ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Using sensor networks to address global issues: Policy opportunities and challenges

Session 2:

Protection of the environment

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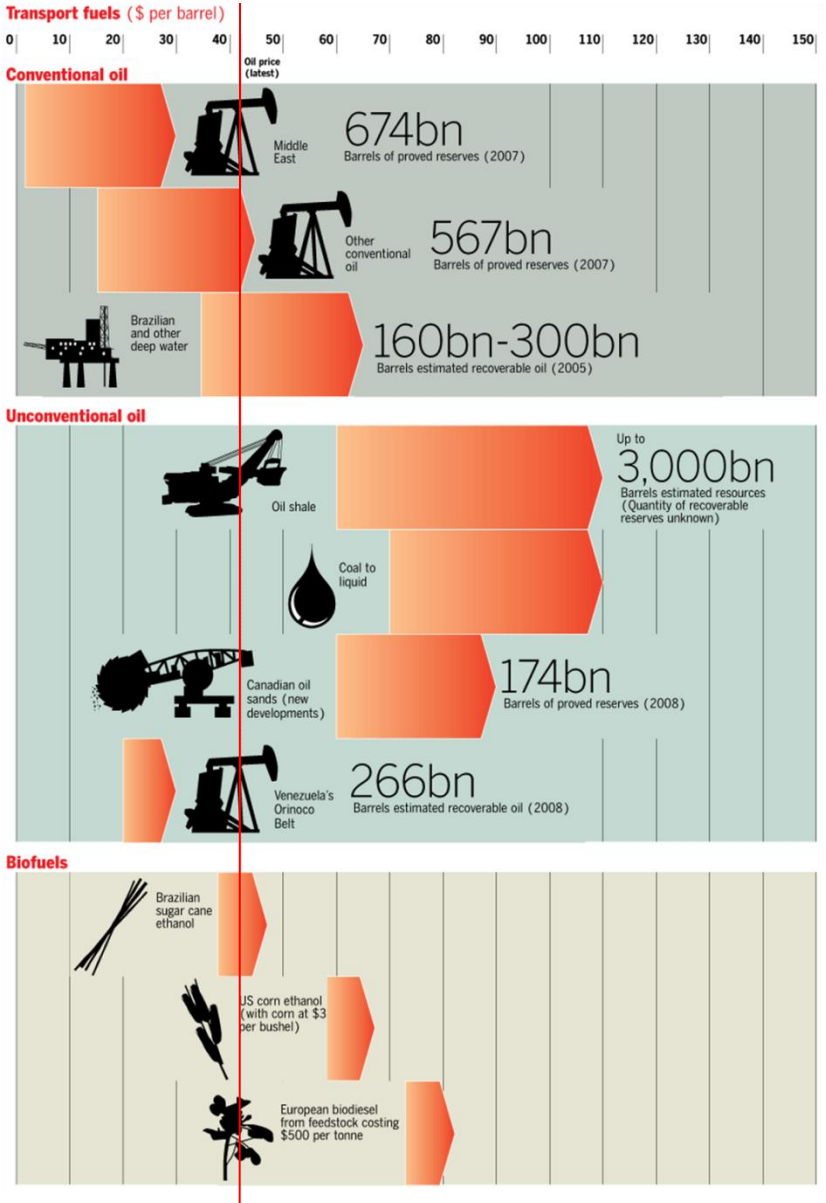
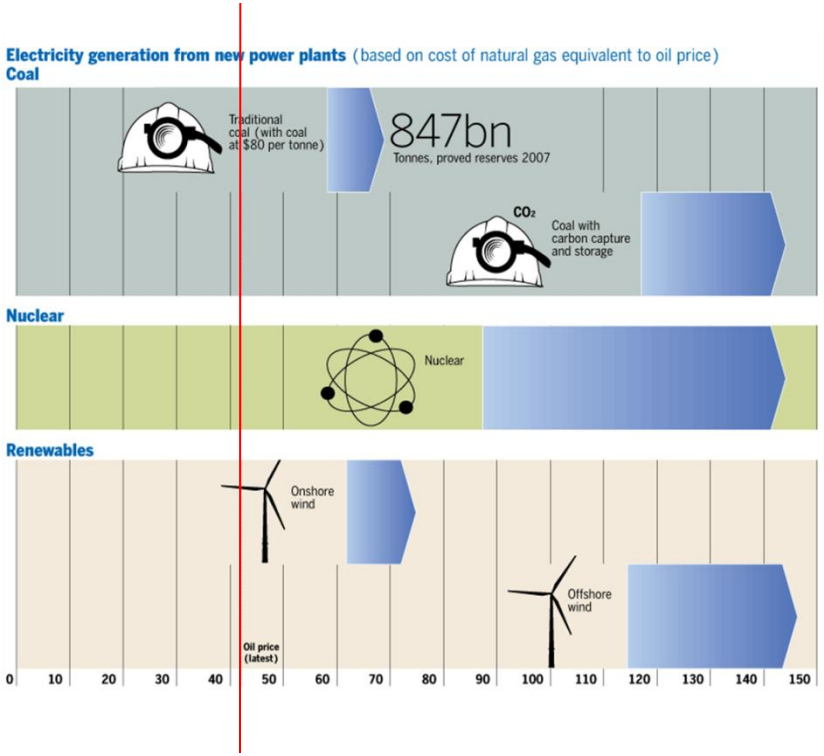
The challenge: break even of energy sources at current oil prices





