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► High Tech: Low Carbon

The role of technology in tackling climate change

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▶ **Problems for the ICT sector**

1. **Sector issues:**

   Efficiency vs. proliferation, peripheral energy use, standby and rapid obsolescence

2. **Transient issues:**

   Uncertainty, transitional technologies and legacy issues

3. **External issues:**

   Procurement, user behaviour and carbon accountability

4. **and…Timing**

► **Problems – I**
Within our control, and which we are acting to address

Efficiency vs. proliferation	Dramatic efficiency improvements are needed to counteract growth
Peripheral energy use	Small fraction of energy demand is actually used for core functions, eg data centres
Standby	Exacerbated by proliferation. Education as well as reduction needed. A red herring?
Rapid obsolescence	Frequent upgrade cycles increase life cycle energy demand – and are particularly prevalent in this sector

▶ Problems II
The inevitable side effects of rapid technological development, and will be resolved over time.

Uncertainty	We can't always predict the effects of disruptive technologies, because they change behaviours – e.g.texts
Transitional Technologies	Technology in transitional phases can use more energy – eg UK digital switchover will result in the duplication of equipment as people buy set top boxes to adapt their TVs
Legacy Issues	Whilst ICT manufacturers are producing better, more efficient equipment, the majority of stock in use will not be in this category

► **Problems III**

# External, over which we have limited influence

| Procurement	Procurement often fails to take account of life cycle aspects or green credentials. Those responsible for procurement are unlikely to pay the electricity bills.
User Behaviour	Devices are often left on, efficiency gains are often negated by "the upgrade cycle"
Carbon accountability	The lack of a true market for Carbon. A price for carbon would provide the incentive to invest in efficiency
Policy	Sarbanes Oxley requires data to be held online for years.

