

Plastics & Composites Performance : Cost

Outline

- Introduction
- BASF & Plastics
- What are the main mechanical properties?
- Plastics performance : cost
- Fillers – how they affect properties and cost in PP
- High performance fillers, e.g. glass fibres in PP, nylon and PBT
- Conclusions

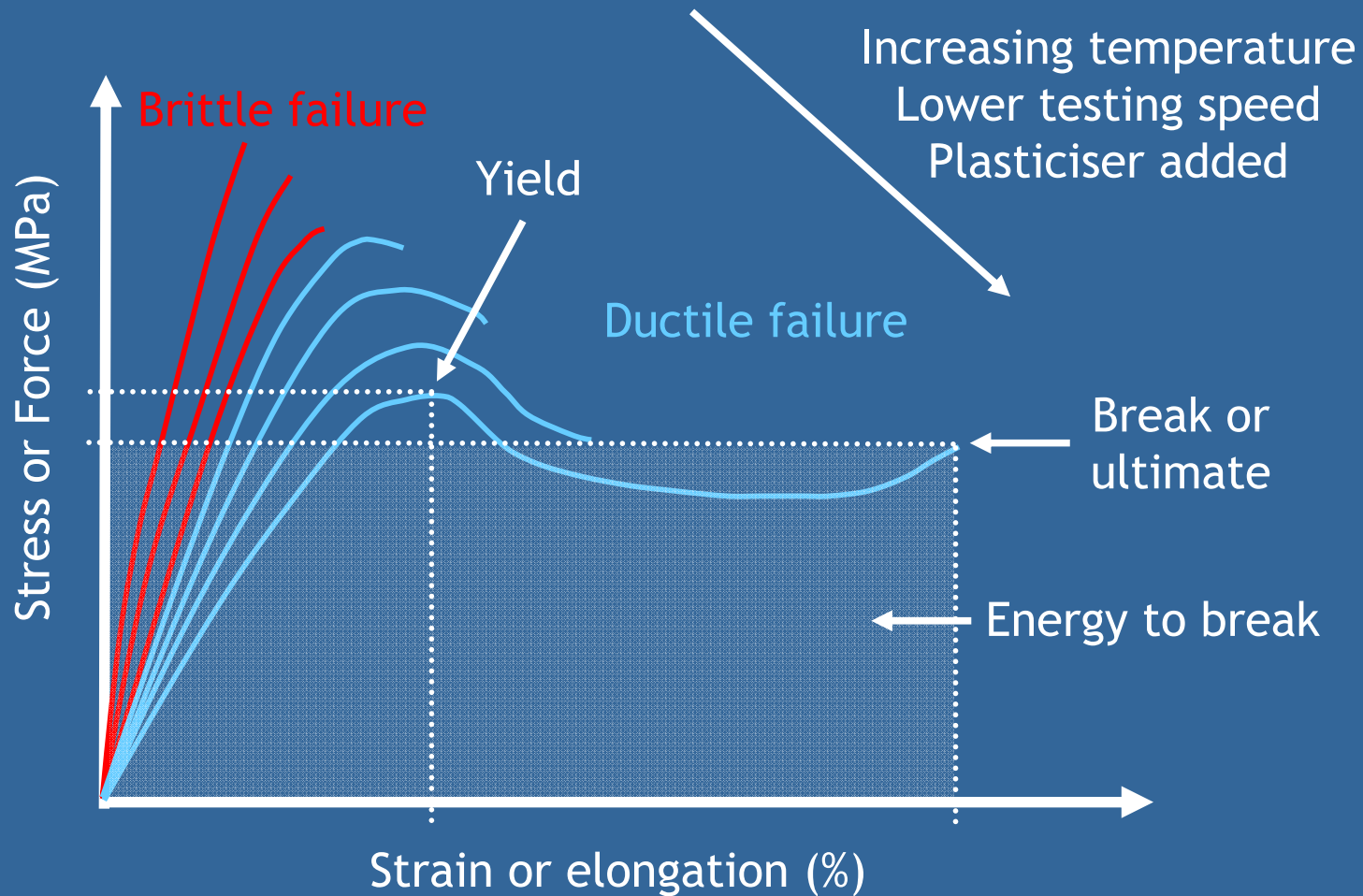
BASF & Plastics



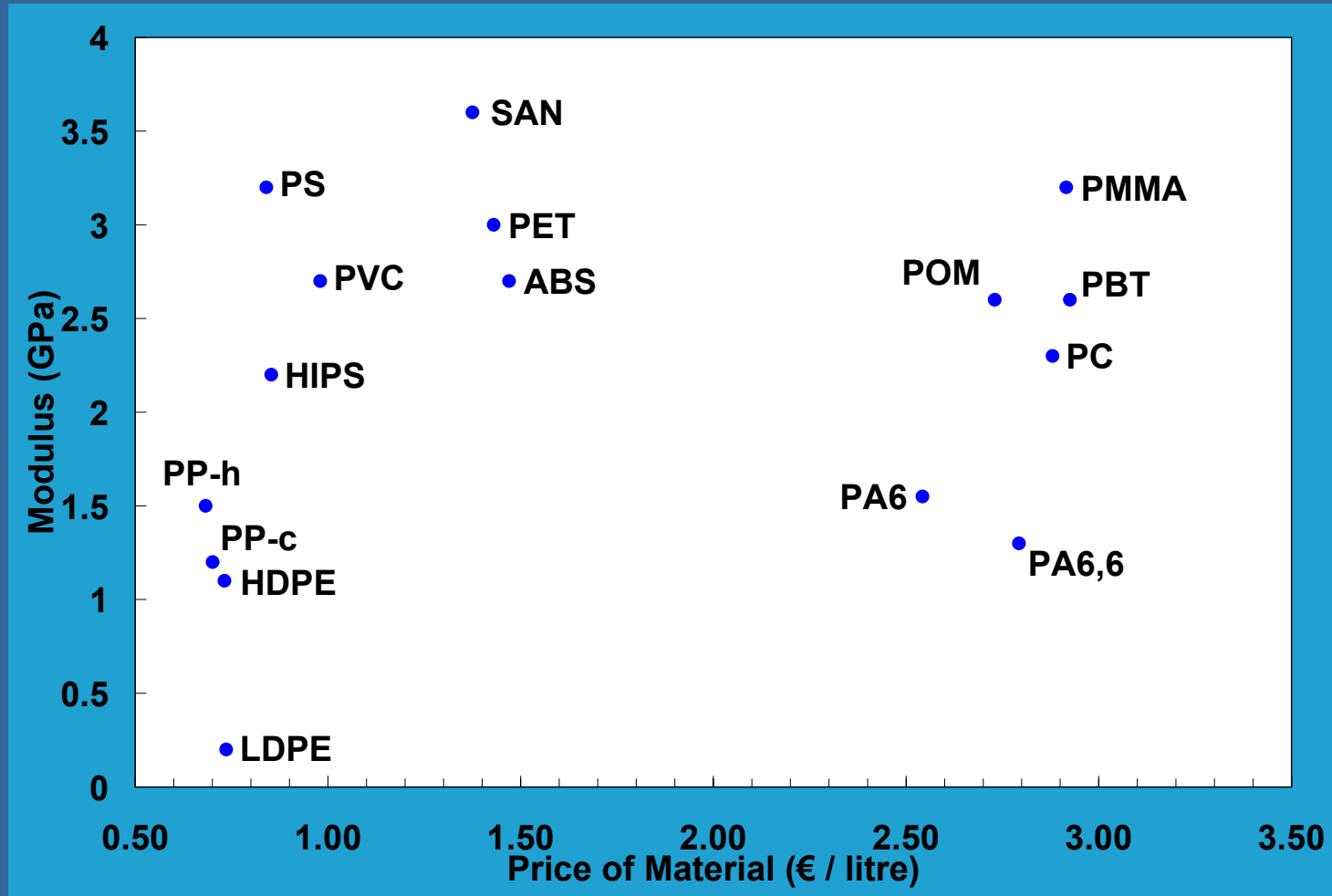
- BASF is the world's leading chemical company
- 87,000 employees
- Chemicals, Plastics, Performance Products, Agricultural Products & Nutrition, Oil & Gas
- Turnover 33.4 Billion Euros
- ~26 % of that is Plastics
- Plastics are: PS, HIPS, SAN, ABS, ASA, MABS, ABS/PA, SBS, PA6, PA6,6, POM, PBT, PSU, PES, PUR (PE, PP & PVC)

