



HD

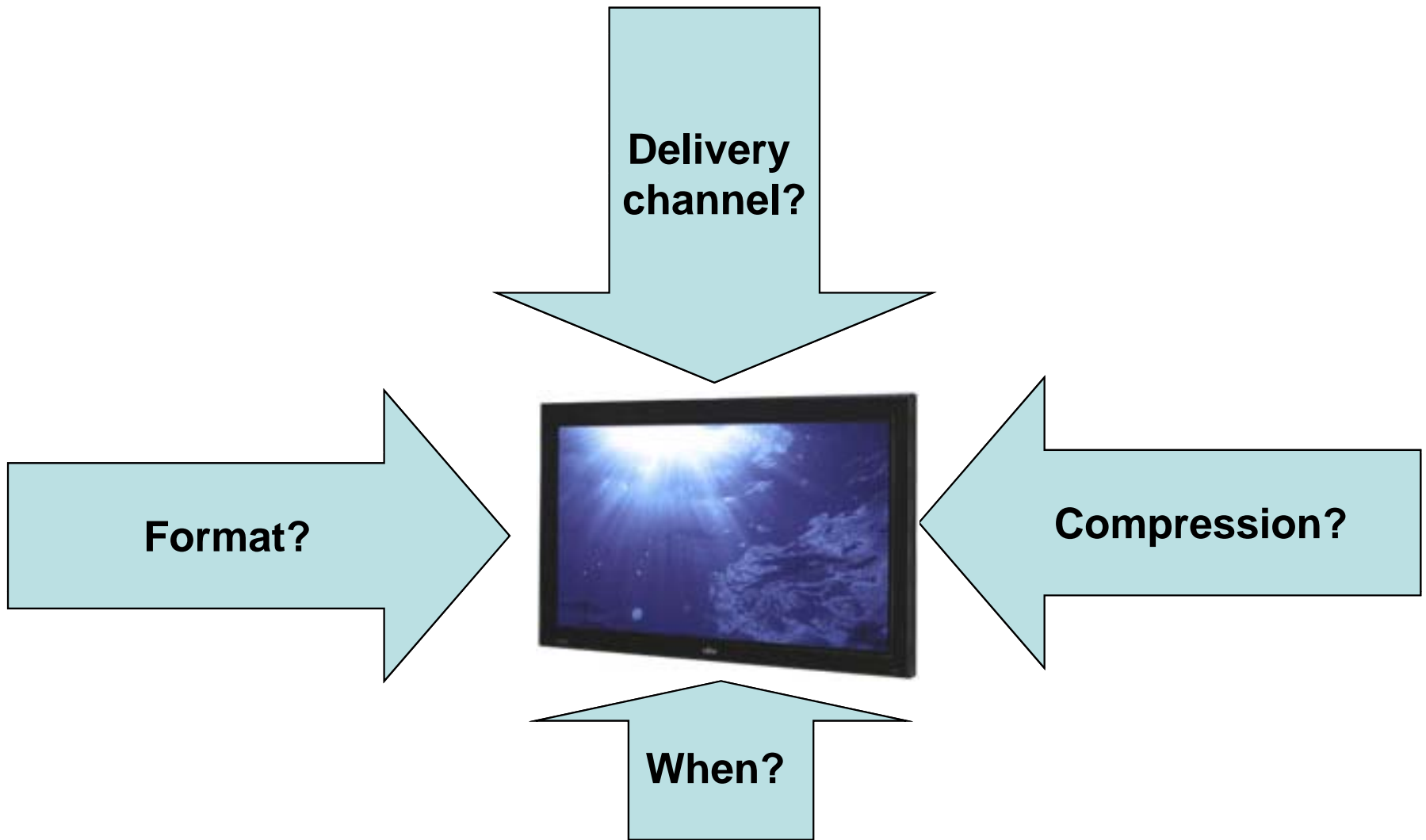
a technology whose time has come?

David Wood EBU

Plan de service MPEG4

R1 HD / SD	 HD	 HD				
R2 HD / SD	 HD	 HD				
R3 HD / SD	 HD					Direct 8
R4 HD / SD	 HD				NT 1	
R5 MOBILITE	MOBILITE « DVB -H »					
R6 HD / SD	 HD	 HD				

TF1 proposal to CSA for DTT in France...watch this space.....