► **Problems IV**
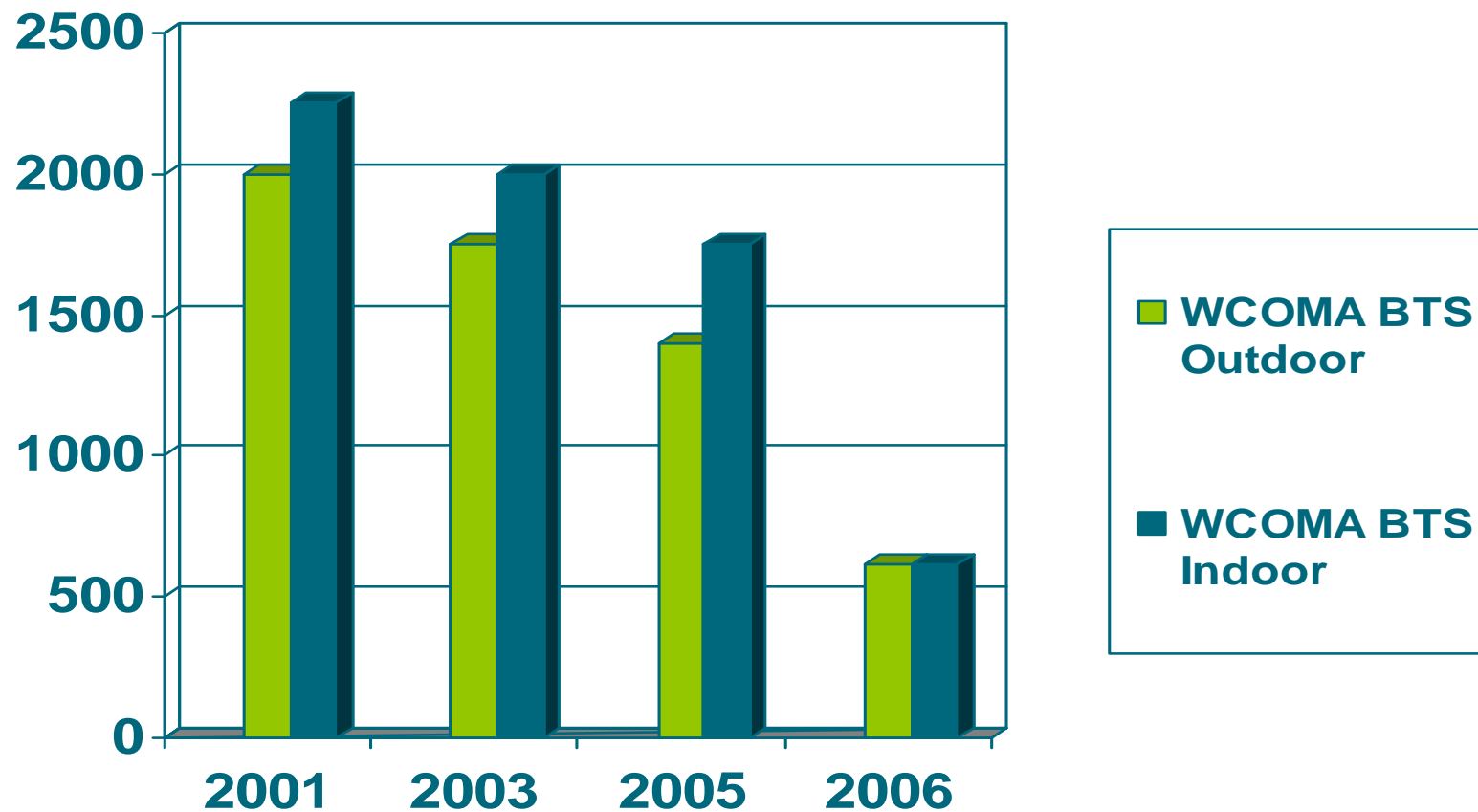

Timing

▶ Scenarios

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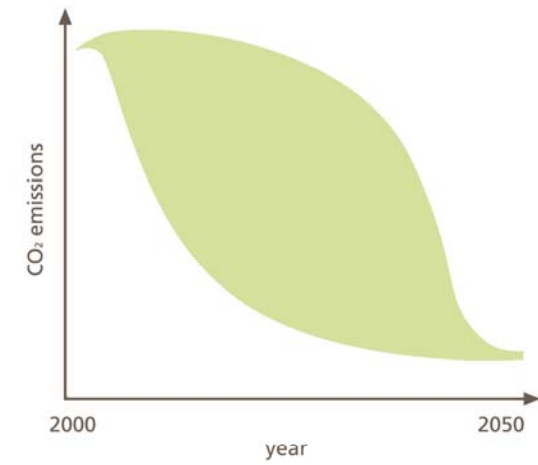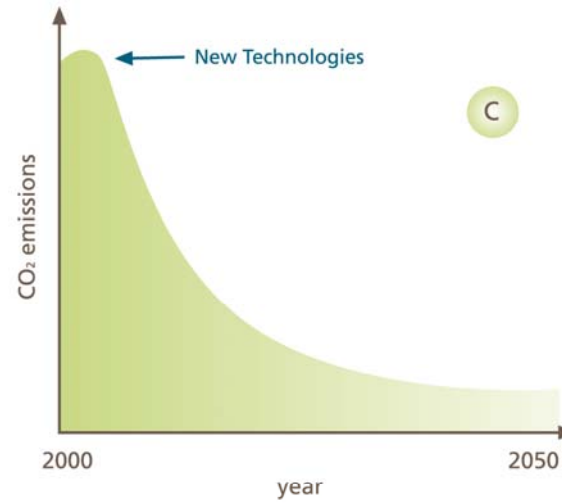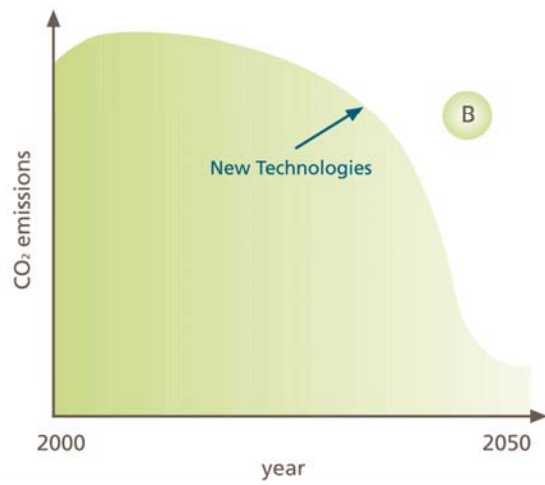
► **So what is the sector doing?**

