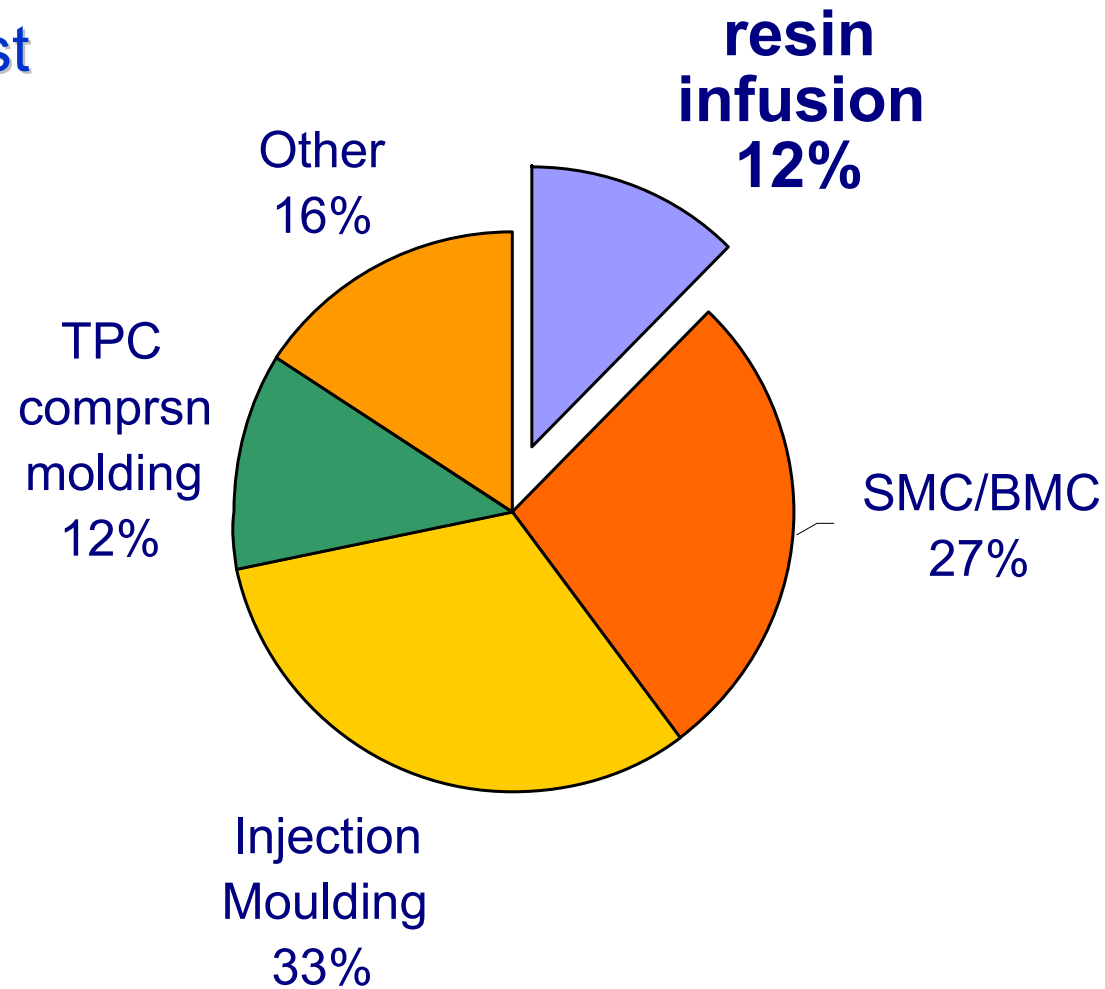
## 2010 Forecast



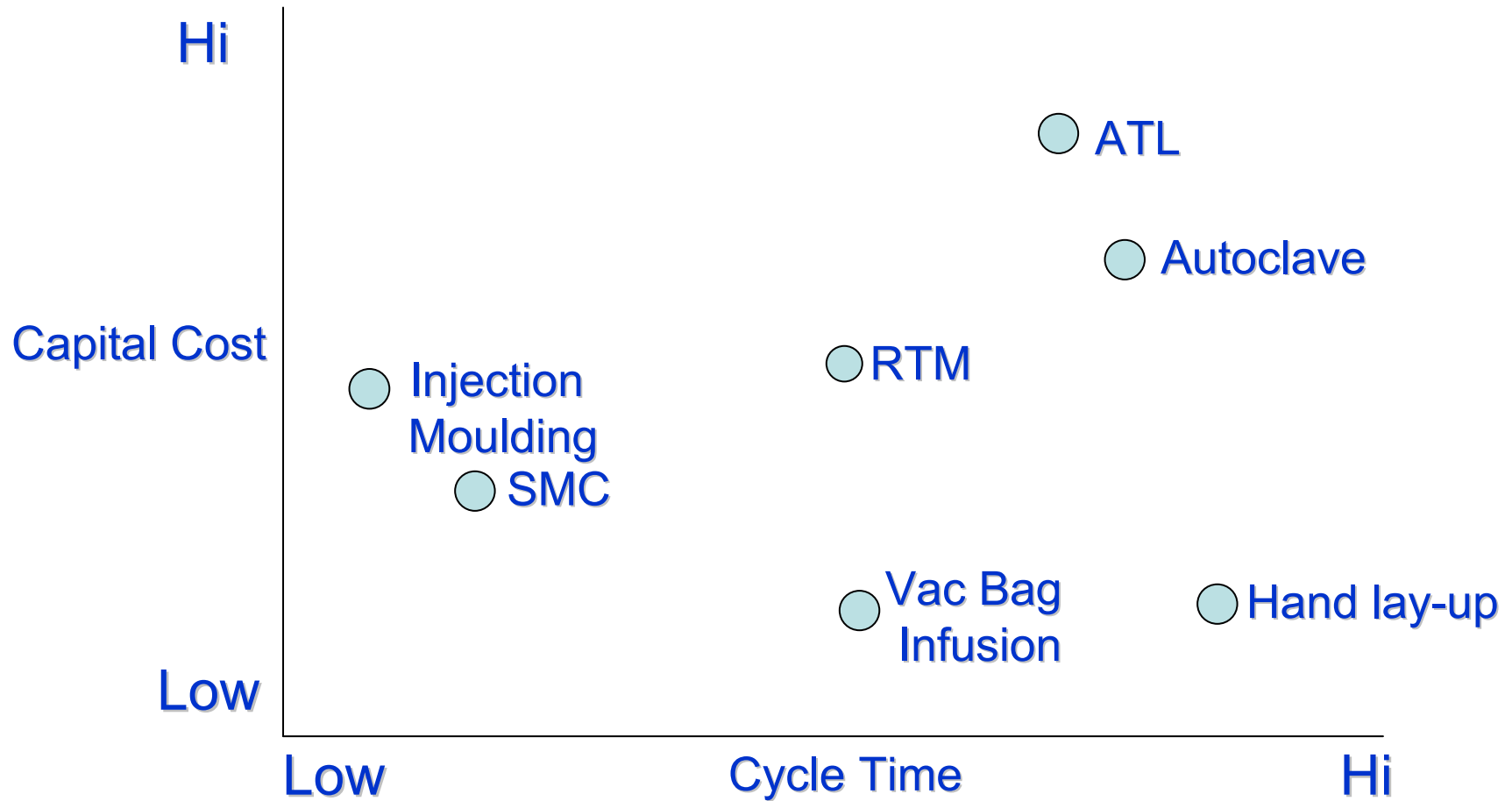
# Manufacturing Methods



## 2010 Forecast



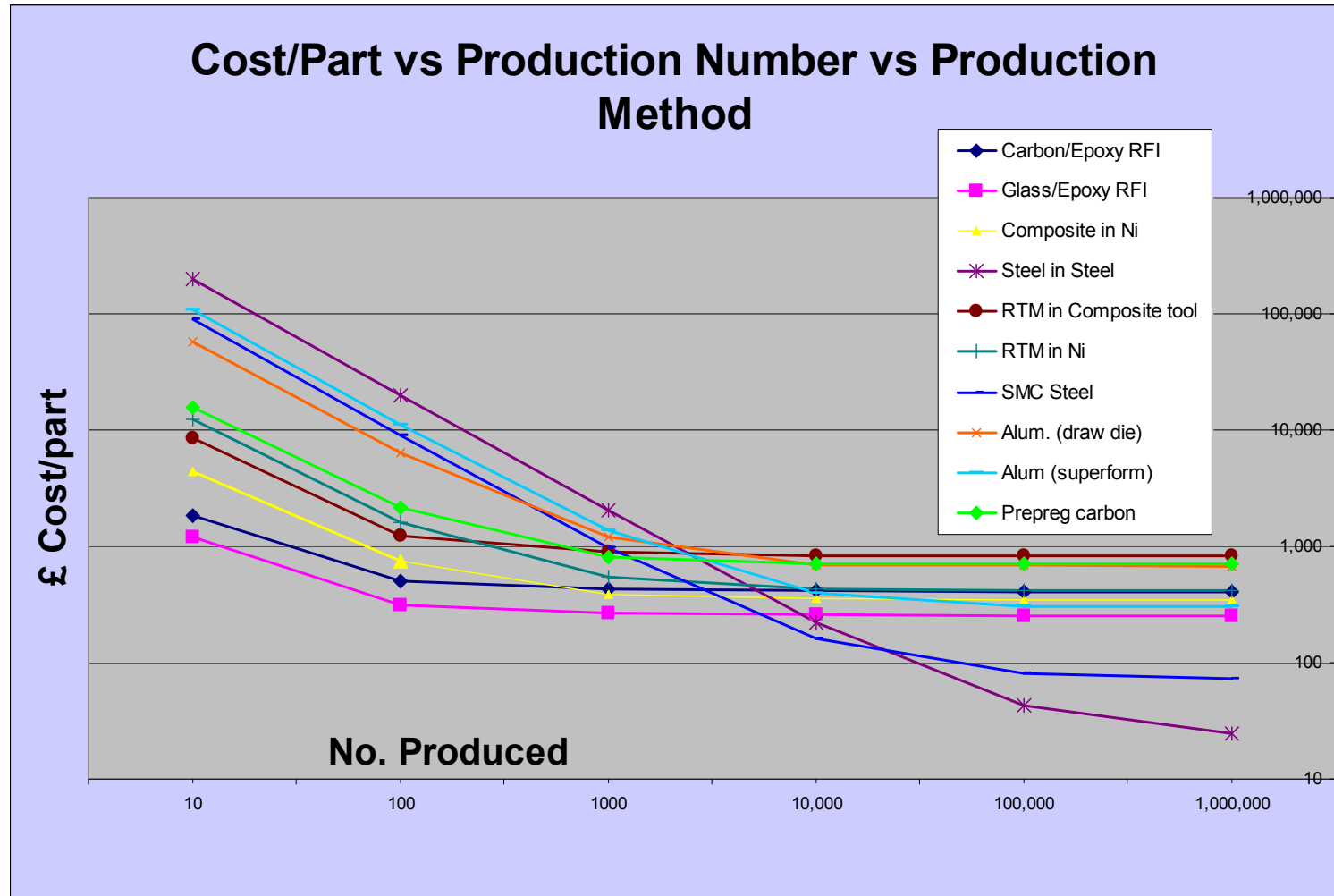
# Capital Cost vs Cycle Time



# Choice of Materials and Process



Raw material cost  
Carbon/Epoxy ↑  
Glass/Epoxy  
Aluminium  
Steel



# Changes in Skills

## Wet Lay-up

- Manual application of resin and fibre
- Quality of part is dependent on skill of operator
- High skills level developed over time (akin to plastering)

## Infusion

- Resin and fibre combined by process
- Quality of part is not solely dependent on skill of operator
- Design for manufacture skills needed to optimise process

# Skills Development Priorities

- New processes
  - Awareness
  - Implementation
- In-house design for manufacture
- In-house structural design and FEA
- Integration of composites and metallics
- Inspection QA/QC capabilities

# Training Provision Needs

- Local practical/hands on courses for transfer of best practice
- Supporting HEI courses for theoretical background
- In-house training logs to monitor on the job skills development
- National certification of courses



ncn

National Composites Network