The Digital Dividend in the UK

Philip Rutnam
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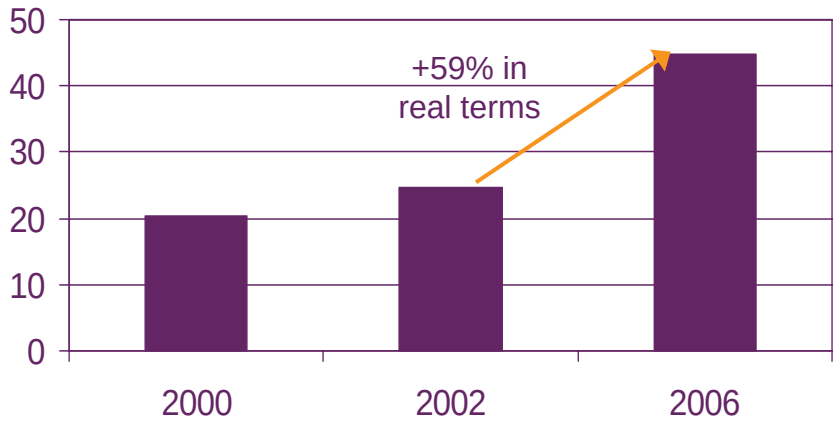
Spectrum and the UK economy

Spectrum is a finite and valuable natural resource. It is the essential input for all forms of wireless communication.

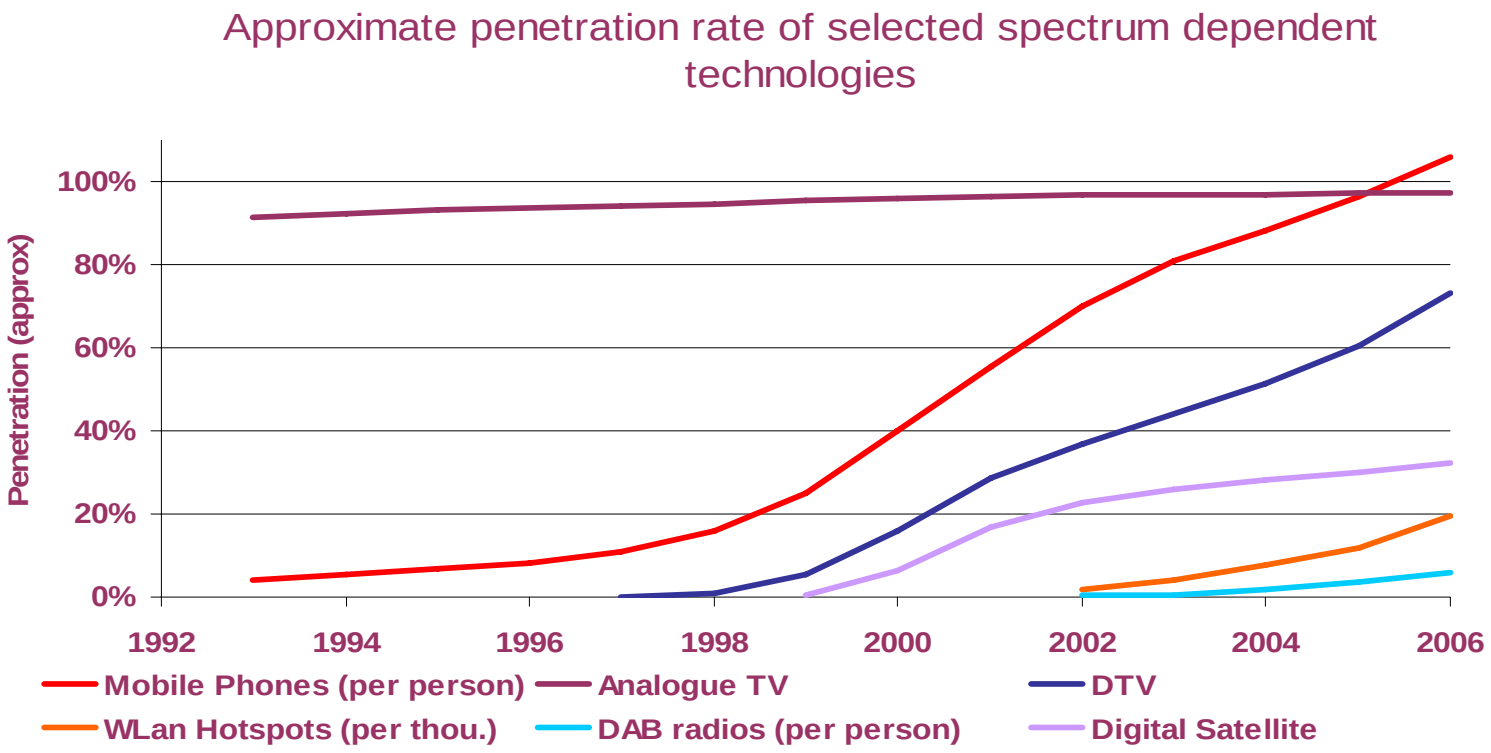
Estimated net benefits to the UK economy (£bn)*