1. Efficiency / proliferation

2. Peripheral energy use

3. Standby

4. Rapid obsolescence
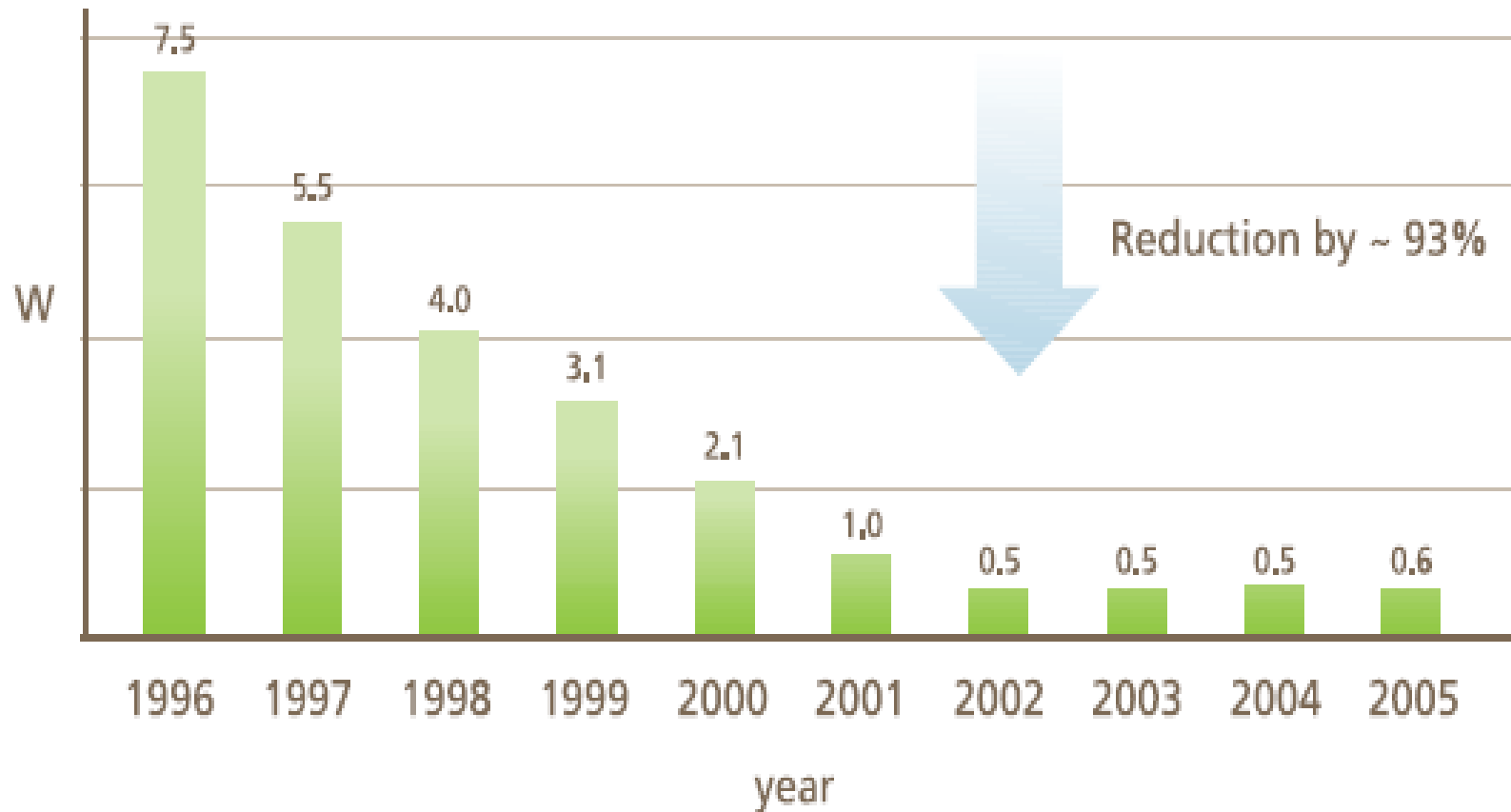