Plastics properties & price

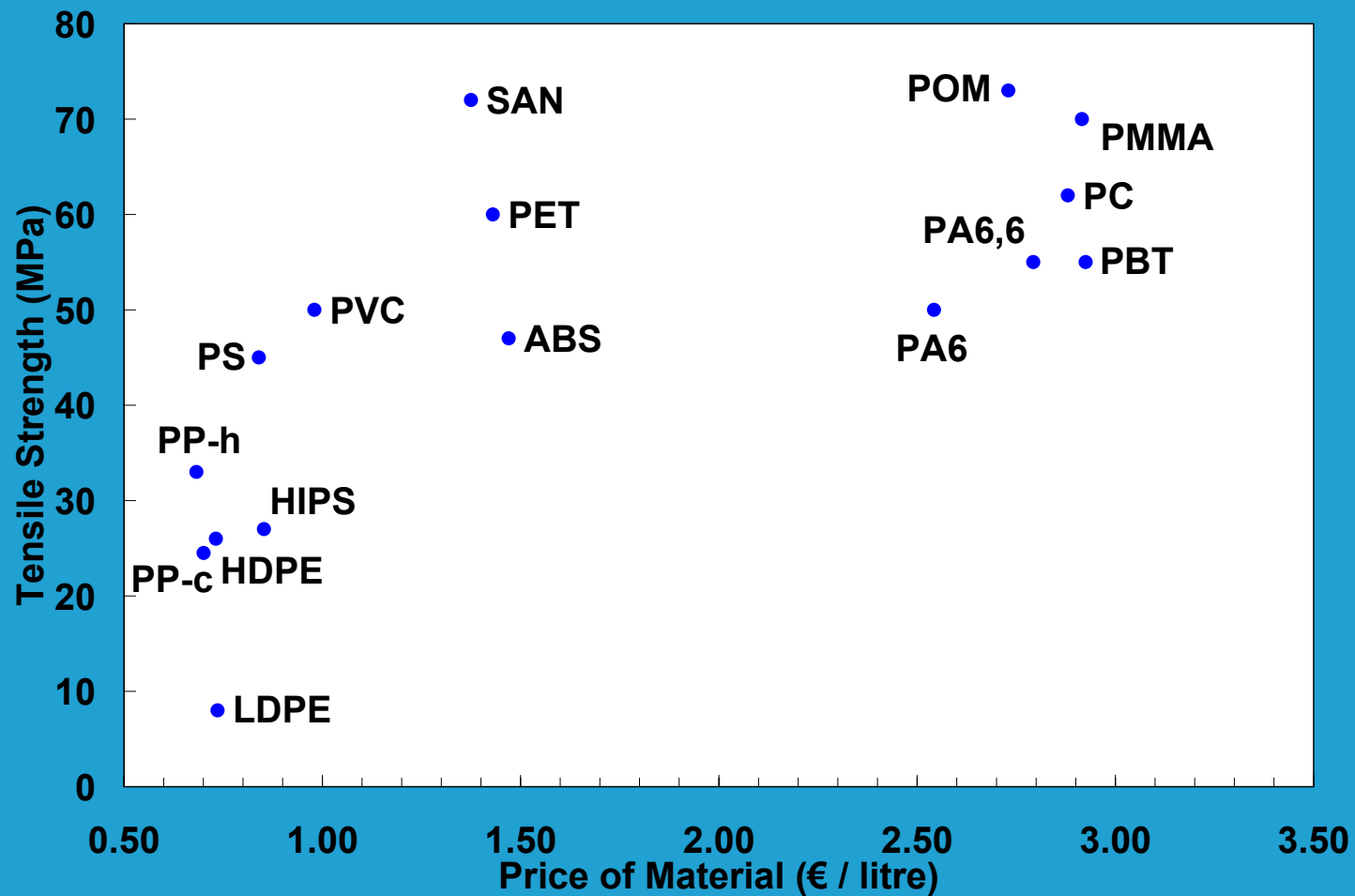
Tensile Testing



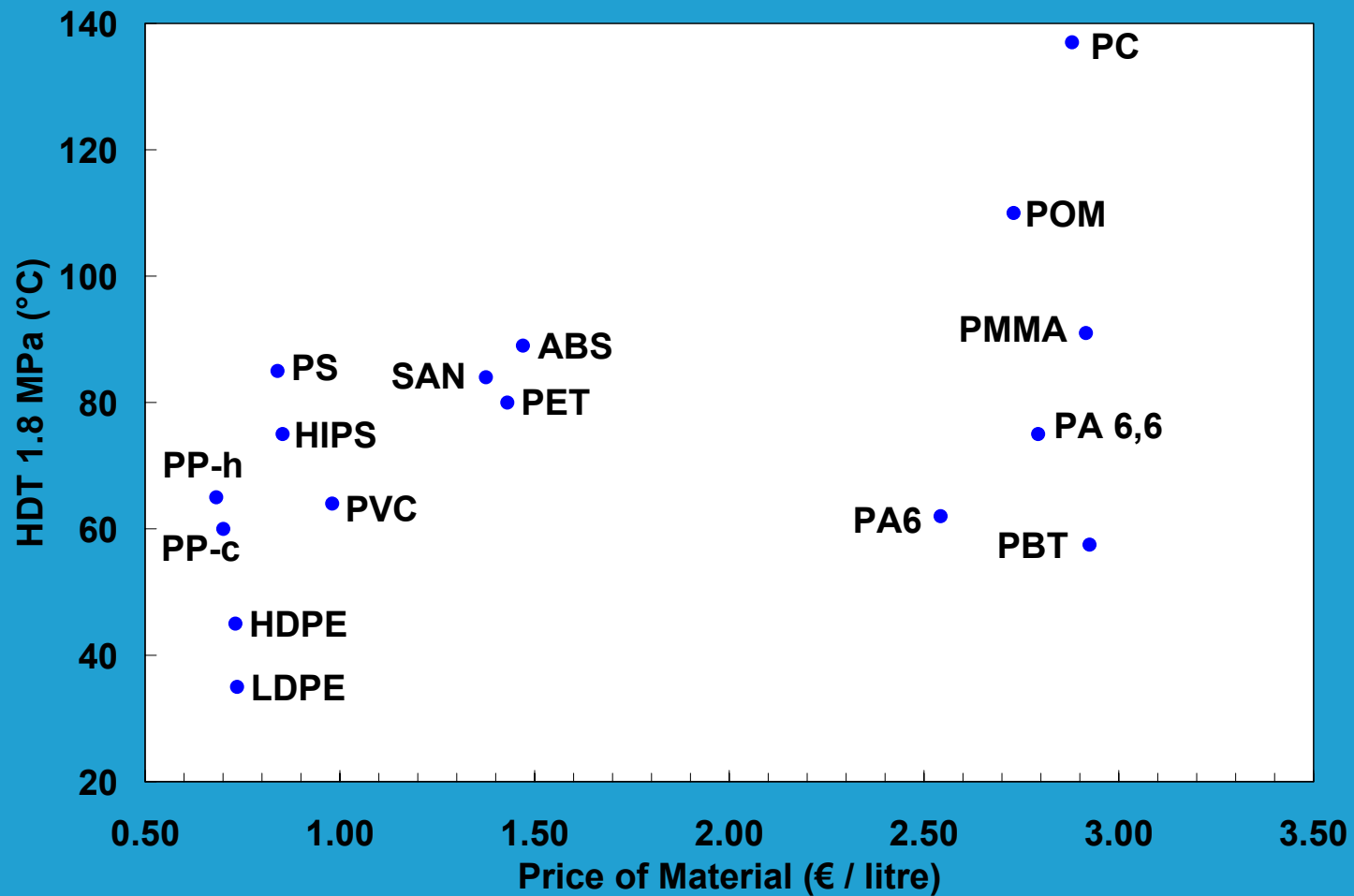
Modulus : Materials cost



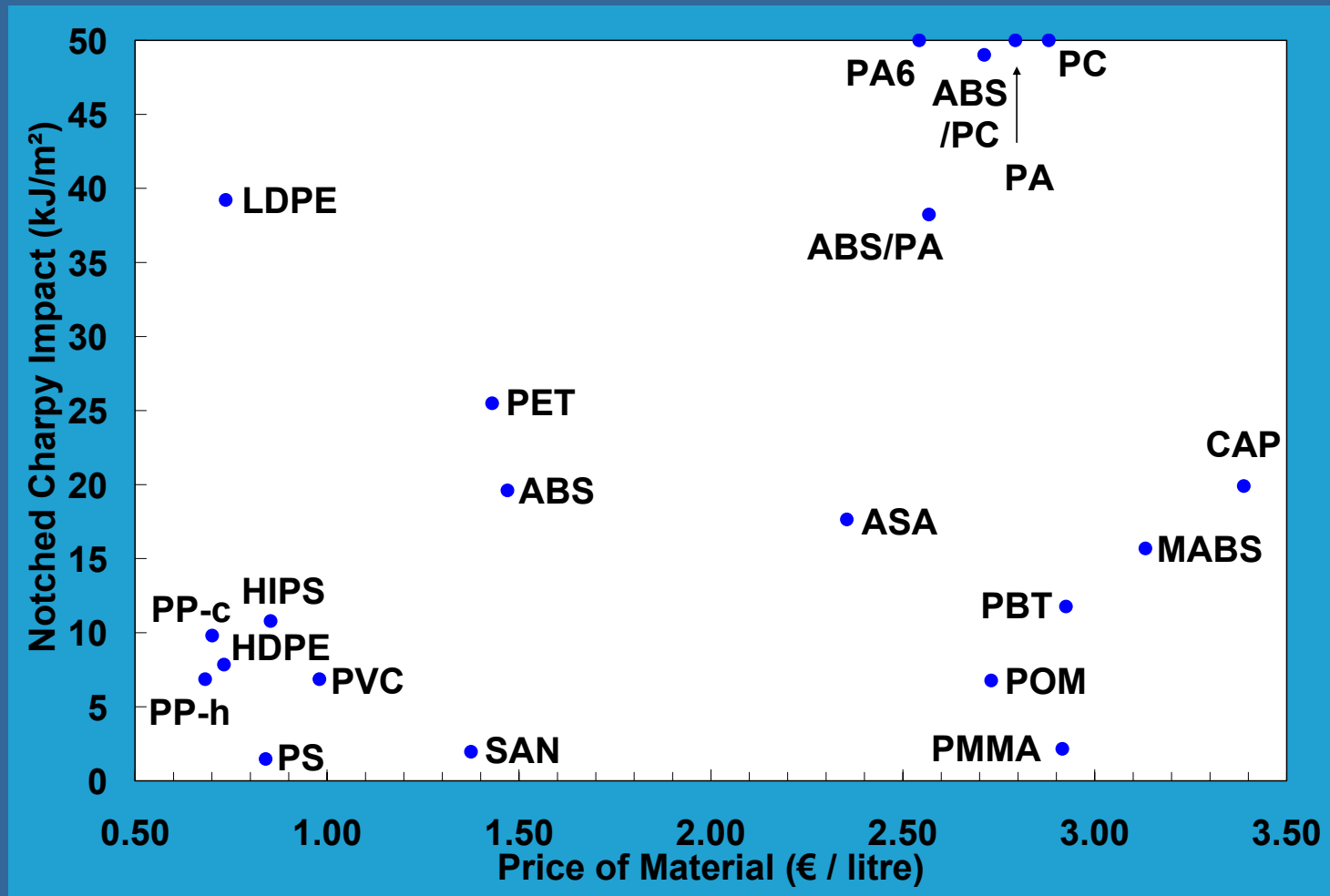
Strength : Materials cost



HDT : Materials cost