—— : Oil price December 2008

Width of the bars: The range of variation in costs

Sources: Cambridge Energy Research Associates; IHS Herold; International Energy Agency; Wood Mackenzie; industry estimates; FT calculations

Crooks (2008), Over a barrel, Financial Times, 21 December.

Framing opportunities and challenges

- **Rationale: Using sensors to improve environment**
  - Climate change/global warming, energy use / energy efficiency, non-energy resource depletion, land use, water use, biodiversity.
- **Coverage:** Activities over the value chain. Life cycle analysis / holistic approach to look at all benefits / costs Behavioural change. Beware of rebound effects.
- **Positioning:** Technology push. Little discussion of technology potential <-> commercial / public applications <-> user /social / economic acceptance.
- **Heterogeneity:** Diversity of applications
  - Environmental monitoring, precision agriculture, industrial applications, housing, transport, smart metering , smart grids. Thousands of different applications.

Readiness and deployment / 1

- **Maturity? Depends on the field**
  - Market failures / underinvestment -- benefits accrue to all, costs borne by few (public goods)
  - Getting “prices right” -- innovation and commercialisation
  - In economic crisis carbon prices are below real cost
  - Government action to substitute / complement price signals, and / or support trials / demonstrations
- **Examples**
  - Public goods where governments intervene (e.g. research / development to monitor and rectify habitats, oceans, water)
  - vs. commercial scalable operations (industrial applications for efficiency, equipment health, “smart” buildings)

Readiness and deployment / 2

- **Markets / drivers / barriers**
  - Some applications scalable, commercial business models, positive benefit/cost
- **“End-to-end” applications**
  - Costs and benefits clearly aligned in business models
  - Not developed in absence of markets; little potential for economies of scale/affordability in components or equipment
- **Data management**
  - Large quantities of sensor data. Bandwidth issues e.g. video
- **Data format standards**
  - Interoperability / compatibility. IP networks what stage?
- **Sensor power issues**
- **Compliance and privacy.** Mission-critical reliability.

Government role

- **Market failures and public goods**
  - Support basic long-term infrastructure
  - R&D, education and training, physical infrastructure (US)
- **Getting prices right and turning taxes into incentives**
- **Strong forward-looking outcomes-based regulation**
  - Reduce CO_2 by X, improve energy efficiency by Y, improve water quality by Z. Remove subsidisation of “wrong” things.
- **Leading by example**
  - Funding development of public goods infrastructure etc.
  - Performance/outcomes-based public procurement
  - Governments as early adopters
- **Privacy.** (“Smart” system applications)
- **Interoperability / open source**