What should we do in a flat panel WXGA HD world?

HD the last time....



- Ten years' ago, the 'risks' for broadcasters in starting HD were enormous.
- 1990 Hypothesis: a national broadcaster with one or two HD channels can drive a market for gigantic HD receivers which cost at least five times the cost of a normal TV set.
- The costs of HD production are very large – and no more income is likely.
- It just did not 'add up'.



HD this time....



- The HD receiver market (WideXGA) is establishing itself. We don't have to do anything
- The receivers will be less obtrusive, and thus more attractive to viewers
- The market drivers will include HD packaged media
- The 'market drivers' may also include consumer HD video
- Production in 'HD islands' is going to be cheap.
- By 2006/10 it may be 'adding up'.



The Flat panel world

- 42" plasma PDP
WideVGA (480p)
- 50" plasma PDP
WideXGA (768p)
- 17"- 36" LCD WideVGA
and WideXGA
- 50"-60" Plasma 1080p
- **Eventual dominance of
WideXGA LCD?**



Want an HD DVD?



- **Welcome to the DVD standards war.**
- HD-DVD-9
- AOD
- Blu-ray
- HD-DVD-2
- HD-DVD-1
- HD-DVD-RW
- EVD
- **HD Content- 2005/6?**

HD 'prosumer' equipment



- The JVC GR-HD1 camcorder
- Native format is currently 720p/30
- Costs about 4.3k Euros
- Records on miniDV using 25Mbit/s MPEG2
- Edit on PC with Adobe Premier
- **“HD for the masses”**



Which delivery platform?



- Different delivery platforms have different data capacities, different coverage areas, different reception targets.
- Digital satellite delivery has few restrictions on capacity. DVB-S2 allows 50Mbit/s or more per transponder, so there will be lots of space.
- Digital terrestrial delivery will have more restrictions on capacity
- There may be new options such as broadband.
- The jury is still out.

Which compression system?



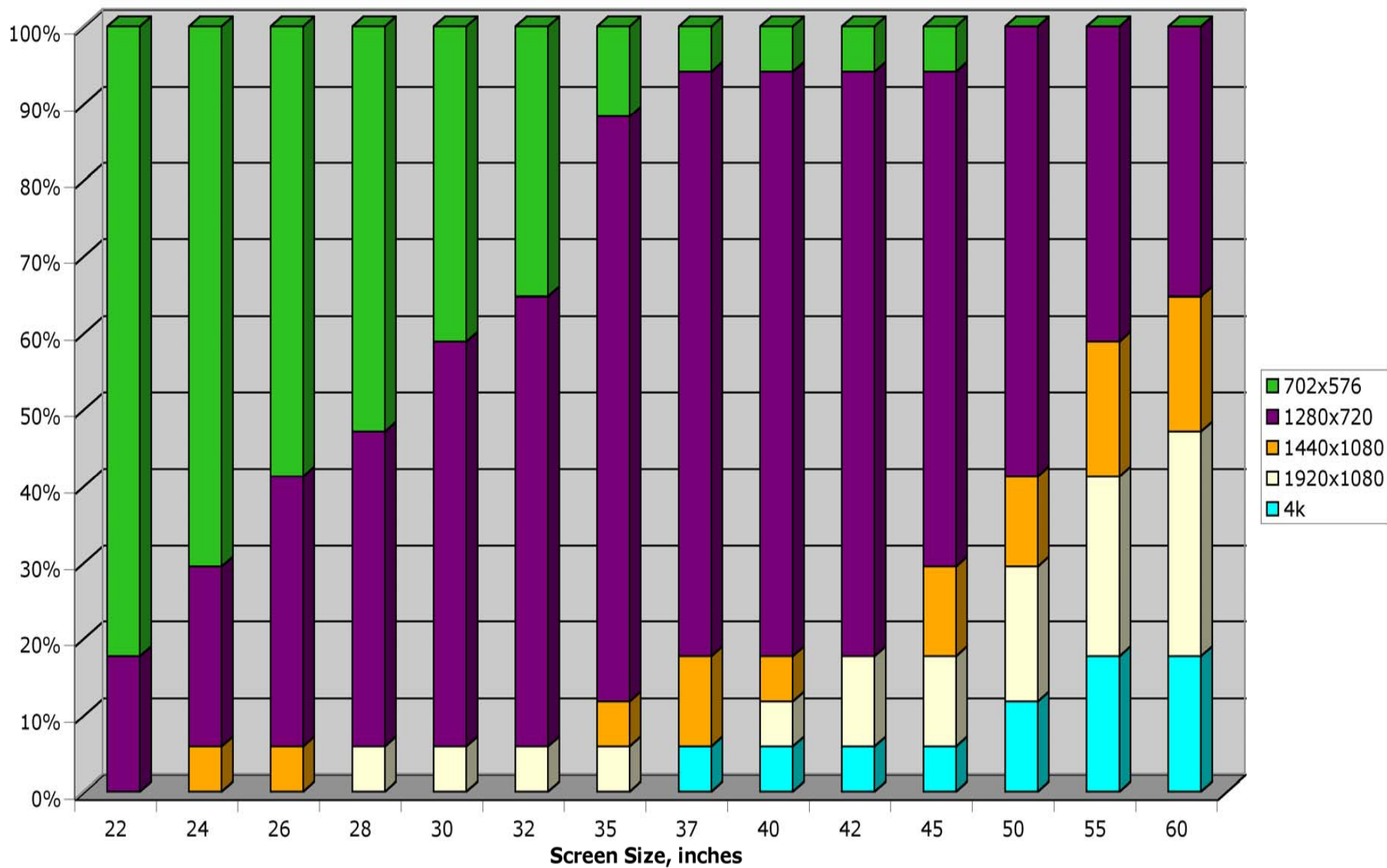
- Choice is probably MPEG2, MPEG4AVC, WMVC9.
- Most efficient may be MPEG4AVC, but there are licensing issues.
- WMVC9 not yet an open standard.
- MPEG2 encoding can still be improved
- The jury is still out

