12. Secondary industry

Figure 1: The industrial sectors

Industrial sector	Definition	Example
PRIMARY	The extraction of raw materials from the ground and sea	mining, fishing, oil drill, forestry
SECONDARY	Processing of raw materials and manufactured goods	metallurgy, machine engineering, electronics
TERTIARY	Provision of services	stores, shops, transport, car hires,
QUATERNARY	Provision of information and administrative services	leasing, IT, real estates, financial services

Secondary industry = manufacturing (processing) industry => changes raw materials into products of more value, e.g. iron ore to steel, steel to motor vehicles

- *Mechanised factories* (production)
  - heavy industry
  - light industry
- *Craft industries* – hand skills, e.g. weaving, pottery, carpentry

Processing industry (Mid-technology industry) = SECONDARY

- *Heavy industry*
  - Power industry
  - Metallurgy/Smelting industry
  - Machine engineering (e.g. car industry)
  - Chemical industry
  - Armament industry (production)
- *Light industry*
  - Textile industry
  - Food processing industry
  - Printing industry
  - Leather industry
  - Paper and pulp (cellulose) industry
- *High-technology industry (machines)*
  - electronics and micro/nanotechnologies (e.g. medical appliances)
  - rocketry (e.g. components and modules for spaceship construction)
  - biotechnologies (e.g. improving crops to gain more harvest)

Heavy industry

Features: large-scale in operation, bulky products heavily dependent on their raw materials => located close to the source of their raw materials, e.g. iron and steel industry

Iron and steel industry

3 main iron and steel producing areas in the world:

1. Europe
2. Japan
3. USA

Former USSR (today Russia and CIS) produce the most iron and steel (>20% of total world production). Other important EU countries = D, I, F, GB. Countries becoming increasingly important = China, India, Brazil, South Korea

World´s pig iron production (millions of tonnes): former USSR 110, EU 80 (D 30, F 14, GB 12, I 12), Japan 80, China 62, USA 50, Brazil 23

Light industry
Features: small-scale in operation, deal in lighter, compact products, not dependent on raw materials, accessibility = most important factor, e.g. electronics

High-technology and knowledge-based industries
High-technology often refers to microelectronics but microelectronics assembly plant may be relatively low-technology and low value is added => knowledge-based industries.
Features: high inputs of scientific research and development (R&D), innovative and technologically advanced products, strong interactions between large multinational corporations (transnational corporations – TNCs) and smaller, brain-intensive enterprises, highly qualified labour (workforce) => professional engineers and scientists.
Best locations have:

- well-developed communications networks (IT, telecomm, fast links to urban areas),
- good scientific infrastructure (networking between similar firms and individuals),
- access to a skilled and educated workforce (links with universities),
- advanced markets for business and information services,
- pleasant natural environment.

These locations of knowledge-based industries = *science parks, business parks, industrial estates*, e.g. Silicon valley in the US (California)
Examples of high-tech industries:

- *electronic equipment* – computers, telecommunicators, industrial control systems, testing and measuring equipment, office equipment, aerospace and military equipment, incorporation in consumer products (cars, washing machines, ovens, etc.)
- *consumer electronics* – TV, radio, VCR, hi-fi (tuners, amplifiers), calculators, electronic games, mobile phones, etc.

Deindustrialization = decline in manufacturing industries and the growth of tertiary and quaternary ⇔

- machinery replaced people in most manufacturing industries
- competition from countries abroad producing manufactured products at much cheaper prices
- highly qualified people preferring jobs in tertiary and quaternary

Reindustrialization = a new phase of qrowth in manufacturing industry
Labour productivity = output per person

Keywords:
heavy/light/high-tech industry, pig iron, biotechnologies, research and development, deindustrialization, reindustrialisation, labour productivity, skilled workforce, science parks, consumer electronics