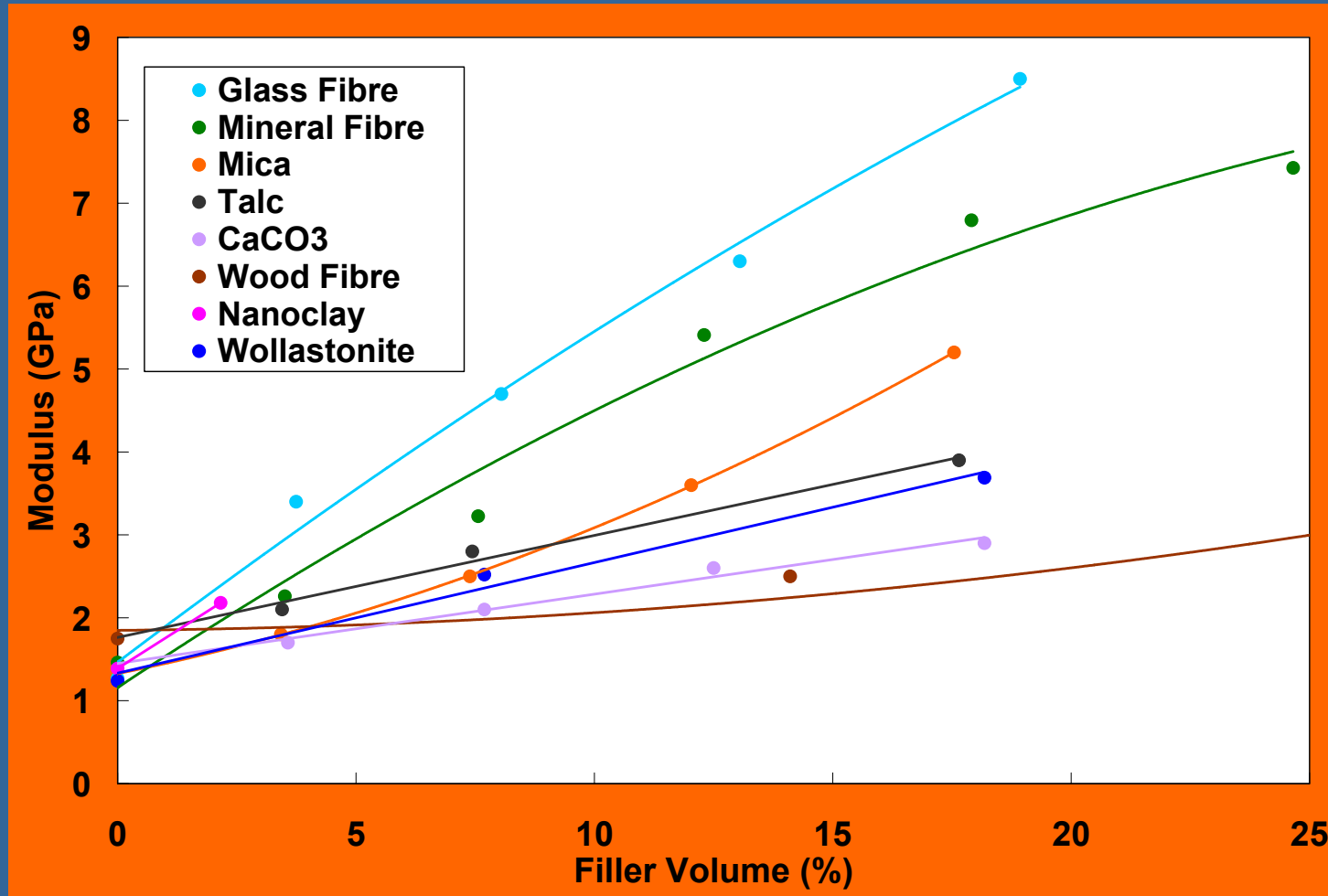
Impact : Materials cost



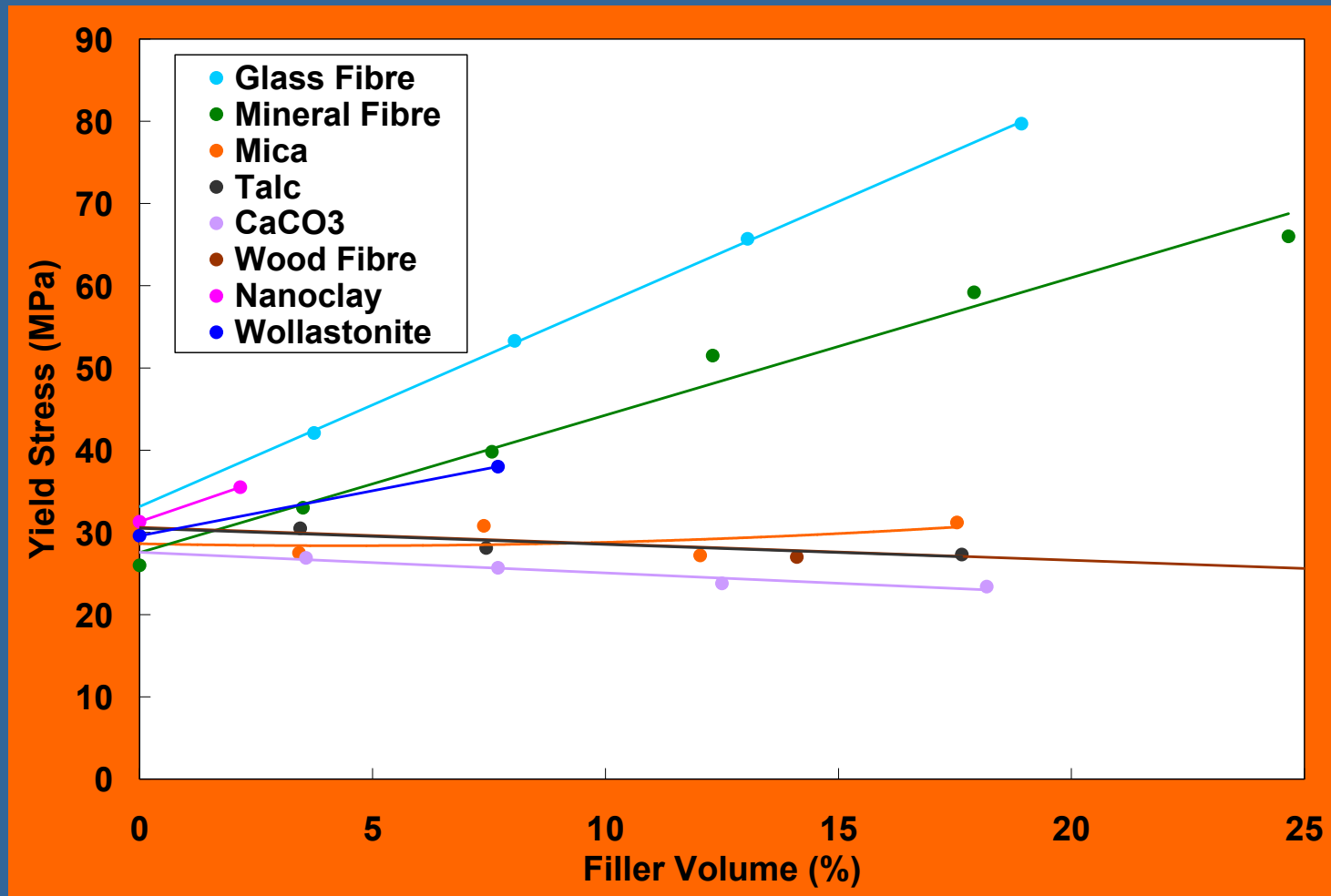
Fillers

effect on performance

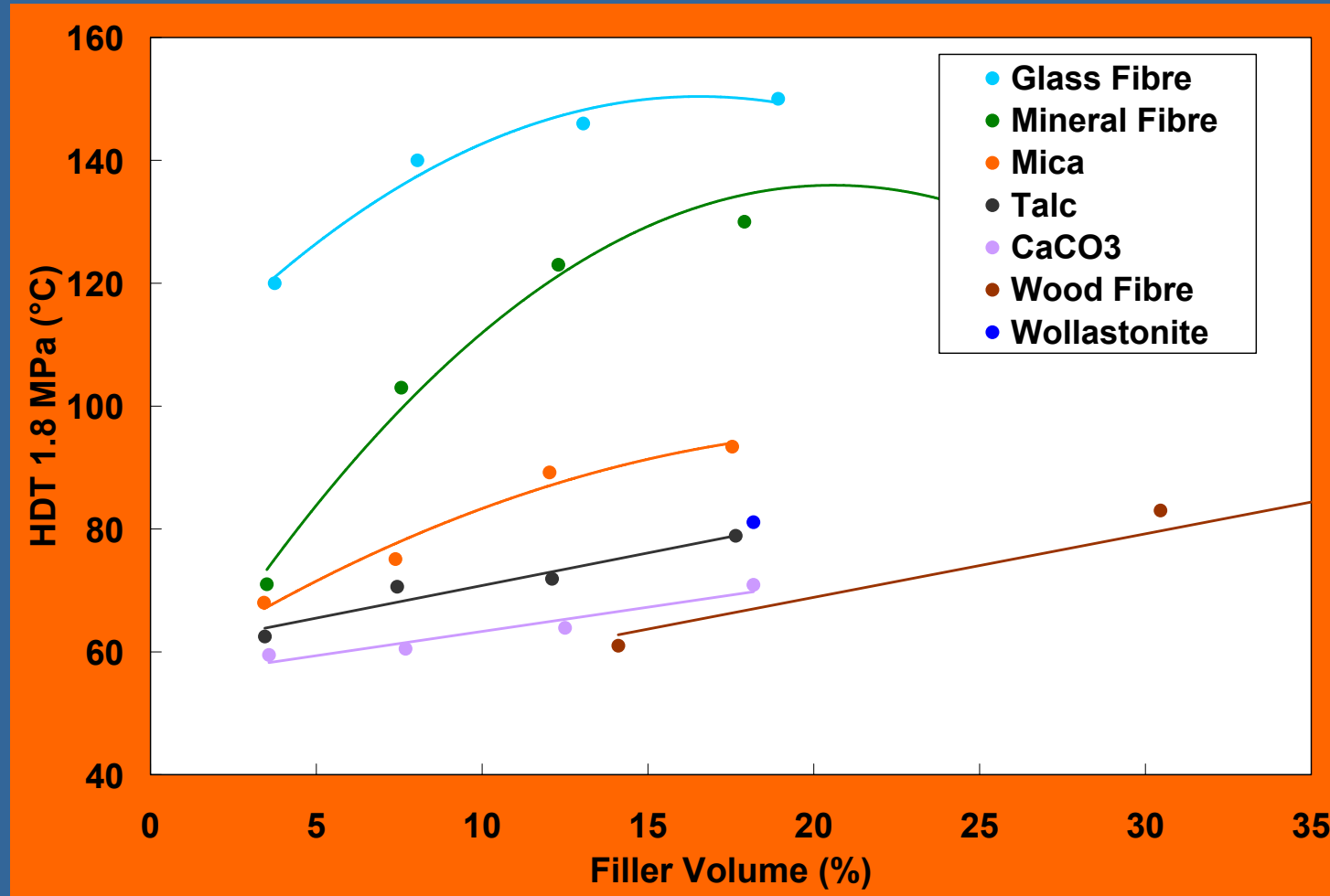
Modulus change with Fillers



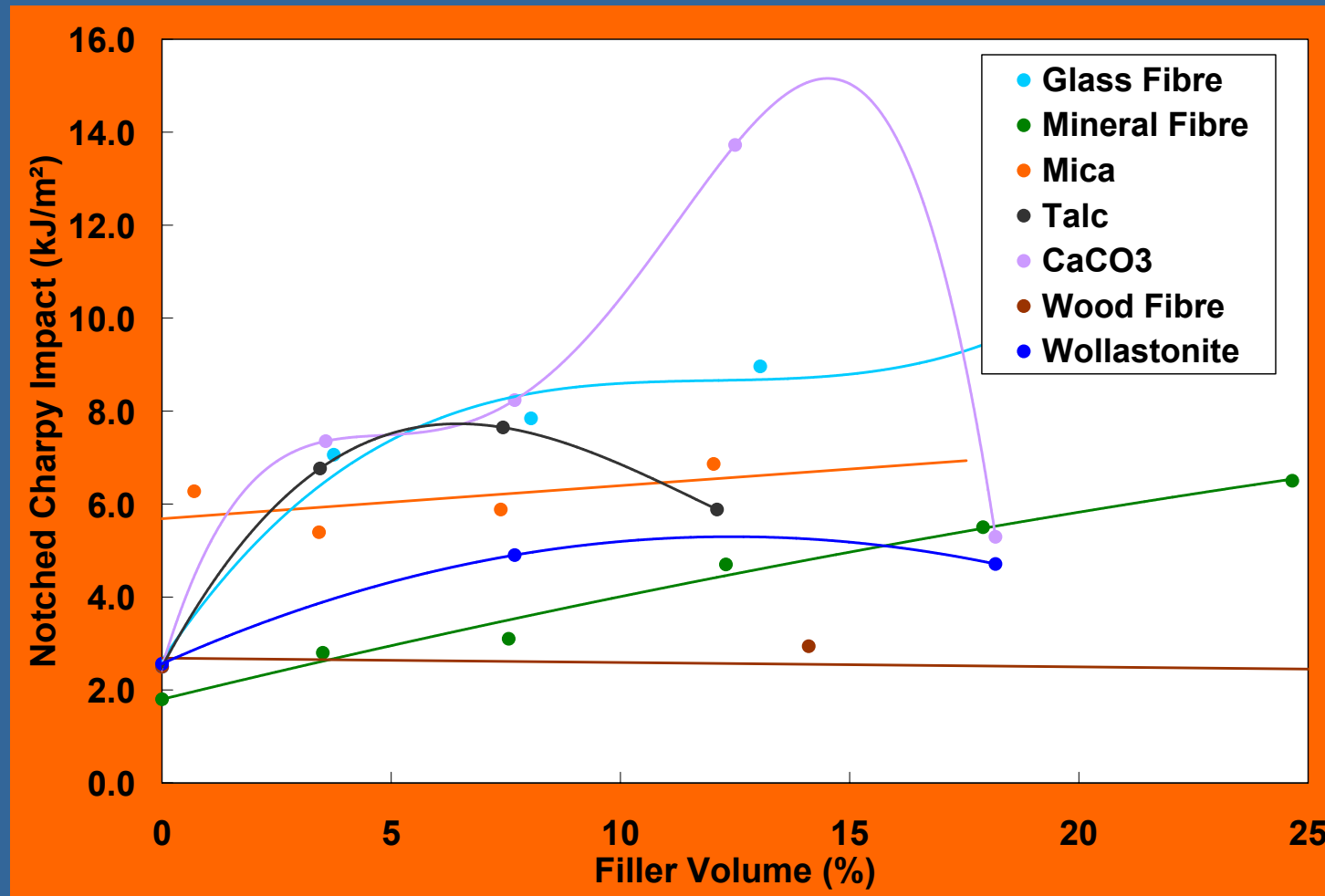