Which format?



- Why progressive delivery channel best?
- **No standards converter** to progressive scanning needed in the receiver
- **More efficient compression**, and thus higher picture quality for a given bit rate
- Better for sports applications - **slow motion replay is better.**
- Two options: 720p and 1080p

TV Standard required to provide adequate horizontal resolution for 2.8m viewing distance



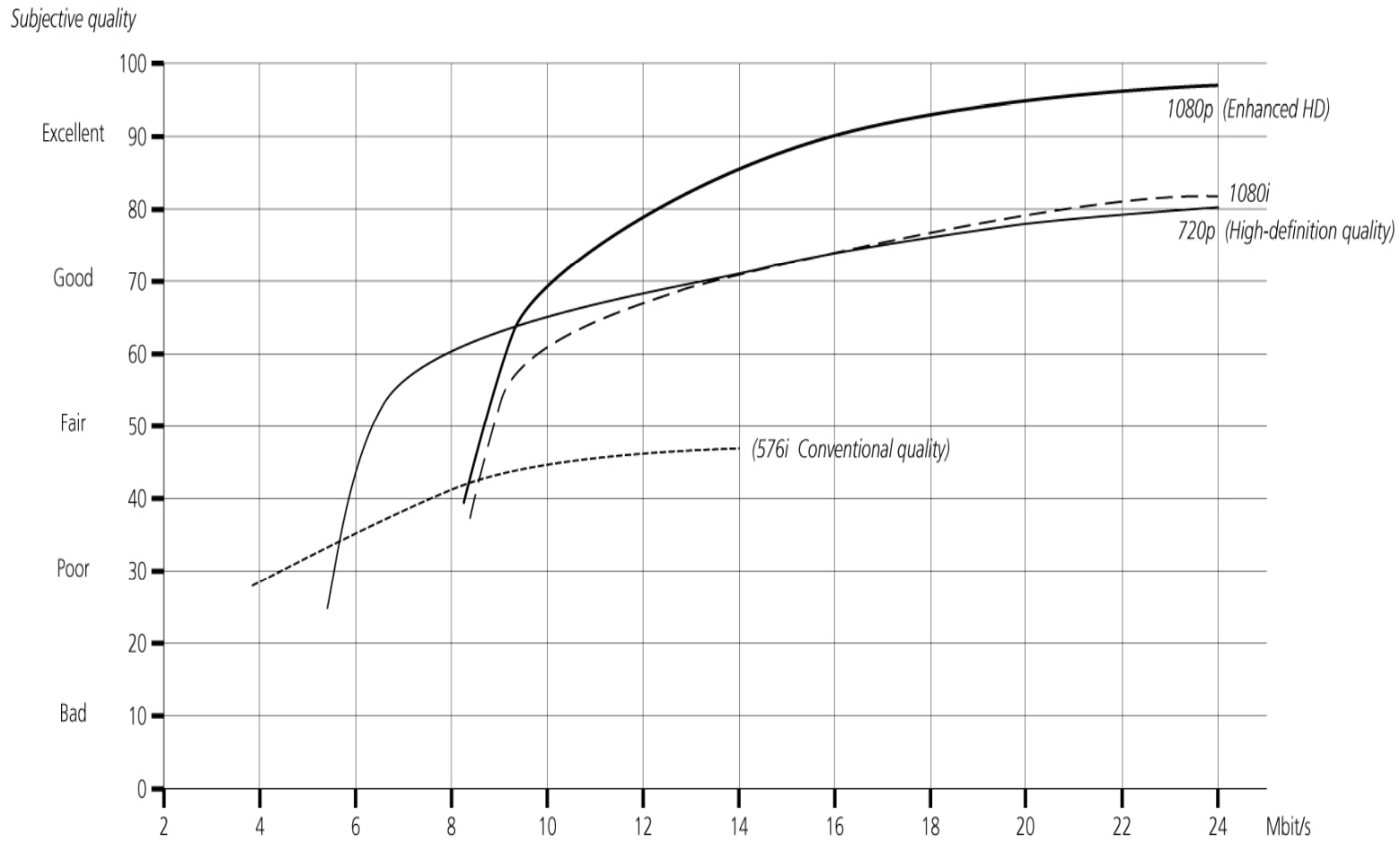


How do they perform using MPEG2?

TQE has tried to estimate this, but
full subjective evaluations will
eventually be needed



FIG. 2: INDICATIVE CURVES OF RELATIVE QUALITY VERSUS COMPRESSED MPEG2 BIT RATE
Wide SXGA FPDs display, 2.5H viewing distance



What happens elsewhere?



- CBS and NBC and US DTH use 1080i/60
- ABC, FOX, ESPN use 720p/60. Their main argument is 'better for sports programming'.
- US HD DTT receivers need to decode 18 different formats (yes, 18, it's not a typing error).
- In Australia 1080i, 720p, 576p allowed. 1080i and 576p in use.
- In Japan 1080i and 720p allowed. 1080i in use.
- 1080i/60 has slightly better performance than 1080i/50 because of higher interlace factor. Progressive scanning thus slightly more valuable for 50Hz countries than 60Hz countries.

Conclusions 1



- Between 2006 and 2010 there **may** be market and consumer pressure to introduce HD broadcasting – bearing in mind the expenditure made in displays and to match HD DVD.
- Home videos may be better quality than our broadcasts.
- New compression systems such as MPEG4AVC should be more developed by then.
- Public service broadcasters have a responsibility to serve the nation. If many have HD receivers, it may be responsible to do something about it.

Conclusions 2



- Progressive scanning advantageous for delivery channel.
- Gives maximum quality to viewer at lowest bit rate, and ‘decouples’ the delivery channel from the ‘production’. It is better to have one expensive standards converter at the studio output than a million cheap ones in viewers’ receivers.
- For those starting in near future, (alas) receivers’ may be limited to 720p.

Conclusions 3



- Probably MPEG4 AVC best bet
- Probably the largest European economies will have 20% HD-capable receivers in the home by end decade.
- HD prosumer based production and editing will be cheap.
- Converting large production studios to HD another matter.but that's another story.

Issues for consideration



- What deliver bit rates are needed for contribution networks?
- What degree of post processing should be allowed for?
- Should there be one or more common formats for international contribution networks?



Are we near to the HD dream?
You decide.

Thank you for listening
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