Power Benefit of Moore's Law
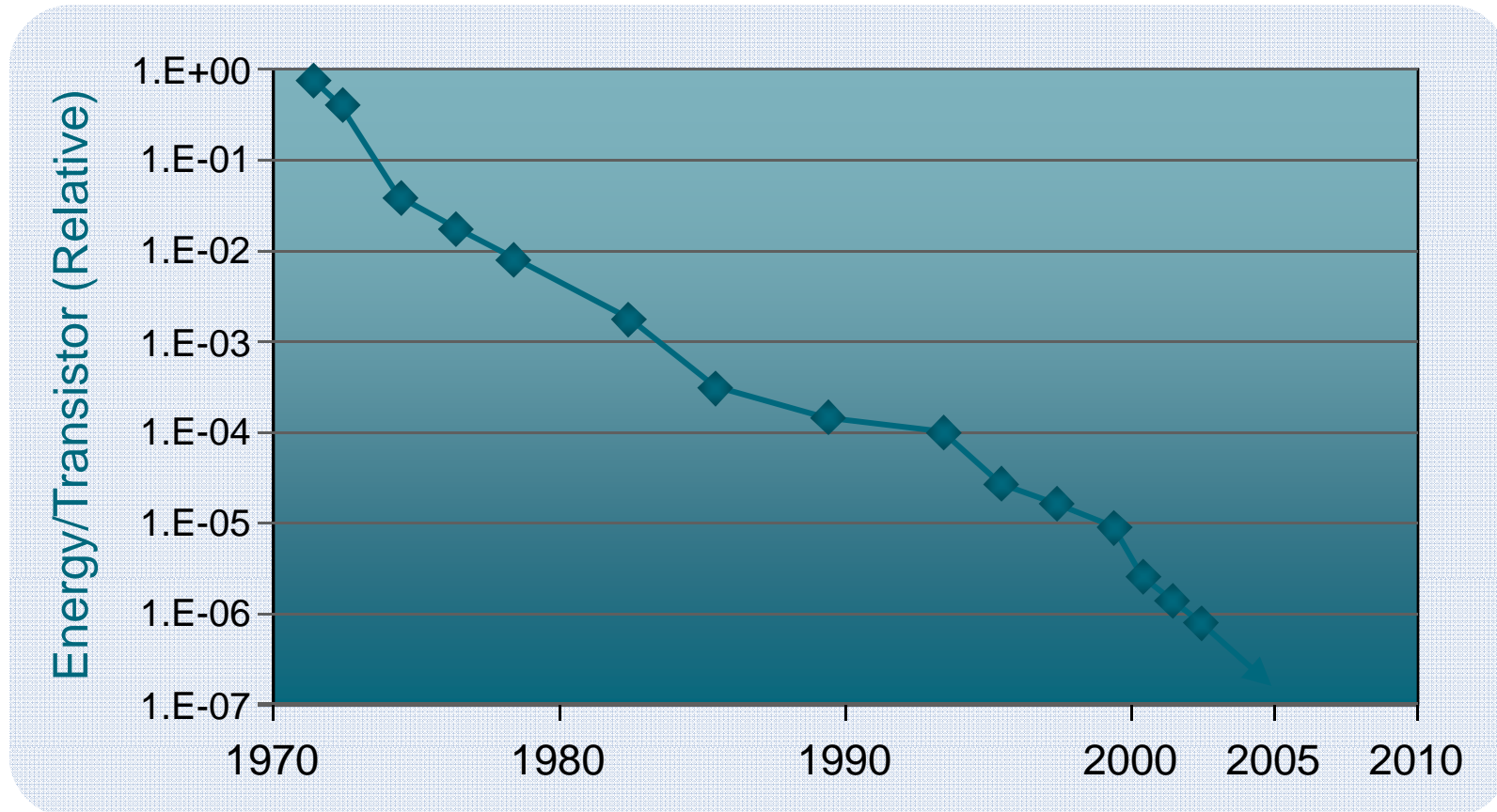
▶ Problems – I Revisited

