

4K TV @ NOS?

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A large red circular graphic on the right side of the slide, partially cut off by the edge. Inside the circle, the NOS logo is displayed.

Altijd.
Overal.
NOS



Agenda

1. Status on HD and 4K in the Dutch broadcasting Industry
2. Status on HD and 4K at NOS
3. 4K and the status of TV production facilities in the Netherlands
4. Looking ahead
5. Actions of NOS regarding 4K

6. Questions



Status on HD and 4K in Dutch Broadcasting

- All Main channels are doing play-out in HD since 3-4 years
 - SBS, RTL, NPO
- Even at this moment not all content is real HD.
- HD production facilities and connections are still more expensive compared to SD
- Not all live broadcasts are in HD yet
- The broadcasters recently invested in HD equipment
- Money is not spent in technical innovations like 4K
- 4k equipment will be installed when renewed if affordable



Status on HD and 4K at NOS

- NOS News is still SD
 - HD will be implemented in the next 6 months
 - Studios will be used at least until 2020
- NOS Sports and most live Events are in HD
 - Replacement of the sports studio at the end of 2015
 - We investigate a 4K/HD for sports
- Last 2 years the whole NOS environment was migrated to HD
 - Archive, Editing, Live Feeds, Play-out



Status on HD and 4K at NOS

- NOS backbone and infrastructure is based on HD bandwidth
 - Videomatrix (still video on copper)
 - Cable length
- Video storage is based on HD not on 4K
- Budget Cut by the government of 25% of budget
- NOS will only invest during the scheduled replacements and against lower budget
- Extra investment in 4K means less investment in live programs



4K MultiCamera production chain “LIVE Broadcast”



ENG 4K production Chain / Editing “NOT LIVE”





Status 4K MultiCamera Facilities in the Netherlands

4K MultiCamera production equipment for 4k

| | Availability | Cost Effect |
|-------------------------------|--------------|-------------|
| Outside Broadcast van in 4K | | ↑ ↑ |
| * Slomo Machines | | ↑ ↑ |
| * Realtime (3d) Graphics | | ↑ |
| * Camera's and chains | | ↑ ↑ |
| * Switcher | | ↑ ↑ |
| * Registration | | ↑ |
| * Interfacing and Integration | | ↑ ↑ |

Connectivity for 4K LIVE broadcasting

| | Availability | Cost Effect |
|------------------------|--------------|-------------|
| Satellite Contribution | | ↑ ↑ |
| FIBER | | ↑ ↑ |



4K chain ENG, Play-Out and Distribution

ENG Camera's

| | Availability | Cost | Effect |
|--------------------------|--------------|------|--------|
| ENG camera's stand alone | | | ↑ |
| Editing simple | | | ↑ |

Play-out Channel

| | Availability | Cost | Effect |
|-------------------------|--------------|------|--------|
| Simple play out | | | ↑ |
| Overlays and animations | ? | | ↑ |

| | Availability | Cost | Effect |
|-------------------------------------|--------------|------|--------|
| Distribution of Live Channel | | | ???? |



Conclusions on 4K MultiCamera production chain



We can't produce it and we can't broadcast it

Conclusions on ENG 4K production chain



We can produce it but we can't broadcast it



Looking ahead

- 4K screens for consumers will reach the same price level in HD in the near future
- Broadcasters & Distributors cannot keep up with this speed.
- Live production of (sport)events in 4K will be an issue for the next coming years
- Instead of 4K many broadcasters would prefer 100/120 frames HD instead of 50 frames 4K
 - Transition is simpler and smoother
 - Quality effect in movements is far better



Looking ahead

- Should we wait for 8K instead of 4K?
 - NHK is announces that the Olympics of 2020 will be in 8K
 - PC world *“Forget 4K, Sharp's already pushing TVs with 8K resolution*
- We should anticipate on 4K or 8k when making decisions about long term investments like studios
- Connectivity and the development of more efficient codecs is crucial. Not only for distribution but also for production standards
- We should wait until the cost equipment of 4K is at the same level as HD (like we did with SD > HD, approx. 5 yrs)



Actions of NOS for 4K

- Investigate and decide on the level of 4K in the renewal of our studio for sports in 2015
- Adapt our infrastructure in order to handle 4K signals
 - Up/Down conversion to and from HD (or even SD)
 - Pass-through during international live events if produced in 4K
- Follow the market of other broadcasters



To Conclude

- I once said during a seminar in 2008 that it would take until 2012 to have a substantial amount of HD productions in the Netherlands.
- In 2014 we are almost producing everything in HD
- Although today technology is developing even faster my estimate is that this takes again another 4 years to get 4K implemented in a substantial amount of live broadcasts.

At least....if it will be 4K and not 8K.....

Thank you

Any questions?



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