Strength change with Fillers



HDT change with Fillers

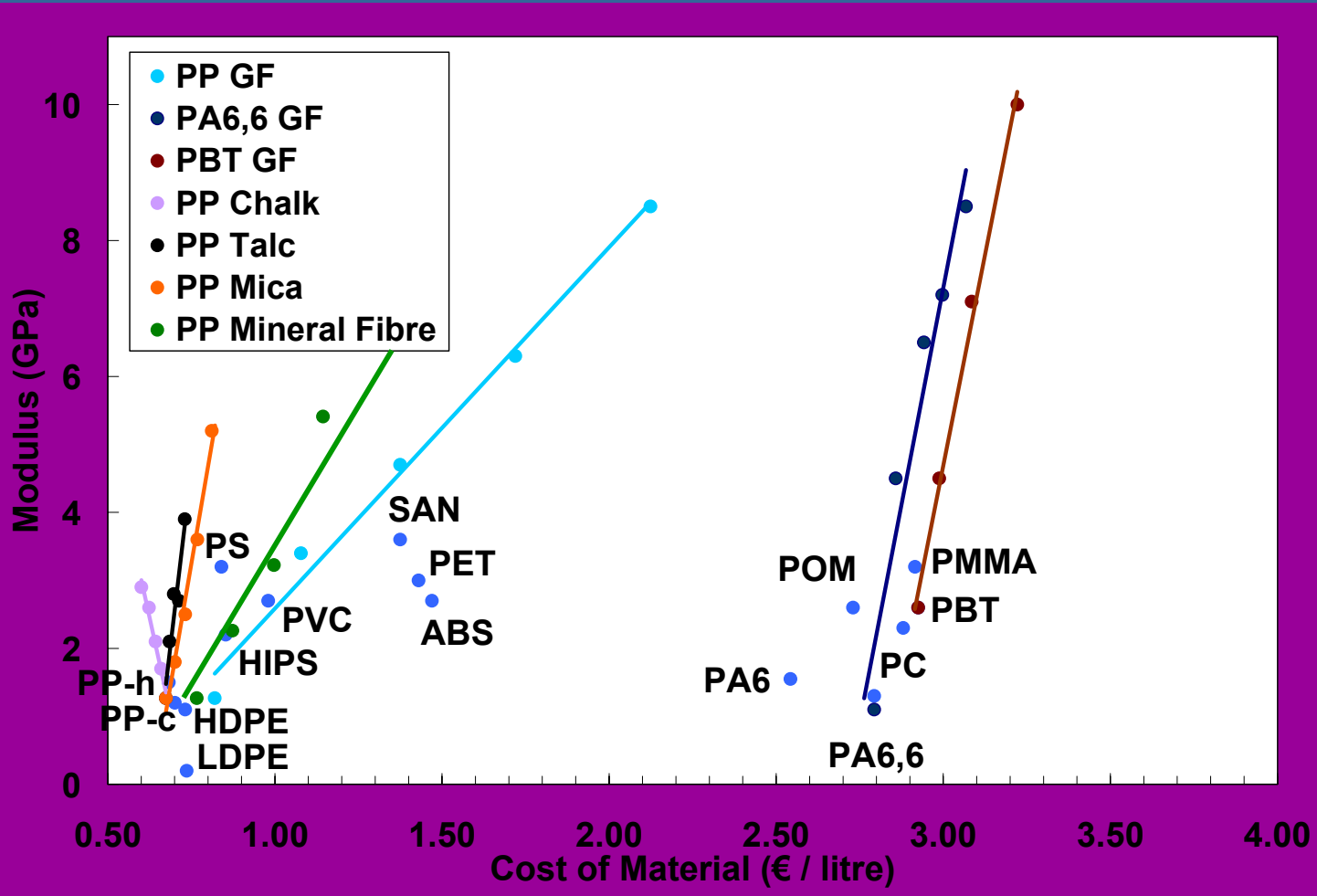


Impact change with Fillers



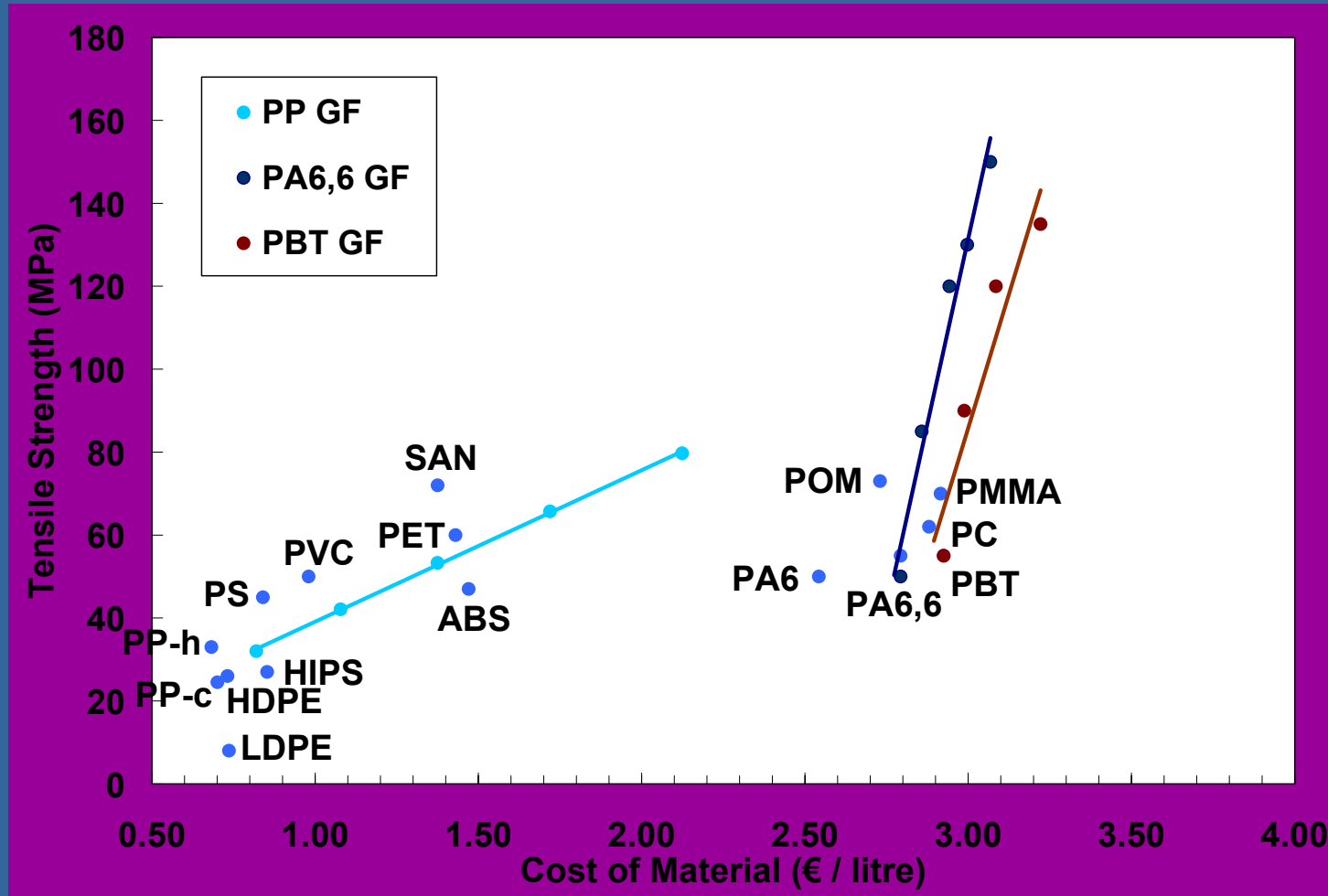
Plastics / composites cost

Composite versus Plastic Modulus & Cost



