

Timeline for Exploitation of Nanotechnology				
Type	Typical Example	Main Uses	Potential Realistic Hazards	Possible time scale to technology being realised
Simple Nanomaterials	Ultrafine particles Carbon nanotubes/ Nanocapsules Nanocoatings	Cosmetics Drug Delivery New Materials Wear resistance Data storage Active surfaces	Inhalation/dermal exposure risk Dust explosion	Some materials already in niche usage. Ultrafine particles have been a by-product of other standard industrial processes for some time. Mainstream usage within 5 years.
Structured Nanomaterials	Membranes Dendrimers Quantum wells and dots Photonic crystals	Dialysis Controlled drug delivery Textiles Communication	As above	Mainly theoretical at present some simple lab-scale demonstrations have been undertaken Likely first substantial industrial usage in 3-7 years
Complex or self assembling Nanomaterials	Modern composites Smart Materials	New Materials Electronic paper Molecular electronics Fuel cells	Above risks during manufacture but it is likely that final products will not pose any novel hazards.	Mainly theoretical at present some simple lab-scale demonstrations have been undertaken Likely first substantial industrial usage in 3-10 years starting in microelectronics Self assembly it systems 20+years

Timeline for Exploitation of Nanotechnology				
Type	Typical Example	Main Uses	Potential Realistic Hazards	Possible time scale to technology being realised
Simple active nano units	Novel Catalysts Actuators Sensors/Probes (linking to Lab on a chip)	Chemical Industry Electrical Devices Medical treatment/diagnosis Prosthetics	As above + If active units entered the body they could demonstrate characteristics similar to a biological venom.	Some simple lab-scale demonstrations have been undertaken. Industrial production of sub 100nm structures commenced in 2004 by chip manufacturers. Further units already in development. MEMS structured devices already in use. Fuel nanocatalyst already in commercial use. Likely wide spread usage in 5-15 years.
Advanced active nano units	Single atom/molecule manipulators/ assemblers Smart dust	Molecular assembly Directed medical interventions Surveillance	As above + If uncontrolled in the body they could demonstrate dose response characteristics similar to a biological venom.	Currently only theoretical. Likely first substantial industrial usage in 5-15 years
Semi or fully Autonomous nano devices 'Nanobots or Nanites' Possibly self-replicating.	Active production units.	Autonomous medical interventions Military Manufacturing	As all above + Potential biological effects or damage to material from 'escaped' units. If self replicating – could act as a biological pathogen and the 'grey goo' scenario is	Currently a theoretical possibility only. If such technology is realised we are unlikely to see substantial industrial usage for at least 20-30 years

Timeline for Exploitation of Nanotechnology				
Type	Typical Example	Main Uses	Potential Realistic Hazards	Possible time scale to technology being realised
			theoretically possible.	
<p>Composed using information from various published sources including: TA-SWISS study TA 47/2003 'Nanotechnologie in der Medizin' DTI sponsored 'NanoBiotechnology/BioNanotechnology – International Technology Service Mission to Japan' July 2002 Greenpeace Environmental Trust 'Future Technologies, Today's Choices' July 2003 EPSRC Briefing note 4. Oct 2002 'Nanotechnology' Proceedings from the Royal Society meeting 'Views of scientists and engineers' 2003 Table drafted 2004</p>				