Efficiency vs. proliferation	Dramatic efficiency improvements are being made…. but not enough to counteract growth.
Peripheral energy use	Things are changing, particularly in the data centre environment. More progress needed.
Standby	TV 0.3W, DVD 0.1W (Sony) Phone charger 0.03W (Nokia)
Rapid obsolescence	Addressed to some extent through eco-design and WEEE. Still a big problem.

Verdict: Could Do Better….

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▶ **So what are we doing about it?**

Industry Commitments

1. Monitor and measure the emissions generated by our own products and services

2. Improve environmental performance throughout our own supply chain by sharing best practice

3. Stimulate and encourage behavioural change

4. Identify and accelerate the development of the best low carbon technologies

► **Progress so far**

Intellect is implementing a programme through which we can deliver the commitments we made in the report

- ➢ Measuring: Joint programme being developed between Warwick University, Intellect, EICTA and INSEAD
- ➢ Best practice: Programme due for launch June 2008, Green Code of conduct drafted
- ➢ User behaviour: Work ongoing to improve information regarding energy use of products at point of sale
- ➢ Identifying the best new technologies: Series of joint workshops scheduled between senior academics and industry CTOs

Work guided by a Leadership Group of UK CEOs.

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**www.intellectuk.org/hightechlowcarbon**

▶ **The Bigger Picture**

What else is the technology sector doing to help other sectors in the economy?

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▶ **What ICT does for other sectors**

Three classes of technology can contribute to an overall reduction in energy demand:

➢ **enhancing** *technologies let us do what we do already, only more efficiently,* **enabling** *technologies produce evolutionary change in everyday processes,* **transforming** *technologies let us do different things altogether*

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► **Enhancing** existing processes: Streetlighting

Before – HPL (Old technology)

After – CosmoPolis (New technology)
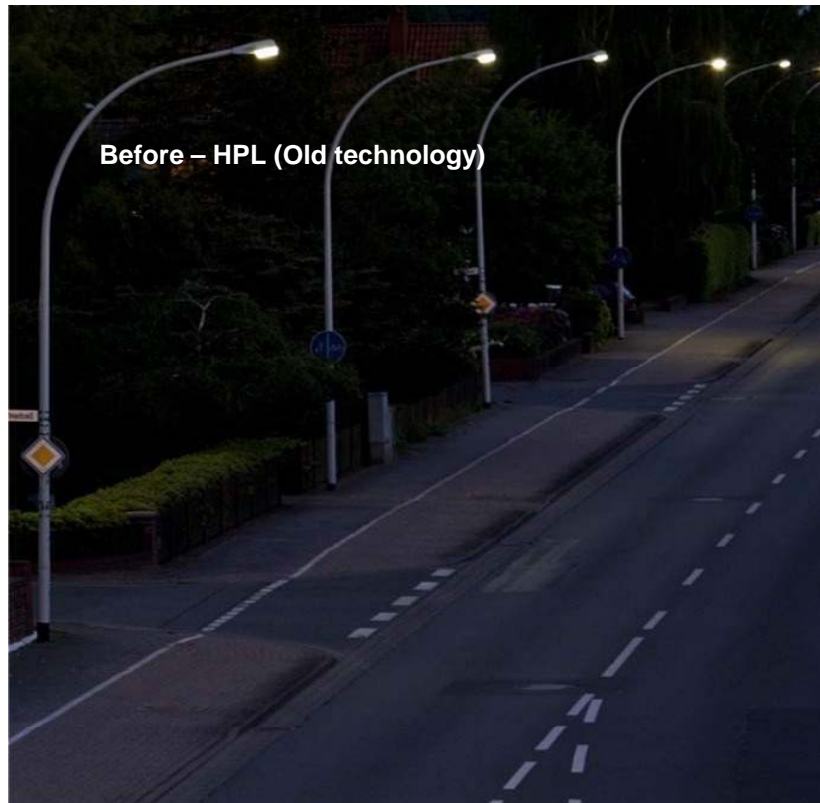
New lighting technology reduces energy requirement by 57% and CO_2 emissions per lamp by 600kg per year – and is better and brighter.

▶ **Enabling** new ways of doing things

	Traditional bookshop	Online Bookshop (Amazon.com)
Titles per store	175,000	2,500,000
Revenue per operating employee	$100,000	$300,000
Annual Inventory Turnover	2-3 times	40-60 times
Sales per square foot	250	2000
Rent per square foot	$20	$8
Energy costs per square foot	$1.10	$0.56
Energy costs per $100 of sales	$0.44	$0.03

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► Transforming behaviour and creating new business models

Broadband – a classic "disruptive" technology

➢ Enables teleworking and videoconferencing
➢ Underpins a whole new range of industries
➢ Has transformed the telecoms market