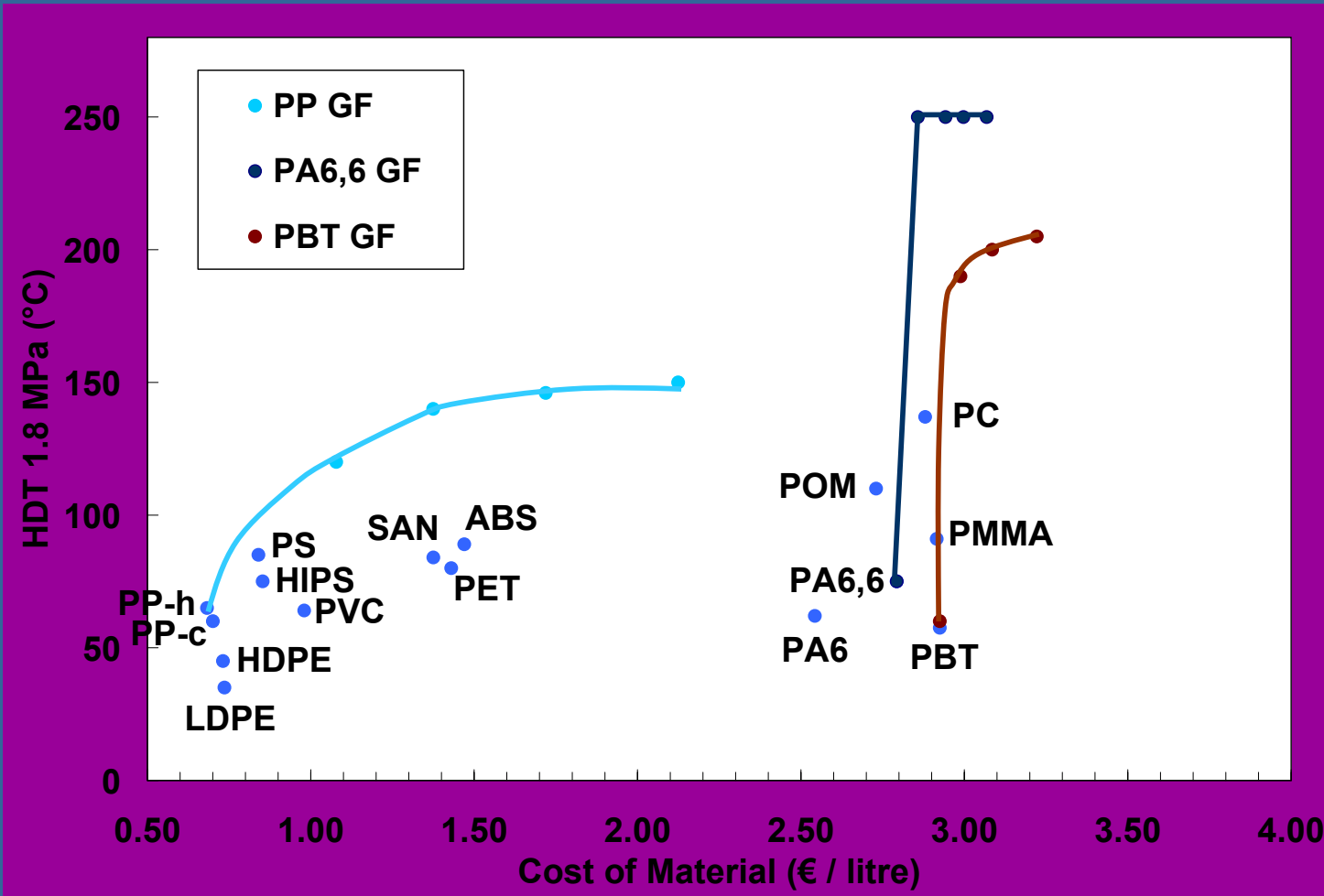
Composite versus Plastic

Tensile yield strength & Cost

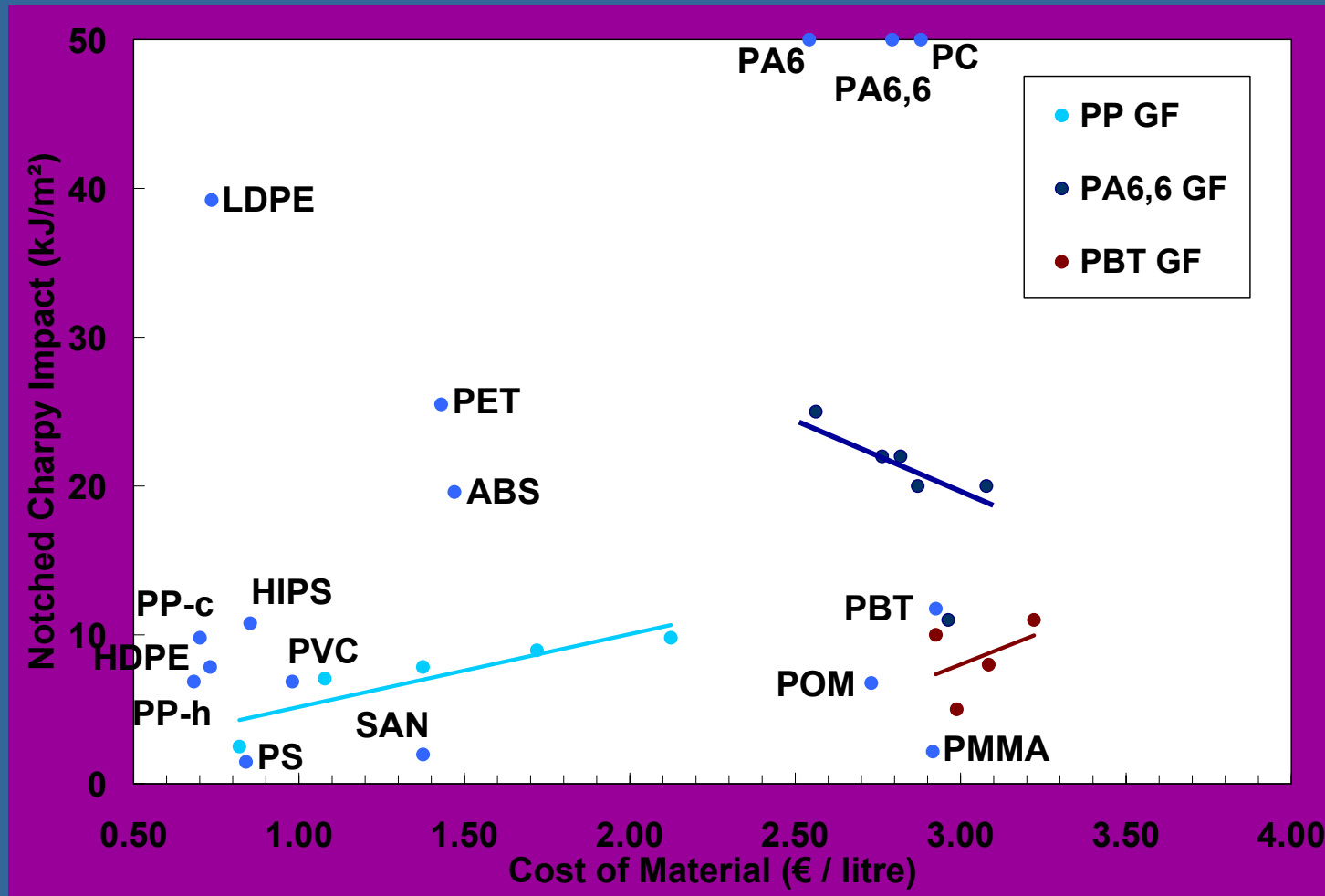


Composite versus Plastic

HDT & Cost

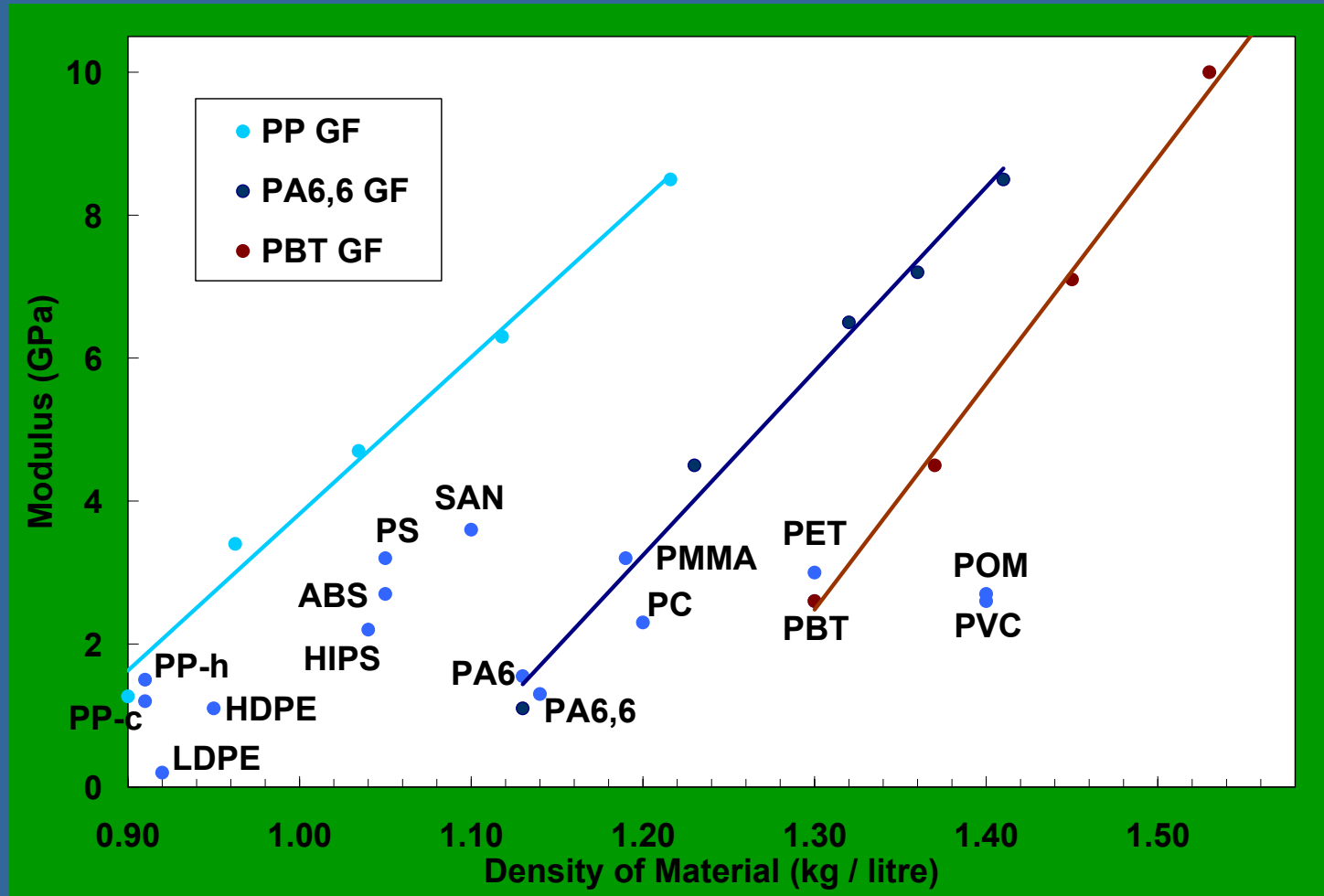


Composite versus Plastic Impact resistance & Cost