*estimate of consumer + producer surplus
Source: *Europe Economics*, 2006

Business activity that is largely dependent on spectrum contributes **£37bn** or 3.1% to the UK GDP in 2006

Take-up of new wireless services



There are three ways to manage spectrum

Command & control
Decisions made by the regulator

Approach that has historically been adopted for over 90% of the spectrum

Market mechanisms
Decisions made in the market

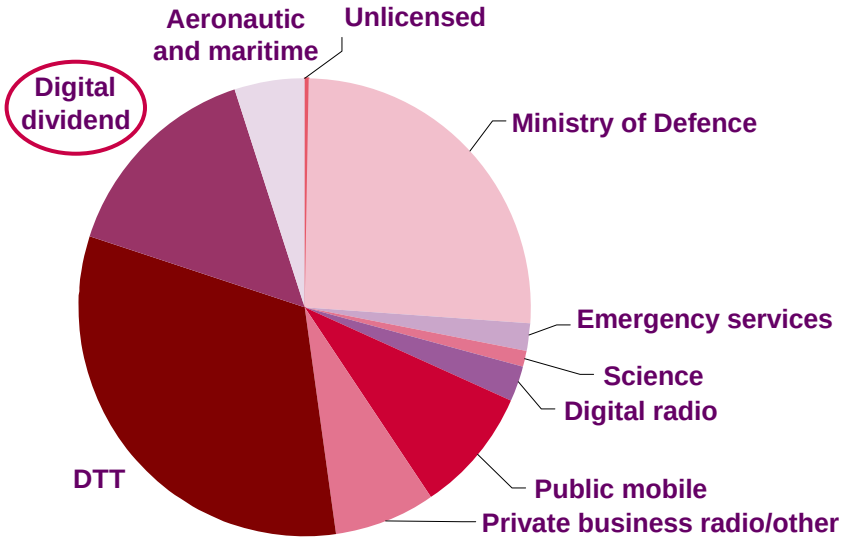
Approach advocated by Cave Reviews in UK. Trading, liberalisation, technology & use neutrality

Licence-exemption
Regulator sets rules, but users not licensed

Approach currently adopted for 9% of spectrum. Some argue for radical increase

Digital switchover and spectrum

- **368MHz** of spectrum presently used by analogue television in the UK.
- UK Government decided in 2003 to reserve **256 MHz** for six DTT multiplexes to operate at digital switchover. This will expand the coverage and capacity of terrestrial broadcasting.
- The core “digital dividend” is the remaining **112 MHz**, available for new uses following switchover



Spectrum in 200 MHz-1 GHz band at switchover

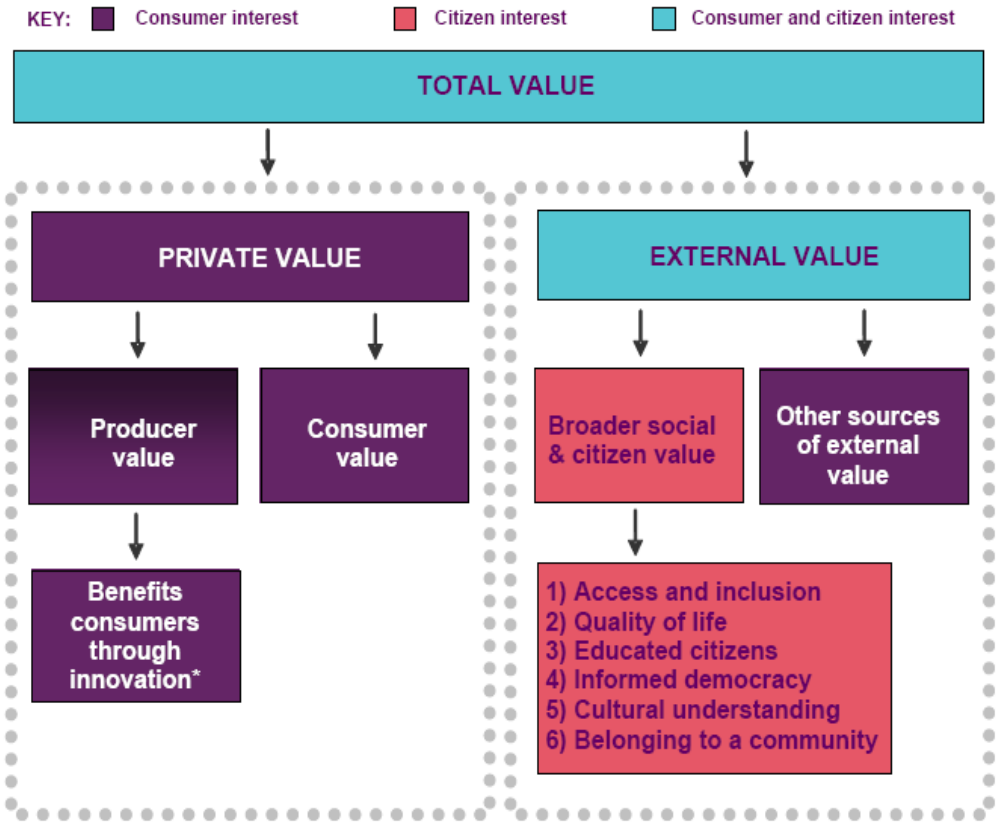
UHF Bands IV and V

Channel	21	22	23	24	25	26	27	28	29	30	31	32
Frequency (MHz)	*470-478*	*478-486*	*486-494*	*494-502*	*502-510*	*510-518*	*518-526*	*526-534*	*534-542*	*542-550*	*550-558*	*558-566*
	33	34	35	36	37	38	39	40	41	42	43	44
	566-574	*574-582*	*582-590*	*590-598*	*598-606*	*606-614*	*614-622*	*622-630*	*630-638*	*638-646*	*646-654*	*654-662*
	45	46	47	48	49	50	51	52	53	54	55	56
	662-670	*670-678*	*678-686*	*686-694*	*694-702*	*702-710*	*710-718*	*718-726*	*726-734*	*734-742*	*742-750*	*750-758*
	57	58	59	60	61	62	63	64	65	66	67	68
	758-766	*766-774*	*774-782*	*782-790*	*790-798*	*798-806*	*806-814*	*814-822*	*822-830*	*830-838*	*838-846*	*846-854*
	69											
	854-862											

- 112 MHz of cleared spectrum (14 × 8 MHz)
- 256 MHz of spectrum retained for DTT (32 × 8 MHz but interleaved capacity available within this)
- Channel 36 (used for airport radar)
- Channel 38 (used for radioastronomy)
- Channel 69 (used for programme-making and special events)

Strategic review: 2006-07

- Objective to maximise the total value to society that using the digital dividend is likely to generate over time
- Key question: should we depart from market-led approach?
- Analysis based on:
  - market research
  - economic modelling
  - secondary research
  - technical analysis
  - consultation responses



Many possible uses

Many potential uses, but here are a few:

- mobile broadband
- mobile television
- more DTT (SD & HD)
- local television
- wireless microphones
- cognitive radio
- low-power applications (e.g. wireless home hubs)

The long list…

- Mobile television and other types of mobile video and multimedia
- Extending existing DTT coverage
- New DTT channels aimed at a UK market in either standard or high definition
- New DTT channels aimed at local markets
- Wireless microphones and other applications for PMSE
- Other low-power applications, like hubs to distribute content around the home or using ultra-wideband technologies
- Broadband wireless applications, which could be mobile, and other mobile voice and data services
- First-responder and public-safety services
- Cognitive radio
- Community radio
- Digital radio
- Communication with medical professionals and educational institutions
- New services for people with disabilities
- Amateur and/or university use
- International and cross-border uses (e.g. an international first-responder channel)
- Digital public-service teletext to match the analogue service
- User-created networks (e.g. employing mesh technology)
- Home networks, including automation and control
- Business networks
- Community and campus networks
- Municipal wi-fi
- Internet-connection sharing by multiple households
- Industrial monitoring and automation
- Agricultural monitoring and automation
- Rural broadband provision
- Ubiquitous wireless networks
- Sensor-based networks
- Remote patient monitoring and healthcare
- An alternative nationwide broadband wireless network

Our conclusion

- After a major consultation and extensive research, we decided not to reserve most of the digital dividend for particular uses (with one important exception)
- Benefits to this market-led approach
  - allows use to change as technology and consumer demand changes
  - gives innovative services the chance to use the spectrum
  - promotes competition, choice and efficiency
- We do not believe in regulators trying to pick winners

Programme-making and live events

- Identified just one compelling case of market failure, requiring intervention
- We have decided to guarantee programme-makers and special events organisers access to spectrum until they can participate effectively in the market
- We are also *packaging* spectrum in a way suitable for local TV – but not reserving access. And looking to allow licence-exempt *cognitive* access.

The challenge of implementation

Define strategy

Define technical usage rights
adjacent bands, other new uses, neighbouring countries

Determine packaging
match supply to demand

Address competition issues
anticompetitive and inefficient behaviour

Design the awards
auction rules, beauty-contest criteria

Engaging with Europe & neighbours
non-mandatory, non-exclusive harmonisation

Deliver the awards

International and European developments

- World Radiocommunication Conference 2007
  - Primary mobile allocation for 790-862 MHz in more Region 1 countries from 2009
  - Primary mobile application for 790-862 MHz in all Region 1 countries from 2015
- European Commission Communication on digital dividend
  - Proposed identification of common bands for clusters of similar networks
  - Did not address precise locations of those bands
- CEPT band plan
  - 790-862 MHz
- Developments in other European countries – especially our neighbours

Why does the digital dividend matter?

- Value to the economy uncertain but estimated to be **£5-10 billion** over 20 years
  - net present value to consumers and businesses
  - not an estimate of auction revenue
- Spectrum below 1 GHz rarely becomes available. Existing framework dates to 1961.

A new world