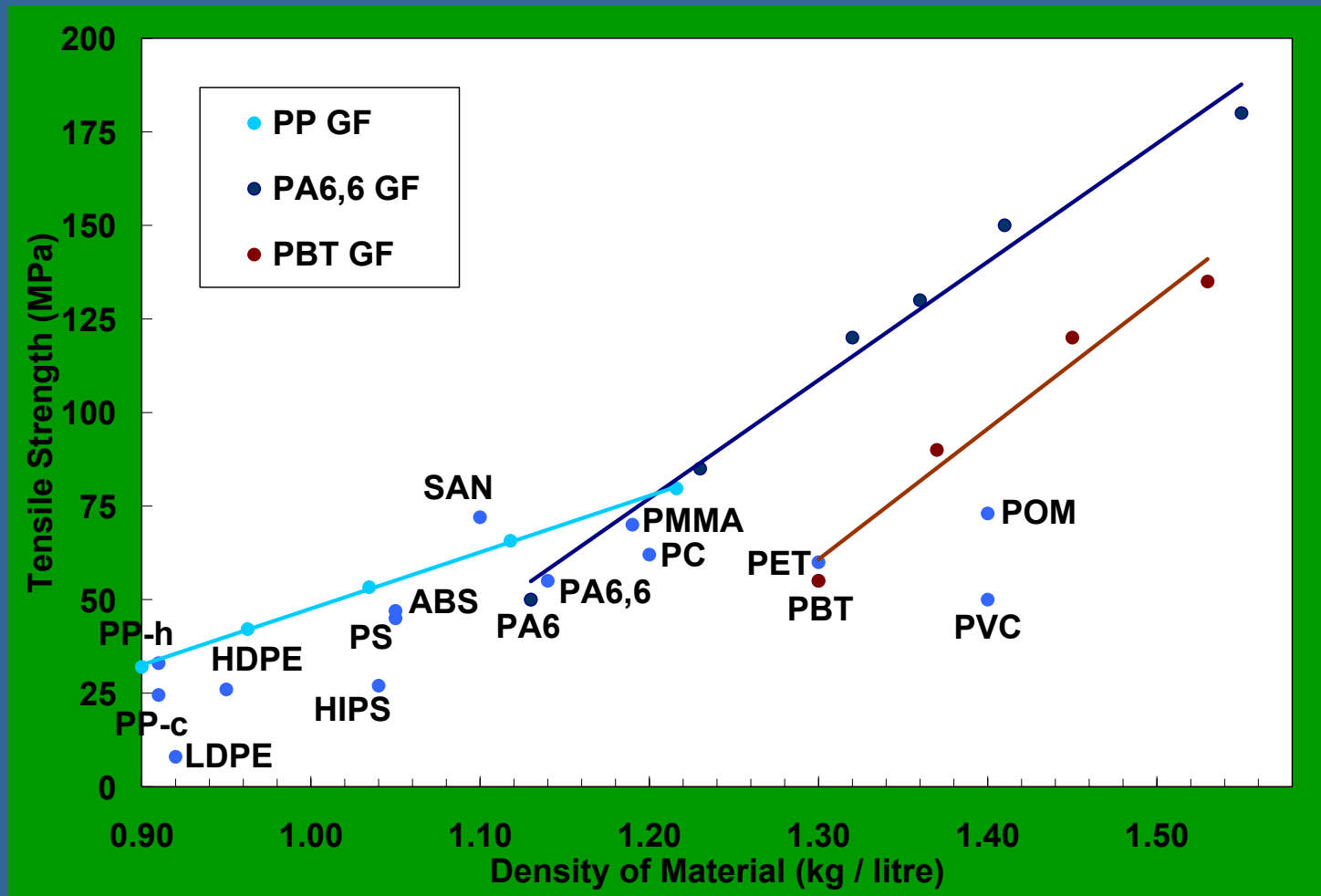
Plastics / composites density

Composite versus Plastic Modulus & Density

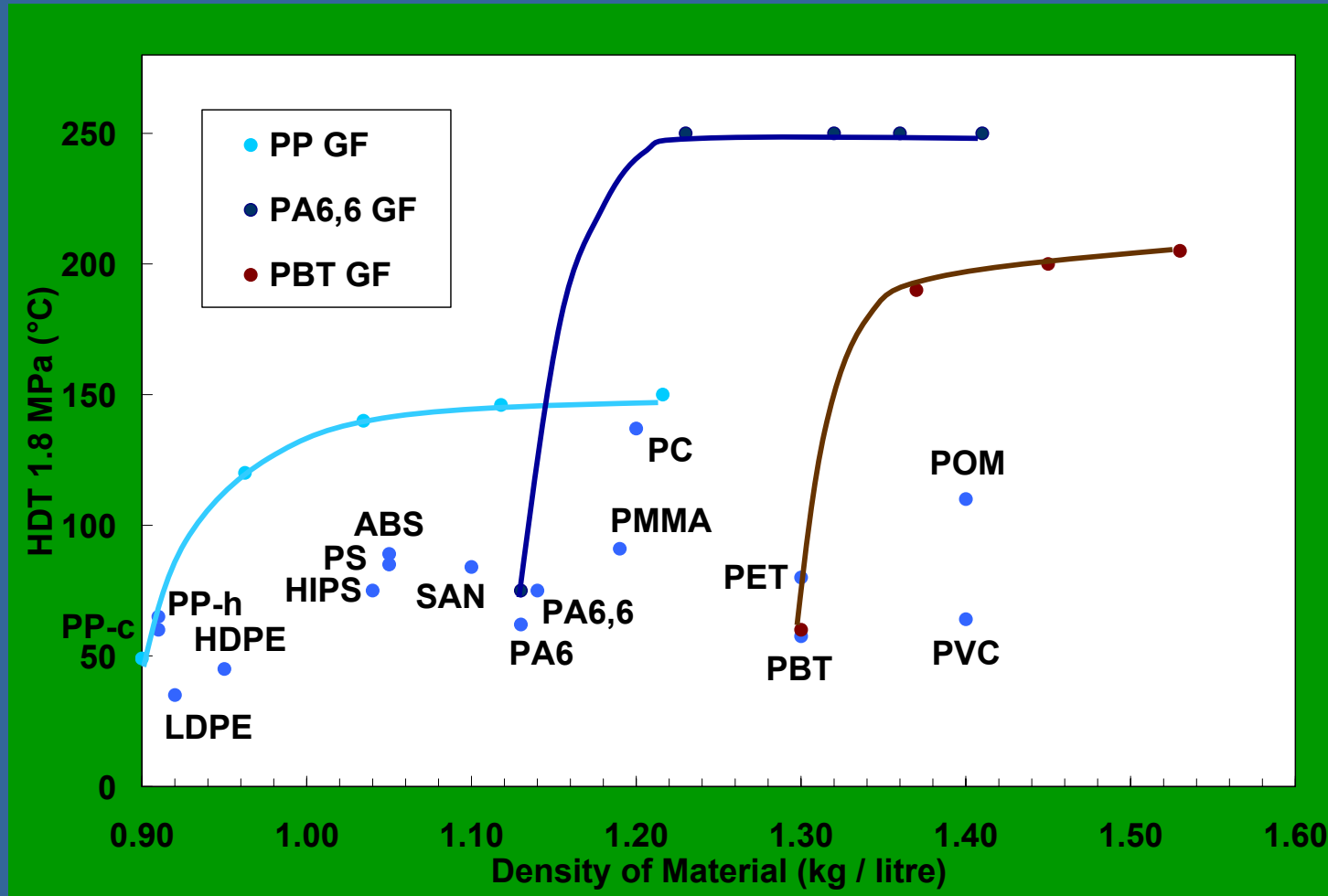


Composite versus Plastic

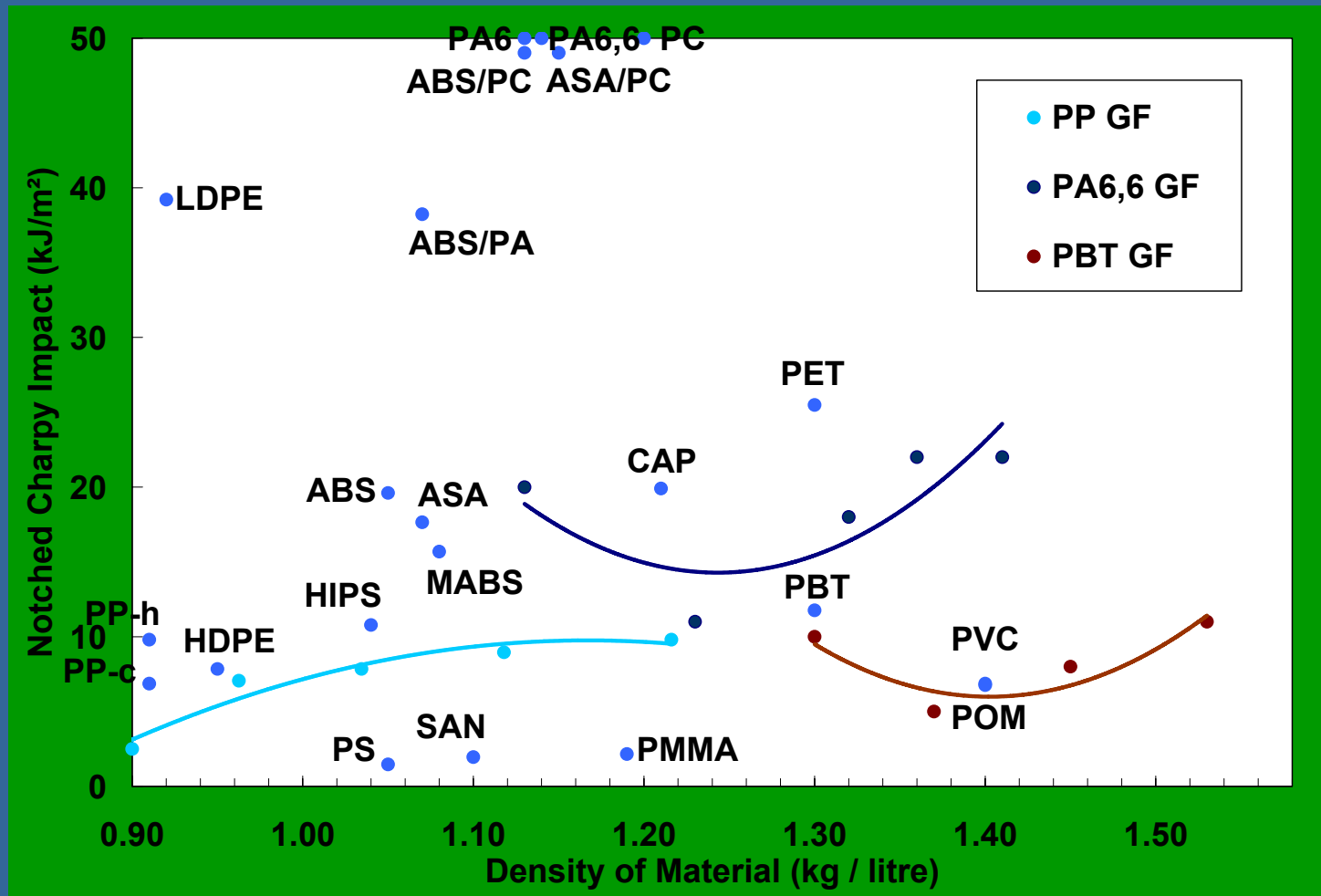
Tensile yield strength & Density



Composite versus Plastic HDT & Density



Composite versus Plastic Impact resistance & Density



Conclusions

- Main mechanical properties are modulus, strength, HDT and impact resistance
- Thermoplastics cover a wide range of performance and price
- Filler can be used to alter properties
- Fillers impart properties not attainable in the unfilled plastics
- Fillers give the best balance of performance and materials cost
- Fillers give the best performance for a given weight